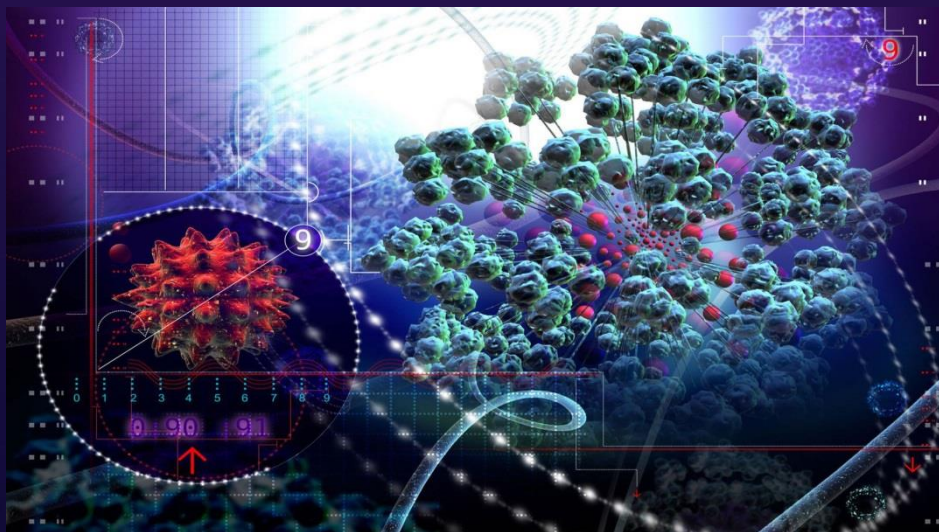


О. С. Воеводина

**Англо-русско-немецкий словарь  
биотехнологических терминов  
с определениями**



Министерство образования и науки Российской Федерации  
ФГБОУВПО «Удмуртский государственный университет»  
Факультет профессионального иностранного языка  
Кафедра №5 для естественнонаучных специальностей

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Словарь-справочник



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Словарь предлагает ряд биотехнологических терминов на английском языке, имеющих определения для уточнения значения и перевод на русский и немецкий языки. Также предложены примерные статьи данной научной области для практики употребления терминологических единиц в контексте и их перевода.

Пособие предназначено для студентов бакалавриата и магистратуры естественнонаучных направлений подготовки, для студентов лингвистических направлений, занимающихся профессиональным переводом, может быть использовано учеными, техническими специалистами, исследователями, соприкасающимися с немецко- и англоязычными научными разработками в сфере биологии, химии, биохимии, биотехнологии, иммунологии, фармацевтики и пр.

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## Предисловие

Настоящее издание англо-русско-немецкого словаря биотехнологических терминов с определениями является попыткой представить новейший список терминов, применяемых в настоящее время в биотехнологии, биохимии, генной инженерии и тесно связанных с ними областях. Данный словарь является удобным справочным материалом и предназначен для студентов высших учебных заведений, обучающихся на естественнонаучных направлениях, а также для студентов лингвистических направлений, включающих в перечень дисциплин углубленный профессиональный перевод. Пособие может быть использовано учеными, техническими специалистами и исследователями, соприкасающимися с немецко- и англоязычными научными разработками в сфере биологии, химии, биохимии, биотехнологии, иммунологии, фармацевтики и пр.

Принимая во внимание специфику целевой аудитории и основываясь на анализе критериев, выдвинутых разными авторами (Л.В. Щерба, И.В. Рахманов, П.Н. Денисов, В.Д. Аракин, А.А. Миролюбов, Н.В. Николаев, Ю.А. Сафьян, В.С. Коростелев и др.), были выделены следующие критерии отбора терминологических единиц: 1) частотность, 2) тематический критерий, 3) интеграционный критерий, 4) функциональность терминов, 5) критерий подобия терминологических единиц в английском, немецком и русском языках. Обозначено их включение в учебный процесс.

Англо-русско-немецкий словарь биотехнологических терминов был подготовлен в ответ на выраженную потребность. При довольно большом количестве стандартных биологических и химических словарей в распоряжении студента на настоящий момент не существует доступного специализированного словаря по более узкой терминологии биотехнологии, биохимии, генной инженерии. Многие термины, приведенные в данном издании, в ином случае можно обнаружить только в опубликованных исследованиях и фундаментальных трудах. Термины, включенные в данное пособие, были отобраны путем изучения специальных словарей, энциклопедий, определителей, толковых словарей, справочников, технических

руководств, книг, веб-сайтов, журналов и рефератов, полностью или частично касающихся биотехнологии или смежных областей.

Объем словаря составляет 1200 терминологических единиц и в большей мере определен требованиями ФГОС ВПО и примерной программой дисциплины «Иностранный язык», предписывающими, что за курс обучения студентам необходимо продуктивно усвоить 1400 - 2000 иноязычных терминов по направлению. Совершенно очевидно, что этим не исчерпывается все разнообразие биотехнологической и биохимической терминологии, что в настоящие дни она динамично развивается и является крайне востребованной.

Выбор английского и немецкого языков неслучаен. В настоящее время это языки, на которых публикуются все передовые исследования и разработки в области биотехнологии и биохимии. Большинство студентов изучают английский в качестве основного иностранного языка. Однако очень многие, особенно предполагающие работать за границей, либо ведущие совместные зарубежные проекты, вынуждены также знать и немецкий язык, так как Германия является современным лидером в области биотехнологий. В данной связи англо-русско-немецкий словарь биохимических и биотехнологических терминов, учитывающий опыт как отечественных, так и зарубежных исследований, представляет особую ценность для лиц, которые приобретают навыки изучения английского и немецкого языков.

Роль определения в данном издании обусловлена тем, что дефиниция не только является важнейшей составляющей языка науки, но и фиксирует состояние знания на определенный момент действительности. Определения помогают студентам и преподавателям, не имеющим естественнонаучного образования, осознавать переводимые понятия и корректировать перевод.

В словаре принято следующее расположение терминов: английские термины располагаются в алфавитном порядке; если термин имеет несколько абсолютно разных значений, он занесен несколько раз, пронумерован, а значения терминов располагаются по степени их употребительности в языке и сочетаемости с другими словами. Во избежание разночтений термина далее следует его краткое определение (разъяснение) на английском языке, так как данный словарь подра-

зумекает только узкое, научное определение терминологической единицы, отбрасывая общеупотребительную лексику. Следующая колонка – это русский, и далее – немецкий эквивалент рассматриваемой терминологической единицы.

В приложении приведены узкоспециальные тексты на английском и немецком языках, предлагающие рассмотрение ряда терминов в контексте. При отборе статей автор ориентировался, как правило, на студентов, владеющих курсами биологии, химии и биохимии в объеме как минимум двух первых курсов биолого-химического факультета университета. Предполагается, что студенты естественнонаучных направлений могут ознакомиться с данными текстами и использовать их в практике перевода.

Автор выражает благодарность **научному консультанту** данного издания кандидату биологических наук **Дё Инессе Александровне** (Гёттингенский университет имени Георга-Августа).

## Словарь биотехнологических терминов с определениями

English term	Definition	Russian term	German term
Abatement	Reducing the degree or intensity of, or eliminating, pollution.	Борьба с выбросами	Verminde-rung
Abscisic acid	Abscisic acid (ABA) is an isoprenoid plant hormone that plays an important part in plant responses to environmental stress and plant pathogens. ABA is produced in terminal buds where it contributes to dormancy and scale formation.	Абсцизовая кислота	Abscisinsäure
Absolute configuration	The actual, as opposed to relative to some other compound, orientation of atoms in space at an asymmetrical centre.	Абсолютная конфигурация	Absolute Konfiguration
Absorbed dose	In exposure assessment, the amount of a substance that penetrates an exposed organism's absorption barriers (e.g. skin, lung tissue, gastrointestinal tract) through physical or biological processes. The term is synonymous with <i>internal dose</i> .	Доза поглощения	Absorbierte Dosis
Absorber	Any material that stops ionizing radiation. Lead, concrete, and steel attenuate gamma rays. A thin sheet of paper or metal will stop or absorb alpha particles and most beta particles.	Поглотитель	Absorber
Absorption barrier	Any of the exchange sites of the body that permit uptake of various substances at different rates (e.g. skin, lung tissue, and gastrointestinal-tract wall).	Абсорбционный барьер	Aufbrennsperre
Absorption spectrum	The molar absorption (extinction) coefficient as a function of wavelength, usually displayed with absorbance on the ordinate and wavelength on the abscissa.	Спектр поглощения	Absorptionspektrum
Acceptor	<p>In enzyme mechanisms, a functional group of an enzyme that transiently receives a moiety of a substrate, the <i>donor</i>, before itself becoming a donor in transferring it to a second substrate, which is also an 'acceptor'.</p> <p>More generally in immunology, pharmacology and cell biology, it is an entity that receives an atom, ligand or structure from a 'donor'.</p>	Акцептор	Acceptor
Acequia	Acequias were important forms of irrigation in the development of agriculture.	Ирригационный канал	Acequia
Acetogenin	A compound derived from acetyl units donated by acetyl- and/or malonyl-CoA units, assembled into a non-reduced polyketide, i.e. with the carbonyl groups intact, often, then, cross-linked by aldol condensation and processed by further biochemical transformations to the final product, e.g. orsellinic acid, griseofulvin.	Ацетогенин	Acetogenin
Acid neutralizing capacity	Measure of ability of a base (e.g. water or soil) to resist changes in pH.	Кислотно-нейтрализующая способность	Säureneutralisationskapazität



Acinar cell	A secretory cell within an acinus.	Ационарная клетка	Azinuszelltu- moren
Acinus	A cluster of secretory cells surrounding a duct.	Ацинус	Acinus
Acrosome	A specialized lysosome of a spermatozoon that contains hyaluronidase, the proteinase acrosin and other hydrolytic enzymes.	Акросома	Akrosom
Actin	A protein present in eukaryotic cells, forming actin filaments, which is a major component of the cell's cytoskeleton, the network of relatively rigid structures within a cell that give it shape.	Актин	Aktin
Activated macrophage	A macrophage in a state of enhanced metabolic activity; a "super phagocyte".	Активирован- ные макрофаги	Aktivierten Makrophagen
Activation energy	The energy needed to raise the reactants, or an enzyme-substrate complex, to the transition state, where it has an equal likelihood of conversion to product or reversion to reactants.	Энергия акти- вации	Aktivierungs- energie
Activator	A chemical that increases the rate of an enzymic re- action.	Активатор	Activator
Active Ingredient	In any pesticide product, the component that kills, or otherwise controls, target pests. Pesticides are regulated primarily on the basis of active ingredients.	Активный ин- гредиент	Wirkstoff
Active site	The binding and catalytic sites of an enzyme; more loosely, those residues of an enzyme that interact with a substrate or participate in any way in binding or catalysis.	Активный центр	Aktives Zentrum
Active transport	An energy-requiring transport mechanism; one that works against a concentration gradient.	Активный транспорт	Aktiver Transport
Acute Exposure	A single exposure to a toxic substance which may result in severe biological harm or death. Acute exposures are usually characterized as lasting no longer than a day, as compared to longer, continuing exposure over a period of time.	Острое воз- действие	Akuten Auswirkun- gen
Acute Toxicity	The ability of a substance to cause severe biological harm or death soon after a single exposure or dose. Also, any poisonous effect resulting from a single short-term exposure to a toxic substance.	Острая ток- сичность	Akute Toxizität
Adaptation	The evolution of a feature or function through natural selection of incremental improvements, as contrasted with exaptation.	Адаптация	Anpassung
Adaptive radiation	The evolution of new species or subspecies to fill unoccupied ecological niches.	Адаптивная радиация	Adaptive Radiation
Additivity	The principle of thermodynamics that free energy (or enthalpy of entropy) is a sum of contributions of independent components, e.g. the free energy of a protein transition is the sum of free energy changes owing to hydrogen bonding, electrostatic interactions, van der Waals packing effects, restriction of rotation about bonds, interactions with solvents, etc.	Аддаитивность	Additivität
Add-on control device	An air pollution control device such as carbon absorber or incinerator that reduces the pollution in an exhaust gas. The control device usually does not affect the process being controlled and thus is "add-on"	Дополнитель- ное устрой- ство контроля	Zusätzliches Steuergerät

	technology, as opposed to a scheme to control pollution through altering the basic process itself.		
Adenine nucleotide translocase	A protein that catalyses the exchange of ATP for ADP across the mitochondrial inner membrane. Its activity is essential in supplying ATP from mitochondria to the cytosol.	Адениннуклеотидная транслоказа	Adenin-Nukleotid-Translokase
Adiponectin	A hormone produced and secreted by adipose cells that modulates lipid and glucose metabolism. Adiponectin concentrations in the blood are inversely correlated with obesity and metabolic derangements.	Адипонектин	Adiponectin
Administered dose	In exposure assessment, the amount of a substance given to a test subject (human or animal) to determine dose-response relationships. Since exposure to chemicals is usually inadvertent, this quantity is often called <i>potential dose</i> .	Введенная доза	Verabreichten Dosis
Adsorption	Removal of a pollutant from air or water by collecting the pollutant on the surface of a solid material; e.g., an advanced method of treating waste in which activated carbon removes organic matter from wastewater.	Адсорбция	Adsorption
Adulterants	Chemical impurities or substances that by law do not belong in a food, or pesticide.	Примеси	Verfälschungsmittel
Advanced treatment	A level of wastewater treatment more stringent than secondary treatment; requires an 85-percent reduction in conventional pollutant concentration or a significant reduction in non-conventional pollutants. Sometimes called <i>tertiary treatment</i> .	Глубокая очистка	Weitergehende
Aeration	A process which promotes biological degradation of organic matter in water.	Аэрация	Behandlung
Aerobe	A microorganism that grows in the presence of oxygen.	Аэробы	Aeroben
Affinity chromatography	The separation of soluble macromolecules by use of a stationary phase that is designed to interact specifically with, and thus retard the elution of, the desired material; e.g. a hapten attached to a resin to help isolate an immunoglobulin directed against it.	Аффинная хроматография	Affinitätschromatographie
Affinity precipitation	A technique for purification of proteins that depends upon reversible attachment to a ligand.	Аффинное осаждение	Affinitätspräzipitation
Afterburner	In incinerator technology, a burner located so that the combustion gases are made to pass through its flame in order to remove smoke and odors. It may be attached to or be separated from the incinerator proper.	Дожигатель	Nachbrenner
Agarose	A highly purified agar derivative that is used as an electrophoresis and chromatography support.	Агароза	Agarose
Agarose gel electrophoresis	A type of gel electrophoresis where the agarose is used as the environment to separate larger DNA and RNA molecules ranging 20,000 nucleotides.	Электрофорез в агарозном геле	Agarose gelelektrophorese
Agent	Any physical, chemical, or biological entity that can be harmful to an organism. Synonymous with stressors.	Агент	Agent
Agglutination	The clumping together of cells that are suspended in a fluid.	Агглютинация	Agglutination

Air cleaning	Indoor-air quality-control strategy to remove various airborne particulates and/or gases from the air.	Воздушная очистка	Luftreinigung
Air curtain	A method of containing oil spills. Air bubbling through a perforated pipe causes an upward water flow that slows the spread of oil. It can also be used to stop fish from entering polluted water.	Воздушная завеса	Luftscheier
Air handling unit	Equipment that includes a fan or blower, heating and/or cooling coils, regulator controls, condensate drain pans, and air filters.	Вентиляционная установка	Lüftung-sgerät, Klim-agerät, AHU
Albimun	A family of globular proteins, the most common of which is serum albumin. Albumins are commonly found in blood plasma, and are unique from other blood proteins in that they are not glycosylated.	Альбумин	Albimun
Aliquot	A measured portion of a sample taken for analysis. One or more aliquots make up a sample.	Аликвота	Aliquot
Alkaline	The condition of water or soil which contains a sufficient amount of alkali substance to raise the pH above 7.0.	Щелочная среда	Alkalischen Bedingungen
Alkaloid	A nitrogen-containing natural product of a plant, often with pharmacological properties, e.g. morphine, nicotine, strychnine.	Алкалоид	Alkaloid
Allele	Alternate forms of a gene or DNA sequence, which occur on either of two homologous chromosomes in a diploid organism.	Аллель	Allel
All-or-none assay	A technique to measure the total amount of a functional enzyme, regardless of its efficiency or affinity for its substrate.	Анализ «Все или ничего»	Alles-oder-Nichts-Assay
Allotype	The protein product of an allele which may be detectable as antigen by another member of the same species.	Аллотип	Allotyp
Alternate pathway	A series if enzyme reactions triggered by foreign surfaces leading the generation of the alternate C3 convertase (C3bBb).	Альтернативный путь	Alternativen Weg
Alternative mRNA splicing	The inclusion or exclusion of different exons to form different mRNA transcripts.	Альтернативный сплайсинг мРНК	Alternative mRNA-Spleißen
Ambient measurement	A measurement of the concentration of a substance or pollutant within the immediate environs of an organism; taken to relate it to the amount of possible exposure.	Окружающее измерение	Raumluft-messung
Ambient temperature	The temperature in a room, or the temperature which surrounds an object under discussion.	Температура среды	Umgebungs-temperatur
Aminimide	A peptide analogue in which an amino nitrogen substitutes the $\alpha$ -amino group of an amino acid residue; this forms a stable, soluble product.	Аминимид	Aminimid
Amino acid	Any of 20 basic building blocks of proteins-composed of a free amino (NH <sub>2</sub> ) end, a free carboxyl (COOH) end, and a side group (R).	Аминокислота	Aminosäure
Amperometric Titration	A way of measuring concentrations of certain substances in water using an electric current that flows during a chemical reaction.	Амперометрическое титрование	Amperometrische Titration

Amphibolic pathway	A metabolic pathway that participates in both anabolic and catabolic pathways, e.g. the tricarboxylic acid cycle.	Амфиболический путь	Amphibolisch Weg
Ampicillin (beta-lactamase)	An antibiotic derived from penicillin that prevents bacterial growth by interfering with cell wall synthesis.	Ампицилин	Ampicillin
Amplification	Increasing the number of copies of a DNA sequence, in vivo by inserting into a cloning vector that replicates within a host cell, or in vitro by polymerase chain reaction (PCR).	Удвоение генов	Genduplikation
Anabolism	Those energy-requiring metabolic pathways that result in synthesis of macromolecules and their building blocks, e.g. gluconeogenesis, fatty acid synthesis.	Анаболизм	Anabolismus
Anaerobe	An organism that grows in the absence of oxygen.	Анаэроб	Anaerobe
Analytical ultracentrifugation	A technique of very-high-speed centrifugation that sediments soluble macromolecules and characterizes them according to their rate of sedimentation (sedimentation-velocity ultracentrifugation) or the extent of their sedimentation (equilibrium sedimentation ultracentrifugation).	Аналитическое центрифугирование	Analytische Ultrazentrifugation
Anaphylaxis	A reaction of immediate hypersensitivity present in nearly all vertebrates which results from sensitization of tissue-fixed mast cells by cytotoxic antibodies following exposure to antigen.	Анафилаксия	Anaphylaxie
Anaplerotic pathway	Metabolic reactions that replenish the pools of intermediates of the tricarboxylic acid cycle. These pools may become depleted, as they also serve as precursors for amino acid synthesis, gluconeogenesis and other anabolic reactions.	Восстановительный путь	Anaplerotische Weg
Androgen	A compound, usually a steroid that supports the development of male secondary sex characteristics, e.g. testosterone.	Андроген	Androgen
Anomer	One of two possible compounds that arise when the open-chain form of a sugar condenses via a hemiacetal or hemiketal bond and produces a new asymmetrical centre.	Аномер	Anomer
Antagonist	A compound, often an analogue of a hormone that binds to a receptor but elicits no response.	Антагонист	Antagonist
Antibiotic	A class of natural and synthetic compounds that inhibit the growth of or kill other microorganisms.	Антибиотики	Antibiotikum
Antibiotic resistance	The ability of a microorganism to produce a protein that disables an antibiotic or prevents transport of the antibiotic into the cell.	Устойчивость к антибиотикам	Antibiotikaresistenz
Antibody	Protein molecule that is synthesized on exposure to antigen and that combines specifically with that antigen.	Антитело	Antikörper
Antibody dependent cellular cytotoxicity	A cytotoxic reaction in which killer cells recognize target cells via specific antibodies.	Антителозависимая клеточная цитотоксичность	Antikörperabhängige zelluläre Zytotoxizität

Anticodon	The three-nucleotide sequence of a tRNA molecule that is complementary to a triplet of mRNA (the <i>codon</i> ) which specifies a certain amino acid.	Антикодон	Anticodon
Antigen	A molecule which induces the formation of antibody.	Антиген	Antigen
Antigen presenting cell	A cell which carries antigen in a form that can stimulate lymphocytes. Macrophage are the most common APCs.	Антиген-презентирующая клетка	Antigenpräsentierende Zelle
Antimetabolite	An inhibitor of a key enzyme in metabolism, used to suppress the activity of the cell; often used in chemotherapy.	Антиметаболит	Antimetabolit
Antioxidant	A scavenger of reactive oxygen free radical species ( $\text{OH}^\cdot$ , $\text{O}_2^\cdot$ , etc.) and other oxidizing compounds; of particular importance are those that act as antioxidants <i>in vivo</i> , e.g. ascorbate, a-tocopherol, reduced glutathione.	Антиоксидант	Antioxidans
Antisense RNA	A complementary RNA sequence that binds to a naturally occurring (sense) mRNA molecule, thus blocking its translation.	Антисмысловые РНК	Antisense-RNA
Antiserum	Serum containing specific antibodies.	Антисыворотка	Antiserum
Antitoxin	Antibodies specific for a toxin.	Антитоксин	Gegengift
Apoprotein	A protein stripped of any prosthetic group or metal ion normally associated with it.	Апобелок	Apoprotein
Aqueous Solubility	The maximum concentration of a chemical that will dissolve in pure water at a reference temperature.	Растворимость в воде	Wasserlöslichkeit
Arginine fork	A specific kind of interaction between an RNA and an RNA-binding protein in which the two equivalent guanidinium nitrogens of an arginine residue interact with adjacent phosphates of a non-double-stranded region of the polynucleotide.	Аргининная вилка	Arginin Gabel
A-Scale Sound Level	A measurement of sound approximating the sensitivity of the human ear, used to note the intensity or annoyance level of sounds.	А-шкала уровня звука	A-Skala Schallpegel
Ascorbate peroxidase	An enzyme that uses ascorbate as an electron donor to degrade peroxides.	Аскорбатпероксидаза	Ascorbatperoxidase
Asexual reproduction	Nonsexual means of reproduction which can include grafting and budding.	Бесполое размножение	Asexuelle Reproduktion
Assay	A test for a specific chemical, microbe, or effect.	Анализ	Assay
Asymmetrical PCR	A protocol for generation of single-stranded DNA. Unequal amounts of primers are used, so that the first PCR cycles generate equal amounts of each strand of the template but later cycles, which have no more of one of the primers, create only one new strand.	Асимметричная ПЦР	Asymmetrische PCR
Asymmetrical reaction	The unequal handling of like groups in a prochiral compound.	Асимметричная реакция	Asymmetrische Reaktion
Atomic absorption spectrometry	A method for quantifying elements, usually metals, in biological samples. The method depends upon the absorption of energy by atoms as they are excited in their electronic ground state.	Атомно-абсорбционная спектметрия	Atomabsorptionsspektrometrie

Attenuation	The process by which a compound is reduced in concentration over time, through absorption, adsorption, degradation, dilution, and/or transformation. Also the decrease with distance of sight caused by attenuation of light by particulate pollution.	Коэффициент ослабления	Dämpfung
Autosome	A chromosome that is not involved in sex determination.	Аутосомы	Autosom
Azurophilic granules	Granules in neutrophils which contain acid hydrolases, myeloperoxidase, and lysozyme.	Азурофильные гранулы	Azurgranula
B-cell	A lymphocyte educated in the bursal equivalent; makes antibody when stimulated.	В-клетки	B-Zell
Backflow	A reverse flow condition created by a difference in water pressures that causes water to flow back into the distribution pipes of a drinking water supply from any source other than the intended one.	Противоток	Rückströmung
Backwashing	Reversing the flow of water back through the filter media to remove entrapped solids.	Обратная промывка	Rückspülung
Bacterial artificial chromosome	A cloning vector that can accept up to 350-kb fragments for cloning and sequencing of fragments of the human genome. Phage artificial chromosomes are similarly used.	Бактериальные искусственные хромосомы	Bakterielle künstliche Chromosomen
Bacteriocide	A class of antibiotics that kills bacterial cells.	Бактерицид	Bakterizid
Baffle	Flat board or plate, deflector, guide, or similar device constructed or placed in flowing water or slurry systems to cause more uniform flow velocities to absorb energy and to divert, guide, or agitate liquids.	Перегородка	Leitblech
Baghouse filter	Large fabric bag, usually made of glass fibers, used to eliminate intermediate and large (greater than 20 PM in diameter) particles. This device operates like the bag of an electric vacuum cleaner, passing the air and smaller particles while entrapping the larger ones.	Фильтр пылеуловительной камеры	Gewebefilter
Balanced polymorphism	The result of selective pressures for and against a deleterious mutation that permits it to persist in a population. An example is the stable presence in Africa of the sickle cell gene due to the protection against malaria enjoyed by heterozygotes, i.e. those with sickle cell trait.	Сбалансированный полиморфизм	Balancierter Polymorphismus
Ballistic Separator	A machine that sorts organic from inorganic matter for composting.	Баллистический сепаратор	Ballistik Separator
Base flipping	The distortion of a double-stranded DNA structure that disrupts a base pair and redirects one nucleoside of the pair outwards, where it can interact with a DNA-modifying enzyme such as a methyltransferase.	Переворот оснований	Basen-Flipping
Base pair	In a nucleic acid double helix, a purine and a pyrimidine on different strands that interact by hydrogen bonding, most commonly a GC or AT pair.	Пара оснований	Basenpaar
Basement membrane	An extracellular network of fibres and glycoconjugates that underlies and strengthens some tissues; an interface between these tissues and the connective tissue that surrounds them.	Базальная мембрана	Basalmembran

Basophil	A granulocyte with deep violet or blue-black staining granules.	Базофилы	Basophil
Bathochromic shift	A shift to longer wavelengths.	Батохромный сдвиг	Bathochrome Verschiebung
B-DNA	A right-handed helix; the dominant conformational variant of DNA in solution, in which the base pairs are stacked nearly perpendicular to the axis of the helix.	Право-закрученная ДНК	B-DNA
Bence Jones protein	The immunoglobulin light chains that are synthesized in large amounts and are secreted into the urine by multiple myeloma patients.	Белок Бенс-Джонса	Bence-Jones-Protein
Bench-scale Tests	Laboratory testing of potential cleanup technologies	Лабораторные испытания	Labor-Pilotversuch
Beta (β)-amino acid	A zwitterionic compound with carboxyl and amino groups on adjacent carbons: H <sub>2</sub> N-CHR-CHR'-COOH	Бета (β)-аминокислота	Beta (β)-Aminosäure
Beta (β)-oxidation	The series of enzymic reactions that oxidizes fatty acyl-CoA esters and shortens them by removal of the C-terminal two carbon atoms as acetyl-CoA. More narrowly, it is the oxidation of a compound, such as a fatty acid, at the β-carbon.	Бета (β)-окисление	Beta (β)-Oxidation
Beta (β)-pleated sheet	A form of secondary structure of a protein in which the amide hydrogens of a peptide bond of one extended polypeptide sequence are shared with the carbonyl oxygens of a peptide bond on a second polypeptide sequence.	Бета (β)-складчатый лист	Beta (β)-Faltblatt
Beta (β)-DNA	The normal form of DNA found in biological systems, which exists as a right-handed helix.	Бета (β)-ДНК	Beta (β)-DNA
Bidirectional replication	Synthesis of DNA that is affected by two replication forks that travel away from a single origin of replication.	Двунаправленная репликация	Bidirektionale Replikation
Bile acid	One of the products of cholesterol hydroxylation and side-chain oxidation to the level of a carboxylic acid. The carboxylate is often conjugated through an amide bond to a glycine or a cysteic acid. Excreted into the small intestine from the gall bladder, bile acids act as detergents, and aid lipid absorption.	Желчная кислота	Gallensäure
Binary system	In transgenic research, an approach to control expression of one transgene by a second, each initially established in its own pedigree. By crossing the two lines, doubly transgenic animals are created in which the control may become operational. The gene of interest is regulated by an exogenous ligand acting either as a positive regulator that binds to a repressor or as a negative regulator that binds to a transactivator. The repressor or transactivator are products of the second transgene.	Бинарная система	Dualsystem
Binding protein	A circulating protein that carries its ligand from one site in the body to another, e.g. thyroxine-binding protein; also any protein specialized for binding a ligand, e.g. a calcium-binding protein.	Связывающий белок	Bindeprotein

Binding site	That region of the surface of an enzyme (or receptor, or binding or transport protein) that holds the substrate or product (or other ligand).	Связывающий участок	Bindungsstelle
Bioaccumulants	Substances that increase in concentration in living organisms as they take in contaminated air, water, or food because the substances are very slowly metabolized or excreted.	Биоаккумулянты	Bioaccumulants
Bioassay	A test to determine the relative strength of a substance by comparing its effect on a test organism with that of a standard preparation.	Биоанализ	Bioassay
Bioaugmentation	Increasing the activity of bacteria that decompose pollutants; a technique used in bioremediation.	Биоаугментация	Bioaugmentation
Biobased products	Fuels, chemicals, building materials, or electric power or heat produced from biological material(s).	Биопродукты	Biobasierte Produkte
Biochemical oxygen demand	A measure of the amount of oxygen consumed in the biological processes that break down organic matter in water. The greater the BOD, the greater the degree of pollution.	Биохимическая потребность в кислороде	Biochemischer Sauerstoffbedarf
Bioconcentration	The accumulation of a chemical in tissues of a fish or other organism to levels greater than in the surrounding medium.	Биоконцентрация	Biokonzentration
Biodiversity	Variety and variability among living organisms and the ecological complexes in which they occur. The term encompasses different ecosystems, species, and genes.	Биоразнообразие	Biodiversität
Biological contaminants	Living organisms or derivatives (e.g. viruses, bacteria, fungi, and mammal and bird antigens) that can cause harmful health effects when inhaled, swallowed, or otherwise taken into the body.	Биологические загрязнители	Biologische Verunreinigungen
Biological control	In pest control, the use of animals and organisms that eat or otherwise kill or out-compete pests.	Биологический контроль	Biological Control
Biological measurement	A measurement taken in a biological medium. For exposure assessment, it is related to the measurement is taken to related it to the established internal dose of a compound.	Биологические измерения	Biologische Messung
Biological medium	One of the major component of an organism; e.g. blood, fatty tissue, lymph nodes or breath, in which chemicals can be stored or transformed.	Биологическая среда	Biologischen Milieu
Biological oxidation	Decomposition of complex organic materials by microorganisms. Occurs in self-purification of water bodies and in activated sludge wastewater treatment.	Биологическое окисление	Biologische Oxidation
Biological stressors	Organisms accidentally or intentionally dropped into habitats in which they do not evolve naturally; e.g. gypsy moths, Dutch elm disease, certain types of algae, and bacteria.	Биологические стрессоры	Biologische Stressoren
Bioluminescence	The chemiluminescent emission of light by a living thing, e.g. firefly, certain fungi.	Биолюминесценция	Biolumineszenz
Biomass	The total dry weight of all organisms in a particular sample, population, or area.	Биомасса	Biomasse
Biopharming	The production of biopharmaceuticals in plants or domestic animals.	Биофарминг	Biopharming



Bioreactor	A vessel and ancillary equipment used for the growth of cells. The bioreactor may be designed to maintain temperature and levels of oxygen and nutrients and to monitor cell density, nutrient or metabolite levels.	Биореактор	Bioreaktor
Bioremediation	Processes that use the capabilities of micro-organisms to treat waste products that may be environmentally harmful and to render them innocuous.	Биоочистка	Bioremediation
Biosensor	A device, especially an electrochemical device that detects, quantitatively and in real time, the presence of an analyte or some biological event (e.g. respiration, enzymic activity, binding to an antibody) and converts it into an electrical signal.	Биодатчик	Biosensor
Biosynthesis	The process by which a biological structure, especially a relatively simple structure, is formed by a sequence of enzymic reactions that starts from common metabolites or 'synthons', e.g. the synthesis of haem from glycine and succinyl-CoA; the synthesis of steroids from acetyl-CoA.	Биосинтез	Biosynthese
Biotechnology	Techniques that use living organisms or parts of organisms to produce a variety of products (from medicines to industrial enzymes) to improve plants or animals or to develop microorganisms to remove toxics from bodies of water, or act as pesticides.	Биотехнология	Biotechnologie
Biotic stress	Living organisms which can harm plants, such as viruses, fungi, and bacteria, and harmful insects.	Биотический стресс	Biotischen Stress
Biotransformation	Conversion of a substance into other compounds by organisms; includes biodegradation.	Биотрансформация	Biotransformation
Biuret reaction	A colour reaction for the quantification of protein in solution. By analogy with the compound biuret ( $\text{H}_2\text{N}-\text{CO}-\text{NH}-\text{CO}-\text{NH}_2$ ), the peptide backbone of proteins reacts with alkaline copper solutions to produce a violet colour.	Биуретовая реакция	Biuret-Reaktion
Blood clotting cascade	The sequence of reactions, initiated by exposure of blood to extravascular surfaces, that results in a fibrin clot.	Свертывание крови	Blutgerinnungskaskade
Blood group substances	The oligosaccharide moieties of glycoproteins that appear in many biological fluids (saliva, urine, milk) as well as on the surface of erythrocytes. These antigens, upon reaction with specific antibodies, cause agglutination of the cells to which they are attached, e.g. A, B and O antigens.	Вещества группы крови	Blutgruppen-substanzen
Blood products	Any product derived from human blood, including but not limited to blood plasma, platelets, red or white corpuscles, and derived licensed products such as interferon.	Продукты крови	Blutprodukte
Bohr effect	The decrease in the affinity of haemoglobin for oxygen that occurs when the haemoglobin solution is made more acid above pH 6. The opposite occurs below pH 6; hence the physiological phenomenon is the alkaline Bohr effect.	Эффект Бора	Bohr-Effekt

Boiler	A vessel designed to transfer heat produced by combustion or electric resistance to water. Boilers may provide hot water or steam.	Бойлер, водонагреватель	Heiz kessel
Bovine spongiform encephalopathy (BSE)	A disease of cattle, related to scrapie of sheep, also known as "mad cow disease." It is hypothesized to be caused by a prion, or small protein, which alters the structure of a normal brain protein, resulting in destruction of brain neural tissue.	Губкообразная энцефалопатия крупного рогатого скота (ГЭКРС)	Bovine spongiforme Enzephalopathie (BSE)
Brackish	Mixed fresh and saltwater.	Солоноватая вода	Brackwasser
Bromoform	Bromoform is one of the trihalomethanes closely related with fluoroform, chloroform and iodoform. It is soluble in about 800 parts water and is miscible with alcohol, benzene, chloroform, ether, petroleum ether, acetone, and oils.	Бромформ	Bromoform
Brown adipose tissue	Thermogenic fatty tissue with a high content of relatively uncoupled mitochondria; especially prominent in infants, located around the kidneys and neck.	Бурая жировая ткань	Braunes Fettgewebe
Buffer	A solution or liquid whose chemical makeup is such that it minimizes changes in pH when acids or bases are added to it.	Буфер	Puffer
Buffer capacity	A measure of the ability of a solution to maintain its pH in the face of the addition of acid or alkali.	Буферная емкость	Pufferkapazität
Buffy coat	The layer of white blood cells immediately above the red blood cells in a tube of blood following centrifugation.	Лейкоцитарная пленка	Buffy-coat
Burial ground	A disposal site for radioactive waste materials that uses earth or water as a shield.	Могильник	Vergrabungsstelle
Bursa of Fabricius	The hindgut organ located in the cloaca of birds that controls the ontogeny of B cells.	Фабрицива сумка	Bursa Fabricii
By-product	Material, other than the principal product, generated as a consequence of an industrial process or as a breakdown product in a living system.	Побочные продукты	Nebenprodukt
C <sub>3</sub> photosynthesis	Carbon dioxide fixation by the reductive pentose phosphate pathway, i.e. the Calvin cycle.	C <sub>3</sub> – фотосинтез	C <sub>3</sub> Photosynthese
C <sub>3</sub> -C <sub>4</sub> photosynthesis	A variant of C <sub>3</sub> photosynthesis in which the 2-carbon product of photorespiration is efficiently oxidized to CO <sub>2</sub> , which is recycled in photosynthesis.	C <sub>3</sub> -C <sub>4</sub> – фотосинтез	C <sub>3</sub> -C <sub>4</sub> Photosynthese
Calvin cycle (reductive pentose cycle)	The series of metabolic reactions by which carbon dioxide is fixed into glycolytic intermediates; the dark reactions of photosynthesis.	Цикл Кальвина (цикл восстановления пентозы)	Calvin-Zyklus (reduktiven Pentose-Zyklus)
Cap (1)	A layer of clay, or other impermeable material installed over the top of a closed landfill to prevent entry of rainwater and minimize leachate.	Крышка	Kappe
Cap (2)	The 7-methylguanosine nucleoside attached to the 5'-end of mRNA by a 5'-5'-triphosphate bond.	Кэп	Kappe
Cap site	The site on a DNA template where transcription begins. It corresponds to the nucleotide at the 5'-end of the RNA transcript which accepts the 7-methylguanosine cap.	Участок кэпирования	Cap-Stelle

Capillary Action	Movement of water through very small spaces due to molecular forces called capillary forces.	Капиллярное явление	Kapillarwirkung
Capping	The process of modifying the 5'-end of eukaryotic mRNA with 7-methylguanosine.	Кэпирование	Capping
Caprylic acid	The common name for the eight-carbon saturated fatty acid known by the systematic name octanoic acid. It is found naturally in the milk of various mammals, and it is a minor constituent of coconut oil and palm kernel oil.	Каприловая кислота	Caprylsäure
Capsid	The coating of a protein that enclosed the nucleic acid core of a virus.	Капсид	Kapsid
Carbanion	A transient species in which a carbon atom bears a formal negative charge, e.g. an intermediate in the carboxylation of glutamate residues of preprothrombin.	Карбанион	Carbanion
Carbohydrates	One of a class of biological materials comprising sugars, polymers of sugars, and compounds related to them. The name derives from the basic sugar structure, $(CH_2O)_n$ . The category includes reduction and oxidation products, phosphate and sulphate esters, and amine derivatives.	Углеводы	Kohlenhydrate
Carbon absorber	An add-on control device that uses activated carbon to absorb volatile organic compounds from a gas stream.	Углеродные поглотители	Carbon-Absorber
Carbon adsorption	A treatment system that removes contaminants from ground water or surface water by forcing it through tanks containing activated carbon treated to attract the contaminants.	Углеродная адсорбция	Aktivkohle-adsorption
Carbon cycle	The movement of carbon atoms through different chemical forms and locations, from dissolved $CO_2$ in equilibrium with atmospheric $CO_2$ through plant carbohydrate, fats and proteins of plants and animals, and via oxidation back to atmospheric $CO_2$ .	Цикл углерода	Kohlenstoffkreislauf
Carbon Tetrachloride	Compound consisting of one carbon atom and four chlorine atoms, once widely used as a industrial raw material, as a solvent, and in the production of CFCs. Use as a solvent ended when it was discovered to be carcinogenic.	Четыреххлористый углерод	Tetrachlor-kohlenstoff
Carboxy-terminal domain (CTD)	The domain of a protein which includes the carboxy-terminal amino residue.	Карбокси-концевой домен	Carboxyterminale Domäne (CTD)
Carcinogen	Any substance that can cause or aggravate cancer.	Карциноген	Karzinogen
CAS Registration Number	A number assigned by the Chemical Abstract Service to identify a chemical.	Регистрационный номер CAS (Химическая реферативная служба)	CAS-Registrier-Nummer
Cascade	A series of enzymic reactions that at each step convert an inactive enzyme into an active enzyme, which in turn activates another inactive enzyme, and thus greatly amplifies the initial signal.	Каскад	Kaskade

Cascade reactions	An interlinked series of enzyme reactions in which the products of one reaction catalyze a second reaction, and so forth.	Каскадные реакции	Kaskadenreaktionen
Cask	A thick-walled container (usually lead) used to transport radioactive material. Synonym: <i>coffin</i> .	Бочка	Fass
Catabolism	The action of energy-yielding metabolic pathways that degrade macromolecules and complex compounds or small molecules into CO <sub>2</sub> , H <sub>2</sub> O, etc.	Катаболизм	Abbaustoffwechsel, Katabolismus
Catabolite	A degradation product derived from a more complex compound.	Катаболит	Kataboliten
Catalase	A heme enzyme that catalyses the breakdown of hydrogen peroxide to oxygen and water. It is mainly present in peroxisomes within eukaryotic cells.	Каталаза	Katalase
Catalyst	A substance that promotes a chemical reaction by lowering the activation energy of a chemical reaction, but which itself remains unaltered at the end of the reaction.	Катализатор	Katalysator
Catalytic converter	An air pollution abatement device that removes pollutants from motor vehicle exhaust, either by oxidizing them into carbon dioxide and water or reducing them to nitrogen.	Каталитический конвертер	Katalytisch Konverter
Catalytic incinerator	A control device that oxidizes volatile organic compounds (VOCs) by using a catalyst to promote the combustion process. Catalytic incinerators require lower temperatures than conventional thermal incinerators, thus saving fuel and other costs.	Катализатор сжигания	Katalytische Verbrennungsanlage
Catecholamine	One of a family of phenolic compounds chemically related to catechol, which is derived metabolically from tyrosine; the family comprises hormones and neurotransmitters, including adrenaline (epinephrine), noradrenaline, dopamine, etc.	Катехоламин	Katecholamin
Cathodic protection	A technique to prevent corrosion of a metal surface by making it the cathode of an electrochemical cell.	Катодная защита	Kathodischer Schutz
Cavitation	The formation and collapse of gas pockets or bubbles on the blade of an impeller or the gate of a valve; collapse of these pockets or bubbles drives water with such force that it can cause pitting of the gate or valve surface.	Кавитация	Kavitation
CD4	Marker specific for Th and Tdth cells.	CD4	CD4
CD8	Marker specific for Ts and CTL cells.	CD8	CD8
Cell	The lowest denomination of life thought to be possible. Cells contain DNA and many other elements to enable the cell to function.	Клетка	Zelle
Cell mediated immunity	Immunity in which the participation of lymphocytes and macrophage is predominant.	Клеточный иммунитет	Zellvermittelte Immunität
Centrifugal collector	A mechanical system using centrifugal force to remove aerosols from a gas stream or to remove water from sludge.	Центробежный коллектор	Kreiselpumpen Collector
Centrifugation	Separating molecules by size or density using centrifugal forces generated by a spinning rotor. G forces	Центрифугирование	Zentrifugation

	of several hundred thousand times gravity are generated in ultracentrifugation.		
Chaotropic agent	A solute that disrupts the structure of the bulk water phase and, in so doing, changes the solubility and stability properties of other solutes, such as proteins.	Хаотропный агент	Chaotrops
Chargaff's rule	An empirical finding that in DNA the frequency of A equals the frequency of T, and the frequency of G equals the frequency of C; later given a theoretical basis by the Watson-Crick double-helix model of DNA.	Правило Чаргаффа	Chargaff-Regel
Charge	<i>In chemistry</i> , the integral sum of positive and negative particles that make up a species, a cation if the charge is positive, an anion, if the charge is negative. <i>In biochemistry</i> , the loading of a binding site with its intended ligand, e.g. the appropriate amino acid bound to its tRNA; <i>in cell biology</i> , essentially as in biochemistry, but on a macromolecular level, e.g. the charging of a liposome with material for transport cross a cell membrane.	Заряд	Ladung
Checkpoint	A point through which the cell cycle cannot progress when its DNA is damaged or its chromosomes are not correctly attached or aligned.	Контрольная точка	Kontrollpunkt
Chemical compound	A distinct and pure substance formed by the union of two or more elements in definite proportion by weight.	Химическое соединение	Chemische Verbindung
Chemical oxygen demand	A measure of the oxygen required to oxidize all compounds, both organic and inorganic, in water.	Химическое окисление	Chemischer Sauerstoffbedarf
Chemical shift	In nuclear magnetic resonance, the modulation of field strength necessary to achieve the resonance frequency characteristic of a particular atom in a particular chemical, i.e. bonding, environment.	Химический сдвиг	Chemische Verschiebung
Chemical stressors	Chemicals released to the environment through industrial waste, auto emissions, pesticides, and other human activity that can cause illnesses and even death in plants and animals.	Химические стрессоры	Chemischer Stressoren
Chemical treatment	Any one of a variety of technologies that use chemicals or a variety of chemical processes to treat waste.	Химическая обработка	Chemische Behandlung
Chemosterilant	A chemical that controls pests by preventing reproduction.	Химический стерилизатор	Chemosterilant
Chemotactic factors	Molecules which attract a specific type of cell to the point of highest concentration, usually the point of generation of the factors.	Факторы хемотаксиса	Chemotaktische Faktoren
Chemotaxis	The movement of a cell along the concentration gradient of a chemical, the chemotactic agent, toward its source, in the case of the chemical being a chemotactant, or away, in the case of a chemorepellant.	Хемотаксис	Chemotaxis
Chemotroph	An organism that derives its energy from chemical reactions, usually by the oxidation of nutrients by molecular oxygen.	Хемотроф	Chemotroph
Chiller	A device that generates a cold liquid that is circulated through an air-handling unit's cooling coil to cool the air supplied to the building.	Охладитель	Kühler

Chimeric DNA	A hybrid molecule produced by combining DNA from two different species into a single polynucleotide.	Химерная ДНК	Chimäre DNA
Chloramphenicol	An antibiotic that interferes with protein synthesis.	Хлорамфеникол	Chloramphenicol
Chlorinated Solvent	An organic solvent containing chlorine atoms(e.g. methylene chloride and 1,1,1-trichloromethane). Uses of chlorinated solvents are include aerosol spray containers, in highway paint, and dry cleaning fluids.	Хлорированные растворители	Chlorierte Lösungsmittel
Chlorination	The application of chlorine to drinking water, sewage, or industrial waste to disinfect or to oxidize undesirable compounds.	Хлорирование	Chlorierung
Chlorinator	A device that adds chlorine, in gas or liquid form, to water or sewage to kill infectious bacteria.	Хлоратор	Chlordosiergerät
Chlorine-Contact Chamber	That part of a water treatment plant where effluent is disinfected by chlorine.	Хлор-контактная камера	Chlor-Kontaktkammer
Chlorofluorocarbons	A family of inert, nontoxic, and easily liquefied chemicals used in refrigeration, air conditioning, packaging, insulation, or as solvents and aerosol propellants. Because CFCs are not destroyed in the lower atmosphere they drift into the upper atmosphere where their chlorine components destroy ozone.	Хлорфторуглероды	Fluorchlorkohlenwasserstoffe
Chloroplast	An organelle of a green plant cell in which light harvesting and ATP synthesis occur.	Хлоропласт	Chloroplast
Chromatin	The complex of DNA and associated proteins, most notably histones, that occurs in the nuclei of eukaryotic cells.	Хроматин	Chromatin
Chromatogram	A graphical representation of a chromatographic separation, e.g. absorbance or radioactivity of the eluate (ordinate) plotted as a function of eluate volume (abscissa).	Хроматограмма	Chromatogramm
Chromatophore	An epithelial cell of a lower animal in which pigment granules can be physically moved to effect colour changes.	Хроматофор	Chromatophor
Chromatophoresis	A technique for protein separation that uses high-pressure liquid chromatography followed by sodium dodecyl sulphate (SDS)/polyacrylamide-gel electrophoresis. The effluent from a reverse-phase column is mixed with SDS and a reducing agent and applied to a polyacrylamide slab gel; the resulting gel shows two-dimensional separation, by polarity in one dimension and by molecular mass in the other.	Хроматофорез	Chromatophoresis
Chromosome	One of the nuclear structures composed largely of chromatin, into which eukaryotic genes are organized.	Хромосома	Chromosom
Chronic effect	An adverse effect on a human or animal in which symptoms recur frequently or develop slowly over a long period of time.	Хронический эффект	Chronische Wirkung
Chronic exposure	Multiple exposures occurring over an extended period of time or over a significant fraction of an animal's or human's lifetime (Usually seven years to a lifetime.)	Хроническое воздействие	Chronische Exposition

Cistern	Small tank or storage facility used to store water for a home or farm; often used to store rain water.	Цистерна	Zisterne
Cistron	A segment of DNA that contains all the information necessary for the production of a single polypeptide and includes both the structural (coding) sequences and regulatory sequences (transcription start and stop signals).	Цистрон	Cistron
Citrovorum factor	N5-Formyltetrahydrofolic acid; originally isolated as a growth factor for <i>Leuconostoc citrovorum</i> .	Фолиновая кислота	Citrovorum Faktor
Class	A general term referring to an isotype of antibody; determined by the constant domains of the heavy chain.	Классы	Klasse
Class I	MHC encoded antigen consisting of one peptide, which closely associates with beta-2-microglobulin. These antigens are involved in CTL responses.	Класс I	Klasse I
Class II	MHC encoded antigen consisting of two nonidentical peptides, which are not covalently bound but remain in close association. These antigens are involved in T-helper cell responses.	Класс II	Klasse II
Classical pathway	A series of enzyme reactions triggered by the binding of C1 to an immune complex, leading to the generation of the classical C3 convertase (C42).	Классический путь	Klassischen Weg
Clathrate	A cage-like structure, e.g. that formed by water molecules that surround a hydrocarbon in solution.	Клатраты	Clathrat
Clean fuels	Blends or substitutes for gasoline fuels, including compressed natural gas, methanol, ethanol, and liquefied petroleum gas.	Чистое топливо	Saubere Kraftstoffe
Clonal selection	The process of lymphocyte selection and activation in which antigen stimulates only those cells with specific receptors for the antigen.	Клональная селекция	Klonale Selektion
Cloning	The mitotic division of a progenitor cell to give rise to a population of identical daughter cells or clones.	Клонирование	Klonierung
Cluster analysis	In genomics, the discovery of genes that are similarly regulated. Statistical analyses are applied to the DNA microarray experiments to identify genes, the expressions of which respond in the same way to a variable, e.g. nutrient or hormone.	Кластерный анализ	Cluster-Analyse
Coagulation	Clumping of particles in wastewater to settle out impurities, often induced by chemicals such as lime, alum, and iron salts.	Коагуляция	Gerinnung
Codon	The three-nucleotide sequence of an mRNA molecule that codes for one specific amino acid.	Кодон	Codon
Coenzyme	A co-substrate in some enzymic reactions that is usually present in limited quantities <i>in vivo</i> and which requires regeneration in subsequent reactions, e.g. coenzyme A, NAD <sup>+</sup> , FAD.	Кофермент	Coenzym
Cofactor	A compound that is covalently or non-covalently bound to a protein and that participates in the protein's function. In the case of an enzyme, a loosely held cofactor is called a coenzyme, essentially a second substrate; when tightly held to the protein, the	Кофактор	Cofaktor

	cofactor is called a prosthetic group. (see apoenzyme, holoenzyme, vitamin)		
Coffin	See Cask		
Collector	A device for collecting friction in chromatography.	Коллектор	Fraktionssammler
Colligative	Descriptive of a property of a solution that depends upon the number but not the nature of solute molecules, e.g. osmotic pressure.	Коллигативность	Kolligative
Colloids	Very small, finely divided solids (that do not dissolve) that remain dispersed in a liquid for a long time due to their small size and electrical charge.	Коллоиды	Kolloiden
Combustion Product	Substance produced during the burning or oxidation of a material.	Продукты сгорания	Verbrennungsprodukt
Commercial Waste	All solid waste emanating from business establishments such as stores, markets, office buildings, restaurants, shopping centers, and theaters.	Промышленные отходы	Gewerbeabfallverordnung
Commercial Waste Management Facility	A treatment, storage, disposal, or transfer facility which accepts waste from a variety of sources, as compared to a private facility which normally manages a limited waste stream generated by its own operations.	Коммерческий комплекс по утилизации отходов	Gewerbeabfallverordnung
Comminuter	A machine that shreds or pulverizes solids to make waste treatment easier.	Измельчитель	Zerkleinerer
Comminution	Used in both solid waste management and wastewater treatment.	Измельчение	Zerkleinerung
Competitive inhibition	A form of enzyme inhibition in which the inhibitor competes with the substrate for the enzyme's substrate-binding site. The result is an increase in the $K_m$ value while leaving $V_{max}$ unaltered.	Конкурентное ингибирование	Kompetitive Hemmung
Complement	A complex linked enzyme system that is activated by such factors as the combination of antigen and antibody and that results in a variety of biological responses.	Комплемент	Komplement
Complementarity	In nucleic acid chemistry, descriptive of the relationship between two polynucleotides that can combine in an antiparallel double helix; the bases of each polynucleotide are in a hydrogen-bonded inter-strand pair with a complementary base, A to T (or U) and C to G. In protein chemistry, the matching of shape and/or charge of a protein to a ligand.	Комплементарность	Komplementarität
Complementary nucleotides	Members of the pairs adenine-thymine, adenine-uracil, and guanine-cytosine that have the ability to hydrogen bond to one another.	Комплементарные нуклеотиды	Komplementäre Nukleotide
Concentration	The relative amount of a substance mixed with another substance.	Концентрация	Konzentration
Condensate	Water created by cooling steam or water vapor.	Конденсат	Kondensat
Configuration	An arrangement in space at an asymmetrical centre.	Конфигурация	Konfiguration
Conformation	A compound or macromolecule that has at least limited freedom of rotation about its chemical bonds, one alternative arrangement in space of its constitu-	Конформация	Konformation



	ent atoms and groups.		
Conjugation	<i>In organic chemistry</i> , the interaction of double or triple bonds or aromatic groups, separated by a single bond, which delocalizes their non-bonding electrons; e.g. -CH=CH-CH=CH-, -CH=CH-CH=O. <i>In molecular biology</i> , conjugation is the transfer of DNA between cells, usually bacteria, by cell-to-cell contact.	Конъюгация	Konjugation
Constant region	The invariant parts of immunoglobulin heavy and light chains.	Константный участок	Konstante Region
Constitutive enzyme	An enzyme that is produced at a constant, non-inducible, rate.	Конститутивный фермент	Konstitutive Enzym
Contact inhibition	The cessation of division that occurs when cells in culture reach confluence and establish gap junctions with neighbouring cells.	Контактное ингибирование	Kontakt Hemmung
Contact site	A small region where the mitochondrial inner and outer membranes touch, and at which structures exist that are responsible for transport of proteins and adenosine nucleotides into and out of the mitochondrion.	Связывающий участок	Kontakt vor Ort
Controlled Reaction	A chemical reaction under temperature and pressure conditions maintained within safe limits to produce a desired product or process.	Управляемая реакция	Kontrollierten Reaktionsbedingungen
Convertase	A cellular proteinase that processes hormone precursors by recognition of the precursor sequence pairs of basic residues, which are the sites of cleavage.	Конвертаза	Konvertase
Coomassie Brilliant Blue	The name of two similar triphenylmethane dyes that were developed for use in the textile industry but are now commonly used for staining proteins in analytical biochemistry.	Кумасси бриллиантовый голубой	Coomassie Brilliant Blue
Cori cycle	The transport of the precursor and product of glycolysis between exercising muscle and the liver, i.e. lactic acid from muscle to liver, and glucose from liver to muscle.	Цикл Кори	Cori-Zyklus
Corrosion	The dissolution and wearing away of metal caused by a chemical reaction such as between water and the pipes, chemicals touching a metal surface, or contact between two metals.	Коррозия	Korrosion
Cortex	The outer layer of a structure, e.g. adrenal cortex, cell cortex.	Кортекс	Kortex
Cosmid	A plasmid used to introduce DNA sequences that are much larger than is suitable for other vectors.	Космид	Cosmide
Cotton effect	A feature of some optical rotatory dispersion spectra that is usefully correlated with conformational and structural features of a molecule. A sharp peak in optical rotation followed by a deep trough is seen as the wavelength decreases; the wavelength between the peak and the trough where the rotation is zero is the point of maximal absorbance. A negative Cotton effect is the reverse, i.e. a fall in rotation followed by a steep rise as the wavelength decreases.	Эффект Коттона	Cotton-Effekt

Coupled phosphorylation	The synthesis of the phosphate anhydride bonds of ATP using energy derived from the electron transport chain.	Сопряженное фосфорилирование	Gekoppelt Phosphorylierung
Coupling factor	A protein that permits the synthesis of ATP driven by the energy made available by mitochondrial electron transport.	Фактор сопряжения	Koppelfaktor
Covalent catalysis	A stage in some enzymic reactions in which one moiety of a substrate is attached by a covalent bond to the enzyme.	Ковалентный катализ	Kovalente Katalyse
Creatine kinase	An enzyme that catalyses the reversible reaction of creatine plus ATP to phosphocreatine (PCr) and ADP. Creatine kinase concentrations are elevated after myocardial infarction or other conditions where muscle breakdown occurs, and can be used as a diagnostic tool.	Креатинкиназа	Creatin-Kinase
Crossover	The physical exchange of homologous parts between a pair of individual chromatids.	Кроссинговер	Überkreuzung
Cross-reactivity	The reaction of antibody with an unrelated antigen, caused by the antigens involved sharing epitopes in common.	Перекрестная реактивность	Kreuzreaktivität
Cry1A	A protein derived from the bacterium <i>Bacillus thuringiensis</i> that is toxic to some insects when ingested. This bacterium occurs widely in nature and has been used for decades as an insecticide although it constitutes less than 2 percent of the overall insecticides used.	Cry1A	Cry1A
Cryptochrome	A blue light- and ultraviolet-A-sensitive receptor protein, containing pterin and flavin prosthetic groups; found ubiquitously in plants and in mammals, and linked to the circadian response of these organisms to light.	Криптохром	Cryptochrom
C-terminal	In a polypeptide sequence, that unique residue which is connected to the linear sequence by its amino group, leaving it with a free carboxy group. In practice, the carboxy group of a C-terminal residue may be modified, e.g. by amidation or, in the case of pyroglutamate, by internal lactamization.	С-конец	C-terminale
Cultivar	Synonymous with variety; the international equivalent of variety.	Сорт	Cultivar
Culture	An inoculum of cells, especially a pure strain, intended for propagation in liquid or on solid media; also the act of propagation of the cells.	Культура	Kultur
Cyanobacterium	Cyanobacteria (also known as blue-green algae, blue-green bacteria, and Cyanophyta) is a phylum of bacteria that obtain their energy through photosynthesis.	Цианобактерии	Cyanobakterium
Cyclic nucleotide	An internal nucleoside phosphodiester; usually a 2',3'-diester or a 3',5'-diester.	Циклический нуклеотид	Zyklische Nukleotid
Cyclone collector	A device that uses centrifugal force to remove large particles from polluted air.	Циклон	Zyklonabscheider

Cystatin	A term applies both to the superfamily of cysteine proteinase inhibitors and to one subgroup; the other subgroups are the kininogens and stephens.	Цистатин	Cystatin
Cysteine	Non-polar sulfur-containing amino acid. Disulfide bonds can form between two cysteine side chains in proteins.	Цистеин	Cystein
Cytochrome c	A haem protein that is present in the mitochondrial intermembrane space. Its primary function is to act as a single electron relay between respiratory complexes in the respiratory chain, carrying electrons from the cytochrome <i>bc1</i> complex to cytochrome oxidase.	Цитохром С	Cytochrom-c
Cytogenetic	Study that relates the appearance and behavior of chromosomes to genetic phenomenon.	Цитогенетика	Zytogenetik
Cytokine	A factor secreted by a cell that affects other cells, often as part of an immunological response; e.g. an interleukin or an interferon (but some cytokines are also involved in co-ordinating development, as in embryogenesis).	Цитокины	Zytokine
Cytokinesis	The separation of two daughter cells in the final stage of mitosis.	Цитокинез	Zytokinese
Cytolysis	The lysis of cells, either specifically or nonspecifically.	Цитолиз	Zytolyse
Cytophilic (cytotropic) antibody	Any of a class of antibodies that attach to tissue cells through their Fc segments to induce the release of histamine and other vasoconstrictive amines important in immediate hypersensitivity reactions.	Цитофильное (анафилактическое) анти-тело	Zytophilen Antikörper
Cytosol	The soluble part of a cell's cytoplasm, i.e. that part that does not sediment during ultracentrifugation.	Цитозоль	Zytosol
Cytotoxic antibody	Any specific antibody directed against cellular antigens that, when bound to the antigen, activates the complement pathway or activates killer cells, resulting in cell lysis.	Цитотоксические антитела	Zytotoxischer Antikörper
Deamination	The abstraction of the elements of ammonia from a compound, e.g. from histidine by the histidine lyase reaction, or from AMP in the adenylate deaminase reaction.	Дезаминирование	Desaminierung
Death gene	A gene whose expression is associated with apoptosis, e.g. a $\text{Ca}^{2+}$ -activated endonuclease that cleaves exposed regions of chromatin to produce nucleosome-sized fragments.	Мертвый ген	Todesgen
Decay products	Degraded radioactive materials, often referred to as "daughters" or "progeny"; radon decay products of most concern from a public health standpoint are polonium-214 and polonium-218.	Продукты распада	Zerfallsprodukte
Dechlorination	Removal of chlorine from a substance.	Дехлорирование	Entchlorung
Decomposition	The breakdown of matter by bacteria and fungi, changing the chemical makeup and physical appearance of materials.	Разложение	Zersetzung

Decontamination	Removal of harmful substances such as noxious chemicals, harmful bacteria or other organisms, or radioactive material from exposed individuals, rooms and furnishings in buildings, or the exterior environment.	Обеззараживание	Dekontamination
Degasification	A water treatment that removes dissolved gases from the water.	Дегазация	Entgasung
Degeneracy	Redundancy of the genetic code, in that each amino acid is specified by more than one codon.	Вырождение	Entartung
Dehydrogenation	The oxidation of a compound by removal of equal numbers of protons and electrons, usually two of each.	Дегидрогенизация	Dehydrierung
Deletion mutation	A mutation caused by the absence of one or more nucleotides in the DNA sequence.	Делеционная мутация	Deletionsmutation
Denaturation	The destruction of the ordered folding of a protein or nucleic acid that is required for its normal function. Protein denaturation often involves a change from a specific globular or fibrous conformation to a random coil; nucleic acid denaturation often involves the dissociation of a duplex into single strands.	Денатурация	Denaturierung
Denature	To induce structural alterations that disrupt the biological activity of a molecule. Often refers to breaking hydrogen bonds between base pairs in double-stranded nucleic acid molecules to produce in single-stranded polynucleotides or altering the secondary and tertiary structure of a protein, destroying its activity.	Денатурировать	Denaturieren
Density	A measure of how heavy a specific volume of a solid, liquid, or gas is in comparison to water.	Плотность	Dichte
Deoxyribonucleic acid (DNA)	An organic acid and polymer composed of four nitrogenous bases--adenine, thymine, cytosine, and guanine linked via intervening units of phosphate and the pentose sugar deoxyribose. DNA is the genetic material of most organisms and usually exists as a double-stranded molecule in which two antiparallel strands are held together by hydrogen bonds between adenine-thymine and cytosine-guanine.	Дезоксирибонуклеиновая кислота	Desoxyribonukleinsäure
Depressurization	Depressurization can occur when household appliances such as fireplaces or furnaces, that consume or exhaust house air, are not supplied with enough makeup air.	Разгерметизация	Entspannung
Depurination	The cleavage of N-glycosidic bonds of DNA to form apurinic DNA.	Депуринизация	Depurinierung
Dermal absorption	Process by which a chemical penetrates the skin and enters the body as an internal dose.	Всасывание через кожу	Dermale Resorption
Desalination	Removing salts from ocean or brackish water by using various technologies.	Опреснение	Entsalzung
Desensitization	The loss of responsiveness of an enzyme to allosteric regulation while retaining its catalytic activity.	Десенсибилизация	Desensibilisierung
Desiccant	A chemical agent that absorbs moisture; some desiccants are capable of drying out plants or insects, causing death.	Осушитель	Trockenmittel

Desulfurization	Removal of sulfur from fossil fuels to reduce pollution.	Сероочистка	Entschwefelung
Detection Limit	The lowest concentration of a chemical that can reliably be distinguished from a zero concentration.	Предел обнаружения	Nachweisgrenze
Detergent (1)	Some contain compounds which kill useful bacteria and encourage algae growth when they are in wastewater that reaches receiving waters.	Моющее средство	Waschmittel
Detergent (2) (surfactant)	An amphipathic compound able to stabilize suspensions of non-polar materials in aqueous solution.	Детергент (ПАВ)	Detergens (Tensid)
Detoxification	The chemical modification by oxidation, methylation, glycosylation, etc. of a xenobiotic to render it innocuous.	Детоксификация	Entgiftung
Dextran	A branched-chain storage polysaccharide of microbial origin.	Декстран	Dextran
Diagonal electrophoresis	A method for identification of a particular kind of peptide in a mixture by identical electrophoretic steps, the second at a 90° angle to the first, with a chemical modification introduced between the steps. An example is the identification of tyrosine-bearing peptides in a mixture of peptides by treatment of the products of paper electrophoresis with iodine vapour to iodinate the tyrosine residues before the second electrophoresis. Iodotyrosine peptides are then identified as those that deviate from the diagonal formed by all the other peptides when they are visualized by, for instance, the ninhydrin reaction.	Диагональный электрофорез	Diagonal-Elektrophorese
Dialysis	A technique for the separation of macromolecules from smaller molecules by placing them within a semi-permeable membrane, such as Cellophane, separating them from a large volume of water. Only the low-molecular-mass diffusible molecules cross the membrane and pass into the larger volume; the macromolecules are confined to their original space. Equilibrium dialysis is the technique of quantification of binding capacity and affinity by dialysis of a macromolecule against various concentrations of a ligand and subsequent measurement of the final concentrations of bound and free ligand within the dialysis chamber and free ligand outside it.	Диализ	Dialyse
Diapedesis	The emigration of cells from blood vessels.	Диapedез	Diapedese
Diaphorase	An enzyme that transfers electrons from NADH to a dye or to ferricyanide.	Диафораза	Diaphorase
Dideoxynucleotide	A 2',3'-dideoxynucleoside 5'-triphosphate; a deoxynucleotide analogue that lacks a hydroxy group at its 3'-carbon and functions as a chain-terminator during DNA synthesis.	Дидезоксинуклеотид	Didesoxynucleotid
Differential centrifugation	The fractionation of subcellular components according to their sedimentation behaviour; separation into nuclei, mitochondria, lysosomes, microsomes (endoplasmic reticulum), ribosomes, cytosol, etc. by removal of sedimenting material after cycles of processing at progressively increasing centrifugal force.	Дифференциальное центрифугирование	Differentielle Zentrifugation

Diffusion	The movement of suspended or dissolved particles (or molecules) from a more concentrated to a less concentrated area.	Диффузия	Diffusion
Digester (Autoclave)	In wastewater treatment, a closed tank; in solid-waste conversion, a unit in which bacterial action is induced and accelerated in order to break down organic matter and establish the proper carbon to nitrogen ratio.	Автоклав	Autoklav
Diluent	Any liquid or solid material used to dilute or carry an active ingredient.	Разбавитель	Verdünnungsmittel, Streckmittel
Dilution Ratio	The relationship between the volume of water in a stream and the volume of incoming water.	Коэффициент разбавления	Verdünnungsverhältnis
Dimedone	5,5-Dimethyl-1,3-cyclohexanedione; a reagent that has been used to assist in the isolation of aldehydes and in their quantification (e.g. for [14C]formaldehyde by its radioactivity) because it forms a water-insoluble, crystallizable adduct.	Димедон	Dimedon
Dioxygenase	An enzyme that reduces molecular oxygen by incorporating both atoms into its substrate, e.g. tryptophan dioxygenase.	Диоксигеназы	Dioxygenase
Direct calorimetry	Evaluation of the heat evolved by a human or experimental animal by measurement of the heat exchanged with the environment in specially constructed insulated chambers.	Прямая калориметрия	Direkte Kalorimetrie
Direct Filtration	A method of treating water which consists of the addition of coagulant chemicals, flash mixing, coagulation, minimal flocculation, and filtration.	Прямая фильтрация	Direkte Filtration
Disc-gel electrophoresis	A technique for electrophoresis of single samples in an open-ended tube. The polyacrylamide stationary phase is polymerized in situ. During electrophoresis the ends of the tube are immersed in upper and lower buffer chambers through which it is connected to the power supply. The highly focused gel travels through the tube as a disc.	Диск-гель-электрофорез	Disc-Gelelektrophorese
Disinfectant	Chlorine is often used to disinfect sewage treatment effluent, water supplies, wells, and swimming pools.	Дезинфицирующее средство	Desinfektionsmittel
Dispersant	A chemical agent used to break up concentrations of organic material such as spilled oil.	Деспергатор	Dispergiermittel
Dissociation constant	Given by $[A][B]/[AB]$ , where $[AB]=[A]+[B]$ ; expressed in units of concentration.	Константа диссоциации	Dissoziationskonstante
Distillation	The act of purifying liquids through boiling, so that the steam or gaseous vapors condense to a pure liquid.	Дистилляция	Destillation
Disulphide bridge	An inter- or intra-polypeptide cross-link formed by oxidation of the thiol groups of two cystine residues to a single cystine residue.	Дисульфидный мостик	Disulfidbrücke

DNA	Deoxyribonucleic acid; a macromolecule formed of repeating deoxyriboses linked by phosphodiester bonds between the 3-hydroxyl group of one and the 5-hydroxyl group of the next. A purine, adenine or guanine, or a pyrimidine, cytidine or thymine, is held in a glycosidic bond to the anomeric carbon of the sugar. It functions as a repository of genetic information that is encoded in its base sequence.	ДНК	DNA
DNA enzyme	A single-stranded DNA that can hydrolyse a complementary RNA sequence. Such activity has been observed only in some synthetic oligodeoxynucleotides.	Ферментативная ДНК	DNA-Enzym
DNA gyrase	An enzyme that uses the energy of ATP hydrolysis to unwind double-stranded circular DNA to form a negatively supercoiled molecule.	ДНК-гираза	DNA-Gyrase
DNA methylation	A phenomenon that represses expression of regions of the genome. Transcription is prevented when the DNA is methylated and folded into nucleosomes. Eukaryotic DNA is methylated almost exclusively as 5-methyl cytosine; prokaryotic DNA is methylated also as 6-methyl adenosine.	Метилирование ДНК	DNA-Methylierung
DNA repair	The removal of damaged segments, e.g. pyrimidine dimers, from one strand of double-stranded DNA and its correct resynthesis.	Репарация ДНК	DNA-Reparatur
Domain	A discrete structural region within an immunoglobulin molecule; contains one disulfide bond and a distinct tertiary structure.	Домен	Domäne
Dominant gene	A gene whose phenotype is when it is present in a single copy.	Доминантный ген	Dominantes Gen
Donnan effect (Gibbs-Donnan effect)	The unequal distribution of a diffusible ion across a semi-permeable membrane when an impermeable electrolyte, such as a protein, is also present on one side; e.g. a solution of an anionic protein with Na <sup>+</sup> as a counter-ion, in contact through a membrane with a NaCl solution, will result in the transfer of Cl <sup>-</sup> into the protein compartment and an equivalent amount of Na <sup>+</sup> out of it, such that the products of concentrations, [Na <sup>+</sup> ] <sup>3</sup> [Cl <sup>-</sup> ], in each compartment are equal.	Эффект Доннана (эффект Гиббса-Доннана)	Donnan-Effekt (Gibbs-Donnan-Effekt)
Dormancy	A period in which a plant does not grow, awaiting necessary environmental conditions such as temperature, moisture, nutrient availability.	Период покоя	Keimruhe
Dosage	The actual quantity of a chemical administered to an organism or to which it is exposed.	Дозировка	Dosierung
Dose Equivalent	The product of the absorbed dose from ionizing radiation and such factors as account for biological differences due to the type of radiation and its distribution in the body in the body.	Эквивалентная доза	Äquivalentdosis
Dosimeter	An instrument to measure dosage; many so-called dosimeters actually measure exposure rather than dosage.	Дозиметр	Dosimeter
Double helix (Watson-Crick model)	The arrangement in space of two polynucleotide chains in which each chain is wrapped around the other to form two antiparallel spirals. Each strand pre-	Двойная спираль (модель Уотсона и	Doppelhelix (Watson-Crick-Modell)

	sents to the other the bases, purine to pyrimidine, with which it can form inter-strand hydrogen bonds.	Крика)	
Doublet	A subunit of the axoneme in which 10 microtubule protofilaments are grafted longitudinally on to a whole microtubule, which itself consists of 13 protofilaments. Also, in magnetic resonance, a peak that has been split into two by the interaction of a resonance with a nearby perturbing centre.	Дуплет	Dublette
DPN <sup>+</sup>	Diphosphopyridine nucleotide; obsolete name for NAD <sup>+</sup> .	НАД <sup>+</sup>	DPN +
DPNH	Reduced diphosphopyridine nucleotide; obsolete name for NADH.	НАДН	DPNH
Edman degradation	A chemical technique to degrade and cleave amino acid residues sequentially from a protein beginning at the N-terminus, and to identify the residues as they are removed. Reaction of the N-terminal residue with phenylisothiocyanate cleaves it from the protein as the phenylthiohydantoin derivative, which may be isolated and identified.	Метод Эдмана	Edman-Abbau
Effector	A compound that modulates an allosteric enzyme; a system that produces an intracellular response to a hormone, e.g. adenylate cyclase.	Эффектор	Effektor
Effluent	Wastewater--treated or untreated--that flows out of a treatment plant, sewer, or industrial outfall.	Сточные воды	Abwasser
Eicosanoid	One of a class of compounds that includes the prostaglandins, thromboxanes and leukotrienes, all derived from arachidonic (eicosatetraenoic) acid.	Эйкозаноиды	Eicosanoide
Electrochemical gradient	A concentration and charge difference across a membrane, e.g. the pH difference and membrane potential developed during mitochondrial electron transport.	Электрохимический градиент	Elektrochemischen Gradienten
Electrodialysis	A process that uses electrical current applied to permeable membranes to remove minerals from water.	Электродиализ	Elektrodialyse
Electroelution	A technique to remove a sample previously purified by electrophoresis on a solid support, by electrophoresing it into a buffer.	Электроэлиция	Elektroelution
Electromicro-filtration	A separation procedure in which an electric field is imposed upon an ultrafiltration membrane in order to prevent non-permeable material from accumulating on and clogging it.	Электромикрофильтрация	Electromicrofiltration
Electron nuclear double resonance (ENDOR)	A technique for detection of coupling between electrons and nuclei in order to gain information about the valence electron distribution around a paramagnetic nucleus; observation of an electron spin resonance transition while applying radio frequency energy to effect nuclear magnetic resonance transitions.	Двойной электронный ядерный резонанс	Elektron-Kern-Doppelresonanz (ENDOR)
Electron spin resonance (ESR)	Also known as electron paramagnetic resonance (EPR); a magnetic resonance technique that detects and characterizes the environment of a moiety that contains an unpaired electron by the energy that is equivalent to a change in its spin state.	Электронный парамагнитный резонанс (ЭПР)	Elektronen-Spin-Resonanz (ESR)



Electron tomography	A technique for visualizing subcellular structures at very high resolution (near 2.5 nm). The material is prepared for electron microscopy; electron micrographs are taken as the sample is tilted + or - 60° in small steps (e.g. 2°). The data are then computer-manipulated to recreate images of the structure in three-dimensional space	Электронная томография	Elektronen-Tomographie
Electron transport	The mediation of oxidation of one metabolite and the reduction of another by a series of carriers, cytochromes, iron-sulphur proteins, quinones, etc.	Электронный транспорт	Elektronentransport
Electron-transfer potential	A quantitative measure of the ability of a molecule to lose an electron in a redox reaction under standard conditions; expressed in volts (V).	Потенциал переноса электронов	Electron-Transfer-Potenzial
Electrophile	A compound or functional group that can attract an electron pair.	Электрофил	Elektrophil
Electrophoresis	The technique of separating charged molecules in a matrix to which are applied an electrical field.	Электрофорез	Elektrophorese
ELISA	<i>Enzyme-linked immunosorbent assay</i> ; a technique that combines the specificity of an immunoglobulin with the detectability of an enzyme-generated chromophoric product to quantify a macromolecule. The enzyme is covalently attached to the immunoglobulin; when the latter is adsorbed to an antigen, its presence is revealed by the enzymic generation of a chromophore.	ИФА	ELISA
Elongation cycle	The reactions of a ribosome that add one amino acid residue to the C-terminus of a growing polypeptide chain and move the ribosome three nucleotides towards the 3'-end of the mRNA.	Цикл элонгации	Elongationszyklus
Elution	In chromatography, the washing out of an adsorbed material from a solid support, especially by conditions that assist displacement, e.g. salt concentration, altered pH.	Элюция	Elution
Embden-Meyerhof pathway	The sequence of enzymic reactions that convert glucose into pyruvic acid; also called <i>aerobic glycolysis</i> .	Аэробный гликолиз	Embden-Meyerhof Weg
Embryonic stem (ES) cells	Cell lines derived from early embryos that have the potential to differentiate into all types of somatic cells as well as to form germ line cells, and hence whole animals, when injected into early embryos.	Эмбриональные стволовые (ЭС) клетки	Embryonale Stammzellen (ES)
Emission spectrum	In fluorescence spectroscopy, emission as a function of wavelength, upon excitation at a fixed, shorter wavelength.	Спектр излучения	Emissionspektrum
Emulsifier	A chemical that aids in suspending one liquid in another.	Эмульгатор	Emulgator
Enantiomer	The mirror image of an asymmetrical compound.	Энантиомер	Enantiomer
Endogenous pyrogen	A factor released by leukocytes which produces fever.	Эндогенные пирогены	Endogene Pyrogene
Endogenous retrovirus	Integrated retrovirus DNA (provirus) derived from infection of the germline of an ancestral animal. All animals are thought to carry numerous endogenous	Эндогенные ретровирусы	Endogenen Retrovirus

	(but nonfunctional) retroviruses, some of which were inserted many millions of years ago.		
Endopeptidase	A peptidase that cleaves a protein at an internal peptide bond.	Эндопептида-зы	Endopeptidase
Endorphin	Endogenous morphine-like peptide; one of a class of peptides that are derived from pro-opiomelanocortin by limited proteolysis and have analgesic properties. The group includes the 31-residue $\beta$ -endorphin, and two pentapeptides, Leu-enkephalin and Met-enkephalin.	Эндорфины	Endorphin
Energy balance	The thermodynamic necessity that for any organism, the energy intake (nutrients, light for photosynthesis, etc.) must equal the internal heat produced, the work (movement, transport, etc.) and growth (the difference between synthesis and degradation and between storage and depletion). Logical consequences of this equation are that a decrease in energy input will result in less work, and/or less growth or that an increase in energy input will result in greater heat generation and/or growth.	Энергетический баланс	Energiebilanz
Energy spectrum	A profile of the energy of the emissions from a radioactive atom; the fraction of total emissions from the decay of a radioactive atom, e.g. the $\beta$ -emissions of $^{14}\text{C}$ as a function of the energy of those emissions.	Энергетический спектр	Energiespektrum
Enhancer	A 50 to 1500 bp dsDNA segment that up-regulates transcription of a gene. The enhancer may be up- or downstream or even within an intron of the gene. It is distinct from the promoter; its action may be limited to a specific cell type or developmental stage	Энхансер	Erweiterer
Enkephalin	A pentapeptide isolated from the brain which has opiate properties, e.g. Met-enkephalin (Tyr-Gly-Gly-Phe-Met), Leu-enkephalin (Tyr-Gly-Gly-Phe-Leu).	Энкефалин	Enkephalin
Enthalpy	A measure of the internal energy of a system, comprising binding forces, pressure, etc., expressed as J/mol (or cal/mol).	Энтальпия	Enthalpie
Entropy	A measure of the disorder or randomness of a system, expressed in J/mol per degree K (or cal/mol per degree K).	Энтропия	Entropie
Entropy effect	The acceleration of a reaction that occurs when reactive groups are constrained in a productive orientation, either intermolecularly, as on an enzyme surface, or intramolecularly as in a model compound.	Энтропийный эффект	Entropie-Effekt
Enucleated oocyte (cytoplast)	An egg cell from which the nucleus has been removed mechanically.	Энуклеированная яйцеклетка	Entkernte Eizelle (cytoplast)
Enveloped virus	Any of the viruses with a lipoprotein envelope surrounding the nucleoprotein core of the virus.	Оболочечный вирус	Umhülltes Virus

Enzyme	One of a class of biological catalysts that is composed principally of a globular protein of one or more polypeptide chains. In some cases enzymes include covalently bound or tightly associated metal ions, prosthetic groups or carbohydrates; they range in molecular mass from around 10000 to several hundred thousand Da.	Ферменты	Enzym
Enzyme activity	The rate of an enzyme – its activity – may be expressed in several ways, depending on the purity of the enzyme and one's knowledge of its characteristics, e.g. molecular mass and active sites per molecule. Optimal conditions of substrate, cofactor and salt concentrations and temperature should be selected to give the maximal rate.	Ферментативная активность	Enzymaktivität
Enzyme-substrate complex	The association of a substrate with an enzyme that is an obligatory intermediate in conversion of the substrate into the product of the enzymic reaction.	Фермент-субстратный комплекс	Enzym-Substrat-Komplexes
Eosinophil	A granulocyte with pink to red staining granules.	Эозинофилы	Eosinophile
Epimer	A compound that differs from another by its configuration at only one asymmetrical centre.	Эпимер	Epimer
Epitope	An area on the surface of an antigenic molecule that stimulates a specific immune response and against which that response is directed. Synonymous with antigenic determinant.	Эпитоп	Epitop
Escherichia coli	A commensal bacterium inhabiting the human colon that is widely used in biology, both as a simple model of cell biochemical function and as a host for molecular cloning experiments.	Кишечная палочка	Escherichia coli, Kolibakterium
Essential amino acid	An amino acid that is not synthesized by an organism at an adequate rate (or at all) from other amino acids or metabolites; therefore one that is a dietary requirement.	Незаменимая аминокислота	Essentielle Aminosäure
Essential fatty acid	A fatty acid that is a dietary necessity, e.g. the polyunsaturated fatty acids linoleic acid and linolenic acid.	Незаменимая жирная кислота	Essentielle Fettsäure
Esterase	An enzyme that hydrolyses esters; unless otherwise indicated, esters of carboxylic acids. The category includes the lipases, which, most generally defined, hydrolyze lipids; however, many lipases are active only when the lipid is in micellar form; thus they are characteristically inactive against low concentrations of a lipid, and show activity (surface activation) only when the lipid concentration rises above the critical micellar concentration.	Эстераза	Esterase
Ethidium bromide	A fluorescent dye used to stain DNA and RNA. The dye fluoresces when exposed to UV light.	Бромид этидия	Ethidiumbromid
Eukaryote	Organism whose cells have (1) chromosomes with nucleosomal structure and are separated from the cytoplasm by a two-membrane nuclear envelope, and (2) compartmentalization of functions in distinct cytoplasmic organelles. Contrast prokaryotes (bacteria and cyanobacteria).	Эукариоты	Eukaryoten

Exchange reaction	A partial enzymic reaction, especially when only one of two substrates is present, in which chemical groups or single atoms of the substrate equilibrate with the medium, with a cofactor or with one of the products.	Реакции обмена	Austauschreaktion
Exon	A DNA sequence that is ultimately translated into protein.	Экзон	Exon
Exopeptidase	A peptidase that cleaves a protein sequentially, starting at the N-terminal peptide bond ( <i>aminopeptidase</i> ) or at the C-terminal peptide bond ( <i>carboxypeptidase</i> ).	Экзопептидазы	Exopeptidase
Exotoxin	A disease-causing agent that is produced and secreted by a pathogen; contrasted with <i>endotoxin</i> , which is an intrinsic component of the pathogen, e.g. the lipopolysaccharide of Gram-negative bacteria.	Экзотоксин	Exotoxin
Expression	The production of a gene product, i.e. protein or RNA, from a gene; the manifestation of a genotype as a phenotype.	Экспрессия	Expression
Fab	Fragment of antibody. That part of the immunoglobulin consisting of the N-terminal half of the heavy chain and its associated light chain; results from papain digestion.	Fab-фрагмент	Fab
Factitious protein	A product of genetic engineering; a protein designed for a specific purpose or for its expected properties.	Искусственный белок	Factitious Protein
Facultative bacteria	Bacteria that can live under aerobic or anaerobic conditions.	Факультативные бактерии	Fakultative Bakterien
Fat	A wide group of compounds that are generally soluble in organic solvents and generally insoluble in water; triacylglycerols.	Жиры	Fett
Fatty acid	A carboxy group on an alkyl chain that is usually unbranched; may be a short-chain (alkyl group contains less than 7 carbons), medium-chain or long-chain (alkyl group contains more than about 11 carbons) fatty acid.	Жирные кислоты	Fettsäure
Fc	Fragment crystallizable. That part of the immunoglobulin consisting of the C-terminal half of the heavy chains, containing the constant domains. This portion determines the isotype of the molecule.	FC-фрагмент	Fc
Feedback inhibition	A form of metabolic control in which the end product of a pathway inhibits the enzyme, usually an allosteric enzyme that catalyzes the earliest irreversible reaction that is unique to the pathway. Also, the control a hormone exerts on the sequence of events that result in its synthesis and release.	Ферментативное ингибирование	Feedback Hemmung
Feed-forward regulation	Control of a metabolic pathway by a metabolite of the pathway that acts in the same direction as the metabolic flux, i.e. downstream or 'later' in the pathway, e.g. the activation of pyruvate kinase by fructose 1,6-bisphosphate.	Опережающее регулирование	Feed-Forward-Regelung
Fenton reaction	The generation of a reactive, and potentially damaging, hydroxyl radical: $\text{H}_2\text{O}_2 + \text{Fe}^{2+} \rightarrow \text{OH}^\cdot + \text{Fe}^{3+} + \text{OH}^-$ .	Реакция Фентона	Fenton-Reaktion

Feral	Refers to an individual or population that has returned to the wild after a history of domestication.	Одичавшие	Ungezähmt
Fermentation	The anaerobic degradation, usually by a micro-organism, of a sugar (or other source of energy) and biosynthetic intermediates, during which secondary metabolites may be produced.	Брожение	Fermentation
Feulgen reaction	A qualitative colorimetric method for identification of DNA, especially in cytochemistry; treatment with fuchsin sulphurous acid to produce a red colour.	Реакция Фельгена	Feulgen-Reaktion
Fibroblast	A type of relatively undifferentiated cell found in many parts of the body involved primarily in wound healing. Fibroblasts are relatively easy to grow in cell culture and often are used for this purpose.	Фибробласты	Fibroblast
Filtration	A treatment process, under the control of qualified operators, for removing solid (particulate) matter from water by means of porous media such as sand or a man-made filter; often used to remove particles that contain pathogens.	Фильтрация	Filtration
Fitness	The ability to survive to reproductive age and produce viable offspring. Fitness also describes the frequency distribution of reproductive success for a population of sexually mature adults.	Приспособленность	Fitness
Flame photometry	An analytical technique to quantify small amounts of some elements, especially alkali metals, in solution; the solution is vapourized in a flame and the intensity of the characteristic spectral line emission produced by excitation of the metal atoms is detected by a photomultiplier.	Пламенная фотометрия	Flammenphotometrie
Flammable	Any material that ignites easily and will burn rapidly.	Легковоспламеняющийся материал	Feuergefährliche Material
Flanking region	The DNA sequences extending on either side of a specific locus or gene.	Ограничивающая область	Flankierenden Region
Flash Point	The lowest temperature at which evaporation of a substance produces sufficient vapor to form an ignitable mixture with air.	Температура вспышки	Flammpunkt
Flippase	A putative enzyme that transports membrane elements, e.g. the lipopolysaccharide of Gram-negative bacteria, from the inner to the outer leaflet of the lipid bilayer cell membrane.	Флиппазы	Flippase
Fluorescence	The property of a compound or moiety of absorbing ultraviolet or visible light and re-emitting it nearly instantaneously at a longer wavelength; also the fluorescent emission itself.	Флуоресценция	Fluoreszenz
Food Processing Waste	Food residues produced during agricultural and industrial operations.	Отходы пищевой промышленности	Die Abfälle der Nahrungsmittelindustrie
Formaldehyde	A colorless, pungent, and irritating gas, CH <sub>2</sub> O, used chiefly as a disinfectant and preservative and in synthesizing other compounds like resins.	Формальдегид	Formaldehyd

Frame-shift	A mutation that throws out of register the normal reading of triplet codons during translation; usually caused by an insertion (or deletion) of one or two nucleotides into (or from) the gene.	Мутация сдвига рамки считывания	Frameshift
Free base	The purine or pyrimidine moiety of a nucleoside, nucleotide or nucleic acid that is not attached to the pentose or pentose phosphate moiety.	Свободное основание	Freie Base
Free radical	A molecular species containing an unpaired electron, e.g. the hydroxyl, superoxide and nitric oxide radicals.	Свободный радикал	Freie Radikale
French paradox	The hypothesis that the lower incidence of heart disease in Mediterranean countries is due to ingestion of constituents of red wine, possibly flavinoids, that act to inhibit oxidation of low-density lipoproteins.	Французский парадокс	Französisch Paradox
Fresh Water	Water that generally contains less than 1,000 milligrams-per-liter of dissolved solids.	Пресная вода	Frisches Wasser
Frictional coefficient	A measure of the size and asymmetry of a molecule in solution, derived from hydrodynamic measurements, e.g. diffusion, ultracentrifugation, mobility in electrophoresis.	Фрикционный коэффициент	Reibungskoeffizient
Fungicide	An agent, such as a chemical, that kills fungi.	Фунгицид	Fungizid
Fungus	A microorganism that lacks chlorophyll.	Гриб	Pilz
Furanose	The form of a sugar when it is condensed into a 5-membered ring. By analogy with furane, the 5-membered cyclic compound containing an oxygen atom and two conjugated carbon-carbon double bonds, a furanose consists of four carbon atoms of a monosaccharide and the oxygen atom that is the link to the anomeric carbon atom.	Фураноза	Furanose
Fusion gene	A hybrid gene created by joining portions of two different genes (to produce a new protein) or by joining a gene to a different promoter (to alter or regulate gene transcription).	Гибридный ген	Verschmelzung-Gen
Gamete	A haploid sex cell, egg or sperm, that contains a single copy of each chromosome.	Гаметы	Gameten
Gas Chromatograph Mass Spectrometer	Instrument that identifies the molecular composition and concentrations of various chemicals in water and soil samples.	Газовый хроматографический масс-спектрометр	Gaschromatograph-Massenspektrometer
Gasification	Conversion of solid material such as coal into a gas for use as a fuel.	Газификация	Vergasung
Gene	The fundamental physical and functional unit of heredity. A gene is an ordered sequence of nucleotides located in a particular position on a particular chromosome that encodes a specific functional product (such as a protein or RNA molecule).	Ген	Gen
Gene flow	The exchange of genetic traits between populations by movement of individuals, gametes, or spores. It involves the spread of new variants among different populations through dispersal.	Поток генов	Genfluss

Gene gun	A device invented at Cornell University that allows genetic material to be introduced into a new organism. The genetic material from the donor is "shot" into cells of the recipient, and the material is incorporated into its DNA.	Генная пушка	Genkanone
Gene splicing	The isolation of a gene from one organism and then the introduction of that gene into another organism using techniques of biotechnology.	Сплайсинг генов	Gene Spleißen
General acid	In chemistry, a proton donor that can participate in catalysis.	Общие кислоты	Allgemeine Säure
General base	In chemistry, a proton acceptor that can participate in catalysis.	Общие основания	Allgemeine Basis
Genetic engineering	A process of inserting new genetic information into existing cells in order to modify a specific organism for the purpose of changing one of its characteristics.	Генная инженерия	Gentechnik
Genetic linkage map	A linear map of the relative positions of genes along a chromosome. Distances are established by linkage analysis, which determines the frequency at which two gene loci become separated during chromosomal recombination.	Сцепленное наследование	Genetische Kopplungskarte
Genetic marker	A gene or group of genes used to "mark" or track the action of microbes.	ДНК-маркер	Genetische Marker
Genetically modified organism (GMO)	Often, the label GMO and the term "transgenic" are used to refer to organisms that have acquired novel genes from other organisms by laboratory "gene transfer" methods.	Генетически модифицированные организмы (ГМО)	Gentechnisch veränderter Organismus (GVO)
Genome	All the genetic material in the chromosomes of a particular organism; its size is generally given as its total number of base pairs.	Геном	Genom
Genomics	Mapping and sequencing of all the genetic material in the DNA of a particular organism as well as the use of information derived from genome sequence data to further elucidate what genes do, how they are controlled, and how they work together.	Геномика	Genomik
Genotype	The genetic identity of an individual. Genotype often is evident by outward characteristics.	Генотип	Genotyp
Germ cell (germ line) gene therapy	The repair or replacement of a defective gene within the gamete-forming tissues, which produces a heritable change in an organism's genetic constitution.	Генная терапия зародышевыми клетками	Keimzelle Getherapie
Germicide	Any compound that kills disease-causing microorganisms.	Бактерицидное средство	Keimtötendes Mittel
Germinal center	A clonal expansion of an activated B cell seen within a secondary follicle.	Зародышевый центр	Keimzentrum
Germline cells	Cells that contain inherited material that comes from the eggs and sperm, and that are passed on to offspring.	Половые клетки	Keimbahnzellen
Glass Containers	For recycling purposes, containers like bottles and jars for drinks, food, cosmetics and other products.	Стеклотара	Glasbehälter

Globular	Descriptive of the folding of a protein upon itself in several convolutions to create interactions of the side chains in many weak salt bridges, hydrogen bonds and hydrophobic bonds that result in a roughly spherical (globular) molecular shape. Single-stranded RNA may also accept a globular shape, and shares with proteins the property of selectivity in binding of ligands.	Глобула	Kügelchen
Globulin	Archaic nomenclature for a protein that is sparingly soluble in water, but is soluble in dilute salt solutions. <i>Euglobulins</i> do not dissolve in salt-free water, whereas <i>pseudoglobulins</i> are soluble in salt-free water. <i>Gamma</i> ( $\gamma$ )-globulins are a population of globulins defined further by their electrophoretic behaviour, and include the immunoglobulins.	Глобулин	Globulin
Glucocorticoid	An adrenal steroid that increases blood glucose concentration, e.g. cortisol.	Глюкокорти- коид	Glucocorticoid
Glucogenic amino acid	An amino acid whose carbon skeleton can be metabolically converted, at least in part, into glucose.	Глюкозоген- ные аминокислоты	Glucogene Aminosäure
Gluconeogenesis	The biosynthesis of glucose from smaller, non-carbohydrate, metabolites, i.e. amino acids, tricarboxylic acid cycle intermediates, lactate or glycerol.	Глюконеогенез	Glukoneogenese
Glucose	A six carbon monosaccharide that is an important cellular fuel and metabolic intermediary.	Глюкоза	Glucose
Glycan	Most generally a linear or branched homo- or hetero-polysaccharide or -oligosaccharide, but often the carbohydrate moiety of a conjugate with a protein or lipid.	Гликан	Glycan
Glycocalyx	The carbohydrate coating on the external surface of a cell membrane.	Гликокаликс	Glykokalyx
Glycolipid	A compound with both lipid and sugar moieties, e.g. lipopolysaccharide of Gram-negative bacteria cell walls, blood group antigens, gangliosides (carbohydrate moieties attached to N-fatty acylsphingosine), cerebroside and ceramides.	Гликолипид	Glykolipid
Glycolysis	One of the central pathways of metabolism in most eukaryotes and many other cells; the sequence of enzymic reactions that converts glucose into lactic acid ( <i>anaerobic glycolysis</i> ) or into pyruvate ( <i>aerobic glycolysis</i> ).	Гликолиз	Glykolyse
Glycoprotein hormone	A representative of a class of hormones that share nearly identical A-chains and unique B-chains, each with about 125 amino acid residues and N-linked or O-linked carbohydrate moieties, e.g. thyrotropin, follicle-stimulating hormone.	Гонадотропные гормоны	Glycoprotein hormon
Glycosaminoglycan	A subunit of a proteoglycan; an oligosaccharide that contains repeating disaccharide residues. One half of each disaccharide is an amino-sugar residue. Glycosaminoglycans include the sulphated chondroitins, dermatans and keratans, and the unsulphated hyaluronans.	Гликозаминогликаны	Glykosaminoglykan



Glycoside	A metabolite formed by conjugation with a sugar through its anomeric carbon atom, e.g. $\beta$ -methyl glucoside.	Гликозид	Glykosid
Glycosidic bond	The linkage of a sugar hemiacetal or hemiketal through its anomeric carbon with another moiety.	Гликозидные связи	Glykosidischen Bindung
Glycosylation	Post-transcriptional modification of a protein by the addition of a carbohydrate moiety.	Гликозирова- ние	Glykosylierung
Glyoxylate cycle (Krebs-Kornberg cycle)	A series of metabolic reactions in plants and bacteria, the net result of which is production of a 4-carbon compound from two 2-carbon compounds. The unique reactions are catalysed by malate synthase and isocitrate lyase.	Глиоксилат- ный цикл (цикл Кребса- Корнберга)	Glyoxylat- Zyklus (Krebs- Kornberg- Zyklus)
Goodpasture's syndrome	An autoimmune disease involving primarily antibodies to basement membranes, leading to glomerulonephritis and pulmonary hemorrhage.	Синдром Гудпасчера	Goodpasture Syndrom
Gortner and Grendel model	A model in which erythrocyte membranes comprise only phosphoacylglycerols, i.e. no protein or sterol component is envisaged; the model presents a bilayer in which each leaflet is composed of lipids stacked perpendicular to the plane of the membrane, with their alkyl chains oriented inwards (towards the opposing leaflet) and with the polar groups oriented towards the exposed surfaces.	Модель Горт- нера и Грен- деля	Gortner und Grendel Modell
Grab Sample	A single sample collected at a particular time and place that represents the composition of the water, air, or soil only at that time and place.	Забираемый образец	Schürfprobe
Gram-negative	Descriptive of bacteria that do not stain by the Gram method, i.e. bacteria with two membranes.	Грамотрица- тельные	Gramnegative
Gram-positive	Descriptive of bacteria that stain by the Gram method, i.e. bacteria with single membranes.	Грамполо- жительные	Grampositive
Granulocyte	A leukocyte with large numbers of cytoplasmic granules and a multi-lobed nucleus. They include neutrophils, eosinophils, and basophils.	Гранулоциты	Granulozyten
Granuloma	A mass of granulation tissue consisting of phagocytic cells, among other things, often the result of persistent inflammation caused by a pathogen.	Гранулёма	Granuloma
Ground substance	The histologically featureless extracellular matrix of connective tissue, largely composed of proteoglycans.	Основное вещество	Grundsub- stanz
Growth factor	A protein that binds to receptors on specific cells and promotes their growth, e.g. nerve growth factor, epidermal growth factor, platelet-derived growth factor.	Фактор роста	Wachstums- faktor
Growth phase	The characteristic periods in the growth of a bacterial culture, as indicated by the shape of a graph of viable cell number versus time.	Фаза роста	Wachstums- phase
Haem oxygenase	Enzyme that catalyses the degradation of haem to iron, biliverdin and carbon monoxide.	Гемоксигена- за	Häm- Oxygenase
Haemoglobinopathy	An abnormality that may produce a disease the basis of which is an alteration in haemoglobin structure or synthesis.	Гемоглоби- нопатия	Haemoglobi- nopathy

Haemolysis	The bursting of erythrocytes due, for example, to a hypotonic environment.	Гемолиз	Hämolyse
Half-Life	The time required for half of the atoms of a radioactive element to undergo self-transmutation or decay. Or the time required for the elimination of half a total dose from the body.	Период полураспада	Halbwertszeit
Halophilic	Descriptive of organisms that survive and grow only in high salt concentrations.	Галофильность	Halophilen
Haploid cell	A cell containing only one set, or half the usual (diploid) number, of chromosomes.	Гаплоидная клетка	Haploiden Zelle
Haplotype	A characteristic combination of alleles on a single chromosome, which may persist in a population because of their close proximity on the chromosome, a founder effect or natural selection.	Гаплотип	Haplotyp
Hapten	A small molecule which by itself is not an antigen, but which as a moiety of a larger structure (a haptenic determinant) can serve as an antigenic determinant.	Гаптен	Hapten
Hard Water	Alkaline water containing dissolved salts that interfere with some industrial processes and prevent soap from sudsing.	Жесткая вода	Hartes Wasser
Haworth projection	A two-dimensional representation of pyranose and furanose structures in which they are shown as hexagons and pentagons respectively. The lower ring atoms are understood as being towards and the upper ones away from the observer; the substituents of ring carbon atoms are shown directly above and below the apices of the polygon.	Проекция Хьюорса	Haworth Projektion
Hazardous Chemical	Such substances are capable of producing fires and explosions or adverse health effects like cancer and dermatitis.	Опасные химические вещества	Gefährliche Chemikalien
Heat-shock protein	One of the proteins produced by some cells when they are stressed, e.g. by an abrupt increase in temperature.	Белки теплового шока	Hitzeschock-Protein
Heavy chain	The larger of the two types of chains making up an immunoglobulin molecule; consisting of one variable domain and three to four constant domains.	Тяжелая цепь	Schwere Kette
Heavy Metals	Metallic elements with high atomic weights; (e.g. mercury, chromium, cadmium, arsenic, and lead); can damage living things at low concentrations and tend to accumulate in the food chain.	Тяжелые металлы	Schwermetalle
Heavy subunit	The larger of the two ribonucleoprotein complexes that make up a ribosome; more generally, the largest of the subunits of any complex	Тяжелая субъединица	Schwerer Untereinheit
Heinz body	A precipitate in the cytoplasm of an erythrocyte of a spontaneously oxidized, unstable, haemoglobin.	Тельца Хайнца	Heinz-Körper
Helix cap	A sequence of amino acids in a protein that terminates a stretch of $\alpha$ -helical structure.	Кэп спирали	Helix Cap
Helix-coil transition	In nucleic acid and protein chemistry, the melting, or co-operative thermal breakdown of the hydrogen bonds that stabilize the secondary structure, of the macromolecule.	Трансформация спираль-клубок	Helix-Knäuel-Übergang

Hemiacetal	The product of reversible condensation of an aldehyde and an alcohol in which the alcoholic hydroxy group adds across the carbonyl group of the aldehyde, e.g. glucose acting as both an aldehyde and an alcohol to give the internally condensed glucopyranose; also the bond formed by this condensation. An acetal is the product formed by abstraction of the hydroxy group of a hemiacetal and the hydrogen of a second alcohol, e.g. a glucopyranoside or a polysaccharide.	Полацеталь	Halbacetal
Hemolysin	An antibody capable of bonding to red blood cells and causing their lysis by activation of complement.	Гемолизин	Hämolysin
Heteromer	See <i>Homomer</i> .	Гетеромер	Heteromer
Henderson-Hasselbalch equation	A logarithmic form of the equation for the dissociation of a weak acid: $\text{pH} = \text{pK}_a + \log[\text{salt form}]/[\text{acid form}]$ .	Уровнение Хендерносна-Хассельбаха	Henderson-Hasselbalch-Gleichung
Herbicide-tolerant crop	Crop plants that have been developed to survive application(s) of one or more commercially available herbicides by the incorporation of certain gene(s) via biotechnology methods such as genetic engineering or traditional breeding methods (such as natural, chemical, or radiation mutation).	Гербицид-устойчивые растения	Herbizid-tolerante Pflanzen
Heterochromatin	Dark-stained regions of chromosomes thought to be for the most part genetically inactive.	Гетерохроматин	Heterochromatin
Heteroduplex	A partially double-stranded polynucleotide in which one strand contains sequences not fully complementary to the opposite strand, e.g. mRNA, which contains no introns, annealed to the coding strand of its corresponding gene, which contains introns. Heteroduplexes are products of recombination between DNA duplexes at a region of heterology.	Гетеродуплекс	Heteroduplex
Heterogeneous nuclear RNA	The name originally given to large RNA molecules found in the nucleus, which are now known to be unedited mRNA transcripts, or pre-mRNAs.	Гетерогенная ядерная РНК	Heterogene Kern-RNA
Hierarchical condensation	The hypothesis that, during the folding of a protein in solution, some regions are much more likely to adopt a secondary structure and that, once formed, these interact to direct the subsequent course of folding. This hypothesis is a component of the framework model.	Иерархическая конденсация	Hierarchische Kondensation
High endothelial venule	A specialized region in the post capillary venule which contains specific ligand receptors that are recognized by circulating lymphocytes; once bound, the lymphocytes are transported through the cells into the lymph node.	Высокие эндотелиальные венулы	Hohe endothelialen venule
High-energy bond	A chemical bond whose hydrolysis results in the generation of 30kJ (7kcal) of energy or, if coupled to an energetically unfavourable reaction, can drive that reaction forward.	Макроэргическая связь	Energiereiche Bindung

High-pressure liquid chromatography	A technique for rapid separation of solutes on a solid support, based on ion-exchange, gel permeation or partition principles; reverse-phase HPLC is when the stationary phase has a non-polar coat; microbore or narrow-bore HPLC is adapted to small quantities and high sensitivity by scaling down.	Жидкостная хроматография высокого давления	Hochdruck-Flüssigkeits-Chromatographie
Hill coefficient	A measure of co-operativity, i.e. the number $h$ in the equation $[\text{HbO}_2]/[\text{Hb}] = k(p\text{O}_2)^h$ that empirically describes the dependence of haemoglobin (Hb) oxygenation on the partial pressure of oxygen ( $p\text{O}_2$ ).	Коэффициент Хилла	Hill-Koeffizient
Hill plot	A graphical representation of binding data, especially for oxygen binding to haemoglobin; a plot of $\log[Y/(1-Y)]$ against $\log p\text{O}_2$ , where $Y$ is the fraction of binding sites occupied and $p\text{O}_2$ is the partial pressure of oxygen; the slope of the plot is the Hill coefficient ( $h$ ).	График Хилла	Hill-Grundstück
Hill reaction	The concomitant reduction of an electron carrier and oxidation of water to molecular oxygen that is performed by illuminated green plants; the <i>light reaction</i> of photosynthesis.	Реакция Хилла	Hill-Reaktion
Hinge (1)	The region between the first and second constant domains in an immunoglobulin molecule. This part allows flexibility between the Fab regions; it is also vulnerable to enzymatic attack.	Шарнирный участок	Gelenkregion
Hinge (2)	A flexible polypeptide sequence connecting two domains of a protein that can move with respect to each other.	Шарнир	Gelenk
Histamine	A vasoactive agent released by basophils, mast cells, and platelets.	Гистамин	Histamin
Histocompatibility antigens	Cell membrane proteins that provoke an immune response when a tissue is grafted into an allogeneic recipient.	Антигены гистосовместимости	Histokompatibilitätsantigene
Histone	One of five small, basic, proteins that are incorporated into chromatin.	Гистоны	Histone
Homeobox	A highly conserved 180-base polynucleotide sequence that controls body part-, organ- or tissue-specific gene expression, e.g. development of antennae or legs of <i>Drosophila</i> , but also in a wide variety of other eukaryotes. It codes for a helix-turn-helix DNA-binding region, a <i>homeodomain</i> , of proteins that are transcription factors.	Гомеобокс	Homeobox
Homolactate fermentation	The fermentation of a hexose that produces only lactic acid, as opposed to heterolactate fermentation, which also produces other products.	Гомолактатное брожение	Homolactate Gärung
Homologous chromosomes	Chromosomes that have the same linear arrangement of genes--a pair of matching chromosomes in a diploid organism.	Гомологичные хромосомы	Homologe Chromosomen
Homologous recombination	Rearrangement of related DNA sequences on a different molecule by crossing over in a region of identical sequence.	Гомологичная рекомбинация	Homologe Rekombination

Homology	The similarity in base sequences of genes or amino acid sequences of proteins that denotes a common evolutionary origin; also the similarity of structure or function of proteins that is due to a common evolutionary origin.	Гомология	Homologie
Homolytic cleavage	The splitting of a covalent bond that leaves one of the bonding electrons with each of the atoms, thus generating free radicals.	Гомолитическое расщепление	Homolytische Spaltung
Homomer	A complex composed of only one kind of subunit; e.g. the neo-natal glycine-gated Cl <sup>-</sup> channel, which is composed of five $\alpha_2$ subunits. This is contrasted with a <i>heteromer</i> , a complex composed of more than one kind of subunit, e.g. the adult glycine-gated Cl <sup>-</sup> channel, which is composed of three $\alpha_1$ and two $\beta$ subunits.	Гомомер	Homomer
Homotropic enzyme	An enzyme that is controlled by an allosteric activator that is also a substrate.	Гомотропный фермент	Homotroper Enzym
Horizontal gene transfer	Transmission of DNA between species, involving close contact between the donor's DNA and the recipient, uptake of DNA by the recipient, and stable incorporation of the DNA into the recipient's genome.	Горизонтальный перенос генов	Horizontaler Gentransfer
Hormone	A substance that mediates interactions between non-contiguous cells; classically, a substance produced in minute amounts by an organ (an endocrine organ) in one part of the body and transported by the blood to a distant target organ, which it stimulates; less rigorously applied to substances that share some part of the classical description.	Гормоны	Hormon
Housecleaning enzyme	An enzyme that hydrolyses or otherwise destroys a potentially mutagenic or physiologically disruptive metabolite; e.g. a nudix hydrolase, an enzyme that hydrolyzes a nucleoside diphosphatase-linked metabolite.	Защитные ферменты	Housecleaning Enzym
Human Equivalent Dose	A dose which, when administered to humans, produces an effect equal to that produced by a dose in animals.	Человеческая эквивалентная доза	Menschliche Äquivalentdosis
Humoral immunity	Immunity in which antibody plays the significant role.	Гуморальный иммунитет	Humorale Immunität
Hybrid	Seed or plants produced as the result of controlled cross-pollination as opposed to seed produced as the result of natural pollination. Hybrid seeds are selected to have higher quality traits (for example, yield or pest tolerance).	Гибрид	Hybride
Hybrid hybridoma	A cell that produces antibodies with dual specificity because it is a fusion of two hybridomas, and therefore produces immunoglobulins characteristic of each parent cell and hybrids that display one binding site of each parental type.	Гибридные гибридомы	Hybrid-Hybridom
Hybridoma	A hybrid cell, composed of a B lymphocyte fused to a tumor cell, which grows indefinitely in tissue culture and is selected for the secretion of a specific antibody of interest.	Гибридома	Hybridoma

Hydraulic Conductivity	The rate at which water can move through a permeable medium.	Гидравлическая проводимость	Hydraulische Leitfähigkeit
Hydrocarbons	Chemical compounds that consist entirely of carbon and hydrogen.	Углеводороды	Kohlenwasserstoffe
Hydrodynamic volume	The volume of a macromolecule as deduced from its behaviour in solution.	Гидродинамический объем	Hydrodynamische Volumen
Hydrogen bond	A relatively weak bond formed between a hydrogen atom (which is covalently bound to a nitrogen or oxygen atom) and a nitrogen or oxygen with an unshared electron pair.	Водородная связь	Wasserstoffbrückenbindung
Hydrogen peroxide	A reactive oxygen species (ROS) that is produced within biological systems, either directly from enzymes such as flavoenzymes, or through the dismutation of superoxide.	Перекись водорода	Wasserstoffperoxid
Hydrogen Sulfide	Gas emitted during organic decomposition. Also a by-product of oil refining and burning.	Сероводород	Schwefelwasserstoff
Hydrolase	One of the class of enzymes that transfer a chemical group from donor substrates to water, e.g. peptidase, nuclease, glycosylase.	Гидролазы	Hydrolase
Hydrolysis	The decomposition of organic compounds by interaction with water.	Гидролиз	Hydrolyse
Hydrophilic	Having a strong affinity for water.	Гидрофильность	Hydrophile
Hydrophilic residue	An amino acid residue that has a charged or polar side chain.	Гидрофильные остатки	Hydrophile Rückstand
Hydrophoby	Having a strong aversion for water.	Гидрофобность	Hydrophobie
Hydrophobic bond	The association of non-polar side chains of a protein that is driven by minimization of the relatively unfavourable interactions of water molecules with the non-polar groups, and maximization of the favourable interaction of water molecules with themselves when they are removed from contact with the non-polar residues and are added to the bulk water phase.	Гидрофобные связи	Hydrophoben Bindung
Hydrophobic collapse	The initial stages in protein folding, in which interactions of local hydrophobic groups interact and quickly reduce the size of the unfolded protein.	Гидрофобный коллапс	Hydrophoben Kollaps
Hyperchromic effect	The increase in absorbance, frequently measured at 260nm, when a native polynucleotide is denatured. The ratio of absorbance of the native polymer to that of the denatured or hydrolysed material is the <i>hyperchromicity ratio</i> , and ranges from 1.0 to 1.4.	Гиперхромный эффект	Hyperchromer Effekt
Hypersensitivity	A state of reactivity with characteristic symptoms to certain substances (allergens) in amounts innocuous to normal individuals.	Гиперчувствительность	Überempfindlichkeit
Hypochromicity	The decrease in absorbance at 260nm observed when a strand of single-stranded DNA base-pairs with its complementary strand to form double-stranded DNA.	Гипохромизм	Hypochromizität

Idiotype	The antigenic characteristic of the variable region of an immunoglobulin.	Идиотип	Idiotyp
IgG	The main antibody isotype found in blood and extracellular fluid allowing it to control infection of body tissues. Composed of four peptide chains.	Иммуноглобулины класса G (IgG)	IgG
IgM	A basic antibody that is produced by B cells. IgM is by far the physically largest antibody in the human circulatory system. It is the first antibody to appear in response to initial exposure to antigen.	Иммуноглобулины класса М (IgM)	IgM
Imino group	A secondary amine, e.g. the ;NH group of proline.	Иминогруппа	Iminogruppe
Immiscibility	The inability of two or more substances or liquids to readily dissolve into one another.	Несмеси-мость	Unmischbarkeit
Immunity	The state of resistance to an infection.	Иммунитет	Immunität
Immunoaffinity chromatography	A variant of affinity chromatography in which an antibody coupled to the stationary phase adsorbs an antigen which is subsequently eluted at a different pH or a higher salt concentration. Specific antibodies may similarly be prepared on columns of immobilized antigens.	Иммуноаффинная хроматография	Immunaффinitätschromatographie
Immunodiffusion	A method for testing the identity of several antigens using an <i>Ouchterlony plate</i> , a glass plate covered with a thin layer of agar on which is incised a hole surrounded by several other holes that serve as wells. In the central well is placed an antibody, and the antigens in question are placed in the surrounding wells; the antibody and antigens diffuse towards each other until they meet and form a visible precipitin line. An antigen in an adjacent well forms a precipitin line that is continuous with the first only if the two antigens are identical. Similarly, the plate can be used to test the identity of antibodies against a single antigen in the central well.	Иммунодиффузия	Immundiffusion
Immuno-electrophoresis	A procedure involving sequential electrophoresis and immunoprecipitation; it is used to identify the proteins in a complex solution such as serum.	Иммуноэлектрофорез	Immunelektrophorese
Immunofluorescence	The visualization of an antigen in a histological section or on a polyacrylamide slab by allowing it to combine with a fluorophore-tagged antibody.	Иммунофлюоресценция	Immunfluoreszenz
Immunogenicity	The ability of a substance to elicit an immune response.	Иммуногенность	Immunogenität
Immunoglobulin	One of a member of five general classes of serum and blood cell proteins that recognize foreign compounds.	Иммуноглобулин	Immunoglobulin
Immunotoxin	A conjugate of an immunoglobulin and a toxin which is designed to mimic a type 2 ribosome-inactivating protein; the immunoglobulin recognizes a target cell and the toxin inactivates it.	Иммунотоксин	Immunotoxin
In vitro	Testing or action outside an organism (e.g. inside a test tube or culture dish).	В пробирке	In Vitro
In vivo	Testing or action inside an organism.	В естественных условиях	In Vivo

Incomplete antibody	An antibody that can bind to a particulate antigen but is incapable of causing its agglutination.	Неполные антитела	Unvollständige Antikörper
Indicator	A substance that shows a visible change, usually of color, at a desired point in a chemical reaction.	Индикатор	Indikator
Indirect calorimetry	Evaluation of the heat evolved by a subject by measurement of oxygen consumption, carbon dioxide evolution and excretion of nitrogenous metabolites.	Непрямая калориметрия	Indirekte Kalorimetrie
Induction	The production of an enzyme in response to the presence of a particular compound, the inducer, or a condition, e.g. heat. <i>In developmental biology</i> , induction is the effect of one group of cells upon the development of another group, mediated by a chemical property, e.g. a cell surface protein, or a secretion of the former group.	Индукция	Induktion
Inertial separator	A device that uses centrifugal force to separate waste particles.	Инерционный сепаратор	Trägheitsabscheider
Infectious agent	Any organism, such as a pathogenic virus, parasite, or bacterium, that is capable of invading body tissues, multiplying, and causing disease.	Инфекционный агент	Infektionserregern
Informational RNA (iRNA)	Essentially, intronic sequences of hnRNA, for which an evolutionary function has been proposed: by a mechanism analogous to the SELEX procedure, and in the absence of any conservative selective pressure, intronic RNA is recruited for evolution of new genes.	Информационная РНК (и-РНК)	Informativ RNA (IRNA)
Infrared spectroscopy	IR spectroscopy; a technique that measures absorption of electromagnetic radiation between the long wavelength end of the visible spectrum (780-800 nm) and the short end of the microwave spectrum (1000 $\mu$ m). In practice, most commercial IR spectrometers measure from 780 nm to 300 $\mu$ m. Absorption in the IR is due to interatomic motions of molecules, vibrations and rotations about bonds. Spectra are commonly presented as percent transmission vs. wavelength.	ИК-спектроскопия	Infrarot-Spektroskopie
Inhibitor	In enzymology, a compound, or even a macromolecule, that blocks the action of an enzyme by reversible attachment in such a way as to prevent binding by the substrate ( <i>competitive inhibition</i> ), or by prevention of the reaction even if the substrate can still bind ( <i>non-competitive inhibition</i> ).	Ингибитор	Inhibitor
Initial velocity	The rate of an enzymic or chemical reaction as it begins, i.e. with all concentrations of substrates and products at defined levels.	Начальная скорость	Anfangsgeschwindigkeit
Initiation codon	A trinucleotide sequence, AUG, that signals the start of translation of a protein; the codon for methionine in eukaryotes and for <i>N</i> -formylmethionine in prokaryotes.	Иницирующий кодон	Initiationscodon
Initiation factor	An accessory protein that is necessary for assembly of the ribosome-mRNA complex and the start of protein synthesis.	Фактор инициации	Initiationsfaktor
Initiator	A site, upstream from a structural gene, for attachment of a protein that stimulates initiation of transcription.	Инициатор	Initiator



Inner filter effect	A fluorescence spectroscopy phenomenon; the decrease in fluorescence emission seen in concentrated solutions due to the absorption of exciting light by the fluorophore that is close to the incident beam and which significantly diminishes light that reaches the sample further away from it.	Эффект внутреннего фильтра	Inneren Filtereffekt
Inorganic chemicals	Chemical substances of mineral origin, not of basically carbon structure.	Неорганические химикаты	Anorganische Chemikalien
Insulin	A hormone secreted by the pancreas that binds to its specific cell surface receptor in tissues throughout the body. Insulin regulates multiple growth and metabolic actions of cells including glucose uptake into tissues.	Инсулин	Insulin
Insulin receptor	Cell surface receptor that binds insulin, leading to the activation of multiple intracellular signalling pathways that regulate cellular growth and metabolism.	Инсулиновый рецептор	Insulin-Rezeptor
Intein	The protein counterpart of the RNA intron; a polypeptide sequence that is excised by a self-catalysing mechanism from the primary translation product.	Интеин	Intein
Interfacial Tension	The strength of the film separating two immiscible fluids (eg oil and water) measured in dynes per, or millidynes per centimeter.	Поверхностное натяжение	Grenzflächen spannung
Interferon	A heterogeneous group of low molecular weight proteins released by virus infected cells which protect non-infected cells.	Интерферон	Interferon
Intergenic region	DNA sequences located between genes that comprise a large percentage of the human genome with no known function.	Межгенный участок	Intergenischen Regionen
Interleukin-1	A lymphokine produced by monocytes and other specific cells which affect T and B cells; important in cell activation and inflammation.	Интерлейкин-1	Interleukin-1
Intermediary metabolism	The individual enzymic reactions that in a tissue or inside a cell transform one metabolite into another, e.g. the conversion of lactate into glucose by the liver, the conversion of leucine into acetoacetate by muscle, the conversion of sucrose into ethanol by yeast.	Промежуточный метаболизм	Intermediärstoffwechsel
Intermediate filament	A structure intermediate in diameter between a thin filament and a microtubule, usually 7-11nm in diameter; a neurofilament, keratin molecule, etc.	Промежуточные филаменты	Intermediärfilamentproteine
Internal dose	<i>See Absorbed dose</i>	Внутренняя доза	Interne Dosis
Intrinsic factor	A glycoprotein secreted by the gastric mucosa that assists in the absorption of vitamin B <sub>12</sub> (extrinsic factor) in the intestine; absent from subjects with pernicious anaemia.	Внутренний фактор	Intrinsic-Faktor
Introgression	Backcrossing of hybrids of two plant populations to introduce new genes into a wild population.	Интрогрессия	Introgression
Intron	A noncoding DNA sequence within a gene that is initially transcribed into messenger RNA but is later snipped out.	Интрон	Intron

Iodine number	A measure of the unsaturation of a lipid; the number of grams of iodine that react with 100g of an olefin.	Йодное число	Jodzahl
Iodine test	The reaction of some polysaccharides, e.g. starch or glycogen, with iodine to give a red to purple colour; diagnostic of $\alpha$ -linked polysaccharide.	Йодный тест	Jod-Test
Ion	An electrically charged atom or group of atoms.	Ион	Ion
Ionization Chamber	A device that measures the intensity of ionizing radiation.	Ионизационная камера	Ionisationskammer
Ionizing Radiation	Radiation that can strip electrons from atoms; eg alpha, beta, and gamma radiation.	Ионизирующие излучение	Ionisierender Strahlung
Ionophore	An agent that allows passage of an ion through an otherwise impermeable membrane, e.g. the protonophore thermogenin, which makes the inner membrane of brown adipose tissue mitochondria permeable to protons.	Ионофор	Ionophor
Iontophoresis	The transport of ions across a semi-permeable membrane under the influence of an electric charge. As ions are driven across the membrane by the electric field, there is also the accompanying transport of bulk water (electro-osmosis) and uncharged solutes.	Ионофорез	Iontophorese
Iron-sulphur cluster	The complex of iron and sulphur atoms in an iron-sulphur protein.	Железосерный кластер	Eisen-Schwefel-Cluster
Iron-sulphur protein	One of a class of redox-sensitive proteins and other enzymes characterized by a prosthetic group of one to four iron atoms, depending upon the protein, which are co-ordinated with the sulphur atoms of cysteine and/or with sulphide ions; e.g. succinate dehydrogenase, aconitase. The most common examples contain a $\text{Fe}_2\text{S}_2$ , $\text{Fe}_3\text{S}_4$ or $\text{Fe}_4\text{S}_4$ (cubane) cluster.	Железосерный белок	Eisen-Schwefel-Protein
Irradiation	Exposure to radiation of wavelengths shorter than those of visible light (gamma, x-ray, or ultra-violet), for medical purposes, to sterilize milk or other foodstuffs, or to induce polymerization of monomers or vulcanization of rubber.	Иррадиация	Bestrahlung
Isoacceptor	One of two or more tRNAs that accept the same amino acid.	Изоакцепторы	Isoakzeptor
Isoelectric point	The pH value at which an amphoteric compound is electrically neutral.	Изоэлектрическая точка	Isoelektrischen Punkt
Isoform	A variant form of a protein. Isoforms may be encoded by different genes, e.g. the isoenzymes of lactate dehydrogenase, or by a single gene, the transcript of which is alternatively spliced and upon translation, yield isoforms that are transported to characteristic subcellular sites, e.g. the isoforms of mammalian acetylcholinesterase.	Изоформы	Isoform
Isomerase	One of a class of enzymes that rearrange the bonds of their substrates, e.g. an epimerase.	Изомеразы	Isomerase

Isomorphous replacement	An X-ray crystallographic technique to assist in solving structures from a diffraction pattern. One or more heavy-metal atoms are inserted in the crystal (replacement) without disturbing the arrangement of the other atoms of the structure (isomorphous). In <i>single isomorphous replacement</i> a single derivative is used to solve a molecular structure; in <i>multiple isomorphous replacement</i> several derivatives are used.	Изоморфное замещение	Isomorphen Ersatzes
Isopeptide bond	An amide bond between amino acids that employs a non- $\alpha$ -amino or a non- $\alpha$ -carboxy group, e.g. the $\gamma$ -carboxy- $\epsilon$ -amino cross-link of hard fibrin clots.	Изопептидные связи	Isopeptidbindung
Isoreceptor	One of two or more homologous plasma membrane or cytosolic receptors that have the same or altered functions; analogous to an isoenzyme.	Изорецептор	Isoreceptor
Isoschizomers	A pair of restriction endonucleases that recognize the same palindromic sequence, although in some cases one member of a pair may differ from the other in its response to methylation of the recognition sequence, or may cleave a different phosphodiester bond within the target sequences.	Изошизомеры	Isoschizomere
Isotherm	A binding curve; at constant temperature, the concentration-dependence of the binding of one material to another, e.g. a gas at various pressures to a solid surface, an amino acid at various concentrations of a neutral salt to a chromatography matrix.	Изотерма	Isotherme
Isotope	A variation of an element that has the same atomic number of protons but a different weight because of the number of neutrons.	Изотоп	Isotop
Iso type	The types of immunoglobulin molecules common to all members of a species.	Изотип	Isotyp
J-chain	A polypeptide found in the dimeric immunoglobulin A and the pentameric immunoglobulin M, involved in joining together the subunits of each multimer.	J-цепь	J-Kette
Junk DNA	DNA for which a function has yet to be identified.	Мусорная ДНК	Junk-DNA
Kanamycin	An antibiotic of the aminoglycoside family that poisons translation by binding to the ribosomes.	Канамицин	Kanamycine
Karyophile	A substance that can diffuse into and be bound in the nucleus of a cell, presumably due to its affinity for a non-diffusible nuclear compound.	Кариофил	Karyophile
Karyotype	All of the chromosomes in a cell or an individual organism, visible through a microscope during cell division.	Кариотип	Karyotyp
Katal	A measure of enzyme activity; the conversion of 1 mol of substrate per s under specified conditions.	Катал	Katal
Ketogenic amino acid	An amino acid whose carbon skeleton can be converted, at least in part, into ketone bodies.	Кетогенные аминокислоты	Ketogene Aminosäure
Ketosis	An accumulation in the blood of ketone bodies, indicative of a metabolic dysfunction such as uncontrolled diabetes mellitus or starvation.	Кетоз	Ketose

Killer cell	A natural killer cell responsible for antibody dependent cellular cytotoxicity.	Клетки кил-леры	Killerzellen
Kinase	An enzyme that uses ATP to phosphorylate a substrate; also, in older literature, an enzyme that activates its substrate, e.g. enterokinase.	Киназы	Kinase
Kinesin	A family of motor proteins that binds to microtubules and then translocates toward the plus end. They typically also bind to cargo such as intracellular vesicles, so that motor activity moves the cargo along the microtubule.	Кинезин	Kinesin
Kinetic assay	An enzyme-based assay that measures the amount of substrate present by correlation of the rate of reaction with the known dependence of the rate on substrate concentration, usually under first-order conditions.	Кинетический анализ	Kinetic-Assay
Kinetic energy	Energy possessed by a moving object or water body.	Кинетическая энергия	Kinetische Energie
Kinin	A hypotensive plasma peptide that dilates small blood vessels and increases capillary permeability, e.g. bradykinin.	Кинин	Kinin
Kininogen	A protein that contains the sequence Arg-Pro-Pro-Gly-Phe-Ser-Pro-Arg which has inhibitory activity against cysteine proteinases.	Кининоген	Kininogen
Kringle	A protein folding motif, as visualized in two dimensions, of loops formed by multiply disulphide-bridged sequences of several circulating proteins, e.g. $\alpha_2$ -macroglobulin, complement component C3, prothrombin, tissue-type plasminogen activator.	Крингл	Kringle
Kupffer cell	A specialized macrophage found in the liver.	Клетки Купффера	Kupfferzellfunktion
Lability	Instability to heat, shear or other physical or chemical stress.	Лабильность	Labilität
Lactoferrin	An iron-containing compound that exerts antimicrobial action by binding iron necessary for microbial growth.	Лактоферрин	Lactoferrin
Lag phase	The initial growth phase, during which cell number remains relatively constant prior to rapid growth.	Лag-фаза	Lag-Phase
Langerhans cell	A specialized antigen presenting cell with characteristic tennis racket shaped granules; found in the epidermis.	Клетки Ларгенганса	Langerhans-Zell
Latency	Time from the first exposure of a chemical until the appearance of a toxic effect.	Латентность	Latenz
Latent	Hidden or cryptic, e.g. the enzymic properties that are expressed <i>in vitro</i> only when the vesicle that encapsulates the enzymes is lysed.	Латентный	Latent
Latrunculin	A fungus-derived compound that binds to G actin and blocks its polymerization into filaments.	Латрункулин	Latrunculin
Lawn	The thick coverage of an agar (or other gel medium) plate with bacteria; usually as a test system for a lyso-genic bacteriophage.	Газон	Rasen

LC 50 (Lethal Concentration)	Median level concentration, a standard measure of toxicity. It tells how much of a substance is needed to kill half of a group of experimental organisms in a given time.	LC 50 летальная концентрация	LC 50 letalen Konzentration
LD 50 (Lethal Dose)	The dose of a toxicant or microbe that will kill 50 percent of the test organisms within a designated period.	LD 50 летальная доза	LD 50 Letalen Dose
Leading strand	The continuous DNA strand synthesized at a fork during DNA replication.	Ведущая нить	Führende Strang
Lectin	A protein, other than one of the immunoglobulins, that binds to the non-reducing ends of a specific oligosaccharide, e.g. that of a glycoprotein or cell surface. Lectins are usually of plant origin, although some have been identified in animal tissues and bacteria.	Лектин	Lektin
Leucine scissors	A supersecondary structure of some DNA-binding proteins; a coiled coil of two parallel $\alpha$ -helices. Each is of about 30 residues in length and contains leucine residues at every seventh position, which places them all to the same side of the helix. The side chains interact with non-polar side chains of the other helix to hold the two together by hydrophobic forces.	Лейциновая застёжка-молния	Leucin Schere
Leukocyte	A white blood cell. This general term covers all the nucleated cells of mammalian blood.	Лейкоциты	Leukozyten
Leukotriene	One of a series of arachidonic acid metabolites; contains three conjugated double bonds and has been oxygenated through the action of a lipoxygenase.	Лейкотриены	Leukotrien
Ligand	A small molecule or ion that binds to a protein or other structure.	Лиганд	Ligand
Ligase	One of a class of enzymes that join two substrate molecules in energy- (usually ATP-) dependent reaction, e.g. an amino acyl-tRNA synthetase, a carboxylase; in <i>molecular biology</i> , an enzyme that attaches the 3'-end of one polynucleotide to the 5'-end of another.	Лигазы	Ligase
Ligase (DNA ligase)	An enzyme that catalyzes a condensation reaction that links two DNA molecules via the formation of a phosphodiester bond between the 3' hydroxyl and 5' phosphate of adjacent nucleotides.	ДНК-лигаза	DNA-Ligasen
Ligase chain reaction	A technique for detection and amplification of target DNA sequences.	Лигазная цепная реакция	Ligase-Kettenreaktion
Light scattering	A phenomenon of solutions of macromolecules; used analytically to determine the molecular mass and shape of a macromolecule from the effect on the intensity of scattered light of the wavelength of light and the angle of its scatter.	Рассеяние света	Lichtstreuung
Light subunit	The smaller of the two ribonucleoprotein complexes that make up a ribosome; more generally, the smallest of the subunits of any complex.	Легкая субъединица	Licht-Untereinheit
Lignin	A random polymer in woody plants formed by oxidation of shikimic acid metabolites to form carbon-carbon and carbon-oxygen cross-links.	Лигнин	Lignin

Line width	The frequency range over which energy absorbance occurs, or over which a spectroscopic peak is observed; frequently measured at half the peak height.	Естественная ширина спектральной линии	Linienbreite
Lipid	A natural substance that is poorly soluble in water but is soluble in organic solvents; lipids include fatty acids, triacylglycerols, phospholipids, waxes and some hormones and vitamins.	Липиды	Lipid
Lipid bilayer	A synthetic or natural membrane in which amphipathic lipids are arranged in two layers with their non-polar chains directed inwards, towards each other, and their polar groups directed outwards, towards the aqueous phase.	Липидный двойной слой	Lipid-Doppelschicht
Lipid peroxidation	The oxidation of polyunsaturated fatty acid side chains, initiated by a free radical such as the hydroxyl radical ( $\text{OH}^\bullet$ ), to form a relatively stable carbon free radical, which reacts further with molecular oxygen to form a peroxy radical, and further yet with another fatty acid side chain to generate another carbon free radical. Such peroxidation causes rancidity in foods, damages membranes and, when it takes place in plasma low-density lipoprotein, can lead to atherosclerosis.	Перекисное окисление липидов	Lipidperoxidation
Lipocalin	One of a family of homologous proteins that bind lipophilic substances, including retinol-binding protein, $\beta$ -lactoglobulin, orosomucoid.	Липокалин	Lipocalin
Lipopolysaccharide	A constituent of the outer membrane of Gram-negative bacteria; composed of an outward-directed and highly variable oligosaccharide (the <i>O-antigen</i> ), which is responsible for the antigenicity of the product, linked to a relatively invariable core oligosaccharide, in turn linked to a less polar moiety ( <i>lipid A</i> ) that is embedded in the membrane and is responsible for the endotoxicity and pyrogenicity of the product.	Липополисахарид	Lipopolysaccharid
Lipoprotein	A complex of lipids and apolipoproteins that is a transport form of lipids in blood. Lipoproteins are characterized by their density, which is determined by the lipid portion, and include high-, low- and very-low-density lipoproteins.	Липопротеин	Lipoprotein
Liposomes	Membrane-bound vesicles constructed in the laboratory to transport biological molecules.	Липосомы	Liposomen
Liquefaction	Changing a solid into a liquid.	Сжижение	Verflüssigung
Lock and key model	A model for enzyme action that explains the basis of specificity as the exact fit of substrate to a site on the enzyme that is complementary in shape and electronic charge.	Модель «ключ-замок»	Schlüssel und Schloss-Modell
Locus	The position on a chromosome of a particular allele.	Локус	Ort
Logarithmic phase (log or exponential growth phase)	The steepest slope of the growth curve--the phase of vigorous growth during which cell number doubles every 20-30 minutes.	Логарифмическая фаза (log или экспоненциальная фаза)	Logarithmischen Phase

Long terminal repeat	A polynucleotide sequence found at each end of an integrated retrovirus genome that contains the signals for expression of the viral genome.	Длинные концевые повторы	Long Terminal Repeat
Loop	A packing structure of eukaryotic DNA that may be identical to a replicon. It is seen when the DNA is unfolded and visualized by electron microscopy, and shows the polynucleotide extending from closely spaced points of attachment to the nuclear matrix, which are presumed to be the terminators of replication. Also, in protein chemistry, a short polypeptide sequence of a protein that connects one region of secondary structure ( $\alpha$ -helix or $\beta$ -sheet) to another.	Петля	Schleife
Lower Detection Limit	The smallest signal above background noise an instrument can reliably detect.	Нижний предел обнаружения	Untere Nachweisgrenze
Lysis	The rupture of the membrane of a cell or bacterium, with the consequent loss of its constituents to the fluid in which it is suspended.	Лизис	Lyse
Luciferin	A potentially chemiluminescent substrate; the enzymic reaction of an enzyme ( <i>luciferase</i> ) converts it to an excited state that decays with emission of visible radiation.	Люциферин	Luciferin
Luminescence	Emission of a photon, of the same or lower energy than the energy that excited it, by an excited state of a chemical compound.	Люминесценция	Lumineszenz
Lyase	One of a class of enzymes that add one substrate across the double bond of another substrate, e.g. a decarboxylase, a dehydratase, an aldolase.	Лиазы	Lyase
Lymph node	Secondary lymphoid organ; major filtering organ for interstitial fluid and lymph; site of immune response to antigens isolated and processed.	Лимфатические узлы	Lymphknoten
Lymphocyte	A mononuclear cell with a round nucleus containing densely packed chromatin. Most have very little cytoplasm.	Лимфоциты	Lymphozyten
Lymphoid	Pertaining to lymphocytes and their ontogeny.	Лимфоиды	Lymphoide
Lymphokines	Soluble products of lymphocytes that are responsible for the multiple effects of a cellular immune response.	Лимфокины	Lymphokine
Lymphotoxin	Cytotoxic factors released by lymphocytes.	Лимфотоксины	Lymphotoxin
Lysate	The product of lysis; a broken-cell preparation.	Лизат	Lysat
Lysozyme	The cationic low-molecular weight enzyme present in tears, saliva, and nasal secretions that reduces the local concentration of susceptible bacteria by attacking the mucopeptides of their cell walls.	Лизозимы	Lysozym
Macroenzyme	A normal, active enzyme that appears in serum as a conjugate, often with a specific autoantibody, thus giving it a greatly increased molecular weight.	Макрофермент	Macroenzyme
Macromolecule	A compound or complex, usually a polymer such as a protein, nucleic acid or polysaccharide, or a covalent or non-covalent complex of any of these.	Макромолекула	Makromolekül

Macrophage	A phagocytic mononuclear cell derived from monocytes; serves accessory roles in cellular immunity.	Макрофаги	Macrophage
Major groove	The wider of the two helical spaces on the surface of an A- or B-DNA double helix. The other helical space is the <i>minor groove</i> .	Большие бороздки	großen Furche
Major histocompatibility complex(MHC)	A genetic region which is responsible for rapid rejection of grafts between individuals; codes for membrane bound proteins which function in signaling between lymphocytes and APCs.	Главный комплекс гистосовместимости	Haupthistokompatibilitätskomplex
Manganese centre	In the photosynthetic photosystem II, a complex of four manganese atoms separated by oxygen atoms that accumulates a positive charge that is used to oxidize water to molecular oxygen.	Марганцевый центр	Mangan-Zentrum
Manometry	A largely obsolete technique for measurement of respiration of tissue slices or other biochemical preparations. The volume of oxygen taken up is measured in a <i>Warburg apparatus</i> , a closed system that consists of a flask with a central well in which NaOH is placed to absorb carbon dioxide. In the absence of alkali, the volume of evolved carbon dioxide is offset by oxygen taken up and is evaluated by difference.	Манометрия	Manometrie
MAP kinase	Mitogen-activated protein kinase; also known as extracellular-signal-regulated protein kinase (ERK).	Митоген-активированная протеинкиназа	MAP-Kinase
Mapping	The creation of an outline of locations of genetic markers (genes or other polynucleotide sequences) within the structures of the chromosomes.	Картирование	Mapping
Mass ratio	The mass ratio of a chemical reaction is defined as the percentage of mass of a product species that was contributed by one or more reactant species.	Относительная масса	Massenverhältnis
Mass spectrometry	A technique for separation of a stream of large ions accelerated in a magnetic field. The resistance to deflection of the ion from its path is a measure of the momentum of the ion, and hence of its mass.	Масс-спектропия	Massenspektrometrie
Maturase	A nuclease involved in RNA processing; it is formed by translation of a fungal mitochondrial mRNA that is produced after a first intron is excised leaving an mRNA in which the open reading frame continues through a second intron and codes for the maturase. The enzyme, by participating in the cleaving out of the second intron, destroys its own mRNA.	Матуразы	Maturase
Maxam-Gilbert method	A technique for sequence analysis of DNA in which four chemical reactions are applied separately, each to cleave the polynucleotide randomly at one of the four bases. Subsequent polyacrylamide-gel electrophoresis separates the products according to chain length, and reveals the distance from the radio-labelled 3'- or 5'-end to the chemically modified base.	Метод Максам-Гилберта	Maxam-Gilbert-Verfahren
Maximum velocity ( $V_{\max}$ )	The limiting rate for an enzymic reaction, shown when it is saturated with substrate.	Максимальная скорость	Maximale Geschwindigkeit



Mediator	A complex of proteins that allows initiation of cell- and/or cell cycle-specific control of eukaryotic transcription. The complex bridges a (usually) upstream promoter DNA sequence bound to an enhancer or silencer, and RNA polymerase II at the initiation site.	Медиатор	Vermittler
Medium	The solid or liquid substratum on which, or in which, cells or organ explants can be made to grow; a medium may include well defined factors such as salts, amino acids and sugars, as well as less well defined factors such as serum or blood.	Среда	Medium
Medium-chain fatty acid	A fatty acid with a skeleton of 4-12 carbon atoms. Those with fewer carbon atoms are <i>short-chain fatty acids</i> ; those with more (up to 20 carbon atoms) are <i>long-chain fatty acids</i> ; and those with skeletons of 20 carbon atoms or more are <i>very-long-chain fatty acids</i> .	Среднецепочечные жирные кислоты	Medium-Fettsäure
Medulla	The inner part; applies to the thymus and lymph node.	Медулла	Mark
Meiosis	The reduction division process by which haploid gametes and spores are formed, consisting of a single duplication of the genetic material followed by two mitotic divisions.	Мейоз	Meiose
Mesothelin	Mesothelin is a protein overexpressed in certain forms of cancer (e.g. mesothelioma). The function of mesothelin remains unknown.	Мезотелин	Mesothelin
Metabolic pathway	A sequence of metabolic reactions that transforms a substrate, e.g. glycolysis, $\beta$ -oxidation, gluconeogenesis.	Метаболический путь	Stoffwechselweg
Metabolism	The sequences by which foodstuffs are degraded for the energy that is released and for transformation into cellular components.	Метаболизм	Stoffwechsel
Metabolite	An intermediate or end product of intermediary metabolism.	Метаболит	Metabolit
Metabolon	A proposed multienzyme complex that is responsible for metabolite channelling, so as to eliminate or minimize loss of efficiency due to the otherwise necessary diffusion of substrates to and of products from the enzymes of a metabolic pathway.	Метаболон	Metabolon
Metalloproteinase	A type of peptidase that has a metal ion at its active site.	Металлопротеиназы	Metalloproteinase
Methyl trap	The accumulation of 5-methyltetrahydrofolate in vitamin B <sub>12</sub> deficiency or related conditions (e.g. pernicious anaemia) due to the inability to transfer the methyl group to homocysteine by the B <sub>12</sub> coenzyme-dependent transferase.	Метильная ловушка	Methyl-Falle
Methyl-accepting protein	One of a group of reversibly methylated proteins of some bacteria that are involved in the chemotactic response to chemoattractants.	Метил-принимаящий белок	Methyl-akzeptierende Proteins
Micelle	A very small aggregate of matter that is dispersed in solution; often of lipid material stabilized by detergents, or even of detergent only.	Мицелла	Micelle

Michaelis constant ( $K_m$ )	Given by $(k_{-1} + k_2)/k_1$ ; the sum of the first-order rate constants for the productive and non-productive breakdown of the Michaelis complex divided by the second-order rate constant for its formation from free enzyme and free substrate; expressed in concentration units.	Константа Михаэлиса	Michaelis-Konstante
Michaelis-Menten kinetics	The hyperbolic dependence of the rate of an enzymic reaction on substrate concentration that can be analysed mathematically according to a model that requires the reaction to proceed through a reversibly formed enzyme-substrate complex, followed by conversion of the complex into product; contrasted with sigmoidal dependence of rate on substrate concentration.	Кинетика Михаэлиса-Ментена	Michaelis-Menten-Kinetik
Microcluster	An aggregate of several (2-10) membrane receptors that forms in response to cell stimulation; such an aggregate is a transitory state between the receptors being dispersed in the membrane and their formation into much larger aggregates, patches that will undergo endocytosis.	Микрокластер	Microcluster
Microinjection	The introduction of DNA into the nucleus of an oocyte, embryo, or other cell by injection through a very fine needle.	Микроинъекция	Mikroinjektion
Micron	A micrometer ( $\mu m$ ) / $10^{-6} m$	Микрон	Mikron
Microscopic reversibility	A principle from molecular physics that holds that each proposed step of a catalytic cycle must in theory be reversible, and particularly that the forward and reverse reactions must pass through the same transition state.	Микроскопическая обратимость	Mikroskopischen Reversibilität
Microtubule	A large (30nm diameter) rigid component of the cytoskeleton that is built of $\alpha$ - and $\beta$ -tubulin subunits and associated proteins and serves as a component of cilia, eukaryotic flagella and mitotic spindles.	Микротрубочки	Mikrotubuli
Microvillus	A finger-like projection from the apical membrane of some epithelial cells, especially those of the intestine.	Микроворсинки	Mikrovillus
Mimotope	A synthetic peptide that binds to an antibody against an unidentified antigen; usually a peptide selected from a large library of peptides.	Мимитоп	Mimotop
Mineralocorticoid	An adrenal steroid that promotes resorption of $Na^+$ by the kidney tubule; notably, aldosterone.	Минералокортикоиды	Mineralokortikoid
Minichromosome	A circular double-stranded DNA structure packaged with protein into nucleosomes or higher-level organization of chromatin.	Минихромосомы	Minichromosom
Minimal molecular mass	A value for the molecular mass of a macromolecule calculated from its content of a metal ion, end group or other feature present in an unknown stoichiometric ratio, e.g. the minimal molecular mass of haemoglobin calculated from its iron content is: $55.84 \text{ g/g-atom of iron} \times 100/0.34\% \text{ iron in haemoglobin} = 16400 \text{ g/mol}$ .	Минимальная молекулярная масса	Minimal Molekularmasse
Mist	Liquid particles measuring 40 to 500 micrometers ( $\mu m$ ), are formed by condensation of vapor.	Туман	Dunst

Mitochondrial wave	A phased depolarization of the mitochondrial surface due to changes in $\text{Ca}^{2+}$ permeability.	Митохондри- альные волны	Mitochondri- ale Welle
Mitochondrion	An organelle of eukaryotic cells that is the site of oxidative phosphorylation, the tricarboxylic acid cycle, $\beta$ -oxidation, etc., and is composed of a relatively permeable outer membrane and a deeply indented inner membrane.	Митохондрия	Mitochondri- um
Mitoplast	A preparation made from mitochondria in which the outer membrane is stripped away by detergents and the inner membrane with the enclosed matrix is left intact.	Митопласт	Mitoplast
Mitosis	The replication of a cell to form two daughter cells with identical sets of chromosomes.	Митоз	Mitose
Mitosol	The soluble matrix that occupies the space inside the mitochondrial inner membrane.	Митозоль	Mitosol
Model substrate	A synthetic substrate that often contains only the minimum necessary features to satisfy the specificity of the enzyme, but sometimes incorporates chemical features to facilitate detection of enzyme activity.	Модель суб- страта	Modell Substrat
Module	In <i>protein chemistry</i> , a building block from which larger proteins are constructed; a recurring folding pattern in proteins, examples of which may have amino acid sequences that are homologous or non-homologous, e.g. the kringle, the EF hand.	Модель	Modell
Molar	The concentration of 1 mole per litre; 1 mole being Avogadro's number ( $6.02 \times 10^{23}$ ) of molecules, which is equivalent in mass to the sum of the atomic masses (in grams) of the constituent atoms; e.g. 1 M NaCl is a concentration of 58.45 g/l (Na = 22.99, Cl = 35.46).	Молярность	Molarität
Molar absorption coefficient	The (calculated) absorbance of a 1M solution of a chromophore present in a 1cm light path.	Молярный коэффициент экстинкции	Molaren Absorptions- koeffizienten
Molecular channel	A proposed feature of multienzyme complexes; the product of catalysis by the first enzyme of the metabolic sequence travels through the channel to the active site of the next enzyme, etc.	Молекуляр- ный канал	Molekulare Kanal
Molecular dynamics	The computer-simulated quantitative evaluation of a molecular model by assignment of force constants to bonded and non-bonded interactions between neighbouring atoms so that bond distances and angles are confined to an acceptable range and crowding is minimized; often coupled with energy minimization, which makes small adjustments in the locations of atoms to optimize these interactions.	Молекуляр- ная динамика	Molekulardy- namik
Molecular filter	The function of specificity in membrane protein trafficking that directs membrane components to their appropriate locus; a phenomenological, rather than a morphological, designation.	Молекуляр- ный фильтр	Molekulare Filter
Molecule	An electrically neutral group of two or more atoms held together by chemical bonds.	Молекула	Molekül
Monoclonal antibody	Immunoglobulin formed from a cloned population of cells.	Моноклональ- ные антитела	Monoklonale Antikörper

Monoculture	The agricultural practice of cultivating crops consisting of genetically similar organisms.	Монокультура	Monokultur
Monocyte	A phagocytic mononuclear cell derived from myeloid stem cells; found in circulating peripheral blood.	Моноциты	Monozyten
Monodisperse	Descriptive of a population of polymers in which all individual molecules have the same covalent structure and molecular size. It is contrasted with <i>polydisperse</i> , descriptive of a population of polymers that have the same repeating unit(s) and the same covalent structure, but vary in molecular size.	Монодисперсность	Monodisperse
Monokines	Soluble products of monocytes and macrophage that are involved in multiple effects of the immune response.	Монокины	Monokine
Morphogen	A molecule, secreted by a tissue that acts by a concentration-dependent mechanism to induce position-specific patterning of distant (non-adjacent) cells during early embryogenesis.	Морфогены	Morphogen
Mosaic protein	A protein composed of discrete domains, each encoded by a different exon, or sometimes by several exons.	Мозаичный белок	Mosaik-Protein
Mossbauer spectroscopy	Mössbauer spectroscopy A technique for studying the chemical environment of some metal atoms in solid samples, especially <sup>57</sup> Fe. The metal is irradiated with soft γ-radiation and emits lower-energy γ-radiation that is indicative of its valence state, electronic and magnetic environment.	Спектроскопия Мёсбрау	Mößbauer-Spektroskopie
mRNA	Messenger RNA; the RNA that contains the coded information, as sequences of codons, for protein synthesis.	м-РНК	mRNA
Mucin	An extracellular glycoprotein with a high carbohydrate content that contains many serine and threonine residues bearing the O-linked carbohydrate moieties.	Муцин	Mucin
Mucosa	The external secretory and absorptive surface of the gastrointestinal tract.	Слизистая оболочка	Schleimhaut
Multienzyme complex	An aggregate of enzymes of specific composition and geometry that act in sequence on a substrate and that, although separable <i>in vitro</i> , fit and function together for efficiency, e.g. pyruvate dehydrogenase complex, bacterial fatty acid synthase.	Мультиферментный комплекс	Multienzym-komplex
Mutagen	A compound that causes a mutation by chemical modification of a base of DNA or as an intercalating agent	Мутаген	Mutagen
Mutarotation	The change in optical rotation that accompanies the approach to equilibrium of the two anomers of a sugar from a solution of one anomer alone; also the conversion of one anomer of a sugar into the other.	Мутаротация	Mutarotation
Mutation	Any inheritable change in DNA sequence.	Мутация	Mutation
Mutation breeding	Commonly used practices in plant breeding and other areas in which chemicals or radiation are applied to whole organisms, for example plants, or cells so changes in the organism's DNA will occur.	Мутационное разведение	Mutations-züchtung

Mutein	A mutant protein, especially a product of recombinant DNA technology.	Мутеин	Mutein
Myeloid	Pertaining to granulocytes and monocytes and their ontogeny. Also included are megakaryocytes and platelets.	Миелоидный ряд	Myeloischer
Myokinase	A former name for adenylate <i>kinase</i> .	Миокиназа	Myokinase
Myosin	A family of actin-dependent motor proteins. Classical myosins assemble to form bipolar filaments that bridge actin filaments. Motor activity causes sliding of the myosin along the filaments. Sliding leads to contraction of actin bundles (actin stress fibres or myofibrils). For other myosins, motor activity promotes movements of vesicles along actin filaments or other movements.	Миозин	Myosin
NAD	NADH (reduced nicotinamide-adenine dinucleotide) acts as an important metabolic electron carrier that carries two electrons as a hydride. It is oxidized to NAD when delivering its pair of electrons and the shuttling between NAD and NADH is widely used in biological redox reactions. In the cytosol NAD accepts electrons from processes such as glycolysis to form NADH. Similarly, in the mitochondrial matrix NAD accepts electrons from processes such as the citric acid cycle or fatty acid oxidation to form NADH which then passes its electrons on to the mitochondrial respiratory chain.	Никотинамидадениндинуклеотид (НАД)	NAD
Native gel	A polyacrylamide gel for support of electrophoresis of proteins that is formulated without sodium dodecyl sulphate, so that the protein remains in its native form.	Нативный гель	Nativen Gel
Native structure	The structure of a protein or nucleic acid in which it is able to perform its physiological function.	Нативная структура	Native Struktur
Natural antibody	An antibody found in serum in the absence of apparent antigenic stimulation.	Натуральные антитела	Natürliche Antikörper
Natural killer cell	A null cell capable of killing tumor cells and virus infected cells.	Натуральные киллеры	Natürliche Killerzellen
Nebulin	A giant (500–900 kD) protein found in skeletal and cardiac muscle that localizes to Z lines and binds actin filaments.	Небулин	Nebulin
Necrosis	Death of plant or animal cells or tissues.	Некроз	Nekrose
Negative cooperativity	A form of allosteric behaviour of multimeric enzymes, in which binding of substrate to one subunit decreases the affinity of the substrate for other subunits	Негативная кооперация	Negative Kooperativität
Negative energy balance	The dietary situation in which caloric dietary intake is smaller than energy expenditure, resulting in loss of weight.	Отрицательный энергетический баланс	Negative Energiebilanz
N-end rule	The observation that the half-life of a protein <i>in vivo</i> is a function of its N-terminal residue.	Правило N-конца	N-Ende-Regel

Nephelometric	Method of measuring turbidity in a water sample by passing light through the sample and measuring the amount of the light that is deflected.	Нефелометрия	Nephelometrische
Nerve gas	Often a fluorophosphate inhibitor of acetylcholinesterase; chemically and functionally related to organophosphate insecticides.	Нервнопаралитический газ	Nervengas
Neuberg ester	Obsolete name for fructose 6-phosphate.	Эфир Ньюберга	Neuberg-Ester
Neurofilament	An intermediate filament seen microscopically in neurons that may consist of one of several types of protein.	Нейрофиламенты	Neurofilament
Neurophysin	A protein associated with oxytocin or vasopressin in the secretory cells of the neurohypophysis and in blood; derived from the same protein precursor, pro-neurophysin, as the hormone it binds.	Нейрофисин	Neurophysin
Neurotransmitter	A chemical signal that passes from an afferent nerve across the synapse to stimulate the efferent nerve, e.g. acetylcholine, noradrenaline (norepinephrine), dopamine.	Нейромедиатор	Neurotransmitter
Neutral glyceride	An uncharged fatty acid ester of glycerol; i.e. a mono-, di- or tri-acylglycerol, as contrasted with a phospholipid.	Нейтральные глицериды	Neutral Glycerid
Neutrophil	A phagocytic granulocyte with a prominent multi-lobed nucleus; usually the first cell type responding to injury or infection.	Нейтрофилы	Neutrophile
Ninhydrin reaction	A colorimetric method for quantification of amino acids; reaction with ninhydrin oxidizes and decarboxylates amino acids and generates an intense blue chromophore from reduction and coupling of the reagent with itself.	Реакция нингидрина	Ninhydrin-Reaktion
Nitrate	A compound containing nitrogen that can exist in the atmosphere or as a dissolved gas in water and which can have harmful effects on humans and animals.	Нитраты	Nitrat
Nitric Oxide	A gas formed by combustion under high temperature and high pressure in an internal combustion engine; it is converted by sunlight and photochemical processes in ambient air to nitrogen oxide.	Оксид азота	Stickstoffoxid
Nitrification	The process whereby ammonia in wastewater is oxidized to nitrite and then to nitrate by bacterial or chemical reactions.	Нитрификация	Nitrifikation
Nitrocellulose	A membrane used to immobilize DNA, RNA, or protein, which can then be probed with a labeled sequence or antibody.	Нитроцеллюлоза	Cellulosenitrat
Nitrogen balance	The quantitative difference between the intake of all nitrogenous products in the diet and the excretion of all nitrogenous products (both expressed in terms of g of nitrogen); <i>positive nitrogen balance</i> if there is a net uptake of nitrogen and <i>negative nitrogen balance</i> if a net loss.	Азотистый баланс	Stickstoff-Bilanz
Nitrogen Dioxide	The result of nitric oxide combining with oxygen in the atmosphere; major component of photochemical smog.	Диоксид азота	Stickstoffdioxid

Nitrogen fixation	The conversion of atmospheric nitrogen to biologically usable nitrates.	Фиксация азота	Stickstofffixierung
Nitrogen mustard	An alkylating agent that can cross-link adjacent guanine bases of DNA and thus interfere with its function, e.g. $\text{CH}_3\text{N}(\text{CH}_2\text{CH}_2\text{Cl})_2$ (mechlorethamine).	Азотистые иприты	Stickstoff-Senf
Nitrogenous bases	The purines (adenine and guanine) and pyrimidines (thymine, cytosine, and uracil) that comprise DNA and RNA molecules.	Азотистые основания	Nukleinbasen
Noble metal	Chemically inactive metal such as gold; does not corrode easily.	Благородные металлы	Edelmetall
Non-competitive inhibition (mixed inhibition)	A form of enzyme inhibition in which the inhibitor binds to both the free enzyme and the enzyme-substrate complex, resulting in an increase in $K_m$ and a decrease in $V_{\max}$ .	Неконкурентное ингибирование	Nicht-kompetitive Hemmung (Mischung aus Inhibition)
Non-ionizing Electromagnetic Radiation	Radiation that does not change the structure of atoms but does heat tissue and may cause harmful biological effects.	Неионизирующее электромагнитное излучение	Nicht-ionisierender elektromagnetischer Strahlung
N-terminal	In a polypeptide sequence, that unique residue which is connected to the linear sequence by its carboxy group, leaving it with a free amino group. In practice, the amino group of an N-terminal residue may be modified, e.g. by acylation by an acetyl or fatty acyl group.	N-конец	N-terminalen
Nuclear envelope	The structure that encloses the eukaryotic nucleus and consists of an inner and an outer nuclear membrane and the perinuclear space between the two.	Ядерная оболочка	Kernhülle
Nuclear reprogramming	Restoration of the correct embryonic pattern of gene expression in a nucleus derived from a somatic cell and introduced into an oocyte.	Ядерное перепрограммирование	Nuklearen Umprogrammierung
Nuclease	A class of enzymes that degrades DNA and/or RNA molecules by cleaving the phosphodiester bonds that link adjacent nucleotides. In deoxyribonuclease (DNase), the substrate is DNA.	Нуклеазы	Nukleasen
Nucleation	In the process of folding of a protein, the rate-limiting formation of the first elements of secondary or tertiary structure around which the remainder of the protein subsequently folds.	Нуклеация	Nukleation
Nucleic acid	DNA or RNA; a macromolecule formed of repeating nucleotide units linked by phosphodiester bonds.	Нуклеиновые кислоты	Nukleinsäure
Nucleoprotein	A protein-DNA or protein-RNA complex.	Нуклеопротеины	Nukleoprotein
Nucleoside	A purine or pyrimidine base with a sugar attached in a glycosidic linkage; <i>ribonucleoside</i> if the sugar is D-ribose and <i>deoxyribonucleoside</i> if the sugar is D-deoxyribose.	Нуклеозиды	Nukleoside

Nucleotide	A subunit of DNA or RNA consisting of a nitrogenous base (adenine, guanine, thymine, or cytosine in DNA; adenine, guanine, uracil, or cytosine in RNA), a phosphate molecule, and a sugar molecule (deoxyribose in DNA and ribose in RNA). Thousands of nucleotides are linked to form a DNA or RNA molecule.	Нуклеотид	Nukleotid
Nucleus	The membrane-bound region of a eukaryotic cell that contains the chromosomes.	Ядро	Zellkern
Null cell	A lymphocyte lacking any markers specific for T cells or for B cells.	Нулевые клетки	Null-Zelle
Oestrogen (estrogen)	A compound, usually a steroid, that supports the development of female secondary sex characteristics; e.g. oestradiol.	Эстроген	Östrogen
Oil desulfurization	Widely used precombustion method for reducing sulfur dioxide emissions from oil-burning power plants. The oil is treated with hydrogen, which removes some of the sulfur by forming hydrogen sulfide gas.	Обессеривание нефти	Öl Entschwefelung
Oligomer	A small polymer of complexity greater than that of a monomer but less, in common usage, than that of a dodecamer.	Олигомер	Oligomer
Oligosaccharide	One of a group of complex oligosaccharides shown to have a regulatory function in plants, i.e. growth regulation, organogenesis, defence against pathogens.	Олигосахариды	Oligosaccharid
Oncogene	A gene present in normal cells which when altered can transform the normal cell into a malignant cell. The alteration may result in overproduction of a gene product or faulty function.	Онкоген	Oncogen
Onconogenicity	The capacity to induce cancer.	Онкогенность	Onconogenität
Oncoprotein	The translation product of an oncogene; a regulator of cellular processes, which if the gene is mutated, results in uncontrolled growth (cancer). Oncoproteins may be embedded in the plasma membrane and serve as receptors, reside in the cytosol and be involved in signal transduction, often associated with a tyrosine kinase activity, or may be found in the nucleus and be directly involved in gene regulation.	Онкопротеин	Onkoprotein
One-electron carrier	A compound that can accept or donate a single electron; e.g. a cytochrome.	Одноэлектронный переносчик	Ein-Elektronen-Träger
Operator	A locus on DNA that controls transcription when a repressor or activator becomes bound.	Оператор	Operator
Operon	A group of genes, usually metabolically related, that can be controlled co-ordinately from a common regulatory sequence.	Оперон	Operon
Opiate	Morphine, pharmacologically active derivatives of it or compounds such as enkephalins and endorphins that similarly act at the same receptors in the brain.	Опиаты	Opiat
Opsonin	An agent of the blood that facilitates the phagocytosis of foreign particles.	Опсонин	Opsonin



Optical rotation	The change in the angle of transmitted plane-polarized light as it passes through a solution of a chiral sample, such that the change is proportional to the concentration of the chiral molecule and to the length of the light path through the solution. In <i>dextro</i> -rotation the change is clockwise when facing the light source; in <i>laevo</i> -rotation the change is counterclockwise.	Оптическое вращение	Optische Drehung
Organelle	Inclusion in the cell cytoplasm that can be membrane-limited (e.g. chloroplast, mitochondrion, endoplasmic reticulum, Golgi apparatus) or non-membrane-limited (e.g. cytoskeletal element, ribosome, nucleosome).	Органеллы	Organell
Organic Chemicals	Naturally occurring (animal or plant-produced or synthetic) substances containing mainly carbon, hydrogen, nitrogen, and oxygen.	Органические химикаты	Organische Chemikalien
Orphan receptor	A membrane protein that has been discovered by cloning of its gene to be of the same family as known receptors, e.g. the G-protein-coupled receptors, but for which the activating ligand has not been identified. The process of identification of the natural ligand for orphan receptors has been called 'reverse physiology'.	Орфановые рецепторы	Orphan-Rezeptor
Osmolarity	The concentration of non-permeable solutes that contribute to osmotic pressure; <i>iso-osmotic</i> or <i>isotonic</i> if equal to that of a cell, <i>hypotonic</i> if lower and <i>hypertonic</i> if higher.	Осмолярность	Osmolarität
Osmosis	The passage of a liquid from a weak solution to a more concentrated solution across a semipermeable membrane that allows passage of the solvent (water) but not the dissolved solids.	Осмоз	Osmose
Osmotic pressure	The pressure developed by a solution of a non-permeable solute isolated by a membrane from a surrounding solution.	Осмотическое давление	Osmotischer Druck
Overlapping gene	A rare phenomenon found in small viral genomes whereby a single mRNA can be translated in two different reading frames to produce two different proteins.	Перекрывающие гены	Überlappende Gen
Oxidant	A collective term for some of the primary constituents of photochemical smog.	Окислитель	Oxydationsmittel
Oxidation	The chemical addition of oxygen to break down pollutants or organic waste; eg, destruction of chemicals such as cyanides, phenols, and organic sulfur compounds in sewage by bacterial and chemical means.	Окисление	Oxydation
Oxidative decarboxylation	Removal of carbon dioxide from a carboxylic acid that is facilitated by oxidation of the $\alpha$ -carbon ( $\alpha$ -oxidative decarboxylation, e.g. the pyruvate dehydrogenase reaction) or the $\beta$ -carbon ( $\beta$ -oxidative decarboxylation, e.g. the isocitrate dehydrogenase reaction).	Окислительное декарбоксилирование	Oxydativ Decarboxylierung

Oxidative phosphorylation	The reactions that synthesize the phosphoanhydride bond of ATP by the coupling of that energetically unfavourable reaction with the spontaneous oxidation of metabolites.	Окислительное фосфорилирование	Oxydativ Phosphorylierung
Oxidative stress	The cumulative damage due to the less than 100% effectiveness of antioxidants in prevention of free radical reactions such as lipid peroxidation.	Окислительный стресс	Oxydativ Stress
Oxidoreductase	One of a class of enzymes that oxidize one substrate as they reduce another, e.g. a dehydrogenase, an oxidase, a peroxidase.	Оксидоредуктазы	Oxydoreduktase
Oxygen dissociation curve	A characterization of an oxygen-binding protein, such as haemoglobin; a plot of percentage saturation against partial pressure of oxygen.	Кривая диссоциации кислорода	Sauerstoffdissoziationskurve
Palindromic sequence	A DNA locus whose 5'-to-3' sequence is identical on each DNA strand. The sequence is the same when one strand is read left to right and the other strand is read right to left. Recognition sites of many restriction enzymes are palindromic.	Полидромная последовательность	Palindromische Sequenz
Paradox of Levinthal	The discrepancy between the enormous number of conformations a polypeptide may assume and the rapidity with which it normally achieves its native conformation. It excludes the possibility that each conformation is sampled and only the thermodynamically most stable form persists and proposes a pathway that leads denatured conformations to the native state. This proposal was later considered naïve, and has been superseded by the funnel concept.	Парадокс Левинтала	Paradox von Levinthal
Paraoxonase	Enzymes (PON1, PON2 and PON3) that regulate the hydrolysis of organophosphates and can function as antioxidants.	Параоксоназы	Paraoxonase
Particulates	Fine liquid or solid particles such as dust, smoke, mist, fumes, or smog, found in air or emissions.	Частицы, взвесь	Feinstaub
Partition coefficient	The ratio of solubility of a substance in two immiscible solvents, e.g. in oil and water.	Коэффициент распределения	Verteilungskoeffizient
Passive diffusion	The transport of compounds across a membrane that is unmediated by any mechanism and is independent of energy sources, and therefore occurs at a rate that is determined by the area of the membrane, the concentration difference across it and the solubility of the compound in the membrane.	Пассивная диффузия	Passiv Diffusion
Passive immunity	Transfer of preformed antibodies or cells from an immune host to a second non-immune individual; does not confer lasting protection.	Пассивный иммунитет	Passiv Immunität
Pasteur effect	The inhibition by oxygen of glucose consumption in a tissue or microbiological preparation.	Эффект Пастера	Pasteur-Effekt
Pathogen	Organism which can cause disease in another organism.	Патоген	Krankheitserreger
Pauly reaction	A colorimetric reaction for identification of imidazole compounds that involves reaction with diazobenzenesulphonate.	Реакция Паули	Pauly Reaktion

Pentose phosphate pathway	The enzymic reactions that oxidatively convert glucose 6-phosphate into ribulose 5-phosphate and then to intermediates of the glycolytic pathway. The two oxidative reactions are the major source of NADPH in many cells. Also known as the Dickens-Warburg pathway, the hexose monophosphate shunt, the pentose shunt and the phosphogluconate oxidative pathway.	Пентозо-фосфатный путь	Pentosephosphatwegs
Peptidase	An enzyme that cleaves the peptide bonds of proteins and peptides.	Пептидазы	Peptidase
Peptide	A compound formed by incomplete hydrolysis of a protein, or by elimination of the elements of water from between the $\alpha$ -carboxy and the $\alpha$ -amino groups of $\alpha$ -amino acids to form a linear polymer.	Пептид	Peptid
Peptide bond	The amide bond formed by condensation of the $\alpha$ -carboxy group of one amino acid with the $\alpha$ -amino group of another; the bond that joins together the amino acid residues that comprise a protein, peptide or polypeptide.	Пептидные связи	Peptidbindung
Peptide site	The part of a ribosome that binds the growing peptidyl-tRNA before the peptidyl group is transferred to the next amino acyl residue which is held at the amino acyl site as its tRNA ester.	Пептидный участок	Peptid Abschnitt
Peptidoglycan	A polymer of bacterial cell walls that exhibits considerable species variation in structure. It is generally composed of a heterodisaccharide attached to a peptide; the carbohydrate moieties of neighbouring subunits are cross-linked, and the peptides of neighbouring subunits are also cross-linked.	Пептидогликан	Peptidoglycan
Peptoid	An analog of a polypeptide, a poly-glycine in which the backbone nitrogen atoms are substituted with groups the same as or different from those of natural amino acids. Although these polymers do not have chiral centres, their N-substituted amide bonds are set into cis or trans conformations, which allows them to adopt helical structures, somewhat like $\alpha$ -helices.	Пептидоид	Peptoid
Percent saturation	The amount of a substance that is dissolved in a solution compared to the amount that could be dissolved in it.	Процент насыщения	Prozent Sättigung
Permeability coefficient	A quantitative measure of the rate at which a molecule can cross a membrane such as a lipid bilayer; expressed in units of cm/s and equal to the diffusion coefficient divided by the width of the membrane.	Коэффициент проницаемости	Durchlässigkeitsbeiwert
Permissible Dose	The dose of a chemical that may be received by an individual without the expectation of a significantly harmful result.	Допустимая доза	Zulässige Dosis
Peroxidase	A haem enzyme that abstracts two hydrogens from one substrate to reduce hydrogen peroxide, its other substrate, to water.	Пероксидазы	Peroxidase
Persistence	Ability of an organism to remain in a particular setting for a period of time after it is introduced.	Резистентность	Resistenz

Personal Protective Equipment (PPE)	Refers to protective clothing, helmets, goggles, or other garment or equipment designed to protect the wearer's body from injury by blunt impacts, electrical hazards, heat, chemicals, and infection, for job-related occupational safety and health purposes, and in sports, martial arts, combat, etc.	Средства индивидуальной защиты	Persönliche Schutzausrüstung
Pesticide resistance	A genetic change in response to selection by a pesticide, resulting in the development of strains capable of surviving a dose lethal to most individuals in a normal population. Resistance may develop in insects, weeds, or pathogens.	Устойчивость к пестицидам	Pestizidresistenz
Peyers patch	A specialized aggregate of lymphocytes and M-cells in the gut; the major part of GALT (gut MALT).	Пейеровы бляшки	Peyer-Patch
pH	An expression of the intensity of the basic or acid condition of a liquid; may range from 0 to 14, where 0 is the most acid and 7 is neutral.	pH (водородный показатель)	pH-Wert
Phagocyte	White blood cells that protect the body by ingesting (phagocytosing) harmful foreign particles, bacteria, and dead or dying cells.	Фагоциты	Phagozytieren
Phagocytosis	The act of eating; refers to the ingestion of particulate matter.	Фагоцитоз	Phagozytose
Pharmacokinetics	The study of the way that drugs move through the body after they are swallowed or injected.	Фармокинетика	Pharmakokinetik
Pharmacophore	In the drug design, the minimum of structural features of a candidate drug that will allow binding to the target protein.	Фармакофор	Phosphoanhydrid
Phenols	Organic compounds that are byproducts of petroleum refining, tanning, and textile, dye, and resin manufacturing.	Фенолы	Phenole
Phenotype	The visible and/or measurable characteristics of an organism (how it appears outwardly) as opposed to its genotype, or genetic characteristics.	Фенотип	Phänotyp
Phosphagen	A compound that acts as a storage form of high-energy phosphate, e.g. phosphocreatine, phosphoarginine.	Фосфаген	Phosphagen
Phosphatase	An enzyme that hydrolyzes esters of phosphoric acid, removing a phosphate group.	Фосфатаза	Phosphatasen
Phosphates	Certain chemical compounds containing phosphorus.	Фосфаты	Phosphate
Phosphoanhydride	A structure formed by the removal of the elements of water from between two phosphoric acids, e.g. pyrophosphate, ADP.	Фосфоангидрид	Pharmakophor
Phosphoinositide cascade	A series of events that is initiated extracellularly and leads via activation of phospholipase C to the liberation from membrane phospholipids of inositol 1,4,5-trisphosphate and diacylglycerol, which act intracellularly to increase cytosolic calcium and to activate protein kinase C respectively.	Фосфоинозитидный каскад	Phosphoinositidkaskade
Phospholipid	A class of lipid molecules in which a phosphate group is linked to glycerol and two fatty acyl groups. A chief component of biological membranes.	Фосфолипиды	Phospholipiden

Phosphorolysis	Analogous to hydrolysis, the cleavage of a covalent bond by insertion across it of the elements of phosphoric acid, e.g. the glycogen phosphorylase reaction.	Фосфорилирование	Phosphorolyse
Phosphorylation potential	A quantitative measure of the energy status of a cell: $[ATP]/[ADP][P_i]$ .	Потенциал фосфорилирования	Phosphorylierung Potenzial
Photochemical Oxidants	Air pollutants formed by the action of sunlight on oxides of nitrogen and hydrocarbons.	Фотохимические окислители	Photochemische Oxidantien
Photocycle	The series of transformations undergone by rhodopsin from its capture of radiant energy, i.e. <i>cis-trans</i> isomerization of the all- <i>trans</i> form and regeneration of all- <i>trans</i> -rhodopsin.	Фотоцикл	Photozyklus
Photoisomerization	The light-induced rearrangement of one of the double bonds of all- <i>trans</i> -retinal.	Фотоизомеризация	Photoisomerisierung
Photorespiration	The reaction of ribulose biphosphate carboxylase in which molecular oxygen replaces carbon dioxide as a substrate, to form 3-phosphoglycerate and phosphoglycolate rather than two 3-phosphoglycerates.	Фотодыхание	Photorespiration
Photosynthesis	The light-dependent chlorophyll-catalysed biosynthesis by green plants of carbohydrate and oxygen from carbon dioxide and water.	Фотосинтез	Photosynthese
Photosynthetic unit	The light-harvesting complex and reaction centre. Light is absorbed at 875 nm by proteins with carotenoid prosthetic groups, and the energy is transferred to photosystem II (PSII) of the reaction centre for the oxidization of water to oxygen and the transfer the electrons via cytochrome b6f to photosystem I (PSI) for the synthesis of NADPH. Especially at low light intensity, additional radiation may be collected by an antenna system, lower wavelength light-harvesting complexes, and transferred via the higher wavelength collectors to the reaction centre.	Фосфосинтетическая единица	Photosynthetischen Einheit
Photosystem I (PSI)	The light-driven reactions of photosynthesis that absorb at 700 nm or below and result in generation of NADPH.	Фотосистема I	Photosystem I
Photosystem II (PSII)	The light-driven reactions of photosynthesis that absorb at 680 nm and above and result in oxidation of water to molecular oxygen.	Фотосистема II	Photosystem II
Pilot tests	Testing a cleanup technology under actual site conditions to identify potential problems prior to full-scale implementation.	Пилотные испытания	Pilotversuche
Pinocytosis	The act of drinking; refers to the ingestion of soluble matter.	Пиноцитоз	Pinozytose
Pitch	A feature of a helix, the distance parallel to the axis that corresponds to one turn of 360°, e.g. 5.4 Å (0.54 nm) for an $\alpha$ -helix.	Шаг	Pech
Plasma	The fluid phase of blood containing full range of circulating proteins, including clotting factors and fibrin.	Плазма	Plasma
Plasmid	A self-replicating extra-chromosomal element, usually a small segment of duplex DNA that occurs in some bacteria; used as a vector for the introduction of new	Плазмиды	Plasmide

	genes into bacteria.		
Pocket	An invagination of the surface of a protein where it can bind a ligand.	Карман	Bindungstasche
Point mutation	A change in a single base pair of a DNA sequence in a gene.	Точечная мутация	Punktmutation
Polyamine	A compound with more than one amino group that often contains short chains of carbon atoms separated by a nitrogen atom and forms a secondary amine; associated in the cell with nucleic acids; e.g. spermine, spermidine, putrescine.	Полиамин	Polyamin
Polyclonal antibody	A heterogeneous immunoglobulin preparation that contains antibodies directed against one or more determinants on an antigen; the product of daughters of several progenitor cells that have been programmed for immunoglobulin synthesis and secretion.	Поликлональные антитела	Polyklonalen Antikörper
Polymer	A natural or synthetic chemical structure where two or more like molecules are joined to form a more complex molecular structure (eg polyethylene in plastic).	Полимер	Polymer
Polymerase	Synthesizes a double-stranded DNA molecule using a primer and DNA as a template.	Полимераза	Polymerasen
Polymerase chain reaction (PCR)	A technique to amplify a specific region of double-stranded DNA. An excess of two <i>amplimers</i> , oligonucleotide primers complementary to two sequences that flank the region to be amplified, are annealed to denatured DNA and subsequently elongated, usually by a heat-stable DNA polymerase from <i>Thermus aquaticus</i> ( <i>Taq</i> polymerase). Each cycle involves heating to denature double-stranded DNA and cooling to allow annealing of excess primer to template and elongation of the primers by the <i>Taq</i> polymerase; the number of <i>amplicons</i> , i.e. the target sequence fragments between flanking primers, doubles with each cycle.	Полимеразная цепная реакция (ПЦР)	Polymerase-Kettenreaktion
Polymorphism	Inherited structural differences between proteins from allogeneic individuals. A form of allotypic variation.	Полиморфизм	Polymorphismus
Polypeptide (protein)	A polymer composed of multiple amino acid units linked by peptide bonds.	Полипептид (белок)	Polypeptid
Positive co-operativity	A form of allosteric behaviour in multimeric enzymes in which binding of substrate to one subunit increases the affinity of the other subunits for the substrate.	Положительная кооперация	Positive Kooperativität
Post-transcriptional modification	The processing of RNA subsequent to its synthesis. This which may include hydrolysis and transesterification of phosphodiester bonds and modification of bases. For eukaryotic mRNA it includes capping of the 5'-end, polyadenylation of the 3'-end and splicing of introns.	Посттранскрипционные модификации	Posttranskriptionale Modifikation
Potassium channel	Potassium channels are membrane proteins that facilitate the transport of potassium ( $K^+$ ) across biological membranes.	Калиевый канал	Kalium-Kanal

Potential dose	See <i>Administered dose</i>		
PP <sub>i</sub>	Pyrophosphate; P <sub>2</sub> O <sub>7</sub> <sup>4-</sup> and protonated forms.	ПП (пирофос- фат)	PP <sub>i</sub>
Precipitate	A substance separated from a solution or suspen- sion by chemical or physical change.	Осадки	Ausfällen
Precipitation	Removal of hazardous solids from liquid waste to permit safe disposal; removal of particles from air- borne emissions as in rain (e.g. acid precipitation).	Осаждение	Niederschlag
Precipitin reaction	The cross-linking of antigens through bivalent anti- bodies that creates an insoluble three-dimensional matrix.	Реакция пре- ципитации	Präzipitin- reaktion
Primary follicle	An organized cluster of B cells found in various lym- phoid tissues and organs, such as lymph node, PALS, and MALT.	Первичные фолликулы	Primäre Follikel
Primary structure	The amino acid sequence of a protein or polypep- tide, or the nucleotide sequence of a polynucleotide.	Первичная структура	Primärstruk- tur
Primer	An RNA sequence hybridized to a DNA template whose elongation by a DNA polymerase constitutes DNA synthesis. A random primer is a mixture of poly- nucleotides with all four bases at each sequence posi- tion; an arbitrary primer is a single species with a sin- gle base at each sequence position.	Праймер	Primer
Primidine	One of the two classes of heterocyclic organic bases that are found in nucleic acids (principally uracil and cytosine in RNA; uracil and thymine in DNA) and in several other kinds of biological compounds, e.g. nu- cleotides, sugar and lipid derivatives.	Пиримидин	Primidine
Prion	A proteinaceous infectious particle which causes one of a number of non-inflammatory, slowly- developing degenerative neurological diseases which are characterized by extracellular plaques, notably bovine spongiform encephalopathy (mad cow dis- ease), scrapie in sheep and Creutzfeld-Jakob disease in humans.	Прион	Prion
Prion-related protein (PrP)	A normal protein, expressed in the nervous system of animals, whose structure when altered (by interac- tion with altered copies of itself) is the cause of sca- pie in sheep, BSE in cattle, and Creutzfeldt-Jakob dis- ease in humans.	Прион- связанный белок	Prion-Protein
Processing	Post-transcriptional modification of RNA or post- translational modification of a polypeptide or protein.	Процессинг	Verarbeitung
Prochirality	The symmetry characteristic of a molecule, or of a centre within a molecule, by which like groups may be distinguished, e.g. the property of citric acid that al- lows aconitase to distinguish between its two carbox- ymethyl groups.	Прохираль- ность	Prochiralitäts- zentren
Prokaryote	Organisms, namely bacteria and cyanobacteria (formerly known as blue-green algae), characterized by the possession of a simple naked DNA chromo- some, occasionally two such chromosomes, usually of circular structure, without a nuclear membrane and	Прокариоты	Prokaryonten

	possessing a very small range of organelles, generally only a plasma membrane and ribosomes.		
Promoter	A sequence of dsDNA that regulates the binding and activity of RNA polymerase. The core promoter includes sequences within 40 nucleotides of a transcription start site; e.g. the initiator, TATA box, downstream promoter element, which separately or together direct synthesis by RNA polymerase II.	Промоутер	Promoter
Propeptide	The part of a protein that is proteolytically cleaved during the protein's maturation, e.g. the internal residues of proinsulin, the N-terminal residues of pepsinogen. The term is usually not used for signal peptides, but for the peptides removed from protein precursors that can be isolated and that have a reasonably long half-life.	Пропептид	Propeptid
Proprotein	A precursor protein that requires post-translational modification for its activity to be expressed, e.g. pepsinogen, trypsinogen.	Пробелок	Proprotein
Prostaglandin	An eicosanoid that features a cyclopentane nucleus.	Простагландин	Prostaglandin
Prosthetic group	A moiety that is tightly attached to a protein, often a participant in an enzymic reaction; e.g. haem, FAD, $Zn^{2+}$ , pyridoxal phosphate.	Простетическая группа	Prothetische Gruppe
Protein	A linear polymer of $\alpha$ -amino acids held together by peptide bonds. A protein may include other components attached covalently (e.g. carbohydrate, phosphate, fatty acid, biotin) or non-covalently (e.g. $Zn^{2+}$ , FAD, haem), and may be cross-linked by disulphide bridges or, less commonly, by other specialized bonds. It may exist as a complex of two or more identical or dissimilar polypeptide chains.	Белок	Protein
Protein class	A classification according to the content of $\alpha$ -helix and $\beta$ -pleated sheet. A protein is designated $\alpha$ if it has a minimum number of residues in an $\alpha$ -helix and fewer than a maximum in $\beta$ -pleated sheets (suggested to be 45% and 5%, respectively); it is $\beta$ , if it has less than a maximum of $\alpha$ -helix and more than a minimum of $\beta$ -sheet (5% and 40%, respectively); $\alpha+\beta$ , if it has minimum of both $\alpha$ -helix and anti-parallel $\beta$ -sheet (15% and 15%); and $\alpha/\beta$ , if it has a minimum of both $\alpha$ -helix and parallel $\beta$ -sheet. It is irregular if it has less than 5% $\alpha$ -helix and 10% $\beta$ -sheet.	Белковый класс	Protein-Klasse
Protein kinase	An enzyme that uses ATP to phosphorylate a group on a protein, e.g. a serine, threonine or tyrosine hydroxy group.	Протеинкиназы	Proteinkinase
Protein splicing	An intramolecular reaction of a particular protein in which an internal protein segment- <i>an intein</i> - is removed from a precursor protein with a ligation of C-terminal and N-terminal external proteins- <i>exteins</i> - on both sides. The splicing junction of the precursor protein is mainly a cysteine or a serine, which are amino acids containing a nucleophilic side chain. The protein splicing reactions which are known now do not re-	Белковый сплайсинг	Protein-Spleißen



	quire exogenous cofactors or energy sources such as adenosine triphosphate (ATP) or guanosine triphosphate (GTP).		
Protein–protein interaction	Physical association of two proteins, often due to binding affinity between specific interaction domains such as SH2, SH3, PDZ, etc.	Белок-белковые взаимодействия	Protein-Protein-Wechselwirkung
Proteoglycan	A complex composed of glycosaminoglycans that radiate from a protein core in a bottlebrush-like structure. There are two major types of membrane proteoglycans: <i>glypicans</i> , which are anchored to the peripheral surface by a glycosylphosphatidylinositol linkage; and <i>syndecans</i> , which contain transmembrane regions and short cytoplasmic tails.	Протеогликан	Proteoglykan
Proteolipid	A protein that is soluble in organic solvents, usually due to the presence of a significant number of fatty acids esterified to secondary hydroxy groups and/or fatty acylation of its N-terminus.	Протеолипид	Proteolipid
Proton pump	A mechanism for the active transport of a proton across a membrane, e.g. the proton pump of the mitochondrial inner membrane, of the gastric parietal cell, of the thylakoid membrane.	Протонный насос	Protonen-Pumpen
Proton switch	In enzyme chemistry, a mechanism of tautomerization in which a proton is removed by a solvent molecule from an ionizable intermediate in the catalytic cycle and added to another atom of the intermediate from another solvent molecule.	Протонный переключатель	Proton-Schalter
Pseudogene	A DNA sequence that is homologous to a structural gene, but cannot be expressed because it has no continuous open reading frame. It often occurs without introns.	Псевдоген	Pseudogen
Pseudo-intron	A sequence of an RNA transcript that sometimes behaves like an intron and is spliced out, but sometimes remains in the mature mRNA.	Псевдоинтрон	Pseudo-Intron
PUFA	Polyunsaturated fatty acid; such as linolenic or arachadonic acid.	ПНЖК	PUFA
Pump	An energy-dependent mechanism by which a metabolite or ion is forced across a membrane against a concentration gradient.	Насос	Pumpen
Purine	One of the two classes of heterocyclic organic bases that are found in nucleic acids (principally adenine and guanine) and in several other kinds of biological compounds, e.g. coenzymes, nucleotides, sugar derivatives; also include methylated purine alkaloids such as caffeine and theobromine.	Пурин	Purin
Pyranose	The form of a sugar when it is condensed into a 6-membered ring. By analogy with pyran, the 6-membered cyclic compound containing an oxygen atom and two conjugated carbon-carbon double bonds, a pyranose consists of five carbon atoms of a monosaccharide and the oxygen atom that is the link to the anomeric carbon.	Пиранозы	Pyranose

Pyrogen	A substance which causes fever; may be endogenous or exogenous.	Пирогены	Pyrogen
Pyrophosphorylation	A post-transcriptional modification of a protein, e.g. the transfer of a phosphate group from pentaphosphatyl-inositol-pyrophosphate to a phosphoprotein, resulting in a pyrophosphoryl protein and a hexaphosphatyl-inositol.	Пирофосфорилирование	Pyrophosphorylation
Quadruplex DNA	A form of DNA in which four oligo(G) sequences, either of the same or of different strands, line up either in a parallel, an anti-parallel or in a fold-back (mixed parallel and antiparallel) pattern. The interior of quadruple the helix has four guanine bases in Hoogsteen base pairings; each plane of four guanines is separated from the adjacent plane by a Na <sup>+</sup> or K <sup>+</sup> ion. Although these structures have not been identified cells, they are strongly suspected to cap the ends of chromosomal DNA.	Квадруплекс ДНК	Quadruplex-DNA
Quantum yield	The ratio of the number of molecules that respond, e.g. by reacting or fluorescing, to the number of photons absorbed.	Квантовый выход	Quantenausbeute
Quaternary structure	The arrangement in space of polypeptide subunits that make up a multimeric protein.	Четвертичная структура	Quartärstruktur
Q $\beta$ replicase	A viral RNA-dependent RNA polymerase; used to greatly amplify concentrations of an RNA that serves as a template.	Q $\beta$ репликазы	Q $\beta$ - Replicase
Racemic mixture	The mixture in equal amounts of two enantiomers, e.g. D- and L-alanine.	Рацемат	Racemische Mischung
Radiation	Transmission of energy through space or any medium.	Излучение	Strahlung
Radioactive decay	Spontaneous change in an atom by emission of charged particles and/or gamma rays; also known as radioactive disintegration and radioactivity.	Радиоактивный распад	Radioaktiver Zerfall
Radioactive Substances	Substances that emit ionizing radiation.	Радиоактивные вещества	Radioaktive Stoffe
Radioisotopes	Chemical variants of radioactive elements with potentially oncogenic, teratogenic, and mutagenic effects on the human body.	Радиоизотопы	Radioisotope
Radionuclide	Radioactive particle, man-made (anthropogenic) or natural, with a distinct atomic weight number.	Радионуклид	Radionuklid
Radon	A colorless naturally occurring, radioactive, inert gas formed by radioactive decay of radium atoms in soil or rocks.	Радон	Radon
Ras protein	A product of the <i>ras</i> gene; a G-protein.	Рас-белок	Ras-Protein
Rate-limiting step	The slowest step of a metabolic pathway or enzymic reaction; the one that determines the rate of appearance of the ultimate product.	Лимитирующая стадия	Geschwindigkeitsbestimmenden Schritt
Ratio	For every amount of one thing, it represents how much there is of another thing	Пропорция, соотношение	Verhältnis

Reaction centre	In photosynthesis, the energy-transducing unit. By absorption of light it excites a chlorophyll dimer, which can then transfer a pair of electrons across a membrane to a quinone, which will accept two protons from its microenvironment to generate a hydroquinone.	Реакционный центр	Reaktionszentrum
Reading frame	The register in which the translation apparatus senses the information coded within an mRNA molecule. As the code is a triplet, there are three possible reading frames.	Рамка считывания	Leseraster
Receptor	The binding site for a hormone or neurotransmitter that initiates its action at the cellular level. First proposed about a century ago to fulfill the postulate that agents may act only if they can bind to a target, receptors are now recognized chemical structures.	Рецептор	Rezeptor
Recombinant DNA	The new DNA that is formed by combining pieces of DNA from different organisms or cells.	Рекомбинантная ДНК	Rekombinante DNA
Recombinant DNA technology	Procedure used to join together DNA segments in a cell-free system (an environment outside a cell or organism). Under appropriate conditions, a recombinant DNA molecule can enter a cell and replicate there, either autonomously or after it has become integrated into a cellular chromosome.	Технологии рекомбинантных ДНК	Rekombinante
Recombination	The natural or synthetic production of a new DNA molecule from polynucleotide sequences that originate from more than one parent DNA molecule.	Рекомбинация	Rekombination DNA-Technologie
Red muscle	A well vascularized form of skeletal muscle with many mitochondria and much cellular myoglobin; supplied with energy mainly by $\beta$ -oxidation.	Красная мускулатура	Red Muskel
Red pulp	Part of the spleen; contains resident macrophage which phagocytize effete red blood cells and particulates found in the blood as it filters through the sinuses.	Красная пульпа	Roten Pulpa
Redox potential	The electrical potential, expressed in volts, of a reductive half-reaction, e.g. for $\text{NAD}^+ + 2\text{e}^- + \text{H}^+ = \text{NADH}$ , $E^\circ = -0.32\text{V}$ .	Окислительно-восстановительный потенциал	Redox-Potential
Regioselectivity	Descriptive of a reaction that proceeds by a unique course even though more than one course is formally possible, e.g. an addition that occurs at only one atom of an unsymmetrical olefin; contrasted with regioselective, in which the reaction shows merely a preference for one course over another; and with stereospecific, in which the reaction produces one diastereoisomer rather than another.	Региоселективность	Regioselektivität
Regulatory subunit	A part of a multimeric enzyme; a protein that binds to and inhibits the <i>catalytic subunit</i> unless it is bound to a regulating molecule; e.g. in the case of cyclic AMP-dependent protein kinase, the subunit that, unless bound to the cyclic nucleotide, inhibits the catalytic subunit.	Регуляторная субъединица	Regulatorischen Untereinheit

Relative permeability	The permeability of a rock to gas, NAIL, or water, when any two or more are present.	Относительная проницаемость	Relative Permeabilität
Relaxation	In kinetics and spectroscopy, the return to equilibrium of a macromolecule after a very brief perturbation of the environment, e.g. recovery of a protein from a sudden burst of energy that allows a fast transient increase in temperature ( <i>temperature-jump</i> ) or a fast transient change of pH ( <i>pH-jump</i> ).	Период релаксации	Entspannung
Renaturation	The return to native structure from a denatured state; in nucleic acid chemistry, identical to annealing.	Ренатурация	Renaturierung
Replication	Synthesis of new DNA strands complementary to existing template strands.	Репликация	Replikation
Replication fork	The site where the two polynucleotides of a parent DNA separate during replication. The daughter strands are attached to the two separated polynucleotides that trail away from the fork as it advances into the parent DNA.	Репликационная вилка	Replikationsgabel
Replicon	A segment of the eukaryotic genome that contains several genes and is replicated as a unit from a single origin. Replication is bi-directional; its boundaries are the points where replication from one origin meets the replication fork which advances from the opposite direction. Each replicon is presumed to be identical to a DNA loop.	Репликон	Replikon
Repressor	A protein that can regulate transcription by binding to the operator and causing repression.	Репрессор	Repressor
Resolution	In X-ray crystallography, the precision with which atoms are located in space; usually expressed in Å ( $10^{-10}$ m).	Разрешение	Auflösung
Resorption	Reabsorption; the reversal of an excretion, e.g. reuptake of $\text{Na}^+$ in kidney tubules, or of a deposition, e.g. degradation of bone mineral by osteoclasts.	Ресорбция	Resorption
Respiratory burst	The increase of metabolic activity that takes place in phagocytic cells at the time of ingestion; highly reactive microbicidal agents are produced which are released into the phagosome.	Респираторный взрыв	Oxidative Burst
Resting potential	The membrane potential of an excitable cell in the absence of stimulation.	Потенциал покоя	Ruhepotential
Restriction endonuclease	One of a group of enzymes that cleave internal phosphodiester bonds of both strands of DNA at specific nucleotide sequences, especially at palindromic sequences.	Рестриктаза	Restriktionseendonuklease
Restriction enzymes	Enzymes that recognize specific regions of a long DNA molecule and cut it at those points.	Рестриктаза	Restriktionsenzyme
Reticuloendothelial system	A mononuclear phagocytic system located primarily in the reticular connective tissue framework of the spleen, liver, and lymphoid tissues.	Ретикулоэндотелиальная система	Retikuloendothelialen Systems
Retinoid	A sesquiterpene related to or derived from retinol.	Ретиноид	Retinoid

Retroelement	A mobile genetic element; either a retrovirus or a retrotransposon, both of which are characterized by long terminal repeats.	Ретроэлемент	Retroelement
Retrovirus	A member of a class of RNA viruses that utilizes the enzyme reverse transcriptase to reverse copy its genome into a DNA intermediate, which integrates into the host cell chromosome. Many naturally occurring cancers of vertebrate animals are caused by retroviruses.	Ретровирус	Retrovirus
Reverse genetics	Using linkage analysis and polymorphic markers to isolate a disease gene in the absence of a known metabolic defect, then using the DNA sequence of the cloned gene to predict the amino acid sequence of its encoded protein.	Обратная генетика	Reverse Genetik
Reverse Osmosis	A treatment process used in water systems by adding pressure to force water through a semi-permeable membrane.	Обратный осмос	Umkehrosmoseanlagen
Reverse transcriptase	A DNA polymerase that uses an RNA template; an RNA-dependent DNA polymerase.	Обратная транскриптаза	Reverse-Transkriptase
Reversible effect	An effect which is not permanent; especially adverse effects which diminish when exposure to a toxic chemical stops.	Обратимый эффект	Reversible Wirkung
Rheumatoid factor	Auto-antibody specific for IgG, found in patients with rheumatoid arthritis and other rheumatoid diseases	Ревматоидный фактор	Rheumafaktor
Ribosome	A non-membrane-bound organelle; a complex of RNA molecules and proteins that is a site of protein synthesis in eukaryotes.	Рибосомы	Ribosomen
Ribozyme	An RNA molecule that owing to peculiarities in its folding, is able to catalyse the interchange of some of its phosphodiester linkages to achieve intramolecular splicing. Examples of ribozyme groups are <i>hammerhead</i> , <i>hairpin</i> and <i>pseudo-knot</i> RNAs.	Рибозим	Ribozym
RNA (ribonucleic acid)	An organic acid composed of repeating nucleotide units of adenine, guanine, cytosine, and uracil, whose ribose components are linked by phosphodiester bonds.	РНК (рибонуклеиновая кислота)	RNA (Ribonukleinsäure)
Rotational catalysis	A proposed partial mechanism of ATP synthase in which a transmembrane ion channel, which is a hexamer composed of a ring of alternating subunits, in which a single subunit rotates, binding ADP and Pi and displacing ATP.	Вращательный катализ	Rotations-Katalyse
saccharide	A sugar or a polymer of sugars linked by glycosidic (acetal or ketal) bonds.	Сахариды	Saccharid
Sakaguchi reaction	A colorimetric reaction for identification and quantification of guanidino groups that involves reaction with $\alpha$ -naphthol and sodium hypochlorite.	Реакция Сакагучи	Sakaguchi-Reaktion
Salinity	The percentage of salt in water.	Соленость	Salzgehalt
Salt bridge	An interaction between positive and negative charges on side chains of a protein.	Соляной мостик	Salzbrücke

Salting out	The addition of a salt, especially ammonium sulphate, to decrease the solubility of a susceptible protein. Some proteins respond by becoming more soluble upon addition of a salt, i.e. <i>salting in</i> .	Высаливание	Aussalzen
Sampling Frequency	The interval between the collections of successive samples.	Частота дискретизации	Sampling-Frequenz
Sandwich immunoassay	A method for quantification of an antigen large enough to have two epitopes. The antigen serves as a bridge between an immobilized (captive) antibody attached to one epitope, and a radioisotope-, fluorophore- or chromogenic enzyme-labelled antibody attached to a second epitope. The amount of immobilized label is directly related to the amount of antigen present.	Сэндвич-иммуноанализ	Sandwich-Immunoassay
Sarcomere	The minimal functional unit of skeletal muscle; roughly a cylinder bounded on its ends by Z-lines where the thin filaments are anchored; these extend towards the centre. Thick filaments extend from the centre of the sarcomere, forming the A-region. The thick and thin filaments overlap in two darker-staining zones, which bracket the central H-region.	Саркомер	Sarkomer
Sarcoplasmic reticulum	A flattened membrane-limited compartment that surrounds a myofibril of skeletal muscle and that contains $\text{Ca}^{2+}$ , which can be released to stimulate contraction.	Саркоплазматический ретикулум	Sarkoplasmatischen Retikulum
Satellite DNA	Short repetitive DNA sequences that occur mainly at the ends or in the centre of chromosomes and are therefore suspected of serving structural roles; also, polynucleotides that are separable, on the basis of their characteristic density, from the bulk of nuclear DNA, and that have repetitive sequences.	Сателлитная ДНК	Satelliten-DNA
Saturation	The condition of a liquid when it has taken into solution the maximum possible quantity of a given substance at a given temperature and pressure.	Насыщение, сатурация	Sättigung
Scanning	In protein synthesis, the movement of a ribosome along an RNA molecule. Also, the rapid surveying of clones, libraries or DNA sequences for a desired trait.	Сканирование	Scannen
Scatchard plot	A graphical method for determination of a binding constant and the number of binding sites. The ratio of the amount of ligand (e.g. a hormone) that is bound (e.g. to a receptor) to the amount that is free is plotted against the free amount.	Диаграмма Скэтчерда	Scatchard-Plot
Schiff base	The product formed by the reversible condensation of an aldehyde with an amino group in which the elements of water have been eliminated. It is featured in structures of biochemical interest, notably the reactions of amino acids with pyridoxal phosphate as a coenzyme of various enzymes of amino acid metabolism.	Основания Шиффа	Schiff-Base
Scissile bond	The bond of a substrate that is subject to enzymic cleavage.	Расщепляющаяся связь	Spaltbare Bindung

Second genetic code	An imprecise term that sometimes refers to the nature of the amino acid residues of a protein which determine its secondary and tertiary structure, and sometimes to the features of a tRNA molecule that make it recognizable by one amino acid synthetase but not by others.	Второй генетический код	Zweitens genetischen Codes
Second messenger	A chemical signal that is generated inside a cell when a hormone (the first messenger) becomes bound to a surface receptor on the outside; e.g. cyclic AMP.	Второй посредник	Zweiter Messenger (zweiter Botenstoff)
Secondary follicle	A follicle containing a germinal center	Вторичные фолликулы	Sekundäre Follikel
Secondary metabolism	Those metabolic pathways, other than those for energy production and for biosynthesis of nucleic acids, proteins, structural components, etc., that are unique to an organism; especially those pathways by which bacteria, moulds and plants synthesize pigments, antibiotics, toxins and other natural products.	Вторичный метаболизм	Sekundärstoffwechsels
Secondary structure	In protein chemistry, the regular folding of a polypeptide in a repeated pattern, e.g. $\alpha$ -helix, $\beta$ -pleated sheet, $\beta$ -turn; in nucleic acid chemistry by analogy, the double-helical structure of a polynucleotide and other regular structures seen in RNA foldings.	Вторичная структура	Sekundärstruktur
Sedimentation constant	A measure of the rate of sedimentation in an analytical ultracentrifuge; $v/\omega^2x$ , where $v$ is the rate of sedimentation, $\omega$ is the angular velocity in radians/s and $x$ is the distance from the axis of rotation; usually expressed in Svedberg units (10-13s).	Постоянная седиментации	Sedimentationskonstante
Selective breeding	Making deliberate crosses or matings of organisms so the offspring will have a desired characteristic derived from one of the parents.	Селективное скрещивание	Selektive Zucht
Self-assembly	The spontaneous aggregation of a complex from its components, the chemistry of which determines the nature of the complex, e.g. the formation of a lipid bilayer from phospholipid molecules.	Самосборка	Selbstaufbau
Semi-conservative replication	The mode of DNA synthesis that results in each new duplex having one parent polynucleotide strand and one newly synthesized strand.	Полуконсервативная репликация	Semi-konservative Replikation
Sensitivity	In quantitative terms, the responsiveness of a physiological system to a stimulus, such as an allosteric effector, substrate or hormone.	Чувствительность	Empfindlichkeit
Serine proteinase	A type of peptidase that has at its active site a serine residue.	Сериновые протеазы	Serin-Protease
Serum	The liquid phase that remains after blood has clotted.	Сыворотка	Serum
Severe combined immunodeficiency	A hereditary disease in which both cellular and humoral immunity fails to develop, thought to be a defect at the stem cell to T and B cell development stage.	Тяжелый комбинированный иммунодефицит	Schwerer kombinierter Immundefizienz
Shikimic acid metabolite	A derivative of shikimic acid with an aromatic 6-carbon ring and an attached 3-carbon side chain, e.g. cinnamic acid, phenylalanine.	Метаболит шикимовой кислоты	Shikimisäure Metabolit

Shuttle	A mechanism for transport of metabolites or chemical groups across the mitochondrial membrane.	Челнок	Shuttle
Side chain	The moiety of an amino acid residue in a protein, or of a free amino acid, that is attached to the $\alpha$ -carbon and is unique to each amino acid, e.g. the isopropyl group of valine, the benzyl group of phenylalanine.	Боковая цепь	Seitenkette
Siderophore	A low-molecular-mass compound that binds to ferric ions and facilitates their absorption by the microorganisms that produce them; e.g. enterobactin, the catechol derivative of some bacteria, and ferrichrome, the hydroxamate compound of some fungi.	Сидерофор	Siderophor
Sigma ( $\sigma$ ) subunit	The subunit of RNA polymerase that recognizes transcription initiation sites on double-stranded DNA.	Сигма ( $\sigma$ ) субъединица	Sigma ( $\sigma$ )-Untereinheit
Signal hypothesis	The proposal that the secretory proteins are initially synthesized with an N-terminal sequence (the signal sequence or leader sequence), that assists it across the membrane of the rough endoplasmic reticulum where it is synthesized, but is cleaved from the protein by a signal peptide peptidase even before the synthesis of the protein is complete. Mitochondrial and chloroplast proteins that are synthesized on ribosomes also have signal sequences that target them to their organelle; these may be N-terminal or internal, and may or may not be removed by proteolysis.	Сигнальная гипотеза	Signalhypothese
Signal molecule	A neurotransmitter, hormone, second messenger or other regulatory molecule.	Сигнальные молекулы	Signalmolekül
Singlet state	An excited electronic state in which an electron is raised to a higher energy level without reversal of its spin state, and thus is easily able to fall back to its ground state, often with a fluorescent emission.	Синглетное состояние	Singulett-Zustand
Sirohaem	A prosthetic group of some redox proteins, consisting of a reduced porphyrin and a $\text{Fe}_4\text{S}_4$ iron-sulphur centre.	Сироген	Sirohaem
Small G protein	A class of proteins that effect intracellular structural changes via modifications of the cytoskeleton. Like other G proteins, they are active when bound to GTP, but inactive when the GTP is exchanged for a GDP. Activity is regulated by proteins which affect the GTP-GDP exchange.	Малый G-белок	Kleine G-Protein
Sodium-dependent phosphate transport protein 2A	A plasma membrane transport protein that catalyses the movement of sodium and phosphate across the plasma membrane.	Натрий-фосфат-зависимые транспортные белки 2A	Natrium-abhängigen Phosphat-Transport-Protein 2A
Soft detergents	Cleaning agents that break down in nature.	Мягкие моющие средства	Weiche Reinigungsmittel
Soft Water	Any water that does not contain a significant amount of dissolved minerals such as salts of calcium or magnesium.	Мягкая вода	Weiches Wasser



Solenoidal model	A representation of the organization of chromatin in which adjacent nucleosomes in the linear DNA sequence are wound into a 36nm diameter helix that contains six nucleosomes per turn.	Соленоидная модель	Solenoid-Modell
Solubility	The amount of mass of a compound that will dissolve in a unit volume of solution. Aqueous Solubility is the maximum concentration of a chemical that will dissolve in pure water at a reference temperature.	Растворимость	Löslichkeit
Somatic cell gene therapy	The repair or replacement of a defective gene within somatic tissue.	Генная терапия соматическими клетками	Somatische Genterapie
Sorption	The action of soaking up or attracting substances; process used in many pollution control systems.	Сорбция	Sorption
Sorting	The translocation to their appropriate loci within a cell of newly synthesized or endocytosed proteins and nucleic acids.	Сортировка	Sortierung
Spacer DNA	DNA that does not yet have a recognized function.	ДНК-спейсер	Spacer DNA
Spare receptors	The phenomenon of a hormone-responsive cell having more receptors capable of binding the hormone than are needed to effect a maximal response; possibly an adaptation that makes the cell responsive to the rate at which the hormone can reach the cell surface (the <i>collisional limit</i> ).	Запасные рецепторы	Ersatz-Rezeptoren
Specific acid	A hydronium ion that can participate in catalysis.	Специфические кислоты	Spezifische Säure
Specific base	A hydroxyl ion that can participate in catalysis.	Специфические основания	Spezifische Basis
Specific granules	Granules found in neutrophils which contain lactoferrin and some lysozyme.	Специфические гранулы	Spezifische Granulate
Spectrin	A family of multidomain proteins that bind both actin and membrane anchors to form a sub-membrane cytoskeletal network.	Спектрин	Spectrin
Spin label	A chemical functional group with an unpaired electron attached to a compound or macromolecule, e.g. a nitroxide group; detectable and characterizable by its electron spin resonance spectrum.	Спиновые метки	Spin-Label
Spliceosome	A complex of (small nuclear RNA)-protein complexes and other proteins that assemble on a pre-mRNA and catalyse the excision of an intron in a process mechanistically similar to group II self-splicing. It acts presumably by forcing the intron into a loop and bridging the pre-mRNA at its splicing sites.	Сплайсосомы	Spleißosoms
Splicing	The process by which an intron is excised and exons are religated in the post-transcriptional modification of RNA ( <i>cis</i> -splicing); also the excision of an intein from a precursor protein.	Сплайсинг	Spleißen
Spore	A form taken by certain microbes that enables them to exist in a dormant stage. It is an asexual reproductive cell.	Споры	Sporen

Spreading factor	An agent that permits the diffusion of foreign materials through tissue, e.g. hyaluronidase, which degrades the extracellular matrix.	Фактор распространения	Spreizfaktor
Start signal	In translation, the initiation codon (AUG); in transcription, the site of initiation of RNA synthesis.	Начальный сигнал	Startsignal
STAT (signal transducer and activator of transcription)	One of a family of proteins that mediate the actions of cytokines and growth factors. When the cytokine or growth factor receptor is occupied, a tyrosine residue of the STAT is phosphorylated and the STAT forms a homo- or hetero-dimer with another STAT. The dimer migrates to the nucleus where it binds to specific DNA sequences and activates transcription of neighboring genes.	ПСАТ(преобразователь сигнала и активатор транскрипции)	STAT (Signal Transducer und Aktivator der Transkription)
Stationary phase	The plateau of the growth curve after log growth, during which cell number remains constant. New cells are produced at the same rate as older cells die.	Стационарная фаза	Stationäre Phase
Steady state	In kinetics, the maintenance of the concentration of an intermediate by its formation from precursors at the same rate as its conversion into products.	Устойчивое состояние	Eingeschungen
Stem cells	Primary bone marrow cells giving rise to more differentiated cell types.	Стволовые клетки	Stammzellen
Stereoisomer	One of two or more compounds that differ only in their orientation at one or more asymmetrical centres.	Стереизомер	Stereoisomere
Sterilization	The removal or destruction of all microorganisms, including pathogenic and other bacteria, vegetative forms, and spores.	Стерилизация	Sterilisation
Steroid	A derivative of perhydrocyclopentanophenanthrene; a more oxygenated product of cholesterol, with the C-17 side chain shortened or removed. Many steroids are hormones, e.g. cortisone, progesterone, oestradiol.	Стероиды	Steroid
Sterol	A crystalline alcohol that incorporates a characteristic perhydrocyclopentanophenanthrene ring system and a branched hydrocarbon side chain, e.g. cholesterol, ergosterol.	Стерол	Sterol
Stokes radius	On the assumption that it is a sphere, the apparent radius of a macromolecule in solution, as determined from its hydrodynamic behaviour, i.e. intrinsic viscosity, diffusion or sedimentation coefficient, or behaviour in gel filtration chromatography.	Стоксовский радиус	Stokessches Radius
Stressors	See <i>Agent</i> .		
S-trityl-L-cysteine	A recently developed cysteine derivative that inhibits kinesins and may have anti-cancer activity.	S-тритил-L-цистеин	S-trityl-L-Cysteine
Structural profile	An approach to prediction of similarities in protein conformations by comparison of amino acid sequences. A two- or three-dimensional plot of one or two features, e.g. optimal matching hydrophobicity, charge, likelihood of occurrence in $\alpha$ -helix or $\beta$ -sheet, against their sequence number allows visual scanning to identify similarities of profiles and similarities of conformations.	Структурный профиль	Strukturelle Profil

Submitochondrial particle	A preparation obtained from mitochondria that is capable of electron transport.	Субмитохондриальные частицы	Submitochondrialen Teilchen
Substrate	A reactant in an enzymic reaction.	Субстрат	Substrat
Substrate inhibition	The inhibition of an enzymic reaction at high substrate levels; usually due to a second, inhibitory and lower-affinity binding site for the substrate in addition to the catalytic site.	Субстратное ингибирование	Substrathemmung
Subunit	One of the identical or non-identical protein molecules that make up a multimeric protein; also one of the ribonucleoprotein complexes that make up the ribosome.	Субъединица	Untereinheit
Sulfane	A persulfide, a compound of the type $RS_2H$ or $RS_2^-$ ; the group includes biosynthetic $\gamma$ -reactive sulfur compounds, which may be precursors of $\gamma$ -inorganic sulfur, e.g. non-haem iron proteins, and $\gamma$ -organic sulfur compounds, e.g. biotin.	Персульфид	Sulfan
Sulphatide	A sulphate ester of a ceramide or related compound, e.g. galactosyl-3-sulphate ceramide, ceramide-dihexoside sulphate.	Сульфатид	Sulfatid
Superelectrophile	A chemical species with higher than usual electrophilic reactivity, often involving two positively charged centres. Superelectrophiles are intermediates in some enzymatic reactions; e.g. those of S-adenosyl methionine, in which the sulfonium group is juxtaposed with an acidic group on the adenosine moiety to promote sulfur-carbon bond cleavage and the consequent transfer of the methyl or aminopropyl group.	Суперэлектрофил	Superelektrophil
Superhelix	The twisted axis of a fibrous polymer, such as double-stranded DNA, myosin tails or collagen.	Суперспираль	Superhelix
Supernatant fluid	The unsedimented portion that remains after centrifugation.	Надосадочная жидкость	Überstand
Superoxide dismutase	Enzymes that catalyse the dismutation of superoxide to hydrogen peroxide through the use of a redox active metal cofactor such as a copper or a manganese. In mammals there is a cytosolic isoform (SOD1 or Cu,Zn-SOD), a mitochondrial isoform, MnSOD (Manganese SOD) SOD2 and an extracellular form (SOD-3) which is also a Cu,Zn-SOD enzyme.	Супероксид-дисмутаза	Superoxiddismutase
Supersecondary structure	The arrangement of elements of secondary structures in a protein (a motif), e.g. $\beta$ -barrel, or in a nucleic acid, e.g. cloverleaf.	Сверхвторичная структура	Supersekundärstruktur
Symbiosis	The close association of two or more dissimilar organisms where both receive an advantage from the association.	Симбиоз	Symbiose
Symmetry	One of the geometrical properties of a chemical or any other structure. <i>Reflectional symmetry</i> is the property of a molecule or object that permits it to be superimposed on its mirror image; <i>rotational symmetry</i> is a property that allows it to be rotated so that, in the new orientation, like groups exchange positions	Симметрия	Symmetrie

	and the rotated orientation is indistinguishable from the original.		
Symport	A transport mechanism that simultaneously drives two different compounds or ions in the same direction across a membrane.	Симпорт	Symport
Synapse	The structure at which a nervous impulse passes from one neuron, the afferent, to another, the efferent.	Синапс	Synapse
Synthase	A lyase (acting in the reverse of the reaction) that adds one substrate across the double bond of another, e.g. $\beta$ -aminolaevulinic acid synthase, hydroxymethyl glutaryl-CoA synthase.	Синтазы	Synthase
Synthetase	An enzyme, regardless of its mechanism, that couples two substrates by a carbon-carbon, carbon-oxygen, carbon-sulphur or carbon-nitrogen bond that is driven by the hydrolysis of a phosphoanhydride bond, e.g. amino acyl-tRNA synthetase, fatty acyl-CoA synthetase. Those enzymes that catalyse such syntheses and do not use the energy of a phosphoanhydride bond are synthases (despite their frequently being misnamed).	Синтетазы	Synthetase
Systemic anaphylaxis	A generalized shock reaction to an allergen resulting in respiratory distress, gastrointestinal upset, hypotension, and often skin rash.	Систематическая анафилаксия	systemische Anaphylaxie
Systemic lupus erythematosus	An autoimmune disease characterized by anti-nuclear antibodies leading to multiple organ involvement.	Системная красная волчанка	Systemischer Lupus erythematosus
T cell	A lymphocyte educated in the thymus; involved in cellular immunity and in regulating all immune responses, both humoral and cellular.	Т-клетки	T-Zell
T cell receptor	A complex of two peptides which function to recognize antigenic determinants and to initiate a response.	Т-клеточный рецептор	T-Zell-Rezeptor
Tannin	A product of plant origin that converts hides into leather; often polyphenols and aldehydes that cross-link collagen chains and render them insoluble and unreactive to enzymes that would degrade and putrefy untreated hides. Chromic acid salts are 'tanning agents' but not tannins.	Танин	Tannin
Tautomer	An alternative arrangement of the chemical bonds of a molecule that requires movement of only electrons and protons, e.g. the enol form of a carbonyl.	Таутомер	Tautomer
Teichoic acid	A linear polymer present in Gram-positive bacterial capsules, cell walls and membranes, characterized by polyols (glycerol, ribitol, sugars), sometimes derivatized as D-alanine esters, and linked together through phosphodiester bonds.	Тейхоевые кислоты	Teichonsäure
Telomere	The end of a chromosome.	Теломер	Telomere
Template	A polynucleotide that encodes the information from which another polynucleotide, of complementary sequence, is synthesized.	Шаблон	Schablone

Teratogen	A substance capable of causing birth defects.	Тератогенный фактор	Teratogen
Teratogenesis	The introduction of nonhereditary birth defects in a developing fetus by exogenous factors such as physical or chemical agents acting in the womb to interfere with normal embryonic development.	Тератогенез	Teratogenese
Terminal glycosylation	The final modifications of the N-linked carbohydrate moieties of a protein that are affected in the Golgi apparatus.	Терминальное гликолизирование	Terminal-Glykosylierung
Termination codon	Any of three mRNA sequences (UGA, UAG, UAA) that do not code for an amino acid and thus signal the end of protein synthesis. Also known as stop codon.	Терминаторный кодон	Stoppcodon
Termination factor	A protein that assists in the termination of the action of an RNA polymerase, e.g. the rho factor.	Фактор терминации	Kündigung Faktor
Terpene	A compound synthesized from isoprene units (biosynthetically, isopentenylpyrophosphate) and recognized in products as a branched five-carbon motif. <i>Amonoterpene</i> is composed of two isoprene units, a <i>sesquiterpene</i> of three, a <i>diterpene</i> of four, and a <i>triterpene</i> of six.	Терпен	Terpene
Tertiary structure	The unique three-dimensional structure of a particular protein or nucleic acid.	Третичная структура	Tertiärstruktur
Tertiary treatment	See <i>Advanced treatment</i>		
Thermogenesis	The process of generation of heat by the uncoupling of electron transport, especially in brown adipose tissue.	Термогенезис	Thermogenese
Thick filament	In muscle cells, an aggregate of myosin molecules in which the long, fibrous tails are intertwined in a superhelix that leaves the globular heads as knobs in a helical array over the surface. The myosin molecules are oriented so that their tails are directed towards the centre of the filament and consequently leave this region of the filaments bare of the knobby projections.	Толстые нити	Dicken Filamenten
Thin filament	In muscle and other cells, polymerized actin and associated proteins	Тонкие нити	Dünnes Filament
Thiolysis	In $\beta$ -oxidation, cleavage of the bond between the $\beta$ - and $\gamma$ -carbons by coenzyme A to form acetyl-coenzyme A from carbons $\alpha$ and $\beta$ and a coenzyme A thioester from the alkyl-carbonyl moiety, i.e. carbons originally $\gamma$ , $\delta$ , ...	Тиолиз	Thiolyse
Thioredoxin	A small redox-active protein with an exposed dithiol motif (-CXXC-) that cycles between a disulphide and a dithiol. The dithiol reduced form is an important cofactor in a number of biological reduction reactions during which it is converted in to the disulphide form, which is converted back to its reduced dithiol form by the action of thioredoxin reductases.	Тиоредоксин	Thioredoxin

Thiosulphate shunt	A pathway for anaerobic metabolism of sulphide by bacteria, e.g. in marine sediments; thiosulphate ( $S_2O_3^{2-}$ ) is an intermediate between sulphide ( $S^{2-}$ ) and sulphate ( $SO_4^{2-}$ ) in reduction to the former, oxidation to the latter and disproportionation to both.	Тиосульфатный шунт	Thiosulfat Shunt
Thoracic duct	Final lymphatic collecting vessel which empties into the left subclavian vein	Грудной проток	Ductus thoracicus
Threshold limit value	The concentration of an airborne substance to which an average person can be repeatedly exposed without adverse effects.	Предельно допустимая концентрация	Grenzwert
Thrombus	The product of coagulation, composed of cells and proteins, found when blood clots.	Тромб	Thrombus
Thylakoid membrane	A membranous structure within chloroplasts that harvests light and synthesizes ATP.	Тилокоидные мембраны	Thylakoid-membran
Thymus	The central lymphoid organ that is located in the thorax which controls the ontogeny of T cells.	Тимус	Thymusdrüse
Tier	The cohort of chains of a branched-chain polysaccharide that all have the same relationship to the branch points. The outer tier of glycogen is all those glucosyl units that are attached in $\alpha 1 \rightarrow 4$ bonds that run from the non-reducing ends to the first $\alpha 1 \rightarrow 6$ branch points; the second tier is those glycosyl units between the first and second outer branch points, etc.	Уровни	Stufe
Tight junction	The seal that closes the gap between adjacent epithelial cells to ensure closure of a vascular space. Transport through a tight junction is <i>paracellular</i> , in contrast to <i>transcellular</i> transport through cells.	Тесные контакты	Schlussleisten
Time constant	In first-order kinetics, the reciprocal of the rate constant.	Временная постоянная	Zeitkonstante
Tissue culture	A process of growing a plant in the laboratory from cells rather than seeds. This technique is used in traditional plant breeding as well as when using techniques of agricultural biotechnology.	Культура тканей	Gewebekultur
Tissue inhibitor of metalloproteinase	TIMP; matrixin; a natural inhibitor of the metalloproteinases that remodel structural proteins of connective tissues.	Тканевый ингибитор металлопротеиназы	Gewebeinhibitor von Metalloproteinase
Titin	An exceptionally large muscle protein, 3000kDa in molecular mass and $1\mu m$ in length that spans the entire length of a sarcomere.	Титин	Titin
Titration curve	A graphical representation of the protonic dissociation of a compound, e.g. pH against equivalents of alkali added to the acid form of the compound.	Кривая титрования	Titrationsskurve
Tolerance	The specific absence of an immune response to an antigen.	Толерантность	Toleranz
Topoisomers	Double-stranded DNA molecules that differ only by their linking numbers.	Топоизомеры	Topoisomeren
Topology	The nature of the supercoiling of a double-stranded DNA molecule; also, in protein chemistry, a formalized array of secondary structures within a molecule.	Топология	Topologie

Toxicity	The degree to which a substance or mixture of substances can harm humans or animals.	Токсичность	Toxizität
Toxin	A natural poison, especially one of a class of proteins that act intracellularly to interrupt vital functions.	Токсины	Toxin
Toxoid	A toxin which has been treated, e.g. with formaldehyde, to inactivate its pathogenicity but not its immunogenicity.	Токсоиды	Toxoid
Trace element	A constituent of a tissue, a cell or the diet that is present in very low amounts, e.g. copper, zinc, molybdenum.	Микроэлементы	Spurenelement
Traffic ATPase	A class of transmembrane transporters that includes the cystic fibrosis transmembrane regulator (CFTR) and transporters responsible for multidrug resistance. Transport is coupled to ATP hydrolysis but not to the counter- or co-transport of any other metabolite.	Движение АТФазы	Verkehr ATPase
Transamidation	The substitution of one amino compound for another in an amide linkage, e.g. the cross-linking of fibrin by the displacement of $\text{NH}_3$ from glutamine residues by an $\epsilon$ -amino group of a lysine residue to form an isopeptide bond.	Трансамидирование	Umamidierung
Transamination	The concurrent amination and reduction of a carbonyl of one compound as another is deaminated and oxidized; especially the conversion of one $\alpha$ -amino acid into its corresponding $\alpha$ -oxo acid as another $\alpha$ -oxo acid is converted into its corresponding $\alpha$ -amino acid, mediated by the pyridoxal phosphate prosthetic group of a transaminase (aminotransferase).	Трансаминирование	Transaminierung
Transcription	The process of creating a complementary RNA copy of DNA.	Транскрипция	Transkription
Transcription factor	A protein that binds to a specific DNA sequence and enhances or suppresses transcription of the target gene. One class is the basic helix-loop-helix proteins; upon associating with another molecule through their helix-loop-helix regions, the basic sequences of the dimer bind the target DNA.	Факторы транскрипции	Transkriptionsfaktor
Transcriptional activation	The process of separation of strands of DNA at which replication will commence. Short RNA sequences hold apart the DNA strands to allow a primosome to bind and synthesize primers of DNA synthesis.	Транскрипционная активация	Transkriptionsaktivierung
Transcriptional silencing	The exercise of genetic control to prevent expression of a structural gene.	Транскрипционное подавление генов	Transkriptionellen Silencing
Transcytosis	The transport of materials across a polarized cell, e.g. in digestion from the apical surface of a cell of the intestinal epithelium and its movement across the cell to the basolateral surface.	Транцитоз	Transzytose

Transduction	The conversion of one kind of energy into another, e.g. conversion of the chemical energy of ATP into mechanical energy by muscle contraction; also conversion of a signal as it crosses a barrier, e.g. linkage of hormone binding on the outside of a plasma membrane to the generation of a second messenger inside it; also DNA transfer by a virus that can incorporate into its own genome part of the DNA of a first host and then transfer it to a second host.	Трансдукция	Transduktion
Transesterification	The substitution of one alcohol for another in an ester bond, e.g. the displacement of one 3'-hydroxy group of a phosphodiester bond by the 3'-hydroxy group of another nucleotide during the self-splicing of an RNA molecule, or the internal transfer of phosphate from a 3'-hydroxy to a 2'-hydroxy group during the reaction of pancreatic ribonuclease.	Переэтерификация	Umesterung
Transfection	Alteration of the genome of a cell by direct introduction of DNA, a small portion of which becomes covalently associated with the host cell DNA.	Трансфекция	Transfektion
Transferase	One of a class of enzymes that transfer a chemical group from donor substrates to acceptor substrates, e.g. a kinase, a phosphorylase, a transaminase.	Трансферазы	Transferase
Transferrin	A protein which sequesters iron, thereby inhibiting microbial growth.	Трансферрин	Transferrin
Transformation	The process by which a cell line, that can normally be expected to undergo a limited number of cell divisions before death, becomes immortal; also the process by which isolated foreign DNA is introduced into a cell or bacterium.	Трансформация	Transformation
Transgene	DNA that has been experimentally introduced into a transgenic animal.	Трансен	Transgen
Transition state	The hypothetical state that is mid-way between reactants and products, poised at a point where the reaction is as likely to go forward to products as it is to fall back to reactants.	Переходное состояние	Übergangszustand
Transition temperature	The temperature at which the plasma membrane undergoes a phase transition, due to the increased mobility at higher temperatures of the fatty acyl chains of phospholipids.	Переходная температура	Sprungtemperatur
Translation	The process of converting the genetic information of an mRNA on ribosomes into a polypeptide. Transfer RNA molecules carry the appropriate amino acids to the ribosome, where they are joined by peptide bonds.	Трансляция	Translation
Transmembrane domain	A feature of most intrinsic proteins of plasma or vesicular membranes; a polypeptide sequence of about seven residues if $\beta$ -sheet, up to 22 residues if $\alpha$ -helix, that connects extracellular to intracellular domains, joined by extended polypeptides on the cytoplasmic and external or vesicular sides.	Трансмембранный домен	Transmembrandomäne



Transmethylation	The metabolic transfer of preformed methyl groups from one acceptor to another, e.g. from S-adenosylmethionine to guanidinoacetate to form creatine.	Трансмети- лирование	Transmethy- lierung
Transpeptidation	A characteristic of some proteinases; the transfer of one product of the catalytic cleavage to another peptide rather than to water; the transfer of the N-terminal fragment to the amino group of an acceptor peptide or the transfer of the C-terminal fragment to the carboxyl group of an acceptor; the former often, but not exclusively, due to an acyl-enzyme intermediate in the catalytic cycle.	Транспепти- дация	Transpepti- dierungsreak- tion
Transversion	In replication or transcription, an error in which a purine is substituted for a pyrimidine, or a pyrimidine for a purine.	Трансверсия	Transversion
Triplet	A three-base codon of the genetic code. Also a component of the mitotic spindle, seen in cross-section as one of nine structures, each composed of a microtubule doublet with an additional series of protofilaments that constitute a third subunit; the nine triplets radiate from a central axis and appear as a <i>cartwheel</i> .	Триплет	Triole
tRNA	Transfer RNA; the RNA that serves in protein synthesis as an interface between mRNA and amino acids. It carries an anticodon sequence that pairs bases with a codon of mRNA, and it binds an amino acid at its 3'-end through an ester bond.	тРНК	tRNA
Tropomyosin	A family of actin-binding proteins that stabilizes F-actin.	Тропомиозин	Tropomyosin
Troponin	A complex of three proteins (TnI, TnC and TnT) that interacts with tropomyosin to control cross bridge formation during skeletal and cardiac muscle contraction. Troponin concentrations are elevated after myocardial infarction and be used as a diagnostic tool.	Тропонин	Troponin
Tumor necrosis factors	Products of lymphocytes and macrophage that can exert a direct toxic effect on neoplastic cells.	Факторы некроза опу- холи	Tumor- Nekrose- Faktoren
Turbidimeter	A device that measures the cloudiness of suspended solids in a liquid; a measure of the quantity of suspended solids.	Нефелометр	Turbidimeter
Turbidity	The cloudiness or haziness of a fluid caused by individual particles (suspended solids) that are generally invisible to the naked eye, similar to smoke in air.	Мутность	Trübheit
Two-component pathway	A pattern of molecular organization by which responses to external stimuli are processed by cells to effect modulation of output, such as chemotaxis in bacteria, or osmolarity regulation in plant cells.	Двухкомпо- нентный путь	Zwei- Komponenten Signalweg
Type I hypersensitivity	IgE mediated, involves triggering of mast cells which release a variety of compounds including histamine and slow-reacting substance of anaphylaxis (SRS-A).	Гиперчув- ствительность типа I	TypI Überempfind- lichkeits

Type II hypersensitivity	IgG or IgM mediated, involves activating complement and cell lysis.	Гиперчувствительность типа II	Typ II Überempfindlichkeit
Type III hypersensitivity	IgG or IgM mediated, involves immune complexes activating complement and inflammation reactions brought on particularly by neutrophils.	Гиперчувствительность типа III	Typ III Überempfindlichkeit
Type IV hypersensitivity	Sensitized T cells, usually T <sub>h</sub> , react to antigen, producing inflammation through the action of lymphokines.	Гиперчувствительность типа IV	Typ IV Überempfindlichkeit
Tyrosinase	This enzyme oxidizes phenols such as tyrosine using oxygen. Its activity is important in the formation of pigments such as melanin in mammals and is responsible for the browning of cut fruit.	Тирозиназы	Tyrosinase
Tyrosine kinase	An enzymic activity associated with the cytoplasmic domain of several growth factor receptors. Two such molecules, when liganded to an effector molecule by their extracellular domains, phosphorylate tyrosine residues on each other; this increases their kinase activities so that they are then able to phosphorylate other cytoplasmic proteins, thus continuing the signal transduction pathway initiated by effector binding to the receptor.	Тирозинкиназы	Tyrosin-Kinase
Ultrafiltration	A separation procedure in which a solution is forced through a membrane with a pore size that is selected to retain macromolecules of a certain size and to pass smaller ones.	Ультрафильтрация	Ultrafiltration
Ultraviolet (UV) spectroscopy	A technique which measures absorption of electromagnetic radiation at wavelengths shorter than the visible spectrum, i.e. below 400 nm. In biological samples, UV spectroscopy detects aromatic residues of proteins and bases of nucleic acids. Commercial UV spectrometers commonly measure the visible spectrum and detect extensively conjugated aromatic systems, such as haemoglobin and chlorophyll, but also transition metals and their complexes.	Ультрафиолетовая (УФ) спектроскопия	Ultraviolett (UV)-Spektroskopie
Ultraviolet rays	The electromagnetic radiation with a wavelength shorter than that of visible light, but longer than X-rays, in the range 10 nm to 400 nm, and energies from 3 eV to 124 eV.	Ультрафиолетовые лучи	UV-Strahlen
Uncompetitive inhibition	A form of enzyme inhibition in which the inhibitor binds to the enzyme-substrate complex, resulting in decreases in the $K_m$ and $V_{max}$ values. $\mu$ mol of substrate per min under specified conditions.	Неполное ингибирование	Unkompetitive Hemmung
Unit	<i>In enzymology</i> , a measure of enzyme activity; usually the conversion of 1	Единица	Einheit
Upper detection limit	The largest concentration that an instrument can reliably detect.	Верхний предел обнаружения	Obere Nachweisgrenze
Urea cycle	The metabolic pathway that receives nitrogen and carbon dioxide, as carbamoyl phosphate and aspartic acid, and synthesizes urea.	Цикл мочевины	Harnstoffzyklus

Uronic acid	A sugar derivative in which the hydroxymethyl group is oxidized to a carboxyl group.	Уроновая кислота	Uronsäure
Vaccination	The administration of an antigen (vaccine) to stimulate an immune response.	Вакцинация	Impfung
Vaccine	A suspension of living or dead organisms, or inactivated toxins, or specific proteins used as antigen to stimulate immunity to a pathogen.	Вакцина	Vakzine
Vaccinome	A plasmid that contains a DNA sequence which encodes an immunologically effective protein, such as an HLA T-cell epitope. A string-of-beads vaccine plasmid is a vaccinome that contains many such sequences.	Вакцином	Vakzinom
Van den Bergh reaction	A method for colorimetric estimation of serum bilirubin by coupling with diazotized sulphanilic acid.	Реакция Ван Ден Берга	Van den Bergh-Reaktion
Van der Waals bond	The weak attraction of neighbouring neutral atoms that includes dipole-dipole and dipole-induced dipole interactions and London dispersion forces.	Связи Ванн-Дер Ваальса	Van der Waals-Bindung
Variable region	That part of the immunoglobulin peptide chains where the amino acid sequence shows significant variation between molecules.	Вариабильный участок	Variable Region
Vector	An animal host and carrier of a pathogen; e.g. the flea which transmits the bacterium <i>Pasteurella pestis</i> ; also, a DNA molecule that can be replicated in a cell and that can serve as the vehicle for transfer to such a cell of DNA that has been inserted into it by recombinant techniques.	Вектор	Vektor
V <sub>H</sub>	The variable domain of an immunoglobulin heavy chain.	V <sub>H</sub>	V <sub>H</sub>
Vinca alkaloid	Also called vinblastine or vincristine; an inhibitor of microtubule polymerization and an anti-mitotic agent.	Алкалоид Винка	Vinca-Alkaloid
Viroid	A nucleic acid that is infective in plants. Unlike a true virus, it has no associated protein	Вироиды	Viroid
Virulence	The ability of an organism to cause disease.	Вирулентность	Virulenz
Virus	A noncellular biological entity that can reproduce only within a host cell. Viruses consist of nucleic acid covered by protein; some animal viruses also are surrounded by a membrane. Inside the infected cell, the virus uses the synthetic capability of the host to produce progeny viruses.	Вирус	Virus
Viscosity	The molecular friction within a fluid that produces flow resistance.	Вязкость	Viskosität
Visual cascade	The sequence of enzymic and non-enzymic events that is triggered by absorption of light in the retina and results in transmission of a nerve impulse.	Визуальный каскад	Visuelle Kaskade
Volatile	Any substance that evaporates readily.	Летучее вещество	Flüchtige Substanz
Volatile liquids	Liquids which easily vaporize or evaporate at room temperature.	Летучие жидкости	Flüchtigen Flüssigkeiten
Volatile organic compound	Any organic compound that participates in atmospheric photochemical reactions except those designated by EPA as having negligible photochemical reactivity.	Летучие органические соединения	Flüchtige Organische Zusammensetzung

Walden inversion	A change of the configuration at an asymmetrical carbon atom due to the entry from one side of the centre of an attacking group, simultaneously with the departure from the other side of a leaving group.	Инверсия Уолдена	Walden-Umkehr
Water Solubility	The maximum possible concentration of a chemical compound dissolved in water.	Растворимость в воде	Wasserlöslichkeit
Wettability	The relative degree to which a fluid will spread into or coat a solid surface in the presence of other immiscible fluids.	Смачиваемость	Benetzbarkeit
White blood cells (WBC), leukocytes (leucocytes)	Cells of the immune system involved in defending the body against both infectious disease and foreign materials.	Лейкоциты	Weißer Blutkörperchen; Leukozyten
White pulp	Part of spleen; see periarteriolar lymphoid sheath.	Белая пульпа	Weißes Fruchtfleisch
Wood-Werkman reaction	The proposed reaction, derived from the observed incorporation of isotopic CO <sub>2</sub> into succinate, by which CO <sub>2</sub> condenses with the 3-carbon compound pyruvate to form a 4-carbon compound, oxaloacetate. The basis of the observation was later recognized as the pyruvate carboxylase reaction.	Реакция Вуд-Веркмана	Wood-Werkman Reaktion
Xenobiotic	A non-biological compound, often one that an organism must eliminate or neutralize by some detoxification strategy.	Ксенобиотики	Fremdstoff
Yeast artificial chromosome	A cloning vector with a yeast that can accept a relatively large fragment of foreign DNA, up to 1 Mb, in yeast cells; a YAC has telomeres on each end and a centromere. Their usefulness is limited by the frequency of extraneous sequences that have been imported into the sequence by homologous recombination.	Дрожжевая искусственная хромосома	Künstliches Hefechromosom
Yellow enzyme	One of the two first-discovered flavoenzymes. The 'new' yellow enzyme ( <i>das neue gelbe Ferment</i> ) catalyses the reduction of molecular oxygen or Methylene Blue by glucose 6-phosphate, as is now understood via reduction by NADPH, and has an FAD prosthetic group. The first-discovered 'old' yellow enzyme ( <i>das alte gelbe Ferment</i> ) has an FMN prosthetic group but has no recognized biological function.	Желтый фермент	Gelb-Enzym
Y-joint	A DNA heteroduplex structure in which one strand is extended by a non-homologous internal sequence. The loop of the longer strand is base-paired with itself in a hairpin structure. In an open Y-joint the shorter, continuous strand is nicked at the joint; in a closed Y-joint the continuous strand is un-nicked.	Y-шарнир	Y-Joint
Z-DNA	A left-handed variant of the DNA double helix originally observed in a sequence of alternating G and C bases, but possible in sequences of alternating purine and pyrimidine bases. The purines are 'flipped' 180° about the glycosidic bond to assume the <i>syn</i> conformation (as opposed to B-form DNA, in which they assume the <i>anti</i> conformation); the pyrimidines remain in the <i>anti</i> conformation.	Z-ДНК	Z-DNA

Zero-order kinetics	The insensitivity of a rate on the concentration of a reactant; especially for an enzymic reaction at substrate concentrations much above the $K_m$ .	Кинетика нулевого порядка	Kinetik nullter Ordnung
Zinc proteinase	A metalloproteinase that features a $Zn^{2+}$ , e.g. carboxypeptidase A, mammalian collagenase.	Цинковые протеиназы	Zink-Proteinase
Zipper-type mechanism	A mechanism for proteolytic degradation of a native protein, in which cleavage of the first peptide bond in each molecule is much faster than subsequent cleavages. The result is that every native molecule has one bond cleaved before any molecule is further affected. In the other alternative extreme case, the <i>one-by-one type mechanism</i> , initial cleavage of the first bond of the native molecule is relatively slow but subsequent bond cleavages are fast, which results in complete degradation of one substrate molecule before another is attacked.	Механизм типа «молния»	Zipper-Mechanismus
Z-scheme	In the Hill reaction of photosynthesis, the flow of electrons from water through photosystems II and I to reduce $NAD^+$ .	Z-схема	Z-Schema

## Примерные статьи для перевода с английского и немецкого языков

### A model mechanism for protein precipitation by caprylic acid: Application to plasma purification

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**Abbreviations:** CA - caprylic acid; BSA - bovine serum albumin; SDS-PAGE - sodium dodecyl sulfate-polyacrylamide gel electrophoresis.

#### Abstract

*A model for the mechanism of protein precipitation by caprylic acid (CA) is developed on the basis of quantitative assays of precipitation with bovine serum albumin (BSA) and CA at different concentrations. It was found that the effect of CA is due to direct interaction with the precipitating protein. Maximum precipitation was achieved when the mass ratio of CA–BSA was close to 1, equivalent to about 450 CA molecules per molecule of BSA. This value was confirmed by optimizing the CA purification of immunoglobulins from equine blood plasma. With a sample diluted 1:1, it was found that CA at a final concentration of 3.5% is optimal to obtain immunoglobulins essentially free of albumin by sodium dodecyl sulfate-polyacrylamide gel electrophoresis. It is proposed that CA binds to specific sites of the protein, thereby inducing partial unfolding of the protein, which exposes additional binding sites. More CA molecules incorporate into all sites in the form of mixed micelles. Thus, the interfacial protein surface becomes highly hydrophobic and increases protein–protein attraction, causing association and precipitation of the macromolecular complexes.*

#### Introduction

The use of caprylic (octanoic) acid (CA) for the purification of monoclonal [1] or polyclonal antibodies such as antivenoms [2–6] and human immunoglobulin [7] is well established. On the basis of previous observations by Chanutin and Curnish [8] about the precipitation properties of medium- and short-chain fatty acids, the method was developed by Steimbuch and Audran in 1969 [9]. They used the capacity of CA to precipitate most plasma proteins—essentially albumin—except the immunoglobulin fraction. Because of the simplicity of the method and the good product purity achieved, institutions devoted to antivenom production have adopted or are implementing this technology [2],[10–12] to replace or complement the traditional process based on precipitation with ammonium sulfate [13].

In the pharmaceutical field, CA at low concentration has been classically used to stabilize commercial human albumin against denaturation [14],[15]. Also, the use of CA for purification of human immunoglobulin obtained from ethanol fractionation of plasma efficiently inactivates enveloped viruses [7],[16]. The method is reported to be bene-

ficial in other respects as well, that is, better yield, lower processing time, and a more pure product. Not only do antivenoms purified by CA give rise to higher processing yields [10],[11] but they also induce a lower number of adverse reactions [17],[18].

The action mechanism of CA precipitation of serum proteins has not been clearly established yet. Steimbuch and Audran [9] have proposed that there is interaction between CA and albumin because of van der Waal's forces. Boyer et al. [19] had previously investigated the nature of this interaction but only concerning the stabilization effect of caprilate at very low concentrations. In a comprehensive report on protein solubility, Van Oss et al. [20] have shown that, for precipitation to occur, an increase in the attraction energy of protein molecules that surpasses 1.5 kT is necessary, so that shortrange hydrophobic forces between protein molecules prevail.

They also described various mechanisms that can lead to this situation under the action of different agents. Among them, dehydration of the outer shell layer of the protein by the addition of a salt (salting out) and the formation of complexes by cross-linking or electrostatic-hydrophobic interactions are the most typical. Although *a priori*, one may be inclined to associate or discard some of these mechanisms with the action of CA, we considered that it was necessary to demonstrate it experimentally. The present work was undertaken to gain insight into the mechanism of protein precipitation by CA using bovine serum albumin (BSA) as the model protein and to determine the best concentration of CA for immunoglobulin purification from plasma, to obtain highest purity and yield using this method.

## **Materials and methods**

Caprylic (octanoic) acid, analytical grade, was from Fluka (Subang Jaya, Selangor, Malaysia) and BSA was pure grade, from Sigma (St. Louis, MO, USA). Equine plasma was obtained as the supernatant phase of blood extracted from equines at the Field Experimental Station of Instituto de Higiene, Montevideo, Uruguay.

### *BSA precipitation assay*

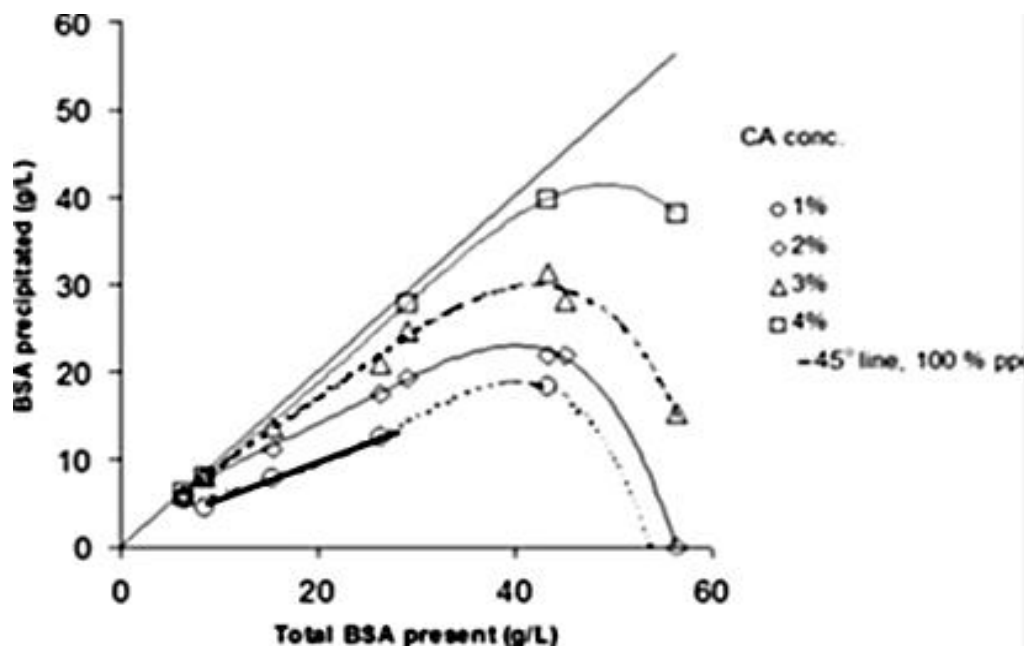
Solutions of various concentrations of BSA were adjusted to pH 5 and then precipitated at ambient temperature (20°C–25 °C) by the slow addition of CA under vigorous agitation, until the specified final CA concentration, 1%, 2%, 3% or 4% (v/v), was reached. After 30 Min agitation, the suspension was filtered through Whatman (Kent, ME, UK) paper No. 2. The BSA concentration in the filtrate was determined in an Ultraspec 1000 [Pharmacia (currently, GE Healthcare), Pittsburgh, PA, USA] spectrophotometer at 280 nm using a 0.7 extinction coefficient and the amount precipitated was estimated by subtraction from the total added. Then the concentration of BSA precipitated by CA (y-axis) was plotted versus the total concentration of BSA present (x-axis), having the final CA concentration as the parameter.

### *Immunoglobulin purification from plasma*

Hyperimmune plasma obtained from horses was diluted with an equal part of distilled water (50 mL final volume) and the pH adjusted to 5. Then CA was added slowly under vigorous stirring until the concentration specified for each run was achieved. After stirring for 30 min, the resultant suspension was filtered through Whatman paper No. 2.

## *Sodium dodecyl sulfate-polyacrylamide gel electrophoresis and densitometry analysis*

Filtrate samples from the assay described above were analyzed by sodium dodecyl sulfate-polyacrylamide gel electrophoresis (SDS-PAGE) according to Laemmli [21] using a 10% polyacrylamide gel, under nonreducing conditions. The gels were stained with Coomassie Brilliant Blue and analyzed by the Quantity One (Biorad, Philadelphia, PA, USA) software.

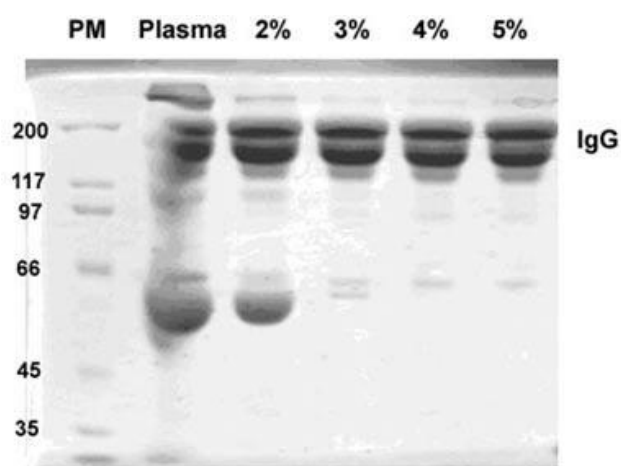


**Fig. 1.** *Experimental results obtained by precipitating BSA with different final concentrations of CA. See text for procedure.*

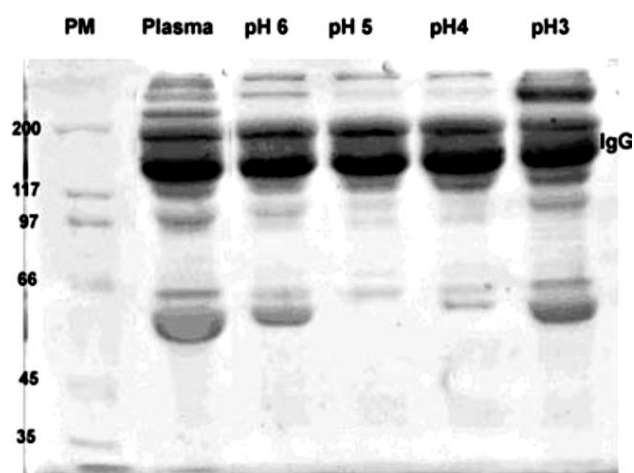
### **Results**

Experimental results of the concentration of BSA precipitated versus the concentration of total BSA present (previously added) are shown in Fig. 1 for four final, previously fixed concentrations of the precipitating agent, CA. The experimental curves gradually depart from the 45° line and reach a maximum after which they decrease, rather abruptly. This trend is repeated for the 2%, 3%, and 4% CA concentrations. The intersection of the 2% concentration line with the  $x$ -axis indicates no precipitate. For the 1% curve, the data are limited to the first three points because it was not possible to obtain reliable results in the filtration of the other intermediate samples. In Fig. 1, it can be noted that the value of the maximum observed concentration of protein precipitated for each curve agrees very closely with the corresponding concentration of CA used, that is, 40, 30, or 20 g/L versus 4%, 3%, and 2%, respectively. Thus, it appears that a conserved relationship, or fixed-mass ratio, holds between CA and BSA that is close to 1 for maximal precipitation.





**Fig. 2. Effect of CA concentration on the purity of immunoglobulins.** The plasma was diluted with an equal part of water. pH = 5 was used throughout.



**Fig. 3. Effect of pH on IgG purification.** The plasma was diluted with an equal part of water. CA 3.5% (v/v) final concentration was used in all experiments.

#### *Immunoglobulin precipitation*

We intended to confirm the previous findings for the practical case of immunoglobulin purification from equine plasma, by determining the concentration of CA required for maximal purification. Figure 2 shows the results of SDS-PAGE obtained from these experiments, carried out at pH 5. Comparison of lanes in Fig. 2 indicates that a concentration between 3% and 4% of CA is the best to precipitate the non-IgG fraction from a 1:1 diluted plasma. By this means, the IgG fraction is purified in one step, with a minimum of minor contaminants. The use of pH 5 was further supported by the results of Fig. 3, which shows IgG purification from the same diluted plasma and 3.5% final concentration of CA, at different pH. It is clear that the best results were obtained at pH 5, as values of pH below 4 or above 6 showed an increase of contaminants. Tables 1 and 2 show that, under these conditions, the values of purity and yield of IgG purification from plasma are rather high, with a total recovery (including physical losses) of IgGs above 60% [9],[11].

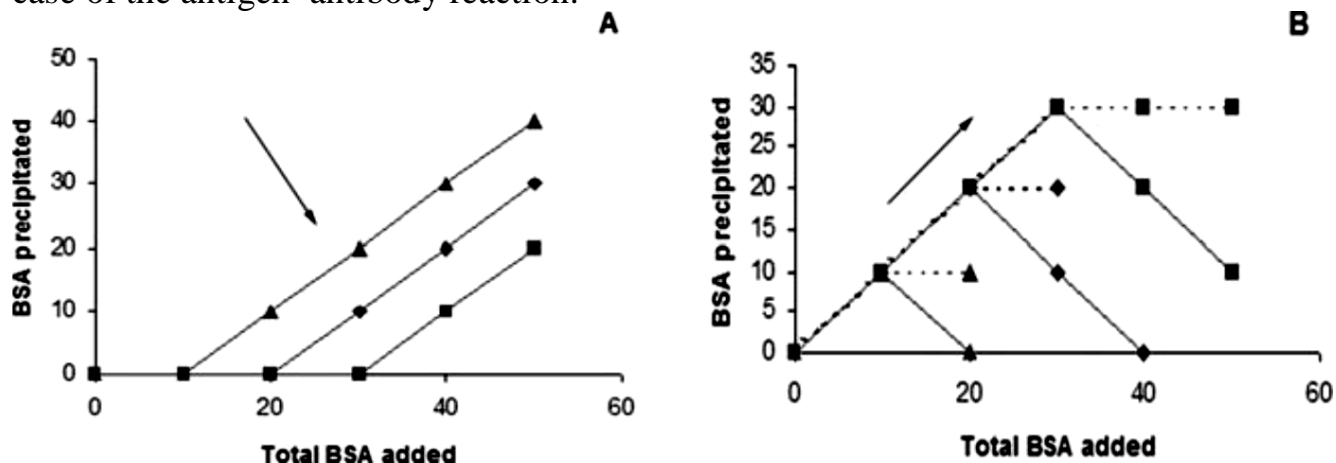
<b>Table 1</b>				<b>Table 2</b>			
<b>Results obtained by densitometry analysis from Fig.2</b>				<b>Results obtained by densitometry analysis from Fig.3</b>			
Caprylic acid (%)	Purity (%)	Yield (%)*	Albumin (%)	pH	Purity (%)	Yield (%)*	Albumin (%)
2	61	90	24	6	77	85	13
3	88	>90	3	5	94	85	1
4	90	>90	1	4	90	92	4
5	90	>90	1	3	61	86	15
*Calculated as (concentration in the filtrate/initial concentration) × 100.				*Calculated as (concentration in the filtrate/total concentration) × 100.			

## **Discussion**

### *Alternative models for the precipitation of proteins*

Adequate dilution is an important issue in protein precipitation and understanding the underlying mechanism is helpful to optimize the process on a rational basis. By focusing on the possible action mechanisms of the precipitating agent, two broadly differ-

ent models can be stated: interaction with the solvent (model A) or interaction with the protein (model B). In model A, precipitation takes place because of salting out (typically with a multivalent salt), whereby the salt “sequesters” water molecules from the protein surface. In model B, precipitation is caused by the binding of a ligand that increases the interfacial hydrophobic character of the protein surface or by cross-linking, as in the case of the antigen–antibody reaction.



**Fig. 4.** Theoretically expected results from the BSA precipitation with a fixed final concentrations of precipitating agent. Family of curves A corresponds to interaction of the agent with the solvent, a typical “salting out” phenomenon. Family of curves B corresponds to direct interaction between the protein and the precipitating agent. Arrows indicate increasing concentrations of precipitating agent.

Figure 4 shows the expected trend of the results according to either model. There we plot the concentration of protein precipitated versus that of the total protein added, with the concentration of precipitating agent as the parameter. We reasoned that in model A, for any final concentration of salt, the added protein initially remains all soluble, that is, the precipitated protein is equal to zero. When the solubility limit corresponding to the particular salt concentration is reached, the protein starts to precipitate and increases in direct proportion to the total amount of protein added. This corresponds to the family of lines A in Fig. 4 in the following equation:

$$BSAp = BSAa - BSAsol \quad (1)$$

where BSAp is the amount of precipitated protein, BSAa is the amount of added protein, and BSAsol = constant is the protein solubility at the given concentration of precipitation agent.

On the contrary, if the interaction occurred directly between the agent and the protein, the amount of precipitated protein should initially increase proportionally to the protein added. When the full precipitating capacity of the agent at a given concentration is reached, the amount precipitated becomes maximal and either remains constant or decreases. This behavior is represented by the family of lines B in Fig. 4, which follow the equations:

$$BSAp = BSAa; \text{ for } BSAa < BSAm \quad (2)$$

and

$$BSAp = BSAm = \text{Constant} \quad (3)$$

or

$$\text{BSA}_p = \text{BSA}_m - \text{BSA}_s = \text{BSA}_m - (\text{BSA}_a - \text{BSA}_m) = 2 \times \text{BSA}_m - \text{BSA}_a;$$

for  $\text{BSA}_a > \text{BSA}_m$  (4)

where  $\text{BSA}_m$  is the maximal quantity of protein precipitated by a given concentration of agent and  $\text{BSA}_s$  is the quantity of protein remaining soluble.

It is seen that the profile of each family of lines is different enough to allow its use as a reliable experimental criterion to discriminate between these models. According to Fig. 4, it is evident that the curves of Fig. 1 show profiles quite similar to those expected for direct interaction between CA and BSA (family of lines B in Fig. 4). In this context, it seems clear that a fixed amount of CA can precipitate, if available, a maximum, fixed amount of protein. As mentioned in *Results*, a fixed-mass ratio of CA–BSA of about 1.0 apparently holds for maximum precipitation of BSA under different dilutions. It is interesting to note that in the antigen–antibody reaction, which clearly belongs to the agent–protein interaction mechanism (model B described earlier), there also exists an optimal relationship Ag–Ab for maximal precipitation.

#### *Immunoglobulin purification from plasma*

In our experiments of IgG purification, we used a 1:1 dilution ratio as a compromise between the inherent filtration problems of original plasma and the use of excessive total volumes of diluted plasma in a scaled-up production. It is intermediate between the ratio 2:1, recommended by Steimbuch and Audran [9] and a ratio 0:1 (no dilution, original concentration), proposed by Rojas et al. [10]. By considering that the non-IgG protein concentration of original plasma (essentially albumin) is about 6%–7%, the fixed-mass ratio predicts an ideal CA concentration around 3%–4% to precipitate all nonimmunoglobulin plasma proteins from a sample diluted 1:1. Precisely, CA = 3.5% is the optimal value we have found in our assay for IgG purification, thereby confirming the fixed-mass ratio of about 1.0. Here, we have assumed that our previous results for the pure model protein, BSA, can be applied to equine serum albumin.

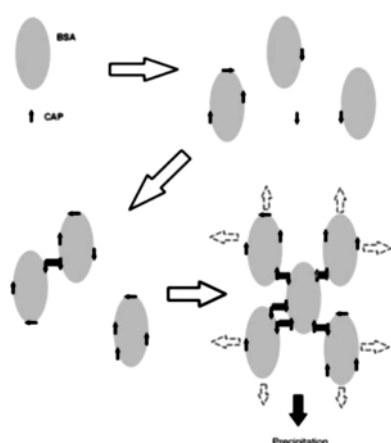
Further support to this result is found in the literature. Thus, a concentration of CA = 6.8% was proposed by Steimbuch and Audran [9] and that of 7% was more recently used by Gutierrez et al. [22], both based on original, undiluted plasma. Also, a final CA concentration of 7% is the value recommended in the literature [23] for purification of IgG from the sera of horse, rabbit, and goat, without dilution. Additional support is provided by the results of McKinney and Parkinson [1] on CA purification of rabbit serum at various dilutions. In effect, these authors report that precipitation of a 2:1 dilution of serum, with a 2.5% concentration of CA gives optimal results in terms of minimum contaminants and maximal yield of IgG. This CA concentration would amount to a  $2.5\% \times 3 = 7.5\%$  concentration—close to the 7% value—based on undiluted plasma. An apparent exception is present in the results of Russo et al. [24], who proposed a 3.3% CA concentration for purification of undiluted mouse serum or ascites fluid. However, their results do not indicate optimal purification of the IgG fraction and unfortunately these authors do not provide results at higher CA concentrations.

An interesting consequence of the fixed-mass ratio = 1 is that it indicates an equivalent proportion of about 450 CA molecules per albumin molecule at maximum precipitation. This number looks rather high when it is considered that albumin has 11 binding

sites of different affinities to transport long- and medium-chain fatty acids in the circulation [25–28]. However, the finding of Bernard et al. [29], of a large mass of CA present in BSA and lysozyme precipitates from CA addition, is consistent with this figure. Various possibilities contribute to explain the potentially higher binding capacity of albumin under precipitation as follows: a) short-chain fatty acids can be expected to be better accommodated within the albumin structure than the longer ones; b) under *in vitro* assays, albumin is known to be capable of transporting much more fatty acid molecules than in physiological situations [30],[31]; c) the phenomenon of cooperative binding to albumin has been described for fatty acids [30], whereby conformational changes and partial unfolding, secondary to the binding of fatty acid molecules to the primary sites, expose new binding sites. The precipitating action of 3-chloroacetic acid [32] has been reported to occur through a partial unfolding mechanism; d) at high free ligand concentrations, “micellar binding” is possible [33] so that a hydrophobic region at the surface of the protein is incorporated into a micelle-like structure shared by several fatty acid molecules; and e) pH = 5, as used in the experiments, is close to the isoelectric point of albumin, thus strongly favoring the hydrophobic interaction.

### Conclusion

In this work, we have provided evidence for a direct CA–protein interaction model of protein precipitation. Now, on the basis of the possible mechanisms for the increased albumin uptake of CA molecules under precipitation, we can suggest the following gradual process: the CA molecules first bind to specific available sites of the protein, thereby eliciting conformational changes of the protein molecules, which thus expose additional sites. Then the CA molecules continue to incorporate into the original and the newly created sites of the macromolecular complex in the form of micelle-like structures that create bridges among complexes, until a cascade precipitation phenomenon takes place. Figure 5 shows the schematic sequence of this process. Finally, we also emphasize the important application of the fixed-mass ratio of CA–albumin close to 1, found here, which allowed us to predict and justify the optimal CA concentration to be used under different dilutions of the precipitating protein from plasma. This is useful because under an industrial setting, CA precipitation of plasma not only enables high immunoglobulin purification and yield to be achieved in one step but also favors a better overall recovery.



**Fig. 5. Schematic diagram of the proposed model for protein precipitation by CA.**

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## Immunogenicity of therapeutic proteins

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### Introduction

A year ago Nicole Casadevall of the Hotel-Dieu in Paris and her colleagues published their first 13 cases of pure red-cell aplasia (PRCA) associated with the use of erythropoietin (Epo) in patients with chronic renal failure [1]. As of November 2002, the number of antibody-mediated reported cases in Europe, Canada and Australia has increased to more than 175. The most likely explanation for this serious side effect is a subtle change in the Epo molecule that may occur during the manufacturing and formulation process, or in the handling and distribution processes.

Apparently a change in the product leads to the induction of antibodies neutralizing the endogenous Epo in these patients causing a complete block in the differentiation of red blood cells. The increased s.c. use and self-administration with inappropriate use, handling and storage have been suggested as cofactors enhancing the immunogenic potential introduced by the change in the product. Recently, most European regulatory agencies have contraindicated the s.c. use of one specific Epo product in dialysis patients.

Although PRCA is a serious clinical condition, which requires the patients to be treated by frequent blood transfusions, the incidence is rare and approximately 20 in 100 000 patient years. Also, it is important to realise that most, if not all, therapeutic proteins are immunogenic, sometimes even in the majority of patients [2].

### **History of the use of therapeutic proteins**

The medical use of proteins has a long history. It started more than a century ago when immune sera from animal origin introduced for the prevention or treatment of infections, followed with the use of insulin of porcine and bovine origin some decades later. These products were immunogenic in patients, sometimes even leading to serious anaphylactic reactions [3]. These side effects were easily explained by the foreign nature of the proteins leading to a classical immune reaction.

The introduction of human-derived proteins such as growth hormone and factor VIII was also associated with the induction of antibodies [4,5]. But these products were mostly given to children with an innate deficiency and therefore a lack of immune tolerance.

With the development of recombinant DNA technology the large-scale production of human homologues like the interferons, growth factors and hormones became feasible resulting in the application in a large number of patients. It was a surprise that these products also induced antibodies, which cannot be explained by the lack of immune tolerance. Some of these products such as Escherichia coli derived interferon beta and interleukin-2 induce these antibodies even in the majority of patients [2].

### **Immunization or breaking tolerance**

It is now clear that nearly all biopharmaceuticals induce antibodies. The frequency of these antibodies varies widely, from common to rare, as is the case with Epo. These antibodies are induced by two mechanisms as depicted in Table 1.

There is the classical reaction to foreign proteins as caused by the biopharmaceuticals of bacterial or plant origins such as streptokinase [6] and asparaginase [7]. The reaction to these proteins is comparable with an immune reaction to a vaccine. Neutralizing antibodies appear in the majority of cases, often even after a single injection. The antibodies persist for a long time and they inhibit the efficacy of the product. The reaction can be easily explained as a normal reaction to a foreign protein.

The other mechanism by which antibodies are induced is based on breaking immune tolerance existing normally to self-antigens. This is the mechanism leading to the antibodies to human homologues like the interferons, IL-2, GM-CSF and Epo. These antibodies are mainly only binding, in general appear after prolonged treatment and of-

ten only in a minority of patients. The antibodies disappear after stopping treatment and sometimes even during treatment. In the majority of cases the antibodies have no consequences. The mechanisms by which tolerance is induced or broken are not completely understood. An important way to break tolerance is to present the self-antigens in a repetitive way [8]. A periodicity of these antigens as present in aggregates of proteins is apparently very efficient in activating ignorant or anergic B cells that are responsible for tolerance [9].

### **Factors influencing the incidence of antibody induction**

An important issue when assessing the immunogenicity of biopharmaceuticals is assays. There are in principle two types: the RIA and ELISA-like assays, which determine binding antibodies, and the bioassays identifying the presence of neutralizing antibodies. These assays are used in conjunction. Sera are first screened for the presence of binding antibodies and, if positive, the presence of neutralizing antibodies is assayed with the more cumbersome bioassay. In most cases, patients start by producing binding antibodies and may ultimately develop neutralizing antibodies. There are, however, no standardized assays available and there are no reference standards which make it difficult to compare results obtained from different laboratories and different studies [10].

As is the case with biopharmaceuticals from plant or microbial origin, the structure of the protein and the presence of foreign epitopes may cause immunogenicity. Also, the lack of glycosylation of glycoproteins produced in prokaryotes, such as GM-CSF and interferon beta, may induce antibodies because such molecules are less soluble or by the exposition of epitopes which are normally hidden by the glycosylation [11,12].

Impurities and contaminants have been identified as the main cause of immunogenicity of human growth hormone and insulin [13,14]. The presence of aggregates by suboptimal production or formulation has been associated with the induction of antibodies [15].

Patient's characteristics are also important. In cancer patients with an impaired immune system the incidence of antibodies is lower than in patients with viral infection [16]. In haemophilia patients the type of the genetic defect in the patients Factor VIII gene influences the frequency of immunogenicity [17].

Route of administration is also a factor. In studies in which the routes of administration were compared the i.v. and local routes showed a lower incidence of antibodies than the groups treated subcutaneously or intramuscularly [18].

But, there are also a number of unknown factors influencing immunogenicity. The same product produced at different sites showed considerable difference in immunogenicity without showing differences in physiochemical characterization (S. Goelz, personal communication).

### **Consequences of antibodies**

In the majority of cases the presence of antibodies has no clinical consequences. The most common biological effect is the loss of efficacy. Sometimes increasing the dose restores efficacy. General immune effects such as anaphylaxis and allergic reactions, which were relatively common, historically have become rare in the highly puri-

fied products currently used. The most dramatic effect of antibodies occurs if a natural protein with an essential biological activity is neutralized. Such a consequence has been described for megakaryocyte-derived growth factor (MDGF) some years ago. This thrombopoietin-like protein induced antibodies neutralizing endogenous TPO leading to severe thrombocytopenia in volunteers and cancer patients [19].

This effect is comparable with the Epo-associated PRCA.

## Conclusion

The antibodies associated with Epo treatment in a small number of patients are not an uncommon event as most biopharmaceuticals induce antibodies in patients. In the majority of cases these antibodies have no clinical effects. However, in the case of Epo the antibodies cross-react with the residual natural erythropoietin resulting in PRCA.

Although the cause of the immunogenicity of Epo is unclear, a subtle change in the molecule was probably introduced by the manufacturing and/or formulation changes in 1998. The current physicochemical characterization methods do not allow us to fully predict the biological and clinical properties of biopharmaceuticals. This puts further emphasis on the quality and the consistency of the production process to ensure the safety of therapeutic proteins. Shortly, the first patents of biopharmaceuticals will expire, opening the market for copy products [20]. Clinicians need to be more aware that the source of the product and the reliability of the manufacturer matter. Only clinical studies and careful monitoring of the market can be used to conclusively demonstrate rates of immunogenicity in humans for protein therapeutics. This is probably the most important lesson to learn from this incident with Epo.

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## **Biopharmaceuticals: current status and future prospects**

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*From Pharmaceutical Biotechnology: concepts and applications*

**Abbreviations:** CSF- colony-stimulating factor; GH - growth hormone; EPO – erythropoietin; RNAi- RNA interference.

Pharmaceutical substances form the backbone of modern medicinal therapy. Most traditional pharmaceuticals are low molecular weight organic chemicals. Although some (e.g. aspirin) were originally isolated from biological sources, most are now manufactured by direct chemical synthesis. Two types of manufacturing company thus comprise the ‘traditional’ pharmaceutical sector: the chemical synthesis plants, which manufacture the raw chemical ingredients in bulk quantities, and the finished product pharmaceutical facilities, which purchase these raw bulk ingredients, formulate them into final pharmaceutical products, and supply these products to the end user.

In addition to chemical-based drugs, a range of pharmaceutical substances (e.g. hormones and blood products) are produced by/extracted from biological sources. Such products may be described as products of biotechnology and are called biopharmaceuticals.

Approximately one in every four new drugs now coming on the market is a biopharmaceutical. By mid 2006, some 160 biopharmaceutical products had gained marketing approval in the USA and/or EU. Collectively, these represent a global biopharmaceutical market in the region of US\$35 billion, and the market value is estimated to surpass US\$50 billion by 2010.

The products include a range of hormones, blood factors and thrombolytic agents, as well as vaccines and monoclonal antibodies. All but two are protein-based therapeutic agents. The exceptions are two nucleic-acid-based products: ‘Vitravene’, an antisense oligonucleotide, and ‘Macugen’, an aptamer. Many additional nucleic-acid-based products for use in gene therapy or antisense technology are in clinical trials, although the range of technical difficulties that still beset this class of therapeutics will ensure that protein-based products will overwhelmingly predominate for the foreseeable future.

Many of the initial biopharmaceuticals approved were simple replacement proteins (e.g. blood factors and human insulin). The ability to alter the amino acid sequence of a protein logically coupled to an increased understanding of the relationship between protein structure and function has facilitated the more recent introduction of several engineered therapeutic proteins. Thus far, the vast majority of approved recombinant proteins

have been produced in the bacterium *E. coli*, the yeast *S. cerevisiae* or in animal cell lines (most notably Chinese hamster ovary (CHO) cells or baby hamster kidney (BHK) cells).

Although most biopharmaceuticals approved to date are intended for human use, a number of products destined for veterinary application have also come on the market. One early such example is that of recombinant bovine GH (Somatotrophin), which was approved in the USA in the early 1990s and used to increase milk yields from dairy cattle. Additional examples of approved veterinary biopharmaceuticals include a range of recombinant vaccines and an interferon-based product.

At least 1000 potential biopharmaceuticals are currently being evaluated in clinical trials, although the majority of these are in early stage trials. Vaccines and monoclonal antibody-based products represent the two biggest product categories. Regulatory factors (e.g. hormones and cytokines) and gene therapy and antisense-based products also represent significant groupings.

Although most protein-based products likely to gain marketing approval over the next 2–3 years will be produced in engineered *E. coli*, *S. cerevisiae* or animal cell lines, some products now in clinical trials are being produced in the milk of transgenic animals. Additionally, plant-based transgenic expression systems may potentially come to the fore, particularly for the production of oral vaccines.

Interestingly, the first generic biopharmaceuticals are already entering the market. Patent protection for many first-generation biopharmaceuticals (including recombinant human GH (rhGH), insulin, EPO, interferon- $\alpha$  (IFN- $\alpha$ ) and granulocyte-CSF (G-CSF)) has now/is now coming to an end. Most of these drugs command an overall annual market value, rendering them attractive potential products for many biotechnology/pharmaceutical companies.

To mid 2006, no gene-therapy-based product has thus far been approved for general medical use in the EU or USA, although one such product ('Gendicine') has been approved in China. Although gene therapy trials were initiated as far back as 1989, the results have been disappointing. Many technical difficulties remain in relation to, for example, gene delivery and regulation of expression. Product effectiveness was not apparent in the majority of trials undertaken and safety concerns have been raised in several trials.

Only one antisense-based product has been approved to date (in 1998) and, although several such antisense agents continue to be clinically evaluated, it is unlikely that a large number of such products will be approved over the next 3–4 years. Aptamers represent an additional emerging class of nucleic-acid-based therapeutic. These are short DNA- or RNA-based sequences that adopt a specific three-dimensional structure, enabling them to bind (and thereby inhibit) specific target molecules. One such product (Macugen) has been approved to date. RNA interference (RNAi) represents a yet additional mechanism of achieving downregulation of gene expression.

It shares many characteristics with antisense technology and, like antisense, provides a potential means of treating medical conditions triggered or exacerbated by the inappropriate overexpression of specific gene products. Despite the disappointing results thus far generated by nucleic-acid-based products, future technical advances will almost

certainly ensure the approval of gene therapy and antisense-based products in the intermediate to longer term future.

Technological developments in areas such as genomics, proteomics and high-throughput screening are also beginning to impact significantly upon the early stages of drug development. By linking changes in gene/protein expression to various disease states, for example, these technologies will identify new drug targets for such diseases. Many/most such targets will themselves be proteins, and drugs will be designed/developed specifically to interact with. They may be protein based or (more often) low molecular mass ligands.

Additional future innovations likely to impact upon pharmaceutical biotechnology include the development of alternative product production systems, alternative methods of delivery and the development of engineered cell-based therapies, particularly stem cell therapy. As mentioned previously, protein-based biotechnology products produced to date are produced in either microbial or in animal cell lines. Work continues on the production of such products in transgenic-based production systems, specifically either transgenic plants or animals.

Virtually all therapeutic proteins must enter the blood in order to promote a therapeutic effect. Such products must usually be administered parenterally. However, research continues on the development of non-parenteral routes which may prove more convenient, less costly and obtain improved patient compliance. Alternative potential delivery routes include transdermal, nasal, oral and buccal approaches, although most progress to date has been recorded with pulmonary-based delivery systems. An inhaled insulin product ('Exubera') was approved in 2006 for the treatment of type I and II diabetes.

A small number of whole-cell-based therapeutic products have also been approved to date. All contain mature, fully differentiated cells extracted from a native biological source. Improved techniques now allow the harvest of embryonic and, indeed, adult stem cells, bringing the development of stem-cell-based drugs one step closer. However, the use of stem cells to replace human cells or even entire tissues/organs remains a long term goal. Overall, therefore, products of pharmaceutical biotechnology play an important role in the clinic and are likely to assume an even greater relative importance in the future.

### **Was ist Satelliten-DNA?**

Als Satelliten-DNA werden in der Genetik hochrepetitive Sequenzen, also sich mehrfach wiederholende Basenabfolgen, im Genom von höheren Organismen (Eukaryoten) bezeichnet.

Die Bezeichnung Satelliten-DNA geht auf die Unterscheidung von Genomfragmenten über ihren GC-Gehalt und somit über ihre Dichte mittels CsCl-Zentrifugationstechnik zurück. Trägt man in einem Diagramm die DNA-Konzentration gegen ihre Dichte auf, so erhält man neben der Hauptbande (*peak*) mehrere Nebenbanden, welche auch als Satelliten-Peaks bezeichnet werden. Die Hauptbande repräsentiert hierbei die durchschnittliche Dichte der DNA.

Meistens handelt es sich um wiederholte Sequenzen von fünf bis zehn Basenpaaren, die aber auch sehr viel länger werden können und sich über Bereiche von bis zu 100.000 Basenpaaren erstrecken können. In einem durchschnittlichen Säugetiergenom bestehen etwa zehn Prozent der DNA aus diesen *einfach strukturierten DNA-Sequenzen*. Diese Abschnitte haben eine besonders hohe Renaturierungsgeschwindigkeit.

Bei Säugetieren liegen die meisten dieser Bereiche im Heterochromatin in der Nähe der Zentromere, bei *Drosophila melanogaster* zudem noch an den Telomeren. An den Zentromeren lagern sich bei der Mitose und Meiose die Mikrotubuli des Spindelapparates an.

Im Allgemeinen unterscheidet man zwischen drei Klassen von Satelliten-DNA.

Klassische Satelliten-DNA ist zwischen 100 und 5000 kb lang. Sie besteht aus bis zu einer Million Wiederholungen von Frequenzen einer Länge zwischen 5 und 300 bp und wird in der Regel nicht transkribiert. Bei den Alpha-Sequenzwiederholungen an den Zentromeren der Chromosomen erfüllt die klassische Satelliten-DNA eine Aufgabe als Proteinbindestelle.

Minisatelliten (Short tandem repeats) sind, wie der Name schon sagt, kleiner als die klassische Satelliten-DNA. Sie sind in der Regel zwischen 100 bp und 20 kb lang, ihre Wiederholungseinheiten bestehen maximal aus 15 Basen. An den Telomeren fungieren sie als Bindestellen für Proteine, welche zum Schutz vor dem Abbau durch Nukleasen dienen.

Mikrosatelliten (simple Sequenzen) sind mit einigen hundert Wiederholungen von 1 bis 6 bp langen Sequenzen die kürzesten Satelliten-DNAs. Sie selbst sind repetitive Einheiten, die über das komplette Genom verteilt bis zu 100.000 Mal vorkommen. Mikrosatelliten entstehen vermutlich während der Replikation, wenn freie DNA-Enden vorliegen und es zu einem Verrutschen (*slippage*) der DNA-Polymerase kommt. Die relativ zufällige Entstehung der Mikrosatelliten zieht auch einen großen Längenpolymorphismus nach sich, welcher für Genetik und Kriminalistik genutzt wird. Wie der Fingerabdruck ist auch der Mikrosatelliten-Längenpolymorphismus ein Erkennungsmerkmal zur einwandfreien Identifizierung eines Individuums.

#### Quellen:

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## Essentielle Aminosäuren

Lebensmittel dienen nicht nur dazu, das menschliche Hungergefühl zu stillen, sondern liefern dem Körper auch die lebenswichtigen essentiellen Aminosäuren. Daher ist die Wahl der Lebensmittel entscheidend, damit auch tatsächlich alle benötigten Aminosäuren zugeführt werden können.

### *Essentielle Aminosäuren und ihre Eigenschaften*

Isoleucin kann dem zentralen Nervensystem verschiedene Botenstoffe liefern. Zudem ist *Isoleucin* entscheidend für den Muskelaufbau. Lebensmittel, die eine erhöhte

Konzentration von Isoleucin aufweisen sind Cashewkerne, Erdnüsse, Linsen, Erbsen, Rindfleisch, Hühnchen, Garnelen sowie Käse.

*Valin* hat die Aufgabe den Blutzucker im Körper zu regulieren sowie diverse Botenstoffe an das Gehirn zu transportieren. Außerdem unterstützt sowie stärkt Valin das Immunsystem. Lebensmittel, die verstärkt Valin beinhalten sind Dinkelmehl, Haf-erflocken, Thunfisch, Hefe, Eier, Käse, Hühnchen.

*Methionin* ist am direkten Aufbau von Eiweißen im Körper beteiligt, sowie vorbeugend gegen Harnwegsinfektionen. Methionin ist in Paranüssen, Fisch, Leber sowie Eiern enthalten. Ebenfalls für den Muskelaufbau verantwortlich gezeichnet wird Leucin. Lebensmittel mit erhöhter Konzentration an Leucin sind: Erdnüsse, Mandeln, Sojabohnen, Erbsen, Käse, Thunfisch, Hühnerbrust sowie Rinderleber.

#### *Wandel von Aminosäuren*

Mit der Aminosäure *Tryptophan* kann der Körper das Glückshormon Serotonin sowie das Schlafhormon Melatonin herstellen. Zudem ist Tryptophan wichtig für die Funktion der Leber. Zu finden ist es beispielsweise in Karotten, Tomaten, Bananen sowie Spinat. Die Aminosäure

*Lysin* ist für den Erhalt des Binde- sowie Muskelgewebes zuständig. In der Synthese entsteht aus Lysin Carnitin, was besonders gerne zum Abnehmen sowie zum Muskelaufbau eingesetzt wird. Lebensmittel, wie etwa Bohnen, Orangen, Mandarinen sowie Sellerie enthalten Lysin.

*Phenylalanin* kann die Bildung von Blutkörperchen (sowohl weiße als auch rote) unterstützen sowie zur Nierenfunktion dienen. Soja, Schweinefleisch, Lachs, Eier, Kürbiskerne sowie Kuhmilch enthalten eine größere Menge von Phenylalanin.

*Threonin* kann vom Körper zu Glycin umgewandelt werden, welches die Nerven beruhigen kann. Zudem wirkt Threonin unterstützend beim Aufbau der Knochen sowie bei der Bildung von Antikörpern, um das Immunsystem zu kräftigen. Threonin ist beispielsweise in den folgenden Lebensmitteln enthalten: Papaya, Karotten, Blattspinat.

#### *Semi-essentiell: Arginin und Tyrosin*

Tyrosin sowie Arginin, können im Säuglingsalter noch nicht vom Körper selbst produziert werden, sodass sie als semi-essentiell bezeichnet werden. *Arginin* ist für seine unterstützende Funktion beim Muskelaufbau bekannt. Zudem soll Arginin das Wachstum des Körpers fördern können. Aus *Tyrosin* werden wichtige Hormone der Schilddrüse gebildet.

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