

# TRANSLATION FOR SCIENCE

УЧЕБНОЕ ПОСОБИЕ ПО ПЕРЕВОДУ ДЛЯ  
ЕСТЕСТВЕННОНАУЧНЫХ НАПРАВЛЕНИЙ  
(АНГЛИЙСКИЙ ЯЗЫК)



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Министерство науки и высшего образования Российской Федерации  
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Институт языка и литературы  
Кафедра профессионального иностранного языка  
для естественнонаучных специальностей

## **Translation for science**

Учебное пособие по переводу для естественнонаучных направлений  
(английский язык)



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Данное учебное пособие предназначено для проведения практических занятий для студентов бакалавриата естественнонаучных направлений и студентов, изучающих английский язык по программе дополнительного образования «Переводчик в сфере профессиональной коммуникации».

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## ПРЕДИСЛОВИЕ

Данное учебное пособие предназначено для студентов бакалавриата естественнонаучных направлений и студентов, изучающих английский язык по программе дополнительного образования «Переводчик в сфере профессиональной коммуникации».

Пособие позволяет приобрести, закрепить и проверить навыки трансформационного перевода, который представляет собой межъязыковое преобразование с целью достижения переводческого эквивалента.

Материал пособия направлен на:

- выработку навыков опознавания и классификации явлений английского языка, которые могут потребовать применения трансформационных способов перевода,
- поиск наилучшего переводческого приема для преодоления контекстуально-несоответствия и выполнения адекватного перевода,
- выработку навыков классификации применяемых переводческих приемов.

В теоретической части даны примеры общей направленности. Практическая часть содержит общую и естественнонаучную лексику. Настоящее пособие по переводу состоит из трех разделов.

Первый раздел посвящен грамматическим трансформациям при переводе с английского на русский язык. Во втором разделе рассматриваются синтаксические трансформации, которые можно применить при выполнении заданий. Третий раздел касается лексических трансформаций. Каждый раздел включает теоретический материал, иллюстрированный примерами и переводом с комментариями, и упражнения, предназначенные для письменного выполнения.

Упражнения для перевода – это предложения или короткие пронумерованные тексты, составленные по материалам американских и британских периодических и непериодических изданий. Орфография в текстах сохранена такой, как в источнике, т. е. соответствует либо американскому, либо британскому варианту английского языка. Английские конструкции и обороты, создающие при переводе контекстуальные несоответствия и требующие применения трансформаций, выделены жирным шрифтом.

В конце пособия приведены тексты естественнонаучной направленности для перевода и анализа.

Предлагаемое пособие адресовано тем студентам, которые, стремятся приобрести базовую переводческую компетенцию под руководством преподавателя или в ходе самостоятельной работы.

## РАЗДЕЛ I. ГРАММАТИЧЕСКИЕ ТРАНСФОРМАЦИИ

### 1.1. Трансформации при отсутствии грамматических эквивалентов в языке перевода

#### 1.1.1. Перевод артикля

##### Определенный артикль

Определенный артикль *the* употребляется перед существительными в единственном и множественном числе для указания на то, что речь идет об определенном или известном ранее из контекста лице или предмете. Он имеет некоторые особенности перевода.

1. Определенный артикль переводится прилагательными (выступает в функции определения) *текущий, нынешний, (ныне) существующий, действующий* и т. п., а также указательными местоимениями *тот, тот самый, этот, эти, те, все, всё* и другими словами в зависимости от контекста.

"Ah! Mr. Burton!" exclaimed the Director, **the** very person I wanted. "...but, my dear, if you remember, I did not encourage **the** idea." ...именно **тот** (как раз тот) человек, который мне нужен". "...я не одобрила эту мысль",

2. Часто определенный артикль приходится передавать дополнительными и (или) уточняющими значение словами. Так, например, существительное *war* с определенным артиклем в зависимости от контекста в газетно-публицистическом тексте может означать и *Вторая мировая война*, и *война во Вьетнаме* и др.; *the Depression* – *Великий кризис 1930-х годов*. Контекст предложения, абзаца или всего текста подсказывает правильный перевод.

Under **the** circumstances I thought it better that we should keep ourselves to ourselves. Я считал, что при **данных** обстоятельствах нам лучше держаться особняком.

##### Неопределенный артикль

Неопределенный артикль *a / an* употребляется для обозначения 1) лица или предмета данного класса в отличие от лица или предмета другого класса и 2) лица или предмета, упоминаемого впервые, неизвестного читателю или слушателю.

1. Неопределенный артикль часто переводится словами *один из, один, некий, какой-либо, какой-то, новый, такой, известный, определенный, любой, каждый* и др.

A drowning man catches at a straw.

Каждый тонущий хватается за соломинку.

2. Необходимость соблюдения при переводе норм сочетаемости слов в русском языке требует лексической развертки в тех случаях, когда существительному с неопределенным артиклем предшествуют такие глаголы, как *to call for, to announce, to seek, to favour, to propose, to drive, to plan, to wage* и т. п., или существительные с тем же значением *proposal, appeal* и т. д.

В тех случаях, когда неопределенный артикль употребляется для обобщения (с классифицирующим значением), определяемое существительное часто переводится существительным во множественном числе.

The assumption that there is a special **relationship** between London and Washington irritates the French.

Предположение (допущение), что существуют особые **взаимоотношения** между Лондоном и Вашингтоном, раздражает французов.

3. Когда неопределенный артикль выполняет функцию маркера центра высказывания (информации), на русском языке это значение часто приходится передавать синтаксическим способом, т. е. изменением порядка слов, так как в русской письменной речи центр высказывания обычно находится в конце предложения.

**The** plan of action was worked out thoroughly and in great detail.

План действий был разработан тщательно и во всех деталях (*подчеркивается, как был разработан план*).

A plan of action was worked out thoroughly and in great detail.

Весьма тщательно и подробно был разработан план действий (*подчеркивается, что было разработано*).

В некоторых случаях употребление или отсутствие неопределенного артикля изменяет значение слова.

a power *держава* power *власть, могущество, электроэнергия*

a government *правительство* government *управление*

a few, a little *некоторое количество (положительное значение)* few, little *мало (иногда просто отрицание)*

He has **a** few objections, but they are unimportant.

У него есть несколько возражений, но они несущественны.

He has few ideas on that matter.

По этому поводу идей у него мало.

Значения английского артикля в русском языке могут быть также переданы спомощью:

**а) падежных окончаний;**

Pour <b>the</b> water into the glass.	Налейте воду в стакан.
Pour some water into the glass.	Налейте воды в стакан.

**б) порядка слов.**

A woman came up to me and asked what time it was.	Ко мне подошла женщина и спросила, который час.
<b>The</b> woman has come...	Женщина пришла...

*Проанализируйте и переведите предложения на русский язык:*

1. "I think her will have a success when the tests are over. I think she has **the** skill. She was just nervous during the experiment," said Peggy Self, a chemistry teacher who was in the laboratory.

2. "With the rest of today's data suggesting that drivers of spending remain weak, we still see little prospect of a recovery in spending growth in the near future," he said.

3. The vast majority of births today share **the** two characteristics – conception has occurred through sexual reproduction and **the** genes of newborns have not been intentionally modified or selected.

4. The company is facing the threat of a €2 million daily fine, on top of **the** €497 million it has already had to pay out, after the Commission ruled that it had abused the dominance of its Windows system.

5. When 21-year-old Liliane's career launched three years ago, her agency tipped her to be the next big thing - she had **the** looks, **the** attitude, **the** diligence.

6. Babilonia is one of dozens of crumbling hillside shantytowns in Rio. Nationwide these communities tend to be majority black – and they have come to symbolize the persistent economic gap between **the** races.

7. Far less attention has been given to the impact that **the** technologies might have upon the morality of society itself.

8. Food can be a powerful lens through which to examine wider cultural differences. This was something Renny O'Shea discovered when she went to someone's home in Eritrea for dinner. They served her chicken so she put aside her vegetarianism and ate it. "It was horrible," she says. "But there was no way that I was going to say no. You don't go to Eritrea for **the** food."

9. When Professor was in a good mood, he was **the** fun parent, **the** player of practical jokes and **the** teller of wild tales.

10. Between **the** electricity-sensing bill, venomous heel spurs and egg laying, **the** platypus was already one of the strangest mammals alive today

11. Many players on the financial market are frantically trying to build or buy **a** presence in energy trading.

12. There was **a** time when the government leaders didn't interfere with science.

13. It is time for **a** decision: without it, in the end, there will be no possible solution.

14. Few other research problems have such **a** complex structure or such wide repercussions.

15. On this particular morning he was giving a lecture in London Scientific Society, **a** Mr. Redginald Wade.

16. **A** platypus is a very interesting phenomenon, especially when it's alive and live in your house!

17. I was beginning to mix complex substances of **a** kind I'd never mixed before.

18. I don't believe he is **a** Newton, though he is undoubtedly an extremely talented physicist.

### 1.1.2. Инфинитивные обороты

В современном английском языке имеются три основных конструкции, или оборота, с инфинитивом.

1) объектный инфинитивный оборот (the Objective-with-the Infinitive Construction);

2) субъектный инфинитивный оборот (the Subjective-with-the-Infinitive Construction);

3) инфинитив с предлогом for (the for-to-Infinitive Construction).

#### 1.1.2.1. Объектный инфинитивный оборот

Конструкция «объектный (винительный) падеж с инфинитивом», или «объектный инфинитивный оборот», состоит из подлежащего, «вводящего» глагола, местоимения в объектном падеже или существительного в общем падеже и инфинитива. В предложении эта конструкция выполняет функцию сложного дополнения (Complex Object).

Do you *expect* him to come?

Ты полагаешь, что он придет?

I *know* her to be a good student.

Я знаю, что она хорошая студентка.

Этот оборот употребляется после глаголов, выражающих:

- 1) желание и намерение: to want, to wish, to desire, to intend, to mean;
- 2) умственное восприятие: to know, to think, to consider, to believe, to suppose, to expect, to imagine;
- 3) приказ, разрешение, просьбу: to order, to ask, to allow, to have, to make;
- 4) чувственное (физическое) восприятие: to see, to hear, to feel, to watch, to observe, to notice (после этих глаголов инфинитив употребляется без частицы to);
- 5) чувства и эмоции: to like, to love, to hate, to dislike.

На русский язык этот оборот переводится придаточным дополнительным предложением с союзами *что, чтобы, как*. Существительное или местоимение становится подлежащим, а инфинитив – сказуемым русского придаточного предложения. Следует обращать внимание, как на форму предшествующего глагола, так и на форму самого инфинитива. Indefinite Infinitive передается глаголом в настоящем (иногда в прошедшем) времени, Perfect Infinitive передается глаголом в прошедшем времени. После глаголов to expect, to hope чаще всего передается глаголом в будущем времени.

*Проанализируйте и переведите предложения на русский язык:*

1. We **expect** these phenomena **to have been investigated**.
2. Everybody **considers** her **to be** a great scientist.
3. We **found** that effect **to have been unknown**.
4. They **thought** the information **to have been published** recently.
5. **Knowing him to be good** at psychology, I asked him to explain this rule.
6. The scientist **expected** his assistants **to obtain** some new data.
7. If the Government **expected** the tenants **to take** the increase lying down, they were very much mistaken.
8. They **heard him deny** it.
9. This story **was told to get** him to go to the police station.
10. The major Powers **expect the talks to take place** at the end of the next month.
11. They **announced it to be** the law.
12. She **meant him to do** it.
13. I **haven't heard anyone call** me.
14. They **saw the fire slowly conquered**.
15. Everybody **expected her to marry** Pete.

### 1.1.2.2. Субъектный инфинитивный оборот

Конструкция «именительный падеж с инфинитивом», или «субъектный инфинитивный оборот», состоит из подлежащего, «вводящего» глагола и инфинитива. В предложении она выполняет функцию сложного подлежащего (Complex Subject).

**All students are supposed to study** four foreign languages in the university. Предполагается, что все студенты изучают четыре иностранных языка в этом университете.

Этот оборот употребляется после глаголов, выражающих:

1) умственное восприятие: to think, to consider, to know, to expect, to believe и т. д.;

2) чувственное восприятие: to see, to hear и т. д.;

3) утверждение, предположение, сообщение и т. д.: to suppose, to report, to prove, to turn out, to appear, to seem, to say;

а также после словосочетаний:

to be (un)likely *вероятно, маловероятно, вряд ли* to be certain, to be sure *обязательно, наверняка*

Глаголы to come out, to turn out *оказываться*, to seem *казаться*, to appear *оказываться*, to prove *оказываться*, to happen *случаться* употребляются в действительном залоге и при переводе всегда приобретают характер вводных слов. Остальные глаголы употребляются в форме страдательного залога, например, is believed, is considered, is reported, is said и др. и при переводе также приобретают характер вводных слов. В целом на русский язык субъектный инфинитивный оборот передается неопределенно-личным предложением.

**The people of all ancient civilizations** are known to have made maps. Известно, что люди всех древних цивилизаций составляли карты.

Следует обратить внимание на перевод следующих слов в конструкции Complex Subject:

(he) is reported to... *передают / сообщают / сообщается, что (он)...*

(he) is believed to... *полагают / считают, что (он)*

(he) is considered to... *считают / считается, что (он)*

(he) is thought to... *считают / думают, что (он)...*

(he) is understood to... *по имеющимся сведениям (он)..., считают / считается, что (он)..., согласно договоренности (он)...*

(he) is expected to... *ожидается / предполагается, что (он)...*

(he) is alleged to... *говорят / считают, что (он) якобы...*

(he) is heard to... *имеются сведения, что (он)...*

(he) is seen to... *считается / рассматривается / рассматривают, что (он)...*

(he) is felt to... *считают, что (он)...*

(he) seems to... *кажется, что (он)...*

(he) appears to... *по-видимому, (он)...*

(he) is likely to... *по-видимому, (он)..., похоже на то, что (он)..., повсей вероятности / вероятно (он)...*

(he) is unlikely to... *маловероятно, чтобы (он)..., едва ли / вряд ли (он)...* (he) happens (happened) to... *случайно (он)..., случилось так, что (он)...* (he) is sure (certain) to... *(он) обязательно / наверняка / определенно...*

*Проанализируйте и переведите предложения на русский язык:*

1. Computers **are likely (are certain) to be used** in the study of UFO.
2. The system **seems to be functioning well**.
3. Mankind **is sure to have entered** the age of automation.
4. Machine languages **are known to be low-level languages**.
5. She **appears to make progress** in languages.
6. He **is known to study** ancient architecture.
7. It **seems to be an exception** to the rule.
8. The new method of investigation **is believed to have produced** good results.
9. Computers **are thought to be divided** into two groups according to the jobs they perform.
10. The result **is expected to agree** with theoretical predictions.
11. She **is known to have the best collection of pictures** in the world.
12. They **are thought to have been killed** in an air crash.
13. He **is sure to come**. I saw him on my way to your place.
14. They **seem to like their work** at the exhibition.
15. The delegation **is reported to have left** for Paris.
16. The sales balance for this sector jumped from minus 63 to minus 7 in a resurgence **seen as mirroring** the recent pick-up in the housing market.
17. At the same time, mortgage approvals – **seen as an important gauge of future housing market conditions** – has fallen.
18. Arkin said his research indicated that the United States, the only country **known to have placed** nuclear weapons abroad, still keeps such weapons in at least seven places: Belgium, Greenland, Italy, the Netherlands, Germany, Turkey and Britain.

19. None of the celebrities – **said to include** numerous local politicians, show-businessstars and TV presenters - who allegedly benefit from the town hall's involuntary vegetal largess have been named.

20. **The experts were felt to have** little hope of reducing the differences even if an attempt were made to bring the two parties together.

### 1.1.2.3. Инфинитив с предлогом *for*

Этот оборот состоит из предлога *for*, существительного в общем падеже или местоимения в объектном падеже и инфинитива.

Он переводится на русский язык придаточным предложением. Тип предложения зависит от функции, выполняемой оборотом в предложении. Чаще всего этот оборот употребляется в функции обстоятельства и переводится предложением с союзами *чтобы, для того чтобы*.

**For the results to be reliable**  
you must have them tested again  
and again.

Для того чтобы результаты  
были надежными, вам нужно  
их проверить снова и снова.

**It is for you to decide**  
whether to come or not.

Вам решать, приходиться  
или нет.

*Проанализируйте и переведите предложения на русский язык:*

1. I am anxious **for her to pass** her exam.
2. He stepped aside **for me to pass**.
3. The text is too difficult **for the students to translate**.
4. It was unusual **for him to go out** in the afternoon.
5. He had made arrangements **for mules and ponies to be ready** for me on my arrival.
6. I waited **for him to go on**.
7. The table was small enough **for the conversation to be general**.
8. He was quite willing **for his little daughter to be brought up** in England by her grandmother.
9. The most important thing **for us is to start early**.
10. She only had to express a wish **for him to fulfil it** if it was in his power.
11. She did not say anything, but made way **for us to pass**.
12. He was so occupied in his research work that it made difficult **for him to be away** from home for several weeks at a time.
13. I sometimes think it is a shame **for people to spend so much money** this way.
14. That was **for him to find out**.

15. He asked **for the papers to be brought**.

16. While working with aluminium you are in control of the pool of aluminium. It's very difficult... It's very easy **for it to start** drifting away from you.

17. The whole idea is **for the handlebars to have** a tight curl so they lay down and match the contours of the bike's gas tank.

18. He called for a combination of policies for state and private pensioners, which can last and provide a good basis **for people to plan** for their retirement.

19. The U.S. National Aeronautics and Space Administration has announced that it will build the long-discussed Next Generation Space Telescope and has selected a design by TRW Inc. **for a successor to Hubble to be launched** in 2010.

20. More investigation and scientific work were required before drawing up any plan **for a further probe to look beyond** the second door in the narrow shaft.

21. We researched other possible treatments. But autism is too complex a disorder for any one biomedical or educational approach to work universally.

22. To have put his idealism, all his work and energy into a system, only **for it to collapse**, that's tough.

**23.** In a wide analysis of the importance of rain forests, Prince Charles said: "We are literally the last generation which can save the rain forest from total destruction. If we don't act now there certainly won't be much rain forest **for our children to be concerned about**."

**24.** Is she too old **for other women to identify with**?

### 1.1.3. Герундий

Герундий (the Gerund) является неличной формой глагола. Он имеет свойства как глагола, так и существительного и всегда выражает действие как развивающийся процесс. В русском языке соответствующая форма отсутствует.

smoking *курение*

rowing *гребля*

understanding *понимание*

speaking *говорение*

dancing *танцы*

driving *вождение*

Герундий, как и причастие, имеет четыре формы. Его формы омонимичны формам причастия.

## Функции герундия в предложении и способы его перевода

Функции герундия во многом сходны с функциями инфинитива, также сочетающего свойства существительного со свойствами глагола. Герундий может выполнять в предложении следующие функции:

### 1. ПОДЛЕЖАЩЕЕ

<b>Travelling</b> around the world has become my hobby	Путешествие (путешествовать) по миру стало моим увлечением.	Переводится существительным или инфинитивом в функции подлежащего.
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### 2. ИМЕННАЯ ЧАСТЬ СОСТАВНОГО ИМЕННОГО СКАЗУЕМОГО

My favourite occupation is **reading**.      Мое любимое занятие — чтение.

Переводится существительным или инфинитивом.

### 3. ЧАСТЬ СОСТАВНОГО ГЛАГОЛЬНОГО СКАЗУЕМОГО

He finished **painting** the picture      Он закончил писать картину.

Переводится инфинитивом в функции дополнения.

### 4. ДОПОЛНЕНИЕ (ПРЯМОЕ И ПРЕДЛОЖНОЕ)

I simply love <b>riding</b> a horse.	Я просто обожаю <b>ездить верхом</b> .	Переводится инфинитивом, существительным или придаточным предложением.
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Thank you <b>for coming</b> .	Благодарю вас за то, что пришли
I am fond <b>of collecting stamps</b> .	Я люблю (обожаю) коллекционировать марки.

## 5. ОПРЕДЕЛЕНИЕ

There are different ways <b>of solving</b> this problem.	Имеются различные способы <b>решения</b> этой проблемы	Переводится существительным или инфинитивом.
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## 6. ОБСТОЯТЕЛЬСТВО

One can demonstrate <b>this by making</b> a very simple experiment.	Можно продемонстрировать это, сделав очень простой эксперимент.	Переводится деепричастием.
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Герундий всегда употребляется после:

а) глаголов: to remember, to like, to hate, to finish, to mind, to keep, to continue, to avoid, to forgive, to enjoy, to deny, to fancy, to dislike и др.;

б) глаголов, управляющих предлогами: to burst out, to give up, to go on, to put off, to depend on, to hear of, to insist on, to know of, to object to, to prevent from, to rely on, to result in, to succeed in, to think of и др.;

в) словосочетаний с предлогами: to be aware of, to be sure of, to be worth (while), to be afraid of, to be astonished at, to be displeased / pleased with, to be famous for, to be fond of, to be glad at, to be interested in, to be proud of, to be surprised at и др.

*Проанализируйте и переведите предложения на русский язык:*

1. I'm fed up with **living** in the city – it's too dirty and crowded.
2. **Speaking** a foreign language every day is the best way of learning it.
3. There's no point in **having** a car if you never use it.
4. **Being** admired by all, she felt proud and happy.
5. The boy was ashamed of **having been beaten** in class by his sister.
6. My **answering** in the affirmative gave him great satisfaction.
7. He is in the habit of **boasting** of his cleverness.
8. We are proud of **being taught** four foreign languages at this University.
9. After **having** the same job for ten years, I felt I needed a change.
10. He is an artistic person – he is very good at **writing** poems and **composing** music.
11. I don't want to force you into **doing** something against your will.
12. I think you should apologize to your mother for **being** so rude to her.

13. Do you mind **meeting** different people every day? Meeting the same people every day, listening to people for many hours?
14. He had the most irritating habit of **joking** at the wrong moment.
15. I hate **reminding** people of their duties or **being reminded** of mine.
16. **Forgetting** may be very rapid when one has no desire to remember; **over-learning** shows that through extra effort, one can build up resistance to **forgetting**.
17. It's no use **talking** like that to me.
18. He did not succeed in **taking** things easily.
19. Joseph could not help **admiring** that man.
20. **Waiting** for the Professor was a lame excuse for doing nothing.

#### 1.1.4. Сложный герундиальный оборот

Подобно всем неличным формам глагола, герундий образует обороты. Сочетание герундия с предшествующим ему притяжательным местоимением или существительным в притяжательном или в общем падеже называется сложным герундиальным оборотом. Такой оборот представляет собой эквивалент придаточного предложения и обычно переводится придаточным предложением, соответствующим синтаксической функции герундия в предложении и вводимого словами *то что, тем что, как, после того как*.

<b>My friend's having a good knowledge of English</b> is the result of his hard work on the language.	<b>То, что мой друг обладает хорошим знанием английского,</b> является результатом его упорной работы над языком
<b>His not having come in time</b> is quite natural.	<b>То, что он не пришел вовремя,</b> вполне естественно.
<b>After their repairing the motor,</b> we set off.	<b>После того как они починили мотор,</b> мы отправились.

*Проанализируйте и переведите предложения на русский язык:*

1. Did you hear of **his having won** a prize?
2. Tom's mother spoke with pride of **her son being** a sailor.
3. I have no objection to **your coming late**.
4. We are concerned about the **company's trading in raw materials**.
5. She was very much surprised **at his being so worried** about the incident.
6. Do you know the reason **for the miners stopping work**?
7. Some parents don't approve **of their children watching** a lot of television.

8. I insist on both **of them coming in time**.
9. **His being a foreigner and an ex-enemy** was bad enough.
10. I can't imagine **your mother approving** of what you are doing.
11. He was against **my going there alone**.
12. I remember **his saying it**.
13. I object **to children going out** on such a windy day.
14. **Our being tired** is easy to explain.
15. He insisted **on my sister's coming with us**.
16. Did you ever hear of **a man of sense rejecting** an offer?

17. Besides preventing Macquarie from launching a competing bid, the development also brings leading knowledge of financing infrastructure on board, increases the chance of **the Ferrovia consortium making** a successful bid and improves the affordability of the potential deal for Ferrovia. It also reduces the chance of **Ferrovia's bid being ruled out** on competition terms, because of its ownership of Bristol airport.

18. Mr DeGuerin, Dr Gilliland's lawyer, said: "One of the crash victims' mothers said that her daughter had explained that she looked up and saw a car coming from the wrong direction," he said. "That would be wrong from her perception. Anybody that has been to Great Britain knows they drive on the left-hand-side of the street. I think the physical evidence is inconsistent with **the car being up** on the kerb."

19. The lawyer's offices have some unusual features, including Japanese-style "sleep pods" and a hidden entrance up to a private suite where deals can be signed in secrecy, rather than **everyone being spotted** falling out of the Ivy or the Walbrook.

20. **Dubai buying Peninsula & Oriental** caused no trouble in Britain, which made it doubly peculiar when America, home of multinationals, blocked most of the bid.

21. The surplus on trade in services shrank to £18.7 billion for the year, fuelled by factors such as further strong increases in **Britons undertaking** travel abroad.

22. Jonathan Todd, spokesman for Mrs Kroes, said that Commission's antitrust officials were worried that Vista's new functions might prevent **customers being offered** a genuine choice on software packages.

23. It was a widely held view that the war would take the form of **each side bombing** the other.

24. What police described as «appalling» weather conditions prevented **the two helicopters** borrowed from the Army **taking part** in the search.

25. He claims the prejudice in a London office of the American-based financial giant led to **him being** unfairly **sacked**.

### 1.1.5. Разное управление

В современном английском языке часто употребляются вместе с одним и тем же дополнением два глагола или два существительных, требующие разных предлогов. Это употребление создает известные трудности для переводчиков. Часто они не могут разобраться в таком построении и, следовательно, понять смысл английского предложения. Их сбивает своеобразная, необычная для русского читателя пунктуация, которую они воспринимают как ошибку, что и вызывает неправильный перевод, нарушающий нормы русского языка. Переводчики согласуют дополнение только со вторым глаголом или со вторым существительным.

Подобная ошибка делается иногда и при переводе двух глаголов, употребляющихся в английском языке с прямым дополнением, а в русском языке – с прямым и косвенным, требующим разных падежей. Например: *They love and trust him.*

Типичной ошибкой является следующий перевод: "Они любят и доверяют ему", тогда как правильный перевод: "Они любят его и доверяют ему".

*Проанализируйте и переведите предложения на русский язык.*

1. The comments on, and criticism **of** the article provides considerable food for thought.

2. The Indians have always entertained the friendliest feelings **towards**, and a high regard **for** the Russian people.

3. One of the first functions of law is to protect, and to give effect **to** rights which have become vested in a person by operation of law.

4. He denied any suggestion that he was connected **with**, or was responsible **for** the absence of the main witness from the Old Bailey during the trial.

5. There is urgent need to produce necessary goods **for**, or in the undeveloped countries.

6. More than two million children in Britain are on or below the poverty line, says the Child Poverty Action Group.

7. Penebe never heard **from** or **about** him again.

8. He would not have fallen in love **with** and married a plain girl.

9. The vote was organized by the "Keep Britain Out" Campaign at the request **of** and in conjunction **with** the MPs in three constituencies.

10. Some Labour leaders believe that no arrangement for Middle Eastern settlement will have any validity unless it is negotiated **with**, and agreed **to**, by Russia.

11. I bought a sports car to get me **to** and **from** the airstrip.

12. In 1995 the commission said that the barrier was continuing "to deny untold numbers of qualified people the opportunity **to compete for** and **hold** executive level positions in the private sector."

13. It comes after spending a long time **listening to, talking with, and reading about** people in the United States and elsewhere who are involved in the struggle to control terrorism.

14. It was in that year when I had surgery for endometriosis, and my case was extreme. But figures collected by the charities **set up by and for sufferers** suggest it still takes an average of 10 years or so for a woman to get a diagnosis. Endometriosis is a condition that is under-researched and poorly understood. It is necessary for doctors not to prejudge, but to **look at and listen to their patients**.

15. Research directors and committee members who **supervise, influence or control** the preparation of research reports and price targets are also covered.

16. Clifford is thought **to have acted for and advised two businessmen** who now wish to distance themselves from the conman.

17. This cheerful horror comedy, **starring and co-written by Simon Pegg** of Channel 4's Spaced, is as smart as paint.

18. Rodents thrive **in and around water**.

## **1.2. Трансформации при несовпадении значений или при различии в употреблении грамматических эквивалентов**

### **1.2.1. Различия в использовании пассивных конструкций**

Предложения с глаголом-сказуемым в страдательном залоге иногда представляют значительные трудности при переводе на русский язык.

1. В английском языке форму страдательного залога имеют не только переходные глаголы, но и глаголы, требующие косвенного или предложного дополнения, например, глаголы с послелогом (предлогами, стоящими после глагола) – непереходные глаголы.

to arrive at *приходить к, достигать* (в переносном значении)

to call upon *призывать* (кого-либо)

to deal with *иметь дело с, общаться с*

to enter into *вступать в* (соглашение и т.п.)

to refer to *ссылаться на*

to report on *сообщать о, доносить на*

to dictate to *диктовать, приказывать*

to comment on *комментировать*

to depend on *зависеть*

The article is often referred to.

На статью часто ссылаются.

2. Английскому переходному глаголу в русском языке может соответствовать **непереходный** глагол, требующий предложного или косвенного дополнения.

to affect *воздействовать на*  
to attend *присутствовать на*  
to follow *следовать за*  
to influence *влиять на*  
to join *присоединиться к*  
to need *нуждаться в*  
to treat *обращаться с*  
to refuse *отказываться, отказываться от*  
to resist *сопротивляться (чему-либо)*

3. В английском языке в страдательном залоге могут употребляться фразеологические сочетания, например, to make use of, to pay attention to, to take notice of, to put an end to, to take care of, to make fun of, to lose sight of и другие. Эти сочетания невозможно перевести на русский язык соответствующими глаголами, не заменив страдательный залог действительным.

His remarks **were taken no notice of.** На его замечания **не обратили внимания.**

Soon the boat **was lost sight of.** Вскоре лодка **исчезла из виду.**

4. Предложения, в которых субъект действия глагола не указан (отсутствует дополнение с предлогом by), обычно переводятся на русский язык неопределенно-личными предложениями.

Yesterday Parliament <b>was told</b> that there is going to be no reduction whatever in the size of the British Army in Northern Ireland.	Вчера парламенту <b>сообщили</b> , что численность английской армии в Северной Ирландии вообще не будет уменьшена.
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5. Очень часто при переводе на русский язык приходится вместо страдательного залога употреблять действительный; личные предложения переводить неопределенно-личными; заменять один глагол другим, а иногда вместо личной формы глагола употреблять в русском тексте форму неличную или передавать эту пассивную форму лексически.

Thousands of London press workers <b>have been urged</b> by their branches to support Tuesday's lobby of Parliament against the wage-freeze.	Местные лондонские организации типографских рабочих <b>призвали</b> тысячи своих членов принять участие в назначенном на вторник походе
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к депутатам парламента (в парламент к депутатам) с протестом против замораживания заработной платы.

6. В русском языке страдательный залог не так употребителен, как в английском, и даже в тех случаях, когда английскому глаголу в страдательном залоге соответствует русский переходный глагол, страдательный залог часто заменяется действительным по стилистическим соображениям или для того, чтобы в русском языке передать смысловое или логическое ударение в английском предложении.

These fears **were reiterated** by the representative of **the** Weavers' Association, who said the closure would cause much hardship. Эти же опасения высказал также и представитель Ассоциации ткачей, который сказал, что закрытие (шахт) вызовет большие трудности.

*Переведите предложения на русский язык:*

1. At least five people **were killed** and scores **injured** as hurricane Inez swept across the Caribbean Island of Martinique and Guadeloupe on Tuesday night. Heavy damage **was caused** as the storm hit with winds up to 125 miles an hour. Communications **were disrupted** and many centers cut off.

2. The Government was "very mild" as regards prices and rents, compared with the "uncompromising tone" when wages and salaries **were dealt with**.

3. This figure of 30 **has been treated** as a military secret until a newspaper published it a few days ago.

4. Another speaker thought that some of the older mental hospitals **can only be adequately dealt with** by pulling them down and rebuilding them.

5. It's not of importance that it's right. What is of importance is how it's **done**, who it's **done by**, and most of all, when it's done.

6. Why do you imagine I'm in this present job at all? I suppose you thought **I wasn't given** any choice?

7. In the lobby, where we were to meet him, he **was being congratulated**.

8. No solution **has been found**. You can't forbid people **to be born**, at least not yet.

9. The different factors **have been** exhaustively **analyzed**.

10. This subject **will be** given detailed treatment here in another essay by the author. In the past housebuilders have received paltry stock market ratings of just five or six times earnings, on fears they will repeat mistakes of the 1990s housing crash,

when many over-borrowed and went bust. Today the best housebuilders **are better-run**, with comparatively low gearing.

11. Woolworths **has been plagued** by stock control and distribution problems for as long as anyone can remember.

12. The Wall Street worries are part of a widening opposition to the proposed CFIUS reforms that is **led** in Washington by a contingent of British diplomats.

13. Organisations **have been flattened** in recent years, as layers of management **have been stripped out**.

15. Many companies **have been motivated** by a desire to broaden the pool of "talent" that their human-resources departments can fish in.

16. The firm's six new business divisions **are all headed** by men.

17. The women that she's gathering for the summit in June presumably **are not wanted** there **to be told** what they're to do, but to discuss what is happening presently.

18. Ironically, when the president said this in the campaign, he was immediately **jumped upon**.

19. Officially, Diana was voiceless and powerless, monitored by protection officers, followed by photographers and always under watchful eyes of the royal family.

20. The comedy is pacily **directed**, nicely **acted** and boasts a script crammed with real gags.

### 1.2.2. Различия в выражении модальности

В практике перевода нет другого явления, которое вобрало бы в себя такой набор специфических особенностей английского языка, как категория модальности. И нет другой категории, которая бы требовала от переводчика столь всестороннего учета не только содержания, стиля и экспрессии переводимого материала, но и предметной обстановки и речевой ситуации.

Модальные глаголы используются для выражения отношения говорящего к действию или состоянию, выраженному инфинитивом, т. е. они показывают, что действие, выраженное инфинитивом, рассматривается как возможное, невозможное, вероятное, невероятное, обязательное, необходимое, желаемое, сомнительное, неопределенное и т. д.

Модальные глаголы **can (could), may (might), must, should, ought, shall, will, would, need, dare** не изменяются по лицам и используются с любой формой инфинитива без частицы **to** (за исключением глагола **ought** и иногда **dare** и **need**), причем перфектный инфинитив переводится глаголом прошедшего времени.

**He may ask (have asked) about it.**

**Он, возможно, спрашивает (спрашивал) об этом.**

**He must ask (have asked).**

**Он, должно быть, спрашивает (спрашивал).**

Модальность выражают также эквиваленты модальных глаголов: to have + инфинитив и to be + инфинитив.

При переводе необходимо различать оттенки значений синонимичных модальных эквивалентов и широко пользоваться модальными словами русского языка: *конечно, несомненно, возможно, может быть, к счастью, очевидно, на самом деле* и т. д. Следует отметить, что в русском языке модальные слова употребляются гораздо чаще, чем модальные глаголы.

Особую трудность для перевода представляют сочетания модальных глаголов и их эквивалентов со страдательным и перфектным инфинитивом.

**You might have told me, you know.**

**Ты мог бы мне сказать, ты знаешь.**

Just think how he **must be suffering.**

Только подумай, как он, **должно быть, страдает.**

*Переведите предложения на русский язык:*

1. The Deputy Prime Minister, a former ship's steward, **may** have annoyed his late father by jettisoning his working class identity, but he was merely reflecting reality. A poll published yesterday by ICM shows that 43 per cent of Britons now regard themselves as middle class, compared with 30 per cent in 1966.

2. Like pedigree, money is not a pure determinant of class. Wayne Rooney **may** take his wages home in bin bags but he is still only Class 2 by virtue of being a professional sportsman. That's because the statisticians look at the average conditions of professions and jobs, and professional sportsmen include those who play for Halifax Town, as well as Manchester United.

3. My idea is that the bends **would have had to** have been so severe that the metal **would** just flatten out or pinch.

4. Unlike stick welding when you use sticks that **would** eat their way through them as you welded, the great thing about MIG welding is you've got continuous feed of your filler wire.

5. There **seem** to have been an increasing number of approaches made over recent weeks, but nothing is being consummated.

6. Sources **would** not confirm whether the fundraising was dependent on Mecom, the bid vehicle, winning the Dutch titles. Mecom **is likely to be transformed** eventually into a newspaper operating company.

7. Supplier firms will wonder whether they can really trust the NHS to respond to their needs in a reasonable way. This is not to say that the NHS **should** attempt to build in-house capabilities for things such as IT.

8. For the year just ended, however, the figures still **won't** look good. Pre-tax profits of perhaps £260 million are little better than last time and considerably less than half what was being achieved in the few previous years.

9. This **might** not look impressive, but the numbers cover the period to the end of December, much of which was dogged by poor consumer sentiment.

10. Eskimos believe that as long as ice and snow covers Greenland, they **shall** not go hungry and their culture will survive.

11. If the catch has been good they **will** sing the old songs.

12. Most patients tolerate heart-lung machines very well. However a few **will** have some serious complications.

13. Some loons **will** migrate from Canada to the Gulf of Mexico.

14. Statistics show that one of these vessels **will** run aground about every four years.

**15.** This is a crucial period as the chicks need to grow very quickly in their first month **if they are to survive.**

16. We **will all have heard**, of course, of people being shot down without ever seeing the aeroplane attacking them. That was principally because the enemy **would** sneak up behind them.

17. Science fiction takes you to places that you can't go, and it makes you dream about things to come and things that **might** be.

18. To this day opinions vary about why this one small city-state **should** have been such a fertile breeding-ground for human genius.

19. This is a show where the paintings, sculptures, books, manuscripts, and perhaps most of all the architectural models and drawings on display **are bound to** make you think.

### 1.2.3. Полисемия и омонимия служебных слов

Многозначные служебные слова: *as, but, but for, either, neither, which.*

*As* может означать: *постольку, так как, по мере того как, что касается (as to), как, в том виде как.* Иногда может переводиться причастным оборотом (*... as they took their seats – занимая свои места*). *But* означает *лишь, but for – если бы не.*

**As** we go further and further to the South **По мере того как** мы приближаемся it grows warmer and warmer. **к Югу** становится все теплее.

Союз *while* представляет трудности в переводе ввиду своей многофункциональности.

*While* употребляется как сочинительный союз для присоединения однородных предложений; переводится *тогда как*.

Older men probably resented him **while** others of his own generation could feel so inadequate when comparing their talent to his.

Старики, возможно, обижались на него, **тогда как** представители его собственного поколения могли чувствовать свою неполноценность, сравнивая свой талант с его.

Как подчинительный союз *while* используется для присоединения придаточных предложений времени; переводится *в то время как, пока*.

**While** I was fumbling for some money, my friend paid the fares.

**В то время как (пока)** я нащупывал деньги, мой друг заплатил по счету.

Как уступительный союз *while* переводится *хотя*.

**While** I disapprove of what you say, I would defend to the death your right to say **it**.

**Хотя** я не одобряю то, что ты говоришь, я намерен до самой смерти защищать твое право на это.

Союз *while* часто употребляется в эллиптическом обороте с причастием I. Этот эллиптический оборот обычно переводится целым предложением – сочинительными или подчинительным.

**While trying** to open the can, I cut my hand.

**Пытаясь** открыть банку, я порезала руку.

*Переведите предложения на русский язык:*

1. Members were solemn as they took their seats: The Prime Minister gave a measured account of interests at stake and events of the past. **Neither** pace **nor** tone altered as he passed on to "what our next step should be."

2. The Premier's speech followed a weekend of warnings by the Chinese leaders in Peking **as** celebrations for New China's National Day got underway.

3. The resolution considered it unnecessary – and so that part disappeared from the resolution **as** adopted.

4. As stated in the program of the Communist Party of Great Britain, the aims of the working class are expressed both clearly and pointedly.

5. **As** released to the press, the communique was **as** softly toned as just only possible, **but** rumour has it that, there had been another communique which was withheld at the very last moment.

6. He is **but** a child, do not be angry with him.

7. **But for** your help I shouldn't be able to understand this.

8. The chiefs said that they were "very troubled by proposals that would discourage foreign investment by requiring lengthy review periods, or proposals that, **while** intended to elevate national security scrutiny of foreign investments, might well prompt decision-makers to disapprove meritorious investments that do not pose genuine national security threats."

9. Oxford University academics found that some clinical trial findings were simply not reported, while others changed tack **once** results had begun to emerge, failing to stick to the original aims set out in the research protocol.

10. "Fire begets fire," he says. "**Once** an area burns, up to 40% of the trees can die. This increases the likelihood of a second fire. Eventually, the forest ceases to become a forest **as** the successive fires allow the invasion of the understorey by grasses, which make the area even more flammable.

11. The Wall Street titans believe such changes to the law will turn foreign investors away from the US because of fears that American companies will have an unfair advantage **as** they will face less regulation in takeovers and mergers.

12. **While** Japan is sympathetic to the plight of European shipbuilders, it is unlikely that the Japanese shipbuilding industry will be able to make further concessions on the matter.

13. **While** UK earnings on investments abroad rose by a healthy £3.4 billion to £50 billion in the quarter, this was outstripped by a £6 billion jump in foreigners' earnings on their investments in Britain, to £46.3 billion.

14. **Once** we had the principles and got the material... we made sure to get the material wherever we needed it and whenever we needed it.

15. "We have boldly declared our invincibility with 110-story skyscrapers, endless talk of the wonders of globalism and arrogant renunciations of agreements that seemed to bind everyone **but** America to international codes of justice and environmental protection."

16. As bodies were lifted out of the rubble, the death toll climbed to some 50,000.

17. "**While** this has led to unprecedented improvements in Chinese incomes and living standards, it also poses challenges for other countries."

18. **Since** the very point of terrorism is to distort our domestic life, the further we go in anti-terror measures, the more we do our enemies' work.

19. He is also charged with assaulting Ms Lees who, magistrates in Darwin were told, was bound with home-made handcuffs and thrown into the back of a lorry **before** escaping into the Australian Outback.

## Раздел II. СИНТАКСИЧЕСКИЕ ТРАНСФОРМАЦИИ

### 2.1. Эмфатические конструкции

Эмоциональная окрашенность и экспрессивность как устной, так и письменной речи в значительной степени создается различными эмфатическими средствами, грамматическими и лексическими, а иногда теми и другими вместе.

Эмфаза есть выделение какого-либо элемента высказывания, достигаемое изменением интонации, порядка слов и применением различных риторических фигур. Эмфатические модели, конструкции, обороты, сочетания лексико-грамматических элементов должны восприниматься не как отступление от нормы или ее нарушение, а как закономерное явление экспрессивной и эмоционально окрашенной речи.

Большое разнообразие средств выражения эмфазы в английском языке и их своеобразный характер позволяют говорить о национальной специфике эмфатических моделей. Эмфатические модели в английском и русском языках иногда совпадают, но чаще наблюдается несовпадение. Совпадение бывает частичным или даже кажущимся. Национальный характер и разнообразие средств выражения эмфазы в английском языке иногда представляют трудности для понимания текста и тем более для перевода.

#### 2.1.1. Инверсия

Одним из наиболее распространенных средств создания эмфазы в английском языке является инверсия. С помощью инверсии выделяется один или несколько элементов высказывания.

**Courage** George II certainly had.      **В храбрости** Георгу II нельзя было отказать.

**Money** he had none.      **Денег** у него не было ни гроша.

Эмфатическая инверсия очень часто употребляется в уступительных придаточных предложениях.

The form of the symphonic movements, **complex though they became**, still bears the mark of the folksong form.      Хотя музыкальная форма различных частей симфонии **очень** усложнилась, на ней все еще лежит отпечаток формы народной песни.

В данном случае в переводе инверсия передана и лексическим путем (введением слова-усилителя *очень*), и синтаксически (перестройкой предложения).

Лексическим путем передается эмфаза, заключенная в конструкциях с предваряющим *it*, часто с помощью усилителя *именно*, иногда с помощью *отнюдь*, *несомненно* и др.

Often, most always, **it** is the least well-written sentences, the ones that the author wrote most hastily, that cause the translator the most trouble.

Часто, почти всегда, **именно** наименее хорошо написанные предложения, те, которые автор написал наиболее поспешно, создают больше всего проблем

*Переведите предложения на русский язык:*

1. To many, the *fiesta* epitomizes the Spanish way of life. So **impressed was Ernest Hemingway** by Spaniards' appetite for a party that he titled a book after their ability to down tools and take to the streets.

2. **Off we splashed** through the cane fields, the tyres slipping and spinning on a dirtroad made soggy by days of heavy rain.

3. **Crucial has been "the tone** at the top".

4. Particularly **controversial** in the debate **was the issue** of the period of protection of copyright.

5. **Hero though Reagan was** to so many Americans, his legacy is marred. Economically, the Reagan years were epitomized by a freewheeling entrepreneurialism and free spending. But the affluent got more affluent and the poor got poorer."

6. **Then came September 11**, followed by the discovery of anthrax spores in letters to U.S. politicians and media figures.

### 2.1.2. Отрицательные эмфатические конструкции

Эта же эмфатическая конструкция нередко употребляется с глаголом в отрицательной форме в сочетании с союзом *until*. Несмотря на отрицательную форму, высказывание имеет утвердительный смысл, и такое употребление отрицательной формы делает утверждение более эмфатичным.

**It was not until** he had read for several days that he came upon a story that quickened his pulse.

И только после того, как он несколько дней просидел за книгами, он натолкнулся на повесть, от которой сердце его забило сильнее.

Конструкция с моделью *not until* переводится на русский язык утвердительным предложением, а заключенная в ней эмфаза передается лексическим путем, обычно усилительным наречием *только*. Следует отметить, что сочетание *not until* выступает не только в конструкции с предваряющим *it*, но всегда выражает эмфазу.

Some roads in Scotland were ice-bound, cars were abandoned in many places, and many people returning from Saturday's international rugby game **did not** reach home **until** the early hours.

На некоторых дорогах Шотландии была гололеда, повсюду стояли оставленные владельцами машины, и многие люди, возвращавшиеся в субботу с международного состязания по Регби, **попали домой только под утро.**

С помощью утвердительных предложений переводятся и предложения, содержащие конструкции с двойным отрицанием, такие как not unnaturally, not unlike, not unfair и др.

**It is not unlike me** that in heading toward the west I should travel east.

Это так похоже на меня, что, собираясь ехать на запад, я поехал на восток.

В нижеследующем примере сочетаются три экспрессивных средства: эмфатическое отрицание, индивидуальное словообразование (respector) и прием парцелляции. Под парцелляцией понимается отделенное точкой высказывание.

Stress is **no** respecter of age. Or sex. Or wealth.

Стресс не считается с возрастом. Ни с полом. Ни с богатством.

В переводе эмфаза передается парцелляцией и повтором отрицания. Индивидуальное словообразование сглажено в силу норм русского языка. Кстати, в английском языке индивидуально образованное существительное не является нарушением нормы, сравните, например, respecter.

*Переведите предложения на русский язык:*

1. It is not the first time that a sizeable chunk of IT expenditure has gone awry. So it is good to see that our health authorities have not been caught napping. **Nor is Accenture** alone in being left financially responsible by the NHS, if the iSoft share-price reaction is a guide.

2. Thomas Hardy thought it was better to know a little bit of the world remarkably well than to know a great part of the world remarkably little. **Nowhere is this truer** than of the part of Dorset that he made his own and called Wessex – a patchwork of woods, heaths, market towns and coastal sweeps that deserve the close attention from today's tourists that the author gave to it.

3. **Not until the Arctic summer marked the end of the polar night was the long wait finally over.**

4. “I should say, the MIG-29 is **no substitute** for the Eurofighter, no way”.

5. But too much of the score seemed to chug along in a monochrome, mildly dissonant fashion. **Not unpleasant**, but not particularly arresting either. And although Hellowell declaimed his own narration clearly, he’s **no** Paul Scofield.

6. It is good to see that our health authorities have not been caught napping. **Nor is Accenture** alone in being left financially responsible by the NHS, if the iSoft share- price reaction is a guide.

7. The researcher making these claims is **no** professional **historian**. Robert Dick- Read never finished university and has no academic qualifications.

8. The pictures also show how the artist’s courtly restraint in color **did not detract** from the character within.

9. Having no human society is **no inconvenience** to me. Sometimes for six months on end we have seen nobody.

10. The obstacles may look simple but **don’t think** they are **unchallenging**.

11. National governments like the European Commission weak, and even the voters do not want hyperactivity in Brussels. **Nor should they**: if anything, it should have less money to spend in future, not more.

### 2.1.3. Оговорки

Так называемые предложения с оговорками (modified statements) часто тоженоксят эмфатический характер.

Is the ship as bad as the newspapers say? Worse, **if anything**.

Неужели судно такое ужасное, как пишут в газетах? – **Намного хуже**.

В этом случае эмфаза передана в переводе лексически.

*Переведите предложения на русский язык:*

1. A flotation, which analysts estimate could value United Biscuits at more than £2 billion, is considered the most likely option, **given the success of Premier Foods and RHM, the London-listed companies** that have focused on owning iconic British food brands.

2. Developers argue that small flats, **if well-designed**, need not feel small. They also say that they will be the saviour of young workers.

3. However venal politicians may be, there is a general, **if grudging**, acceptance that they are always with us.

4. A lot of information is from head office - **telling me what I can and cannot do** and some of it is really important like the weekly accounting report that shows our turnover and profit; it tells me how I’m doing and keeps us all on our toes.

5. Huge profit increases in later years have already been fully priced in. **If anything**, the share rally has got a little bit ahead of reality. Rivals are not going to sit still and watch as Sainsbury's eat their lunch.

6. It may be long time, **if ever**, before South Korea is strong enough to face unification unaided.

7. These methods are limited by either their inability to remove all contaminants or, in the case of evaporation, the high operating costs involved and the large quantities of secondary solid waste produced, **making satisfactory processing difficult**.

8. Mecom is bidding for Limburgs Dagblad, a deal that, **if successful**, would be considered a reverse takeover under AIM (Association of Information Management) rules.

9. Some of the words quoted need special mentions; one of them is "leader", **a word which suggests an army officer going into battle first and getting the troops to rally round and attack**.

11. Beauty, **if it's to be deemed to have any worth**, has to be rare. And it's not just perfect beauty that works. Unusual beauty - **to the point of ugliness, even** - has become the ticket to success.

12. One remembers loose, black hair and a ruddy complexion, against what appears - **at first** - nearly a monochrome canvas. One absorbs the rest in the picture effortlessly and with pleasure.

13. The firm declined to say what, **if any**, action it had taken.

14. Vitamin A is principally - **and usable, full complex vitamin D entirely** - found in animal products.

15. **Given** complaints about service at Ryanair plus recent staffing problems suffered by Easy Jet, leading to flight cancellations, passengers could think again.

## РАЗДЕЛ III. ЛЕКСИЧЕСКИЕ ТРАНСФОРМАЦИИ

### 3.1. Трансформации при переводе неологизмов

Неологизмы – это новые слова, еще не зарегистрированные в словарях, или не зафиксированные словарями новые значения слов, уже существующих в языке.

Для уяснения значения неологизма рекомендуется: 1) выяснить значение слова из контекста, 2) обратиться к последнему изданию одного из англо-русских или англо-английских словарей и попытаться отыскать данное слово в разделе "Новые слова", 3) постараться выяснить значение нового слова, исходя из его структуры, т.е. определить, образовано ли оно по существующей словообразовательной модели, моделируемо ли оно.

#### Перевод неологизмов

При переводе неологизмов используются следующие переводческие приемы:

- 1) транскрипция,
- 2) транслитерация,
- 3) калькирование,
- 4) описательный перевод.

1) Примеры транскрибирования неологизмов:

beatniks *битники*

Beatles *Битлз*

briefing *брифинг*

Reaganomic *рейганомика*

2) Транслитерация в настоящее время практически не употребляется:

inauguration *инаугурация*

Benelux countries *страны Бенилюкс*

3) Примеры калькирования неологизмов (т. е. воспроизведения средствами русского языка значения и морфологической структуры нового английского слова или словосочетания):

air bridge *воздушный мост*

shadow cabinet *теневого кабинета*

nuclear umbrella *ядерный зонтик*

brain trust *мозговой трест*

Brown Berets *коричневые береты*

4) Примеры описательного перевода:

to lobby *посылать делегатов для оказания давления на членов парламента – депутатов их округа*

buck-passer *человек, любящий перекладывать ответственность на других*  
educrat *официальное лицо, работающее в системе образования*

journalese *язык средств массовой информации, изобилующий модными в данный период времени клише.*

*Переведите предложения на русский язык:*

1. Celebrities often get panned when they appear on Broadway, as Denzel Washington ("plagued by **actorly** insecurity"), Sean "Diddy" Combs and Jessica Lange recently learnt.

2. SJ Berwin has just moved into flash new offices next to Southwark Bridge – just above that car showroom that the **crusties** trashed during a riot a few years ago, as I recall.

3. She may look slender but she is a racing champion and, frankly, the racing fans love this **throttle stomper**.

4. Ronald Reagan was a staunch **cold warrior**, and enlisted as a secret FBI informant.

5. One look at the cars that make up this year's final eight – not to mention the **also-rans** - and you'd think the "Don Ridler" Award was always about gloss, flash and the never-ending pursuit of style.

6. It was a decorated, **becatered** and **bewaitered** table.

7. She displayed wonders of **horsemanship** and **horseman-woman-ship**.

8. A man doesn't come a thousand and odd miles **to be not-at-homed** at the end of it.

9. There are people who have much and those who have nothing. – Well, you see. I'm among **muchers**.

10. We are the **not-wanted**s.

11. "We are **has-beens** now Kelly," said the former policeman to his dog.

12. Summer at last. You look **summary** too.

13. She did her duty by me completely, but it is clear that there was nomotherhood, **no sonship** between us.

14. The white tiled, gleaming-tapped bathroom.

15. Ireland has a right to **nationhood**.

16. This man is an **escapist** from modern society.

17. Is the child, a **mouth-breather**?

18. Modern Italy is an **underbathroomed** and **overmonumented** country.

19. They had not so much **Herbertian** and **Martaish** in them when they came home from France.

20. The **burstless** crests of the waves were coming on and on.

### 3.2. Трансформационные способы перевода терминов и реалий

Термин – это слово со строго определенным значением, являющееся элементом подязыка науки. Он выполняет назывную функцию и лишен эмоциональной окраски. Термин не имеет национальной принадлежности, он достояние всего человечества. Реалия же всегда принадлежит народу, в языке которого она родилась. Но есть реалии, и их немало, которые, не будучи терминами, имеют международное распространение и употребляются так же широко, как и термины.

Термины отличаются от реалий и по происхождению. Они создаются искусственно для наименования тех или иных предметов (в качестве строительного материала часто используются средства латинского и греческого языков) или путем опять-таки сознательного переосмысления уже существующих слов. В то время как реалии возникают всегда путем естественного словотворчества, они народные слова, тесно связанные с бытом и мировоззрением создающего их народа.

Важной чертой реалии является, в отличие от терминов, их общеупотребительность, популярность, знакомость всем или большинству носителей исходного языка (ИЯ) и, наоборот, их Чуждость носителям принимающего их языка перевода (ПЯ).

Принято считать, что специальная терминология – область специальных наук и дело узких специалистов. Однако благодаря интенсивному развитию средств массовой информации, сближающих континенты и людей науки с остальной частью человечества, для нашего времени характерна одновременная тенденция к терминологичности и деспециализации, обусловленная широким проникновением терминов в народную жизнь. В этой связи показатели «знакомости» и «чуждости» в качестве ограничительных критериев не слишком надежны.

Если добавить к этому частый и легкий переход реалий в термины и терминов в реалии, то наиболее убедительными средствами отличия реалий от терминов следует считать местную и/или историческую окраску, характер литературы (художественная, научная), в которой употребляется данная лексическая единица, и, разумеется, узкий и широкий контекст.

## Приемы передачи реалий

1. Транскрипция – механическое перенесение реалии из ИЯ в ПЯ графическими средствами последнего с максимальным приближением к оригинальной фонетической форме, т. е. передача на уровне фонем.

*Soviet, sputnik, kolkhoz*

2. Транслитерация – передача реалии на уровне графем.

*Lincoln Линкольн*

3. Перевод (или замена, субституция) как прием передачи реалии на ПЯ применяют обычно в тех случаях, когда транскрипция по тем или иным причинам нежелательна. Существуют следующие способы перевода реалии:

1) введение неологизма (в виде кальки и полукальки):

а) калька – заимствование путем буквального перевода (обычно по частям) слова или оборота;

*Victory Day День Победы*

*May Day Первомай*

б) полукалька – новое слово или (устойчивое) словосочетание, являющееся частичным заимствованием;

*Decembrist декабрист*

2) приблизительный перевод (применяется чаще, чем любой другой прием): а) принцип родо-видовой замены (позволяет передать содержание реалии единицей с более широким, очень редко – более узким значением, подставляя родовое понятие вместо видového: прием генерализации);

*Нарзан, Боржоми* —> минеральная вода

*изба, хата, сакля, коттедж* —> дом

*церковь, пагода, мечеть, синагога* —> храм

б) функциональный аналог (удобен для передачи реалий-мер, в частности, когда они предназначены для создания у читателя каких-то качественных представлений);

*столько-то миль* —> очень далеко

*сто пудов* —> очень тяжелый

*пара фунтов* —> немного

в) описание, объяснение, толкование как прием приблизительного перевода (используется в тех случаях, когда нет иного пути: понятие, не передаваемое транскрипцией, приходится просто объяснять).

*Two boys were playing flys up with a soft ball.*

Мальчики играли в мяч.

3) Контекстуальный перевод – передача содержания при помощи трансформированного соответствующим образом контекста.

Сколько стоит путевка на курорт?

How much are accommodations at health resorts?

Перевод реалий-мер, обладающих ярким историческим и национальным колоритом, чаще всего осуществляется путем транскрипции или функционального аналога.

*миля, фут, фунт, бушель*

Перевод советизмов и русизмов, как правило, осуществляется путем обычной транскрипции или калькирования.

*kerosene, bor(t)sch, ataman, vodka, muzhik, samovar, subotnik*

Перевод реалий-денег (названий валют) осуществляется: 1) с помощью транскрипции, 2) функционального аналога.

*франк, доллар, фунт*

***Приведите соответствия реалиям:***

Ale, to carry coals to Newcastle, whisky, businessman, Tory Labour, Sir, skin-heads, franc, lend-lease, blues, road company, flop, traffic court, kitchen-cabinet, MP – Member of Parliament, the White House, to make hay while the sun shines, the Gordian knot, an apple of discord / a bone of contention, the Kremlin, Red Army men, official family, squatter, stars and stripes, canyon.

*Переведите предложения на русский язык:*

1. His liver bled enormously when he was brought here. He has very severe and very **life threatening injuries**.

2. For Taylor, the world of magic represented **an imprisoning of the self**. The world of magic seems to entail a thralldom, an **imprisoning of the self** in uncanny external forces, even a ravishing or loss of self.

4. In India they had helped to establish a tree nursery and supplied trees free to any farmer who wanted to plant them, and free **permaculture** courses for local people.

5. A leveraged buyout of the Crowne Plaza and Holiday Inn-owner could command a hefty 55 per cent premium to yesterday's open.

6. Such disengagement, according to philosopher Charles Taylor, carried a profound **disenchantment** in spiritual outlook.

7. It felt strange to return to my house of bricks and mortar and feel cut off from **the elements** after living close to them for a week.

8. Some mailing firms may provide a **pick up** service.

### 3.3. Интернациональные слова. «Ложные друзья переводчика»

При переводе важно отличать подлинно интернациональные слова, т. е. сходные по написанию или звучанию в разных языках и совпадающие по значению, от слов, которые при своем внешнем сходстве имеют различное значение. Слова второй категории особенно опасны для переводчика, т. к. нередко вводят его в заблуждение и являются причиной грубых смысловых ошибок. Их называют псевдоинтернациональными словами, или «ложными друзьями» переводчика.

Подлинно интернациональные слова зачастую выражают общественно-политические и научные понятия, например: *conference, constitution, press, geology, climate, planet*.

Наряду со словами такого порядка интернациональными словами являются и слова обиходные, нередко латинского корня: *dramatic, detail, scandal, occipant* и др.

Обладая одинаковым предметно-логическим значением и имея почти одинаковую форму, эти слова в различных языках часто имеют и другие значения, не совпадающие полностью друг с другом. В разных языках они также приобрели характерные черты, связанные с особенностями структуры и истории каждого языка. Благодаря тому что в английском языке много слов романского происхождения, интернациональные слова легко в нем ассимилировались и приобрели широкое хождение.

Интернациональные слова, как правило, имеют в русском языке более узкое специальное значение. Так, например, слово *революция* имеет в русском языке только одно значение – «революция, переворот», тогда как в английском языке основное значение слова *revolution* – «круговое вращение, полный оборот колеса, машины». В редких случаях заимствованное слово имеет в русском языке более широкое значение, как, например, слово *аппарат*.

Интернациональные слова представляют известную трудность при переводе, т. к. естественно в первую очередь напрашивается соответствующее интернациональное слово в русском языке, и переводчик часто упускает из виду другие значения этого слова или иную сферу его употребления. Так, в современных переводах часто неправильно используются слова *практически, формальный, драматический*.

Под «ложными друзьями» переводчика подразумеваются слова чаще всего латинского и греческого происхождения, имеющие сходное написание, но различное значение в английском и русском языках.

accurate *точный*, а не *аккуратный* actual *фактический*, а не *актуальный* object *цель, предмет*, а не *объект* prospect *вид, перспектива*, а не *проспект* subject *вопрос, предмет*, а не *субъект* technique *метод, методика*, а не *техника*

**It lasted the whole decade.**

Это продолжалось **целое десятилетие.**

**She has a very fine complexion.**

**У нее прекрасный цвет лица.**

**Well, he must be a lunatic.**

Да он, должно быть, **сумасшедший.**

подавляющее большинство этих слов лишь в одном значении являются подлинно интернациональными. Например: base *база* имеет еще около десяти других значений; expert *эксперт* и *знаток, сведущий человек, специалист*, control *контроль* и *руководство, управление, надзор, проверка* и др.

«Ложные друзья» переводчика подразделяются на три группы:

Слова, которые имеют внешнее сходство (звучание и написание) со словами русского языка, но значение которых не всегда совпадает.

dramatic *драматический, драматичный, неожиданный, яркий, впечатляющий, сенсационный*

decade *десятилетие*

popular *народный, популярный*

formal *формальный, официальный*

nation *нация, народ, страна*

sabotage *вредительство, диверсионный акт, саботаж*

control *n* *руководство, власть, контроль; v* *руководить, управлять, распоряжаться, владеть, контролировать*

crisis *кризис, конфликт, напряженная ситуация*

partisan *n* *сторонник, активист, партизан; adj* *пристрастный*

В зависимости от контекста эти слова могут иметь другие оттенки значения и переводиться иначе.

Слова, которые во множественном числе приобретают новое значение.

difference *разница, различие* differences *1) различия, 2) разногласия*

development *развитие* developments *события*

Слово development часто употребляется и в значении *участок, подлежащий освоению; освоение; микрорайон* и т. д.

Слова, употребление которых в единственном и множественном числе не совпадает в русском и английском языках.

industry *промышленность*

industries *промышленность, отрасли промышленности*

policy *политика, политический курс*

policies *политика, политические акции*

weapon *оружие*  
weapons *оружие*

Большим подспорьем для переводчика может служить «Англо-русский и русско-английский словарь «ложных друзей» переводчика» В.В. Акуленко и др. В словаре приведен подробный анализ значений свыше 1000 английских слов, в подавляющем большинстве абстрактного значения, имеющих русские аналоги.

*Переведите предложения на русский язык:*

1. It is interesting to note that the law did not become **effective** until late in 1910, which provided casino **operators** with almost 20 months to successfully move their operations underground».

2. In 1911, the 1909 prohibition was relaxed to permit "**social**" games such as poker, provided the dealing of cards changed hands and the house (casino operator) did not take a percentage from the players' wagers.

3. During the next legislative **session** in 1915, laws were re-enacted that permitted social games and nickel slot **machines**».

4. The response to good intelligence was immediate and **aggressive**. Analysts have speculated that United Biscuits is pursuing an **aggressive** marketing push in an attempt to bolster its financial figures ahead of a likely flotation or sale.

5. Such a move is sure to meet opposition from Spanish unions, but the Socialist Government may be inclined to consider any move that strengthens the country's flagging **productivity**.

6. The number of public companies opting to go private shrank **dramatically** in the first three months of the year, according to a survey by the Centre of Management Buyout Research (CMBOR).

7. The tax revenues were to be split, with 75% going to the county where the casino was located and the remaining **portion** going to the state.

8. A **massive** 16 per cent was wiped from the market value of iSoft, a UK-based provider of health service IT, as investors ran scared at the thought that it could suffer as Accenture suffered.

9. With careful control and a bit of luck, there is no reason why Sainsbury's shouldn't be able to keep the costs of growth lagging the growth in sales over the next few years, thus **dramatically** boosting profits from their current meagre levels.

10. Yesterday's trading statement, showing a 5.3 per cent increase in underlying sales, is particularly encouraging because it is the fifth quarter of **progress**.

11. In order to operate a game, the game boss (inmate) had to satisfy a prison **administrative** board that he could afford to bankroll the game.

12. In 1777, musical and **dramatic** compositions were held to be books within the meaning of the Statute of Anne and in 1883 the **Dramatic** Copyright Act provided for a public performance right in **dramatic** works.

13. The idea of miniature living came to the fore in the 1970s in the form of Kisho Kurokawa's Nakagin Capsule Tower, constructed in Tokyo in the early years of that **decade**.

14. But, why had the combustion chamber cracked so **dramatically**?

15. "I confess I **enthusiastically** supported breaking the earnings link," he said.

16. But he emphasised that the letter was not a **formal** antitrust inquiry into Vista.

17. These two events provided the impetus for the introduction and subsequent **passage** of Assembly Bill 98, which is better known as the Wide Open Gambling Bill».

18. Today, the **general** rule applied is for a stockholder to own 10% of the voting stock in a **public corporation** before being required to obtain a gaming license.

19. The **original** version of the bill failed to provide for any means of regulation.

20. After Hughes' entry into gaming, a Corporate Gaming Act was passed in 1969 by Nevada's gaming **regulators**.

21. In our relations, he was definitely the pursuer. He was very **aggressive**.

22. Reagan was the man who restored **popular** faith in the presidency and the American government...

### 3.4. Лексико-стилистические средства

#### 3.4.1. Метафора. Развернутая метафора

В разных языковых стилях используются образные средства, но эта образность не всегда носит оригинальный характер, иногда она является трафаретной, даже привычной, что в значительной степени обуславливает способы ее передачи в переводе. В ряде случаев вполне оправдано снятие такой образности, так как сохранение ее в переводе придало бы ей большую выразительность и яркость, которыми она не обладает в английском тексте. В других случаях ее можно заменить образом, равноценным по употребительности, т. е. столь же привычным и трафаретным. Следует отметить, что, например, стиль русской газеты строже, и поэтому сохранение такой образности, возможно, будет восприниматься как нечто излишнее и неуместное.

Japanese stock prices **plummeted** again today amid reports that the United States is demanding an upward revaluation of the yen by between 17 and 25 per cent.

Сегодня снова наблюдалось **резкое падение** курса ценных бумаг на японской бирже в связи с сообщением что США требует ревальвации иены на 17–25 %.

Глагол **to plummet** образован путем конверсии от существительного **plummet** *грузило*. Естественно, что в данном случае налицо трафаретная метафора и вполне закономерен отказ от нее в переводе этого краткого газетного сообщения. Отказ от образности в переводе компенсируется прилагательным *резкое*.

В газетных статьях, в рекламе часто встречаются развернутые метафоры, т. е. многочисленные метафоры, состоящие из нескольких логически связанных между собой образных элементов. Сохранение всех этих элементов в переводе не всегда возможно, поскольку это может создать впечатление чего-то искусственного, некоторого излишнего нагромождения образов. Но в следующем примере общая метафора рекламного текста строится на созвучии названия места и признака: **Sparkler** — название гостиничного комплекса, оно раскрывается в "сверкающей" метафоре на основе однокоренных слов *sparkle, sparkling сверкать, блестеть, искриться*. В оригинале название гостиницы, происходит от разговорного значения *sparkler алмаз, бриллиант*.

**Sparkler.** Honeymoons, family outings, golf and tennis holidays... **sparklingly spectacular!** Discover the Sparkler, favourite of discerning vacationers of America and Europe. All's 5-star **sparkling**, from beach, accommodations, dining, sports to service, service, service. **Sparkler!** Light up your life!

**Спарклер — бриллиант чистойшей воды.** Здесь все сияет и все высшей пробы: все условия для медового месяца, семейного отдыха, спорта... Откройте для себя **бриллиант Спарклера** — его уже открыли самые проникательные туристы Америки и Европы. Пятизвездочный блеск повсюду: от пляжей, апартаментов, ресторанов, спортивных площадок до сервиса, сервиса, сервиса... **Спарклер — сверкающий бриллиант.** Придайте блеск Вашей жизни!

В основе метафоры лежит употребление слова или выражения в переносном значении на основе сходства и аналогии.

В русском языке:

*говор волн*

*шелковые ресницы*

*ситец неба голубой*

*черный день (черное дело, черная зависть, неблагодарность) красная девица*

*добрый молодец*

В английском языке:

*black sheep (day, deed, frost)*

*white lie (crow, man)*

*cold war (reason)*

*iron will (fist)*

*gilded youth*

*to gild the pill*

*to sugar the pill*

*the newspaper runs*

*a price explosion*

*international climate*

*crazy policies*

*a beast of a car*

*a dream of a dress*

*Переведите предложения на русский язык:*

1. In the unforgiving world of statistics, **how one eats one's peas** is quite irrelevant.

2. Analysts viewed the chatter as optimistic and pinned yesterday's gains on activity in the options market, where there was a persistent buyer of May £21.00 calls: a bet that **raised eyebrows**, given that it has only a 15 per cent chance of making money on the basis on which RBS (Royal Bank of Scotland) options are currently priced.

3. Average selling prices are 2.2 per cent lower than a year earlier as the group **took the axe** to a thousand prices in the first 12 weeks of this year.

4. A number of the errors and deviations from the truth later to be found in the doctrine find only **a seed** in the original teachings of the author.

5. The girls were **the icing on the rich fashion cake**, and when, after September 11, the cake went stale, so did they.

6. CSFB has about 25 people trading electricity and natural gas. JPMorgan **has also plumped for organic growth**. After hiring a number of key hires the bank quickly made some energy wins in the third quarter.

7. There is evidence that the property market's upturn could be **running out of steam**.

8. Ronald Wilson Reagan won that election, ousting a sitting president and leading **a conservative tidal** wave... He led Americans to believe in themselves and the future again. He led them to accept that they did not need the welfare state to solve all of their economic and social problems. And he looked the Soviets in the eye and saw **they were not 10ft tall**.

9. The almost 180-strong **army** of the London Philharmonic Choir coped marvellously with awkward **leaps** and sustained **stratospheric** passages. They responded enthusiastically to the illustrative cameos that are the naive side of this maturely reflective work, and rushed **in perfect order** up **challenging ladders** of semiquavers.

10. Britain absorbed 157,000 Poles after 1945 without upsetting the collective **applecart**. It seems incredible to contemplate that, because of EU enlargement, one might walk to the High Street in anticipation of watching the latest Julia Roberts movie only to discover that the local Odeon just shows Polish-language films made at a place known as Zolliwood.

11. The overall balance of the judgments seems to have been that the Mirror **used asledgehammer to crack a nut**. The judges didn't have a problem with the paper revealing that Naomi Campbell used drugs, nor that she was undergoing treatment. But they clearly didn't like the amount of intrusive detail about the treatment, which they felt could have jeopardised her recovery.

12. The conversation moved slowly, touching upon all the usual bases of idlechitchat, until suddenly they found **the hook** that broke through **the proverbial ice**.

13. Our parents are **the architects** of the culture of divorce we live in today, and while they endured their divorces **armed** with the resources of age their breakups defined our childhood, leaving imprints that may last a lifetime.

14. The Fed Chairman has indicated that he will cut interest rates to avert recession. That is the best way to **steer the US economy through the shoals ahead**. The President is **the captain on the bridge** but, until **the dangers** are past, he should **leave the pilot to do the steering**.

15. With a collection this fine, the MET deserves **to pat itself on the back**.

16. At slightly more than nine million barrels a day, Russia's current oil production **is within shouting distance** of Saudi Arabia's 9.5 million barrels a day.

### 3.4.2. Метонимия

В основе метонимии лежит употребление слова или выражения в переносном значении на основе ассоциации по смежности: процесс > результат (идет прием студентов – новый прием студентов), материал > изделие (ложка из серебра – столовое серебро), объект знания > отрасль знания (заниматься физикой – ядерная физика) и т. д.

В английском языке:

the kettle is boiling *кипит чайник*

an ear for music *музыкальный слух*

to lose one's head *потерять голову*  
the authorities were greeted *приветствие властям*

Метонимия, как и метафора, тоже нередко употребляется в разного рода текстах. Метонимия носит традиционный характер и является скорее языковым, а не стилистическим средством, но все же она придает известную живость изложению или описанию. Однако использование метонимии не всегда совпадает в английском и русском языках, и это вызывает необходимость в опущении и заменах при переводе, т. к. ее сохранение иногда может придать большую красочность переводу по сравнению с оригиналом. В этом случае метонимия в переводе опускается.

U.S. public opinion has always	Общественное мнение США
been against using American <b>flesh and</b>	всегда выступает против использо-
<b>blood</b> soldiers in any wars.	вания американских <b>солдат</b>
	в каких-либо войнах.

В следующем примере недостаточно перевести сами имена, необходимо восстановить основу метонимического переноса — **tune** или **music**.

<b>The</b> guards now change at Buck-	Смена караула у Букингемского
ingham palace to a <b>Lennon and</b>	дворца происходит теперь под <b>музы-</b>
<b>McCartney</b>	<b>ку Леннона и Маккартни.</b>

К образным средствам языка относятся также сравнения, т. е. образные выражения, в которых одно явление уподобляется другому.

*бесчестный* (ср. *пробу ставить негде*) crooked as a cork-screw *храбрый как лев* brave as a lion (здесь образ совпадает в обоих языках) *с быстротой молнии, в мгновение ока* swift as an arrow (as lightning, as thought, as the wind) *преданный как собака* faithful as a dog *медленный как черепаха* slow as a tortoise

*Переведите предложения на русский язык:*

1. «I never engaged in any of the **Parent Trap fantasies** that my parents would reunite...» (*Parent Trap, 1961 movie*). The New York Times confirmed it had received a «suspicious package addressed to one of our employees». **Two floors** were temporarily evacuated and police were investigating, the newspaper said.

2. Institutions public and private, here and overseas, have rued umpteen days when they agreed to let the **anoraks** in for a tech-spec upgrade. NHS procurement authorities would have been naive if they signed a contract that left them marooned with a bucketload of cost when the music stopped. Or in this case, when the system crashed.

3. It isn't hard to foresee a day like that painted in the film "Gattaca," where only the wealthy can afford to genetically engineer their children with such "killer applications" as intelligence, beauty, long life or health. "If you are going to disadvantage even further those who are already disadvantaged," says bioethicist Ruth Macklin, of Albert Einstein College of Medicine, "then that does raise serious concerns." But perhaps not enough to keep designer babies solely in **Hollywood's** imagination.

4. The **media** went wild. A line of furry **microphones** advanced like lancers. She smiled and moved hurriedly forward.6. «The day **Hitler** walked into Norway I walked into Leger's studio and bought a wonderful 1919 painting from him for \$ 1,000,» wrote Peggy Guggenheim in *Confessions of an Art Addict*.

5. An ultimate super car has to be so technologically advanced against the others that it makes the **competition** look like it's come from the Stone Age.

6. Cindy, the elephant will never forget her brief charge to freedom, and her trainer will never forget being charged by **eleven thousand pounds of bad attitude**.

7. The robot is **four wheels of high voltage excitement**.

8. In previous downturns, blue-collar manufacturing workers bore the brunt of job losses. This time **white-collar jobs** in services, from banking to advertising, have also been axed – the very sectors that provided virtually all the new jobs of the past two decades.

### 3.4.3. Фразеологические единицы

В «шкале непереводимости» или «труднопереводимое» фразеологические единицы (ФЕ) занимают едва ли не первое место. Их перевод решается по-разному в зависимости от их характера и особенностей. Определение, данное проф. А.В. Куниным, характеризует ФЕ следующим образом: «Фразеологические единицы или идиомы – это раздельно оформленные единицы языка с полностью или частично переосмысленными значениями» (см.: Англо-русский фразеологический словарь, с. 7).

К ФЕ относятся как идиоматика, так и ФЕ пословичного типа (крылатые выражения, афоризмы, сентенции), как образные (метафорические) единицы, так и необразные (безобразные) сочетания и даже случаи устойчивой сочетаемости, как «нормативные», «обкатанные» временем, так и отшлифованные мастерами обороты.

Возможности достижения полноценного словарного перевода ФЕ зависят в основном от соотношения между единицами ИЯ и ПЯ. При переводе ФЕ нужно передать смысл и отразить образность, найдя аналогичное выражение в ПЯ и не упустив при этом из виду стилистическую функцию ФЕ. При отсут-

ствии в ПЯ идентичного образа переводчик вынужден прибегать к поиску приблизительногосоответствия. Существуют различные пути перевода ФЕ:

1) эквивалентом;

to blush to the roots of one's hair *покраснеть до корней волос* to trim one's sail to the winds *держат нос по ветру*

2) вариантом (аналогом);

to be born with a silver spoon in one's mouth *родиться в сорочке*

3) при отсутствии эквивалентов и аналогов – иными нефразеологическими средствами.

to set (or) put on fire *зажечь* —> *передать огню*

to set fire to something *поджечь* —> *пустить красного петуха*

Фразеологические эквиваленты и аналоги чаще всего встречаются:

1) в интернациональной фразеологии; к ней принадлежат ФЕ, которые вошли в язык многих народов из исторических, главным образом античных (Библии), мифологических и литературных источников, заимствовались из языка в язык или же возникали у разных народов независимо друг от друга вследствие общности человеческого мышления, близости моментов социальной жизни, трудовой деятельности, производства, развития науки и искусств;

Achilles' heel *ахиллесова пята*

Pyrrhic victory *пиррова победа*

the die is cast *жребий брошен*

the apple of discord *яблоко раздора*

the salt of the earth *соль земли*

2) в национальной фразеологии (эквиваленты и аналоги присутствуют при совпадении образа).

to play with fire *играть с огнем*

out of the frying pan into the fire *из огня да в полымя*

to carry coals to Newcastle *ездить в Тулу со своим самоваром*

Нефразеологический перевод (несовпадение образа) передает ФЕ при помощи лексических, а не фразеологических средств. Различают:

1) строго лексический перевод, применимый, как правило, в тех случаях, когда ИЯ понятие обозначено в виде ФЕ, а в ПЯ – словом;

at first *вначале*

red tape *бюрократия*

2) калькирование или дословный перевод, используемый, когда ФЕ достаточно мотивирована значениями ее компонентов;

to bite the hand that feeds you *кусать руку, которая кормит*  
after dinner sleep awhile, after supper walk a mile *пообедавши – вздремни,*  
*ужин съел – гулять иди*

not to climb for a word into one's pocket *нелезть за словом в карман* fish begins to stink at the head *рыба тухнет с головы*

3) описательный перевод, предполагающий использование объяснений, сравнений, толкований, описаний – всех средств, передающих в максимально ясной и краткой форме содержание ФЕ;

4) выборочный перевод с использованием разностильных синонимов, соответствующих по стилю ФЕ.

Сравните, как с помощью ФЕ выражается понятие «смерть, умирание».

В русском языке:

*Умереть, сыграть в ящик, окочуриться, почить, загнуться, дать дуба, испустить дух, уйти в иной мир*

В английском языке:

to kick the bucket *сыграть в ящик*

to join the great majority *отправиться к праотцам*

to pass away *уйти на покой, почить*

to join one's grandfathers *отправиться к праотцам*

to depart from this life *покинуть этот (бренный) мир*

to go to meet one's Maker *уйти на встречу с Создателем*

to breathe one's last *испустить дух*

to go the way of all flesh *отправиться в путь всего земного*

При переводе крылатых выражений, пословиц и поговорок часто приходится сталкиваться с таким явлением, когда одному выражению в ИЯ соответствует несколько выражений в ПЯ. Для перевода таких единиц переводчик вынужден прибегать к экспрессивно-стилистической адаптации, т. е. к некоторому изменению образной структуры высказывания, изменению, которое приводит к замене образа, лежащего в основе одного из компонентов высказывания.

Семь бед, один ответ. 1) in for a penny, in for a pound

2) as well be hanged for a sheep as for a lamb

*Переведите предложения на русский язык:*

1. Knight actually thinks that **the writing is on the wall**.

2. A lot of people are growing way too quickly," says one market player. "If they don't have the right risk management, it's a question of how soon will they **pull the plug?**"

3. **The other cloud on the Chancellor's horizon** comes in the form of the strike by firefighters, who are pursuing a pay claim that could see their salaries go up by as much as 40 per cent.

4. She says: "No editor actually likes making journalists redundant. We'd prefer to have as many as possible. But the board has to ensure that the paper **makes financial sense** and, in the circumstances, I think cutting 14 staff is pretty insignificant."

5. Friends of the Earth, the environmental group, said the industry had a record of «**green-washing**» to create the appearance of action to cut carbon dioxide emissions, reduce particulates in exhaust fumes and increase recycling.

6. Right now, **on the back** of high prices, high volatility, high trading volumes and new investors entering the financial market, commodities, and particularly energy trading, is hot.

7. CSFB, the investment-bank of Credit Suisse has made some 19 per cent of its bankers redundant, while JP Morgan **has wielded its axe** three times.

8. I know we'll have to do something about the design. But **we'll cross that bridgwhen we get to it.**

9. Energy trading is Wall Street's **golden child** and a **handy** diversification **play** away from equities and interest rate products.

10. "They'll let you **write your own ticket**, pretty much." "A ticket to where?"

11. To listen to him was, as the phrase goes, **as good as a play...**

12. I'll say this for Irma, she's **pretty as a picture**. I wish I had a waist like that and such eyes.

13. The palace is **a sight for sore eyes**.

14. "You have strength... it is untutored strength. **Like a bull in a china shop,**" hesuggested...

15. ...the police were naturally reluctant to admit, that they **had found a mare'snest**.

16. I was supposed to be **the milestone around the President's neck**.

17. Lieutenant: ...I hope you won't insist on my starting off on a **wild-goose chase** after the fellow now. I haven't a notion where to look for him.

18. I had two hundred jobs all told. Reckon **I'm a Jack of all trades and master of none**.

19. I am getting better **by leaps and bounds**.

20. He is good **through and through**, and I have promised to marry him.

## ТЕКСТЫ ДЛЯ ПЕРЕВОДА И АНАЛИЗА

### **Culling vampire bats failed to beat rabies – and made the problem worse**

*The timing of the cull makes all the difference.*

*Jude Coleman*

*Nature, 10 March 2023*

Latin American governments' decades-long campaign of killing vampire bats to reduce rabies outbreaks has the opposite effect, a study in Peru has found. Reactive culling, which takes place after the disease is already present, can accelerate the spread of the virus, according to a paper published today in *Science Advances*.

Vampire bats (*Desmodus rotundus*) are considered to be pests of livestock such as cattle because they feed on animal blood. Although only a small amount of blood is taken, the bite wound is vulnerable to infection. A rabies-infected bat can transmit the disease, which ultimately kills the prey, harming farmers and their families financially. The infected bats also pose a public-health risk – few humans survive late-stage rabies. To reduce the spread of the disease, authorities use a deadly poison called vampiricide to decimate vampire-bat populations.

Daniel Streicker, an infectious-disease ecologist at the University of Glasgow, UK, and his colleagues used infection rates in livestock and sequenced the genomes of rabies viruses collected from livestock before, during and after a two-year programme in three regions of Peru to model the policy's effects. When bats were poisoned before rabies was detected in an area, the researchers found that the culling could slow the spread of rabies. This might be because fewer bats means fewer opportunities for virus transmission. But reactive culling had little benefit and even increased disease spread. They also found that culling didn't reduce the numbers of dead livestock – once an outbreak had begun, the burden of disease was the same regardless of whether bats were killed. The finding counters the idea that reducing populations of vampire bats will help to limit rabies outbreaks.

“What they found is so important because it challenges this assumption that culling is the way to go,” says Elsa Cárdenas-Canales, a veterinarian researcher at the University of Wisconsin–Madison, who has previously worked with the researchers. She says that a more evidence-based approach could better limit disease spread. “It helps the rest of us [make] a case for finding alternative solutions.”

Reactive culling probably contributes to the spatial spread of rabies because it disturbs the bats in their roosts, causing infected bats to relocate. Rabies is an ephemeral disease that flares up from population to population, Streicker says, which means a bat community might already be on its way to recovery by the time an outbreak is

identified and the local bats are killed – meanwhile, the virus slips away to another area.

The study confirms earlier work that suggested that killing vampire bats does not reduce rabies spillover, although the current analysis uses more-extensive data and offers a more-comprehensive picture of the effects of culling, says Pejman Rohani, an epidemiologist at the University of Georgia in Athens, who has previously worked with the authors.

Because non-rabid vampire-bat bites can cause other infections, too, and therefore harm livestock, bat populations need to be controlled, says Streicker. But before any changes to the bat-culling policy are considered, he would like to see more research on rabies management, particularly developing disease-outbreak forecasting tools. Shifting toward preventative culling would help authorities to get ahead of outbreaks and control the virus's spatial spread, he says. Combining preventive culling with other population- and disease-control methods – such as rabies vaccines or, in future, the control of bat birth rates – could further reduce the disease burden.

### **A blue-green glow adds to platypuses' long list of bizarre features**

*By Christie Wilcox*

*Science news, November 6, 2020*

Between the electricity-sensing bill, venomous heel spurs and egg laying, the platypus was already one of the strangest mammals alive today. Now, researchers have found that this Australian oddity has another unexpected feature: it fluoresces under ultraviolet light.

Platypuses' dense, waterproof fur absorbs ultraviolet light and emits a blue-green glow, a mammalogist Paula Spaeth Anich and colleagues discovered somewhat serendipitously. A chance sighting of a fluorescent flying squirrel in the wild had led the researchers to the mammal collection at the Field Museum in Chicago. After examining the museum's preserved squirrel skins and finding that fluorescence occurred in at least three flying squirrel species, the team decided to examine pelts from marsupials too, as those were the only mammals previously known to possess fluorescent fur. And it just so happened that the drawer of monotremes – an early branch of mammals that, today, is represented only by platypuses (*Ornithorhynchus anatinus*) and echidnas – was the next one over from marsupials.

“We were curious,” says Anich. “So, we pulled the monotreme drawer, and we shined our [ultraviolet] light on the platypuses. And they were incredibly, vividly fluorescent green and blue!”

To make sure the glow wasn't something unusual about the Field Museum's pelts, the team also examined a platypus specimen at the University of Nebraska State Museum in Lincoln. Sure enough, it also glowed, the researchers report online October 15 in *Mammalia*.

Anich is confident that the glow isn't an artifact of preservation, because several of the examined squirrel species and the echidna pelts didn't fluoresce. The living animals are likely to glow like their pelts, she says, as that's been the case for all other known fluorescent mammals.

What, if any, purpose this fluorescence may have remains a mystery. Anich's hunch is that it helps camouflage the mostly nocturnal platypuses from nighttime predators that have UV vision, since, by absorbing some of the UV light, platypuses reflect less of it.

"Maybe up in northern Queensland, they get chomped by a crocodile every now and then," says Josh Griffiths, a wildlife ecologist with the environmental consulting company *Cesar* in Parkville, Australia, who has been working with platypuses for over a decade. "But essentially, they just don't have any predators." Instead, he thinks that the glow could be helping the usually solitary animals spot one another or communicate when they do meet up. Something similar is thought to occur in some nocturnal frogs.

In fact, all known cases of fluorescence in mammals occur in species that are active at night or the low light of dawn and dusk, so Anich thinks the glow has something to do with darkness. "We don't know as much about the nocturnal world," she notes, so it's possible there are lots of other fluorescent mammals awaiting discovery.

It may even be that the ancestor of all mammals glowed this way. To see this feature in "all three of the major branches" of mammals – placental mammals, marsupials and monotremes – "is really indicative that it is an ancestral trait," Anich says, and she'd like to see further research explore that possibility.

Evolutionary and ecological significance aside, Griffiths is excited to see if these findings can help biologists who study these shy, elusive animals. "Platypuses are just bloody difficult to study in the wild," he explains, so perhaps fluorescence will allow researchers to detect these creatures more reliably.

Even if not, the glowing fur certainly adds to platypuses' reputation for bizarreness. "It's another weird thing about this weird creature," he says.

## Scientists Discover New “Superfast” Muscle Fibers in Mouse Limbs

*Katherine Irving*

*The Scientist, Feb 9, 2023*

Most humans move a lot less than our ancestors did, a change in use which is likely to be reflected in the composition of muscles themselves. Understanding our muscle makeup is a key step towards improving regenerative medicine for neuromuscular diseases. But it has been difficult to quantify aspects of how muscles have changed, including fundamental details such as what fibers exist in which parts of the muscle. Now, a group of scientists has found a way to better identify these fibers. Using an integrated mass spectrometry method, the scientists discovered a group of “superfast” muscles in mice.

Muscles are made up of slow twitch fibers, which produce smaller muscle contractions and are more fatigue resistant, and two types of fast twitch fibers, which produce bigger contractions in shorter spurts. However, studies have suggested that repeated exercise can actually cause muscle fibers to switch types. Ng Shyh-Chang, a stem cell biologist at the Institute of Zoology at the Chinese Academy of Sciences who coauthored the new study, tells *The Scientist* that he wanted to examine these fibers more closely and identify which metabolic subtypes exist in which part of a muscle.

The most ideal method for researching this would be to use mass spectrometry, Ng says. He explains that the tried-and-true mass spectrometry protocol, called liquid chromatography mass spectrometry (LC-MS), involves crushing tissue into a semi-liquid mixture called *a slurry*, then running that the metabolites from that fluid through specialized chromatography columns followed by a mass spectrometer to separate and identify important proteins and metabolites. Although the LC-MS method produces strong signals, which make it easy to identify which basic fiber types are in the sample, Ng says that because the method uses crushed up rather than intact tissue, it is difficult to figure out how exactly those fibers are distributed, and identify rare fiber subtypes.

To overcome this issue, Ng and colleagues decided to examine the fiber distribution by using mass spectrometry imaging (MSI), which can capture high resolution images of intact frozen muscle sections. Because MSI can work on intact tissue, it also gives scientists a better idea of which parts of a tissue go where, and how different fibers group together.

The scientists were faced with a conundrum: they could either get the metabolite resolution of LC-MS or the spatial resolution of MSI. Or they could simply do both. To increase their chances of success, and in hopes of learning more about fiber sub-

types, Ng and his team started with mouse leg muscle tissue, as its structure is relatively simple and its big fibers would produce strong signals, making them easier to identify. Ng decided to run the fibers through LC-MS and process them through existing metabolome databases to pick out signals of different fiber groups. They then used the same fibers to cross-check the LC-MS data with MSI data, helping them link the patterns they saw in the LC-MS with the high resolution MSI images. They found that each of the subsets of muscle fibers was very distinct from the other and fell into the categories that had already been identified – save for one exception.

Running a genetic analysis on the fiber that didn't fit into an existing category, Ng was shocked to find signatures of what are known as “superfast” muscle fibers in the limb muscles of a mouse. These fibers, typically found in areas known for their ultra-high speed and endurance, such as human eyes and hummingbird wings, had never been documented in a mammalian limb bone before. The superfast fibers they found in the mouse limb were slightly different from the ones seen elsewhere in the body, Ng says. Although clinical uses are a long way off, he says that finding these fibers in limb muscles is particularly exciting for regenerative medicine, speculating that because of their fast movement speed, they could be employed to increase neurostimulation and improve neuromuscular coordination in humans.

## **Experimental Alzheimer's drug slows cognitive declines in large trial**

*By Meg Tirrell*

*CNNHealthMay3, 2023*

An experimental Alzheimer's medication slowed declines in patients' ability to think clearly and perform daily tasks by more than a third in a large clinical trial, drugmaker Eli Lilly said Wednesday.

Based on the results, in people with early symptomatic Alzheimer's disease, Lilly said it plans to file for approval from the US Food and Drug Administration by the end of June.

The medicine, donanemab, works by removing plaque buildups in the brain known as amyloid that are a hallmark of Alzheimer's disease. However, there were some side effects reported; there were three deaths in the trial among people taking the drug, two of which were attributed to adverse events such as brain swelling or microhemorrhages, known as amyloid-related imaging abnormalities or ARIA. The trial was run in more than 1,700 patients for 18 months.

“For every medicine, for every disease, there are potential risks and potential benefits,” said Lilly's chief scientific and medical officer, Dr. Daniel Skovronsky. But he noted that almost half of the participants taking the drug, 47 %, showed no de-

cline on a key measure of cognition over the course of a year, compared with 29 % of people taking a placebo.

That's "the kind of efficacy that's never been seen before in Alzheimer's disease," Skovronsky said.

Alzheimer's affects more than 6 million Americans, with an estimated 1.7 million to 2 million people over 65 in the early stages of the disease, according to Lilly. Drug development for Alzheimer's has been riddled with failures, but Lilly's drug is among a new group showing promise. The first, Eisai and Biogen's Leqembi, received accelerated FDA approval in January.

Skovronsky, who noted he's been working in the field of Alzheimer's for 25 years, said the new class of medicines is different because of "the amount of amyloid they can clear and how quickly they can clear it."

The medicine is given by infusion once a month. Donanemab clears amyloid so effectively, the company says, that a majority of patients in the trial – 52 % – were able to stop taking the medicine by one year, and 72 % were able to do so by a year and a half. Researchers will continue to monitor these patients' progress.

In the trial, researchers looked at the participants in two groups, separated by levels of a brain protein known as tau. A 35 % slowing in cognitive and functional decline was seen in the group with intermediate levels of tau, whose disease hadn't progressed as far. When this intermediate group was combined with the group with higher levels of tau, the figure was 22 %. The results have not been peer-reviewed or published in a journal.

Lilly filed for accelerated approval with the FDA for donanemab based on earlier results but was rejected in January as the agency sought more data. With these results, the company will file for full approval, which is expected to lead to broader insurance reimbursement for the medicine. Leqembi was approved on an accelerated basis in January, and Medicare is not expected to cover the drug broadly until it receives full approval as well, most likely by early July.

Leqembi is priced at \$26,500 a year. Skovronsky declined to discuss potential pricing for donanemab before the drug is approved.

## How marine bristle worms use a special protein to distinguish between sunlight and moonlight

November 13, 2023  
*ScienceDaily*

In a recent publication in *Nature Communications*, a joint research team of Johannes Gutenberg University Mainz (JGU), the University of Cologne, and the University of Oldenburg has presented their findings on the functioning of an atypical cryptochrome protein (Cry). These proteins are found in a variety of organisms, and they are often involved in light-controlled biological processes. The marine bristle worm *Platynereis dumerilii*, for example, employs a special Cry protein designated L-Cry to distinguish between sunlight and moonlight as well as between different moon phases. This is essential for the worms to synchronize their reproduction to the full moon phase via an inner monthly calendar, also called circalunar clock.

The researchers in Cologne used the cryo-electron microscopy platform of their university to visualize the three-dimensional structure of the L-Cry protein under different light conditions. The results of these structural analyses together with those of the biochemical investigations undertaken primarily at Mainz University revealed that, in the dark, L-Cry adopts a so-called dimer arrangement consisting of two subunits linked by a stable connection, while under intensive sunlight-like illumination it disassembles into its subunits or monomers.

It is not only the spatial arrangement of the two subunits in the dark that is unusual and corresponds to an arrangement not previously observed in other Cry proteins. The direction of light-induced changes is also unusual, since for other Cry proteins only the reverse process has been described, i.e., from monomer arrangements in the dark to dimer or higher oligomer arrangements in the light. The research team was also able to identify the main structural features in the protein that are important for this unusual behavior. Furthermore, knowledge of the three-dimensional structure enabled the researchers to introduce targeted mutations in the L-Cry protein to further characterize its functioning as a photoreceptor.

"Our findings could explain how L-Cry manages to distinguish between sunlight and moonlight: Intense sunlight always activates both subunits of the dimer simultaneously, which initiates its breakdown into individual subunits. The significantly weaker moonlight, however, statistically only activates one of two subunits," explained Professor Eva Wolf of the JGU Institute of Molecular Physiology, who led the study at Mainz University. The results of the study highlight the uniqueness of L-Cry among the highly diverse Cry proteins with their wide range of functions. They

are also thought, for example, to be sensor proteins in the perception of the Earth's magnetic field in birds.

### **First steps of decoding the molecular processes of the circalunar clock**

"Working with light-sensitive proteins is always a challenge," said Hong Ha Vu, a doctoral candidate in the JGU research group of Professor Eva Wolf and a major contributor to the study. "When preparing the L-Cry proteins for analysis, we need to carry out all experimental processes in the dark or under specifically defined red light conditions to prevent unintentional pre-activation of these very light-sensitive proteins. For the functional characterization of L-Cry, it is also necessary to use lighting conditions similar to underwater natural sunlight and moonlight illumination of the kind that the bristle worms encounter in their natural habitat. Only then we can compare the specific properties of L-Cry in its role as a sunlight and moonlight receptor with those of other cryptochromes."

Professor Eva Wolf added: "Our investigations have provided important new insights into how this most unusual sunlight and moonlight receptor works. Furthermore, our structural and molecular mechanistic insights into L-Cry's function have opened up future avenues of research that should help us better understand the still largely unknown molecular processes involved in synchronization of the circalunar clock with the moon phases.

### **Redefining Microbiology: Discovery of a 3-in-1 Microorganism Upends Textbooks**

*SciTech, NOVEMBER 6, 2023*

*Technical University of Braunschweig*

**Study on environmentally relevant microorganisms shows greater diversity than previously assumed.** A team of researchers has shown that there is an incredibly high biodiversity of environmentally relevant microorganisms in nature. This diversity is at least 4.5 times greater than previously known. The researchers recently published their findings in the prestigious journals *Nature Communications* and *FEMS Microbiology Reviews*.

The hidden world of microorganisms is often overlooked, even though many climate-relevant processes are influenced by microorganisms, often associated with an incredible diversity of species within the groups of bacteria and archaea ("primitive bacteria"). For example, sulfate-reducing microorganisms convert a third of the organic carbon in marine sediments into carbon dioxide. This produces toxic hydro-

gen sulfide. On the positive side, sulfur-oxidizing microorganisms quickly use this as an energy source and render it harmless.

“These processes also play an important role in lakes, bogs, and even in the human gut to keep nature and health in balance,” says Prof. Michael Pester, Head of the Department of Microorganisms at the Leibniz Institute DSMZ and Professor at the Institute of Microbiology at Technische Universität Braunschweig. A study examined the metabolism of one of these novel microorganisms in more detail, revealing a multifunctionality that was previously unattainable.

**The Sulfur Cycle’s Critical Balance.** The sulfur cycle is one of the most important and oldest biogeochemical cycles on our planet. At the same time, it is closely linked to the carbon and nitrogen cycles, underlining its importance. It is mainly driven by sulfate-reducing and sulphur-oxidising microorganisms. On a global scale, sulfate reducers convert about a third of the organic carbon that reaches the seafloor each year. In return, sulfur oxidizers consume about a quarter of the oxygen in marine sediments.

When these ecosystems become unbalanced, the activities of these microorganisms can rapidly lead to oxygen depletion and the accumulation of toxic hydrogen sulfide. This leads to the formation of ‘dead zones’ where animals and plants can no longer survive. This not only causes economic damage, for example to fisheries, but also social damage through the destruction of important local recreational areas. It is therefore important to understand which microorganisms keep the sulfur cycle in balance and how they do this.

The published results show that the species diversity of sulfate-reducing microorganisms includes at least 27 phyla (strains). Previously, only six phyla were known. By comparison, 40 phyla are currently known in the animal kingdom, with vertebrates belonging to only one phylum, the Chordata.

**Newly Discovered Multifunctional Bacterial Species.** The researchers were able to assign one of these novel “sulfate reducers” to the little-researched phylum of acidobacteriota and to study it in a bioreactor.

Using cutting-edge methods from environmental microbiology, they were able to show that these bacteria can obtain energy from both sulfate reduction and oxygen respiration. These two pathways are normally mutually exclusive in all known microorganisms. At the same time, the researchers were able to show that the sulfate-reducing acidobacteriota can break down complex plant carbohydrates such as pectin – another previously unknown property of “sulfate reducers.”

The researchers have thus turned textbook knowledge on its head. They show that complex plant compounds can be degraded under oxygen exclusion not only by the coordinated interaction of different microorganisms, as previously thought, but also by a single bacterial species via a shortcut.

Another new finding is that these bacteria can use both sulfate and oxygen for this purpose. Researchers at the DSMZ and Technische Universität Braunschweig are currently investigating how the new findings affect the interplay of the carbon and sulfur cycles and how they are linked to climate-relevant processes.

## **New study discovers how altered protein folding drives multicellular evolution**

*March 8, 2024*

*Science Daily*

Researchers have discovered a mechanism steering the evolution of multicellular life. They identified how altered protein folding drives multicellular evolution.

In a new study led by researchers from the University of Helsinki and the Georgia Institute of Technology, scientists turned to a tool called *experimental evolution*. In the ongoing Multicellularity Long Term Evolution Experiment (MuLTEE), laboratory yeast are evolving novel multicellular functions, enabling researchers to investigate how they arise.

The study puts the spotlight on the regulation of proteins in understanding evolution.

"By demonstrating the effect of protein-level changes in facilitating evolutionary change, this work highlights why knowledge of the genetic code in itself does not provide a full understanding of how organisms acquire adaptive behaviors. Achieving such understanding requires mapping the entire flow of genetic information, extending all the way to the actionable states of proteins that ultimately control the behavior of cells," says Associate Professor Juha Saarikangas from the Helsinki Institute of Life Science HiLIFE and Faculty of Biological and Environmental Sciences, University of Helsinki.

### **Snowflake yeast evolves robust bodies in 3,000 generations by changing cell shape**

Among the most important multicellular innovations is the origin of robust bodies: over 3,000 generations, these 'snowflake yeast' started out weaker than gelatin but evolved to be as strong and tough as wood.

Researchers identified a non-genetic mechanism at the base of this new multicellular trait, which acts at the level of protein folding. The authors found that the expression of the chaperone protein Hsp90, which helps other proteins acquire their functional shape, was gradually turned down as snowflake yeast evolved larger, tougher bodies. It turns out Hsp90 acted as a critically-important tuning knob, destabilizing a central molecule that regulates the progression of the cell cycle, causing

cells to become elongated. This elongated shape, in turn, allows cells to wrap around one another, forming larger, more mechanically tough multicellular groups.

"Hsp90 has long been known to stabilize proteins and help them fold properly," explains lead author Kristopher Montrose, from the Helsinki Institute of Life Science, Finland. "What we've found is that slight alterations in how Hsp90 operates can have profound effects not just on single cells, but on the very nature of multicellular organisms."

### **Path to adaptive evolution through altering protein shapes**

From an evolutionary perspective, this work highlights the power of non-genetic mechanisms in rapid evolutionary change.

"We tend to focus on genetic change and were quite surprised to find such large changes in the behavior of chaperone proteins. This underscores how creative and unpredictable evolution can be when finding solutions to new problems, like building a tough body," says Professor Will Ratcliff from the Georgia Institute of Technology, USA.

This study was funded by a research grant from the Human Frontier Science Program.

## **Blood test could determine diabetes risks**

*February 21, 2024*

*Edith Cowan University*

A blood test could potentially be used to assess a patient's risk of type 2 diabetes, a new study from Edith Cowan University (ECU) has found.

The most commonly used inflammatory biomarker currently used to predict the risk of type 2 diabetes is high-sensitivity C-reactive protein (CRP). However, emerging research has suggested that the joint assessment of biomarkers, rather than assessing each individually, would improve the chances of predicting diabetes risk and diabetic complications.

A study by ECU researcher Dan Wu investigated the connection between systematic inflammation, assessed by joint cumulative high-sensitivity CRP and another biomarker called monocyte to high-density lipoprotein ratio (MHR), and incident type 2 diabetes.

The study followed more than 40,800 non-diabetic participants over a near ten-year period, with more than 4,800 of the participants developing diabetes over this period. Wu said that of those patients presenting with type 2 diabetes, significant interaction between MHR and CRP was observed.

"Specifically, increases in the MHR in each CRP stratum increased the risk of type 2 diabetes; concomitant increases in MHR and CRP presented significantly higher incidence rates and risks of diabetes.

"Furthermore, the association between chronic inflammation (reflected by the joint cumulative MHR and CRP exposure) and incident diabetes was highly age- and sex-specific and influenced by hypertension, high cholesterol, or prediabetes. The addition of the MHR and CRP to the clinical risk model significantly improved the prediction of incident diabetes," said Wu.

### **Females most at risk**

The study found that females had a greater risk of type 2 diabetes conferred by joint increases in CRP and MHR, with Wu stating that sex hormones could account for these differences.

Wu said that the research findings corroborated the involvement of chronic inflammation in causing early-onset diabetes and merited specific attention.

"Epidemiological evidence indicates a consistent increase in early-onset diabetes, especially in developing countries. Leveraging this age-specific association between chronic inflammation and type 2 diabetes may be a promising method for achieving early identification of at-risk young adults and developing personalised interventions," she added.

Wu noted that the chronic progressive nature of diabetes and the enormous burden of subsequent comorbidities further highlighted the urgent need to address this critical health issue.

Although aging and genetics are non-modifiable risk factors, other risk factors could be modified through lifestyle changes. Inflammation is strongly influenced by life activities and metabolic conditions such as diet, sleep disruptions, chronic stress, and glucose and cholesterol dysregulation, thereby indicating the potential benefits of monitoring risk-related metabolic conditions.

Wu said that the dual advantages of cost effectiveness and the wide availability of cumulative MHR and CRP in current clinical settings, potentiated the widespread use of these measures as a convenient tool for predicting the risk of diabetes.

## **Scientists Solve Century-Old Cell Division Mystery**

*Pohang University of Science & Technology (POSTECH) March 14, 2024*

A research team from Pohang University of Science and Technology unveiled the mechanism behind crossover interference during meiosis, solving a long-standing mystery in genetics. This breakthrough could revolutionize agricultural breeding

by enabling precise control over crop traits, paving the way for improved disease resistance and productivity in plants.

Movies such as ‘X-Men,’ ‘Fantastic Four,’ and ‘The Guardians,’ which showcase vibrant mutant heroes, have captivated global audiences. Recently, a high-throughput genetic screening of meiotic crossover rate mutants in *Arabidopsis thaliana* garnered the interest of the academic community by unraveling a century-old mystery in the life sciences.

A research team, consisting of Professor Kyuha Choi, Dr. Jaeil Kim, and PhD candidate Heejin Kim from the Department of Life Sciences at Pohang University of Science and Technology (POSTECH), has achieved a remarkable feat by unveiling the molecular mechanism responsible for crossover interference during meiosis, a biological pattern at the chromosome level. The findings of this research were published on February 20 in *Nature Plants*, an international journal in the field of life sciences.

### *The Role of Meiosis in Genetic Diversity*

In sexually reproducing organisms, individuals resemble their parents or siblings. Despite the striking similarities, it’s crucial to recognize that absolute identicalness is unattainable. This variation is attributed to the process of meiosis, which generates reproductive cells like sperm and eggs in animals or pollen and ovules in plants. Unlike somatic cell division, which duplicates and divides the genome identically, meiosis creates genetically diverse reproductive cells through a mechanism known as crossover.

Meiosis and crossover play pivotal roles in biodiversity and have significant implications in breeding where the selection and cultivation of superior traits in crops occur. Typically, most animal and plant species exhibit a minimum of one and a maximum of three crossovers per a pair of homologous chromosomes.

The ability to control the number of these crossovers could lead to cultivating crops with specific desired traits. However, achieving such control has been challenging due to the ‘phenomenon of crossover interference.’ Crossover interference, where one crossover inhibits the formation of another crossover nearby along the same chromosome, was initially identified by fruit fly geneticist Hermann J. Muller in 1916. Despite researchers’ persistent efforts over the past century since its discovery, it is only recently that the mechanisms underlying crossover interference have started to unveil their secrets.

### *Breakthrough in Understanding Crossover Interference*

In this research, the team utilized a high-throughput fluorescent seed scoring method to directly measure crossover frequency in *Arabidopsis* plants. Through a genetic screen, they identified a mutant named *hcr3* (*high crossover rate3*) that exhibited an increased crossover rate at the genomic level. Further analysis revealed that the

elevated crossovers in *hcr3* was attributed to a point mutation in the *J3* gene, which encodes a co-chaperone related to HSP40 protein.

This research demonstrated that a network involving HCR3/J3/HSP40 co-chaperone and the chaperone HSP70 controls crossover interference and localization by facilitating the degradation of the pro-crossover protein, HEI10 ubiquitin E3 ligase. The application of genetic screen approaches to uncover the crossover interference and inhibition pathway successfully addressed a century-old puzzle in the life sciences.

### **New technique reveals earliest signs of genetic mutations**

*June , 2024*

*NYU Langone Health / NYU Grossman School of Medicine*

Mutations are changes in the molecular "letters" that make up the DNA code, the blueprint for all living cells. Some of these changes can have little effect, but others can lead to diseases, including cancer. Now, a new study introduces an original technique, called HiDEF-seq, that can accurately detect the early molecular changes in DNA code that precede mutations.

The study authors say their technique – HiDEF-seq, short for Hairpin Duplex Enhanced Fidelity Sequencing – could advance our understanding of the basic causes of mutations, in both healthy cells and in cancer, and how genetic changes naturally accumulate in human cells as people age.

Led by a team of researchers at NYU Langone Health, with collaborators across North America and in Denmark, the work helps to resolve the earliest steps in how mutations occur in DNA.

The new study is based on the understanding that DNA is made up of two strands of molecular letters, or bases. Each strand is composed of four types of letters: adenine (A), thymine (T), guanine (G), and cytosine (C). The bases of each strand pair with bases in the other strand in a specific pattern, with As pairing with Ts and Gs pairing with Cs. This allows the DNA code to be replicated and passed down accurately from one generation of cells to the next. Importantly, mutations are changes in the DNA code that are present in both strands of DNA. For example, a base pair of G and C, with a G on one strand paired with a C on the other strand, can mutate to an A and T base pair.

However, researchers say, most mutations have their origins in DNA changes that are present in only one of the two DNA strands, and these single-strand changes, such as a mismatched G and T base pair, cannot be accurately identified using previous testing techniques. These changes can occur when a DNA strand is not copied

correctly during replication, as a cell divides into two cells, or when one of the two DNA strands is damaged by heat or by other chemicals in the body. If these single-strand DNA changes are not repaired by the cell, then the changes are at risk of becoming permanent double-strand mutations.

Publishing in the journal *Nature* online June 12, the HiDEF-seq technique was shown to detect double-strand mutations with extremely high accuracy, with an estimate of one recording error per 100 trillion base pairs analyzed. Moreover, HiDEF-seq detected changes in the DNA letter code while they were present on just one of the two strands of DNA, before they become permanent double-strand mutations.

"Our new HiDEF-seq sequencing technique allows us to see the earliest fingerprints of molecular changes in DNA when the changes are only in single strands of DNA," said senior study author Gilad Evrony, MD, PhD, a core member of the Center for Human Genetics & Genomics at NYU Grossman School of Medicine.

Because people with genetic syndromes linked to cancer are known to have higher rates of mutations in their cells than cells in people with no cancer predisposition, researchers began their experiments by describing the DNA changes in healthy cells from people with these syndromes. Specifically, investigators worked with healthy cells from people with polymerase proofreading-associated polyposis (PPAP), a hereditary condition linked to an increased risk for colorectal cancer, and congenital mismatch repair deficiency (CMMRD), another hereditary condition that increases the likelihood of several cancers in children.

Using HiDEF-seq, researchers found a higher number of single-strand DNA changes in their cells, such as a T paired with a C in place of the original G paired with a C, than in the cells from people who did not have either syndrome. Moreover, the pattern of these single-strand changes was similar to the pattern observed in the double-strand DNA mutations for people with either syndrome.

Subsequent experiments were performed in human sperm, which are known to have among the lowest double-strand mutation rates of any human cell type. Researchers found that the pattern of chemical damage, called cytosine deamination, observed by HiDEF-seq in single stands of DNA in sperm, closely matched the damage observed in blood DNA intentionally damaged by heat. This, the researchers say, suggests that the two patterns of chemical damage to DNA, one natural and the other induced, occur through a similar process.

"Our study lays the foundation for using the HiDEF-seq technique in future experiments to transform our understanding of how DNA damage and mutations arise," said Evrony, who is also an assistant professor in the Department of Pediatrics and the Department of Neuroscience and Physiology at NYU Grossman School of Medicine. Single-strand changes in DNA occur continually as cells divide and multiply,

and while layers of repair mechanisms fix most changes, some get through and become mutations.

"Our long-term goal is to use HiDEF-seq to create a comprehensive catalogue of single-strand DNA mismatch and damage patterns that will help explain the known double-strand mutation patterns," said Evrony. "In the future, we hope to combine profiling of single-strand DNA lesions, as obtained from HiDEF-seq, with the lesions' resulting double-strand mutations to better understand and monitor the everyday effects on DNA from environmental exposures."

Geneticists estimate that there are approximately 12 billion bases or individual DNA letters that can be damaged or mismatched in each human cell, as there are two copies of the genetic code, with one copy inherited from each parent. Each of these copies comprise a double-stranded DNA spanning 3 billion base pairs. Evrony says that every base position in the genetic code is likely damaged or mutated at some point during an individual's lifetime in at least some cells.

## **Under pressure: How comb jellies have adapted to life at the bottom of the ocean**

**Research shows deep sea organisms have unique lipid structures to help them survive**

*June , 2024*

*University of California - San Diego*

The bottom of the ocean is not hospitable: there is no light; the temperature is freezing cold; and the pressure of all the water above will literally crush you. The animals that live at this depth have developed biophysical adaptations that allow them to survive in these harsh conditions. What are these adaptations and how did they develop?

University of California San Diego Assistant Professor of Chemistry and Biochemistry Itay Budin teamed up with researchers from around the country to study the cell membranes of ctenophores ("comb jellies") and found they had unique lipid structures that allow them to live under intense pressure. Their work appears in *Science*.

### **Adapting to the environment**

First things first: although comb jellies look like jellyfish, they are not closely related. Comb jellies comprise the phylum Ctenophora (pronounced *tee-no-for-a*). They are predators that can grow as large as a volleyball and live in oceans all over the world and at various depths, from the surface all the way down to the deep sea.

Cell membranes have thin sheets of lipids and proteins that need to maintain certain properties for cells to function properly. While it has been known for decades that some organisms have adapted their lipids to maintain fluidity in extreme cold -- called homeoviscous adaptation -- it was not known how organisms living in the deep sea have adapted to extreme pressure, nor whether the adaptation to pressure was the same as the adaptation to cold.

Budin had been studying homeoviscous adaptation in *E. coli* bacteria, but when Steven Haddock, senior scientist at the Monterey Bay Aquarium Research Institute (MBARI), asked whether ctenophores had the same homeoviscous adaptation to compensate for extreme pressure, Budin was intrigued.

Complex organisms have different types of lipids. Humans have thousands of them: the heart has different ones than the lungs, which are different from those in the skin, and so on. They have different shapes too: some are cylindrical and some are shaped like cones.

To answer whether ctenophores adapted to cold and to pressure through the same mechanism, the team needed to control the temperature variable. Jacob Winnikoff, the study's lead author who worked at both MBARI and UC San Diego, analyzed ctenophores collected from across the northern hemisphere, including those that lived at the bottom of the ocean in California (cold, high pressure) and those from the surface of the Arctic Ocean (cold, not high pressure).

"It turns out that ctenophores have developed unique lipid structures to compensate for the intense pressure that are separate from the ones that compensate for intense cold," stated Budin. "So much so that the pressure is actually what's holding their cell membranes together."

The researchers call this adaptation "homeocurvature" because the curve-forming shape of the lipids has adapted to the ctenophores' unique habitat. In the deep sea, the cone-shaped lipids have evolved into exaggerated cone shapes. The pressure of the ocean counteracts the exaggeration so the lipid shape is normal, but only at these extreme pressures. When deep-sea ctenophores are brought up to the surface, the exaggerated cone shape returns, the membranes split apart, and the animals disintegrate.

The molecules with an exaggerated cone shape are a type of phospholipid called plasmalogens. Plasmalogens are abundant in human brains and their declining abundance often accompanies diminishing brain function and even neurodegenerative disease like Alzheimer's. This makes them very interesting to scientists and medical researchers.

"One of the reasons we chose to study ctenophores is because their lipid metabolism is similar to humans," stated Budin. "And while I wasn't surprised to find plas-

malogens, I was shocked to see that they make up as much as three-quarters of a deep-sea ctenophore's lipid count."

To further test this discovery, the team went back to *E. coli*, conducting two experiments in high-pressure chambers: one with unaltered bacteria and a second with bacteria that had been bioengineered to synthesize plasmalogens. While the unaltered *E. coli* died off, the *E. coli* strain containing plasmalogens thrived.

These experiments were conducted over the course of several years and with collaborators across multiple institutions and disciplines. At UC San Diego, in addition to Budin, whose group conducted the biophysics and microbiology experiments, Distinguished Professor of Chemistry and Biochemistry Edward Dennis's lab conducted lipid analysis by mass spectrometry. Marine biologists at MBARI collected ctenophores to study, while physicists at the University of Delaware ran computer simulations to validate membrane behaviors at different pressures.

Budin, who is interested in studying how cells regulate lipid production, hopes this discovery will lead to further investigations into the role plasmalogens play in brain health and disease.

"I think the research shows that plasmalogens have really unique biophysical properties," he said. "So now the question is, how are those properties important for the function of our own cells? I think that's one takeaway message."

### **Virus-like nanoparticles control the multicellular organization and reproduction of host bacteria**

*June , 2024*

*University of Tsukuba*

Researchers from University of Tsukuba have discovered that virus-like nanoparticles can promote the multicellular organization and reproduction of host bacteria. These particles, which are evolutionarily related to phages (viruses that infect bacteria), contain an enzyme that helps shape the multicellular architecture and ultimately enhances morphological differentiation.

Viruses are ubiquitous in the environment, and organisms have developed various mechanisms to counter their threat. However, the genome of actinomycetes contains a highly conserved gene set encoding virus-like nanoparticles, although its biological significance has remained unclear.

In this study, researchers examined *Streptomyces davawensis*, an actinomycete species, and discovered that it produces virus-like particles that facilitate host reproduction. Extracellular DNA, which serves as a scaffold for multicellular organization, was significantly reduced in the colonies of mutant *S. davawensis* strains lacking vi-

rus-like particle production and cells trapped in abnormal aggregates. Detailed analysis revealed that the virus-like particles contain a unique enzyme (effector) crucial to their function, which partially degrades genomic DNA. The effector is released from the particle and localizes at the host cell membrane. The proposed model suggests that the effector partially degrades genomic DNA, bridging the intracellular and extracellular environments, thereby facilitating extracellular DNA release and providing a scaffold and nutrients for host cell reproduction. These findings reveal the exploitation mechanism of virus-related nanoparticles for bacterial proliferation and offer a novel strategy to reprogram virus-related nanoparticle functionality through modulation of effector activity for various applications in biotechnology.

### **Local disparities may prevent national vaccination efforts for rubella**

*May , 2024*

*Penn State*

When public health officials make policies about when and how vaccination programs are implemented, they must weigh the benefits and risks of how infectious diseases spread throughout the country. However, these analyses are often based on national-level data and, in some countries, may overlook nuances at the local level.

A new analysis by an international team, including Penn State researchers, revealed that the resulting recommendations may keep some countries from realizing the benefits of vaccination and globally eradicating diseases, such as rubella -- a contagious viral infection that causes mild symptoms in children. The team examined data from Nigeria, one of 19 countries that hasn't yet introduced rubella vaccination, as a case study. Their findings were published in the journal *Vaccine*.

"It's this interesting challenge where rubella is a mild disease if you get it as a kid, but it's high risk if you get it as an adult," said senior author Matthew Ferrari, professor of biology and director of the Center for Infectious Disease Dynamics at the Huck Institutes of Life Sciences at Penn State. "All of the policy surrounding rubella vaccination has been guided by that risk in adults, which has been holding back the benefit of rubella vaccination in some countries."

The primary concern among adults is the potential risk for congenital rubella syndrome (CRS), a serious health condition that can occur if a pregnant person contracts the virus. When an infectious disease like rubella is common, people are more likely to contract it earlier in life. And because the rubella virus is immunizing, those who are infected as children won't have pregnancies at risk of CRS when they are older.

Vaccination, on the other hand, reduces the amount of circulating virus, meaning individuals who were not vaccinated as children are less likely to be infected with rubella by adolescence or adulthood, Ferrari explained. As a result, even as the total number of rubella cases goes down with vaccination, the number of rubella infections in people of reproductive age -- who were neither infected nor vaccinated as children -- increases, putting those pregnancies at risk of CRS. Because of this complex dynamic, the World Health Organization (WHO) recommends that countries demonstrate that they can achieve a coverage level of 80% or greater, through either routine immunization or supplemental campaigns, before introducing rubella vaccination. The conventional wisdom has been that when vaccination coverage is above this threshold, the reduced risk of CRS due to less rubella virus offsets the paradoxical increase in CRS risk because infections tend to happen later in life, Ferrari explained.

The research team, working in partnership with the U.S. Centers of Disease Control and Prevention and the Nigeria Centre for Disease Control and Prevention, studied the epidemiology of rubella in Nigeria. Rubella is a comparatively rare disease, so it's difficult to quantify the potential harm and risk of CRS. These assessments are further complicated by the fact that Nigeria, Ferrari said, is a country with disparate ranges of wealth, vaccination coverage, health care access and birth rates, all of which play a role in infection and CRS risk.

To gain a better understanding of the factors at play, the team analyzed data from a nationally representative serosurvey, which detects the presence of antibodies in blood. The data allowed the researchers to see how many people, particularly women of reproductive age, had rubella antibodies, how many were potentially at risk of rubella infection and where the infection risk was greatest geographically. They identified regional differences in transmission between the northern versus southern part of the country, finding that transmission in the north was two-times higher compared to the south. They were also able to estimate the number of pregnancies affected by rubella infection today.

"We grounded the current infection risk and potential pregnancies at risk in strong empirical data and real-world phenomena," Ferrari said. "Parts of the country can already vaccinate more than 80% of kids, based on their current rate of measles vaccination, but low vaccination coverage in the north is a barrier to introduction across the whole country under the current recommendation."

What's more, the concern about increased CRS cases may not be as bad as conventionally believed, Ferrari noted. The team's new estimates of transmission rates show that the 80% threshold is conservative and that introducing a rubella vaccination program in Nigeria today could reduce the number of CRS cases by thousands in the first five years. "Some states could see CRS risk increase by hundreds of cases," he said, "but that increased risk would not come to fruition until 10 years down the

road" – providing a decade for public health officials to implement policies and programs to prevent this possibility.

"Strengthening and improving routine immunization programs and advancing them everywhere in the world is a benefit to everyone in the world. The more we do this, the elimination of rubella as a virus on this planet is entirely feasible," Ferrari said.

## **Hope for a vaccination against *Staphylococcus aureus* infections?**

*January 21, 2021*

*German Center for Infection Research*

*Staphylococcus aureus* (*S. aureus*) ranks among the globally most important causes of infections in humans and is considered a dreaded hospital pathogen. Active and passive immunisation against multi-resistant strains is seen as a potentially valuable alternative to antibiotic therapy. However, all vaccine candidates so far have been clinically unsuccessful. With an epitope-based immunisation, scientists at Cologne University Hospital and the German Center for Infection Research (DZIF) have now described a new vaccination strategy against *S. aureus* in the Nature Partner Journal *NPJ VACCINES*.

*S. aureus* causes life-threatening conditions such as deep wound infections, sepsis, endocarditis, pneumonia or osteomyelitis. Furthermore, the increase in antibiotic resistance such as in case of the methicillin-resistant *S. aureus* (MRSA) poses new challenges in medicine. In the past, numerous vaccines against *S. aureus* were developed, but without exception they proved unsuccessful in the clinical trial stages. "For the future development of vaccines, this means that the traditional approaches in vaccine development have to be qualitatively changed in order to achieve a breakthrough for an effective vaccine against *S. aureus*," explains Prof. Dr. Martin Krönke, Director of the Institute for Medical Microbiology, Immunology and Hygiene at Cologne University Hospital.

After decades of research, the Cologne scientists have now published a new promising vaccine strategy against *S. aureus*. Having initially characterised several *S. aureus* antigens as potential vaccine candidates, they went a step further. With the aid of monoclonal antibodies that had shown a protective effect in the infection model, Dr. Alexander Klimka, first author of the study and head of a DZIF working group, was able to establish the precise location of their binding sites, known as epitopes, in the vaccination antigens.

"For the *S. aureus* protein coproporphyrinogen III oxidase (CgoX), we were able to narrow the epitope to a section comprising 12 amino acids," Klima explains.

"What makes this work special is that it has been possible with this extremely small section of CgoX to trigger a protective immune response against the *S. aureus* infection. Narrowing the vaccine to a small epitope of 12 amino acids constitutes an unprecedented precision of a vaccine candidate against *S. aureus*."

Particularly encouraging is the observation that greater than 97 percent of the more than 35,000 investigated clinical strains of *S. aureus* feature this epitope unchanged and that this vaccine candidate will thus have a broad effect. "Epitope focused immunisation represents a new quality in vaccine development because far fewer adverse immune reactions can be anticipated than those observed occasionally for the use of total proteins or even inactivated pathogens," Prof. Krönke concludes.

## **СПИСОК ИСПОЛЬЗОВАННОЙ ЛИТЕРАТУРЫ И ЭЛЕКТРОННЫХ РЕСУРСОВ**

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