

Week 6 Nobel Prize

1. *The following phone call was made in 2009. Listen and answer the questions below:*

a) **Who is making the phone call?**

b) **Why is he making it?**

c) **Who is answering the phone?**

d) **The interviewer is asking for a permission to do something. What is it?**

e) **What does the interviewee do?**

f) **What was the interviewee doing when the phone rang earlier in the morning?**

g) **What structure is the interviewee talking about?**

2. *What do you know about the Nobel Prize? Why was it established? Work in pairs and use the vocabulary from the bank below:*

Swedish manufacturer	sign a will	awarded for	consist of
amount	achievements in	administered by	cash award
medal	since 1901	personal diploma	the Nobel Foundation
economic sciences	laureate		

Now read the text and compare it with the information that you came up with.

- Alfred Nobel was a Swedish chemist, engineer, innovator, inventor of dynamite, a major manufacturer of cannon and other armaments.
- His brother Ludvig died while visiting Cannes and a French newspaper erroneously published Alfred's obituary. It condemned him for his invention of dynamite and this is said to have brought about his decision to leave a better legacy after his death. The obituary stated **°["The merchant of death is dead"]** and went on to say, "Dr Alfred Nobel, who became rich by finding ways to kill more people faster than ever before, died yesterday." ¹ **[Alfred was disappointed with what he read] and concerned with how he would be remembered.**
- **²[On 27 November 1895, a year before his death, Alfred Nobel signed the famous will]** and set aside more than SEK 31 million (today approximately SEK 1,702 million) to establish the Nobel Prizes to be awarded annually without distinction of nationality.
- Every year **³[since 1901 the Nobel Prize has been awarded]** for achievements in physics, chemistry, physiology or medicine, literature and for peace. The Nobel Prize is an international award administered by the Nobel Foundation in Stockholm, Sweden. In 1968, Sveriges Riksbank established The Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel, founder of the Nobel Prize. **4[Each prize consists of a medal, personal diploma, and a cash award.]**
- The Nobel Prize amount for 2012 is set at Swedish kronor (SEK) 8.0 million per full Nobel Prize (1.2 million USD at the time of the 2012 Nobel Prize Announcement).
- Why are the individuals and organisations awarded a Nobel Prize called Nobel Laureates? **5 [The word "Laureate" refers to being signified by the laurel wreath.]** In Greek mythology, the god Apollo is represented wearing a laurel wreath on his head. A laureal wreath is a circular crown made of branches and leaves of the bay laurel (In latin: *Laurus nobilis*). In Ancient Greece, **6 [laurel wreaths were awarded to victors]** as a sign of honour - both in athletic competitions and in poetic meets.

3. Grammar – asking questions:

Read the text in exercise 2 again. Some expressions have been underlined and indexed. Form questions in which you ask for the underlined part. Square brackets indicate the context for asking the questions. An example has been done for you:

0 - Example: *Who is dead?*

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

4. **Nowadays, the boundaries between chemistry and biology are blurred.** Do you agree or disagree with this statement? Why?

5. **Listening exe:**

Listen and fill in the missing words (1-2)

Example 0: This is not the first time the scientist visited Stockholm.

1. The scientist was awarded for investigating atoms _____ in a molecule.
2. Chemistry is capable of providing answers to questions about _____
3. The connection to biology is in _____ the life process.
4. Chemistry has always _____ studies of molecules derived from nature.
5. It does not matter how we _____ individual disciplines.
6. Dividing research group into manageable units is useful for _____ purposes.
7. _____ research can be done either at departments of chemistry or biology.
8. In the scientist's view, _____ governs the sciences.
9. Biological organisms are _____ at the level of chemistry.
10. Chemistry should be part of general _____ of an educated person.

6. **Reading exe: Read the text summarizing the Nobel Prizes awarded to chemists in the 20th century and decide if the statements below are true or false. You have to provide justification for the false statements:**

1. The most prizes in chemistry were awarded for investigations in organic chemistry.
2. Recently, there has been a decline in the prizes for polymer chemistry.
3. The prizes for physical chemistry outnumber those for biochemical discoveries.
4. There is a link between the number of awards in organic chemistry and structural variability of organic compounds.
5. The laureates for chemistry are proportionally distributed within a narrow range of countries.
6. Swiss and Canadian laureates got the same number of awards.
7. Numbers of German chemists awarded before and after 1945 are comparable.
8. Laureates from the US were awarded mainly in the first decades of the 20th century.
9. The majority of British chemists awarded in the 20th century got the prize after 1950.
10. French scientists represent the fourth most awarded group of chemistry laureates.

The first hundred years of Nobel Prizes for Chemistry give a beautiful picture of the development of modern chemistry. The prizes cover the whole spectrum of the basic chemical sciences, from theoretical chemistry to biochemistry, and also a number of contributions to applied chemistry. From a quantitative point of view, organic chemistry dominates with no less than 25 awards. This is not surprising, since the special valence properties of carbon result in an almost infinite variation in the structure of organic compounds. Also, a large number of the prizes in organic chemistry were given for investigations of the chemistry of natural products of increasing complexity and thus are on the border to biochemistry.

As many as 11 prizes have been awarded for biochemical discoveries. Even if the first biochemical prize was already given in 1907 (Buchner), only three awards in this area came in the first half of the century, illustrating the explosive growth of biochemistry in recent decades (8 prizes in 1970-1997). At the other end of the chemical spectrum, physical chemistry, including chemical thermodynamics and kinetics, dominates with 14 prizes, but there have also been 6 prizes in theoretical chemistry. Chemical structure is another large area with 8 prizes, including awards for methodological developments as well as for the determination of the structure of large biological molecules or molecular complexes. Industrial chemistry was first recognized in 1931 (Bergius, Bosch), but many more recent prizes for basic contributions lie close to industrial applications, for example, those in polymer chemistry.

Science is a truly international undertaking, but the western dominance of the Nobel scene is striking. No less than 49 scientists in the United States have received the Nobel Prize for Chemistry, but the majority have been given the prize after World War II. The first US prize was awarded in 1915 (for 1914, Richards), and only two more Americans got the prize before 1946 (Langmuir in 1932, Urey in 1934). German chemists form the second most awarded group with 26 Laureates, but 14 of these received the prize before 1945. Of the 25 British investigators recognized, on the other hand, no less than 19 got the prize in the second half of the century. France has 7 Laureates in chemistry, Sweden and Switzerland 5 each, and the Netherlands and Canada 3. One prize winner each is found in the following countries: Argentina, Austria, Belgium, Czechoslovakia, Denmark, Finland, Italy, Norway and Russia.

Extrapolating the trend of the 20th century Nobel Prizes for Chemistry, it is expected that in the 21st century theoretical and computational chemistry will flourish with the aid of the expansion of computer technology. The study of biological systems may become more dominant and move from individual macromolecules to large interactive systems, for example, in chemical signalling and in neural function, including the brain. And it is to be hoped that the next century will witness a wider national distribution of Laureates.

7. 2012 Nobel Prize in Chemistry

Read the text below. Certain parts have been removed from it. Match the gaps and the removed parts.

G protein-coupled receptor (GPCR), also called seven-transmembrane receptor or heptahelical receptor, is a protein located in the cell membrane 1) _____ to an intracellular molecule called a G protein (guanine nucleotide-binding protein). GPCRs are found in the cell membranes of a wide range of organisms, 2) _____. There are numerous different types of GPCRs—some 1,000 types are encoded by the human genome alone—and as a group they respond to a diverse range of substances, 3) _____.

The existence of GPCRs was demonstrated in the 1970s by American physician and molecular biologist Robert J. Lefkowitz. Lefkowitz shared the 2012 Nobel Prize for Chemistry with his colleague Brian K. Kobilka, 4) _____.

A GPCR is made up of a long protein that has three basic regions: an extracellular portion (the N-terminus), an intracellular portion (the C-terminus), 5) _____. Beginning at the N-terminus, this long protein winds up and down through the cell membrane, 6) _____. The last of the seven domains is connected to the C-terminus. When a GPCR binds a ligand (a molecule that possesses an affinity for the receptor), 7) _____. This activates the C-terminus, 8) _____. Activation of the G protein initiates a series of intracellular reactions that end ultimately in the generation of some effect, 9) _____ or changes in vision in response to dim light.

- A. including mammals, plants, microorganisms, and invertebrates**
- B. which then recruits a substance that in turn activates the G protein associated with the GPCR**
- C. such as increased heart rate in response to epinephrine**
- D. with the long middle segment traversing the membrane seven times in a serpentine pattern**
- E. including light, hormones, amines, neurotransmitters, and lipids**
- F. and a middle segment containing seven transmembrane domains**
- G. who helped to elucidate GPCR structure and function**
- H. the ligand triggers a conformational change in the seven-transmembrane region of the receptor**
- I. that binds extracellular substances and transmits signals from these substances**

1	2	3	4	5	6	7	8	9