METAPHOR IN SCIENTIFIC TERMINOLOGY

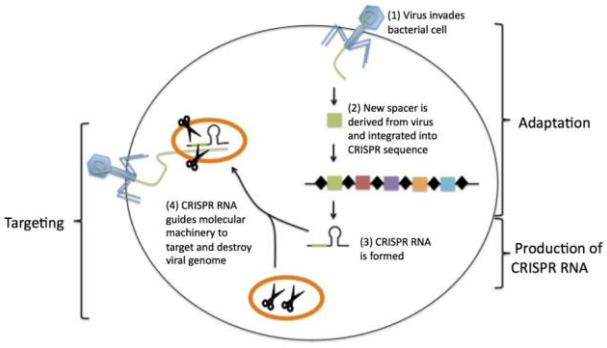
Ait Assila Nour Alimane, Mulk Ellah Taha
Scientific supervisor: Lytvynenko O.O.
National University of Pharmacy, Kharkiv, Ukraine
nourfrance97@gmail.com

Introduction. There has existed a persistent belief that such phrases as metaphors cannot be used in the language of science, for it should only operate the exact terms and definitions. As it is known, the term metaphor can be traced to the Greek word metaphora, which is derived from meta (meaning "over") and pherein (meaning "to carry"), thus the metaphor is the ability of language to "rename" the object or phenomenon, to "transfer" the peculiarities inherent in one thing to another one, resembling the former in a specific way. Despite the metaphors are widely used in fiction literature, they are as well pervasive in the language of science. Scientists regularly engage in analogical reasoning to develop hypotheses and interpret results, and they rely heavily on metaphors to communicate observations and findings. Metaphors are crucial in the production of knowledge in that they allow making connections between abstract concepts and everyday experiences. It is, in fact, metaphor that makes theory possible, and a great number of scientific revolutions have been initiated through the comparisons between natural phenomena and everyday experiences.

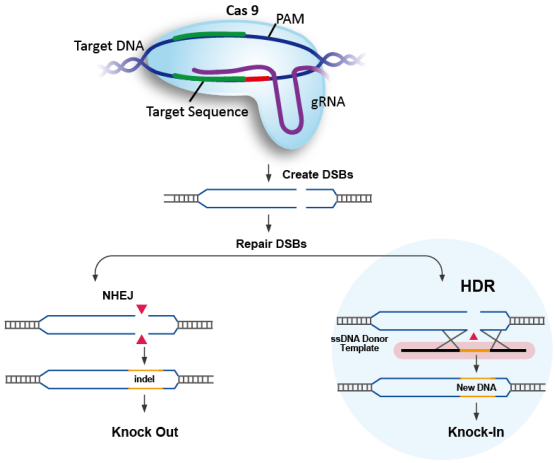
Aim. Our research is aimed to investigate one of the metaphors which has recently appeared in novel science is genetic scissors CRISPR-CAS9.

Materials and methods. Every cell in our body contains a copy of our genome, over 200 thousand genes and 3 billion of letters of DNA. Our genes shape who we are as undividuals and species. Genes also profound effects on health and thanks to DNA sequencing researchers identify a thousand of genes that affect our risque of diseases. To understand how genes work researchers develop ways to control and manipulate genes in living cells, therefore recently a new method has been found which provide a genius tool to add, eliminate, and change at specific locations in the genome of any species including humans.

Results and discussions. According to the researches made by the two scientists Emmanuelle Charpentier and Jennifer Doudna in 2012 CRISPR-CAS9 (Clustered Regularly Interspaced Short Palindoromic Repeats) as revolutionary innovation was adapted from a natural pathway used by bacteria to



protect themselves from infections by viruses. Many bacteria have short DNA sequences that are regularly repeated along their genome, called palindromes. These palindromes are interspaced with different viral DNA (spacer) forming CRISPR locus. it allows bacteria to retain the memory of a virus or bacteriophage infection to better defend themselves the next time they are infected. When an infection by virus occurs, the viral DNA within the CRISPR is copied into RNA and is associated with the Cas9 protein (for CRISPR associated). This endonuclease associated RNA attaches to the DNA of the virus and inactivates the viral DNA by cutting it, which disable the virus.



The engineered CRISPR-CAS9 system was introduced in the lab by creating a snippet of RNA with a short sequence named guide that binds to the desired target sequence of DNA in the genome, then the protein-9 nuclease cuts it, Once it is incised, researchers employ the cell's own DNA repair machinery to insert or remove parts of genetic material (non homology end joining), or to modify DNA by replacing an existing fragment with a customized DNA sequence (homology-directed repair). All this can be done in stem cells providing different cell types, or in the state of a fertilized egg which allows the creation of transgenic animals with targeted mutations. CRISPR-CAS9 is characterized from other methods by the capacity to detect many genes at once, it is an open door for studying complex human diseases that are caused not only by a single mutation but by many genes acting together.

Conclusions. The technique is already being engaged in numerous applications in different domains. Within the context of health it could pave the way to the development of new treatments for rare metabolic disorders like Gaucher and hunter syndromes, mental diseases such as Autism and Alzheimer, and genetic diseases from Hemophilia through to Huntingdon's disease. It is also being utilized in the creation of transgenic animals to produce organs for transplants into human patients (in the case of pigs). This method was also investigated for gene therapy. Such therapy aims to insert normal genes into the cells of patients to cure various disorders. Several start-up companies have been founded to develop this technology commercially and large pharmaceutical companies are also exploring its use for medicines discovery and development purposes.