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Phosphate modified mRNA for therapeutic applications

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For several decades, scientists from all over the world have been trying to discover effective methods of combating diseases that are difficult to treat with traditional methods, such as cancer, genetic rare diseases, and the last year in every aspect of our lives has been dominated by the pandemic caused by the coronavirus SARS-CoV-2. The hope for improving this situation is the so-called gene therapy, in which a therapeutic is delivered in the form of a genetic recipe, which is then expressed in the cells of the patient. In recent years, messenger RNA (mRNA), which is the genetic recipe for a specific protein, has received a great deal of attention in this context. A kind of culmination of these efforts was the development of mRNA vaccines against coronavirus, which were the first to be approved for widespread use. On the way to effective mRNA-based therapies, there have been a number of problems that have been solved, but there is also room for improvement. During the lecture, the speaker will present the idea of gene therapies and their enormous potential beyond anticancer and antiviral therapies. He will talk about the main problems associated with the development of this novel therapy and ways to solve them using biological and chemical methods, including those developed at the University of Warsaw.