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FOREWORD

It is known that the world has now entered the period of the 4th industrial revolution. Every technical innovation in the life of society, along with progress, also causes certain problems. Several relevant international health, food (nutrition), biological, and energy security programs have been adopted to meet the growing needs and requirements for food and clothing, place of residence, energy, medicines, etc. due to the increase in the world's population and the pressure on the environment. The main directions of biological safety programs include the prevention of the spread of infectious diseases, as well as invasive and other diseases transmitted by animals and birds.

Throughout its history, mankind has faced numerous epidemics - pandemics - caused by various pathogenic microorganisms, accompanied by large-scale and numerous casualties. Justinian plague or bubonic plague (540-740, a treatment found in the late 19th century), "black death" (1346-1353, until the end of the 19th century), chickenpox, (1750, 1960 and later), cholera (1816-1826, 1829-1851, 1852-1860, 1863-1875, 1881-1896, 1899-1923, 1962-1966), swine flu (1918, 1958, 1968), Spanish influenza (1918-1920), AIDS (although historically available, it was recorded in 1981), Ebola, bird flu, tuberculosis, malaria, leprosy, etc. occurred in different years and the number of victims together amounted to several hundred million. A number of dangerous infectious diseases, caused by viruses of similar origin such as SARS CoV-1 (2002-2003), MERS (2012-2015), the new SARS-CoV-2 (COVID-19) (2019), supplemented the list of pandemics at the beginning of the XXI century.

A pandemic (COVID-19; the first outbreak was reported in late 2019 in Wuhan, China) of the new coronavirus that can multiply, spread and change rapidly, has suddenly shaken not only the 3rd and 2nd world countries but also the leading countries with advanced science, technology, health care and economy, such as United States, France, Germany, Spain, Italy, Great Britain, Japan, China, South Korea, etc. The vast majority of infections and victims (human casualties) around the world, as well as the damage to the world economy, accounted for developed countries. It is still unknown when the pandemic will end.

Opinions about the origin of the first infection with the virus and how it is transmitted to humans are still controversial. In the early days of the pandemic, there were not even test systems – they all were developed during the pandemic. At present, PCR (the most accurate, it has direct and indirect variants) and serological (ELISA, analysis of antibodies in the blood, which allows testing even a previously existing infection) test systems have been developed. Besides, CRISPR and chest computed tomography (CT) methods are available.

Research has been carried out in the world's leading countries (USA, England, France, Germany, Italy, China, Spain, Russia, Japan, Turkey, South Korea, etc.) to develop a vaccine against the virus. There are already reports in the world media about the development of several effective vaccines that will be available soon.

Today, the genomes of thousands of virus strains isolated from dead and recovered people have been read, and numerous polymorphic variants of them have been identified as a result of comparisons. The endocytosis and exocytosis of virus entry into human cells have been studied, and it has been found that the virus, activated by transmembrane proteins, enters the human cell mainly through the receptor of angiotensin-converting enzyme 2 (ACE2), which is found in almost all cells. This mechanism makes the virus "invincible".

In the summer months, the infections are somewhat "slowed down", and in the autumn, the coronavirus "reactivates" more strongly, and the incidence and mortality rates increase steadily. In general, the prognosis for the second wave of coronavirus is not optimistic.

Measures (quarantine, restrictions on travel and leaving home, social distancing, use of masks, disinfection, etc.) are being taken at various levels in the world to combat the coronavirus pandemic, which already caused a large number of victims. A quarantine regime has been applied in our country to minimize the spread of the virus, and this regime is currently underway.

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Along with the preventive measures against coronavirus, it is necessary to conduct serious research. Today, science, especially biology and medicine, face some important issues in the fight against the virus in our country. These issues can be divided into the following areas:

(a) Genome sequencing of the virus spread in the Republic, detection of mutated strains, adding the obtained results to GenBank;
(b) Development of more accurate and express virus testing methods;
(c) Development and testing of new medicinal products to treat the viral infection;
(d) Participation in vaccine development activities around the world and taking an active part in this process;
(e) Establishing close cooperation with world research centers on coronavirus control, as well as with the WHO;
(f) Obtaining financial support from both public authorities and the private sector for sustainable and efficient research;
(g) Training of scientists and specialists who can act professionally in similar situations in the future.

On August 4-6, 2020, the Department of Biological and Medical Sciences of ANAS, along with the Institute of Molecular Biology and Biotechnology of ANAS organized an international online conference on "The coronavirus pandemic: from scientific research to ensuring a healthy future". "The main purposes of the conference were to discuss and assess the real situation with the pandemic in the country, to get acquainted with the steps taken and scientific achievements in the fight against the virus, to identify strategic aspects of future research, to develop effective recommendations for minimizing pandemic damage, to inform the public, as well as doctors and specialists, who are practically fighting the pandemic, on the achievements in this area. The materials of the conference were elegantly published.

(*http://bteb.science.gov.az/uploads/COVID-19_Beynelxalq_Konfransin_materiallari_2020%20(3).pdf*).

The current special issue of the journal is based on articles reflecting the results of selected research papers presented at the conference.

This year, the people of Azerbaijan fought against two great enemies - the coronavirus and the Armenian occupants. On the Karabakh front, under the leadership of Supreme Commander-in-Chief Ilham Aliyev, the victorious Azerbaijani army has won a great victory, and our lands, which have been occupied for almost 30 years, have been liberated from the clutches of the enemy. We believe that thanks to the consistent and purposeful leadership of Mr. President and scientifically based measures, a worthy victory over the pandemic will be achieved with the participation of scientists, and our people will be saved from this disaster.

Sincerely yours,

Academician Irada Huseynova
Vice-president of ANAS