

## COVID-19: Activities of Al-Farabi Kazakh National University (KazNU), Kazakhstan

### 1. Shifting activities online

In response to the novel coronavirus (COVID-19) pandemic, Al-Farabi KazNU completely moved to remote learning using advanced digital educational technologies.

An important part of KazNU's transformation into a research university is the digitization of all business processes. In recent years the University has created a smart information-communication infrastructure and smart-campus; introduced cloud and mobile technologies; and developed IT-services that has brought the University to a completely new digital level. This has also made it possible to shift the teaching process to a distance-education mode according to the current schedule.

All students in the dormitories were given free access to high-speed Internet connection. Situation Management Centre oversees and monitors the process of distance education.

A productive partnership between KazNU and Microsoft also offers great opportunities for distance learning. Thanks to the collaboration with the world-famous IT company and introduction of the software product Office 365, students and teachers can use the Microsoft Teams service for education.

As part of social responsibility, Al-Farabi KazNU offers its platform to other Kazakhstani educational institutions that do not have the resources of their own to provide distance learning.

### 2. Help for the community

More than 50 undergraduates and doctoral students of Al-Farabi KazNU Faculty of Medicine and Health Care were at the forefront of the fight against the coronavirus. They contributed to the efforts on defeating the deadly virus by working in hospitals with infected people and those that have come into contact with the infected ones.

Teachers of all the Clinical Departments of the Faculty of Medicine treated patients and fought for life and health by performing their professional duty. Infectious disease specialists, pulmonologists and resuscitation experts worked 24-hours at medical institutions in Almaty. Epidemiologists worked at roadblocks and cordoned places and many of them helped to transport patients and contact persons.

### 3. Development of the new immunostimulators for protection against coronavirus

"Science Fund" JSC organized and held "Stop Coronavirus" contest to find effective solutions to prevent pandemic and overcome its consequences. Al-Farabi KazNU researchers took part in the event and presented their proposals for combating coronavirus. The competition was held online from 13<sup>th</sup> – 15<sup>th</sup> April 2020. Among 39 projects selected by the decision of the jury and the results of the public online voting for the final round, the developments concerning prevention and control of the spread of coronavirus infection presented by the scientists of Al-Farabi KazNU scored the highest marks.

The jurors found KazNU's projects on development of biodegradable hand protection, new immunostimulators and antiviral drugs, as well as projects on production of disinfecting cleansing agents and chamomile antiseptic to have a high degree of effectiveness. That formed the basis for submission of KazNU's developments along with other projects for consideration by the Government and interested investors.

The "Development of new immunostimulators for protection against coronavirus from *Spirulina platensis* cyanobacteria biomass and its various combinations with useful plants" project under the guidance of Professor Bolatkhan Zayadan was listed as the winner of the jury evaluation competition and also topped "People's choice" list of projects, scoring the highest number of votes – 653. The project aims to develop a technology for obtaining new immunostimulators with

antibacterial, antiviral, probiotic and antioxidant properties from *Spirulina platensis* cyanobacteria biomass and its various combinations with useful plants for protection against coronavirus.

This project consists of the implementation of a strong and secure triple formula using *Nelumbo nucifera*, *Angelica keiskei* and *Vitis vinifera* natural resources that demonstrate the highest therapeutic potential against COVID-19. This would be the first powerful anti-COVID-19 herbal medication containing a mixture of low-toxic medicinal and food plants. It will be a safe product made of edible herbs which would provide patients with a quick solution due to special formula that works through a number of mechanisms, including targeted inhibition of beta-coronaviruses. Herbal medicines are less expensive and cost-effective than modern treatments so the new medicine will be low-cost and will also strengthen the immune system.

Following the results of the contest, "Science Fund" JSC together with other interested parties are now working to further advance and implement the proposals.

#### **4. Development and production of sodium hypochlorite-based antiseptics**

Moreover, with the emergence of the pandemic ICESCO held an international call for scientific and technological projects aimed at fighting COVID-19 among the universities of the organization's member countries.

Al-Farabi KazNU's project was recognized as one of the best and was selected for funding. The project is aimed at the production of universal antiseptics and disinfectants of the new generation. The funds allocated by ICESCO were used to purchase part of the equipment for production which is planned to be launched in the near future.

Electrochemical method was used for the production of sodium hypochlorite-based antiseptics, developed by Al-Farabi KazNU chemists. The antiseptics has a wide range of applications in the medical, municipal and household spheres. One of the undoubted advantages of these disinfectants is the cost, which is much lower than that of foreign analogues, since the production uses Kazakhstani raw materials. The production also uses patented developments of KazNU scientists, including highly resistant ruthenium oxide titanium anodes, the use of which significantly reduces the cost of production.

The resulting disinfecting product is used to treat University buildings as well as was distributed among employees and social strata of the population in need.

#### **5. Development of Software**

KazNU's team of researchers at the laboratory of the department of informatics developed a program to instantly determine the presence of a mask on a person's face and measure the distance between people. Innovative development allowed CCTV cameras to identify violators of the quarantine regime.



## 6. Development of Face Shields

Young specialists of the scientific and technological park of KazNU together with scientists from the Scientific Research Institute of Combustion Problems developed a protective face shield ALFASHIELD.

With the outset of the pandemic, many tech companies began developing different versions of screen protectors for healthcare workers, offering their designs to organizations wishing to create their own versions. Most of the models are made using a 3D printer. Printing of one such protective screen takes on average 1.5-2 hours, which is a rather time-consuming process.

A team of young student researchers from KazNU developed their own technology for the manufacture of anti-virus protective screens, the advantage of which is the speed of the process. A 3D printer is not required to produce these screens. The technology allows to speed up the manufacturing process by 5-6 times. According to the developers, two people can make up to 100 protective screens. In a pandemic, when the number of infected people in the country and the world is growing rapidly, this is a very important factor.



## 7. Vaccination

Since March 2021, KazNU carries out vaccinations for the employees of the University. The vaccine used for this purpose is Sputnik V developed by the Gamaleya Research Institute of Epidemiology and Microbiology (Russia).