



Dear Friends,

Throughout the year 2020, the novel pandemic coronavirus SARS-CoV-2 year has been in the spotlight of both the media and molecular biology and medicine alike. On the one hand, the pandemic has eclipsed many other pivotal issues of healthcare; on the other hand, it peaked the interest of the public in viruses as living objects and in their interaction with the human body.

Until recently, it was universally believed that viruses cause disease and should be treated as pathogenic agents. However, viruses are more than that. These infinitesimal life forms are part of our microbiome, and viruses that affect bacteria, known as bacteriophages, are efficient “antibiotics” used in medicine, agriculture, and food industry. Viral genetic material has been used as the basis for biotechnological systems for bulk production of proteins in bacteria and cell cultures. Elements of viral structures are extensively applied in the development and production of analytic devices, materials for electronics and therapeutic tools.

Since 2010, scientists in Novosibirsk have been working on creating infectious agents based on modified viruses that would selectively target cancer cells. They are using well-known viruses, such as the vaccinia virus; gene inserts improve their tumor-dissolving (oncolytic) powers. Moreover, viruses in which their own genetic material has been removed can be used as nanocontainers for targeted delivery of drugs. These so-called virosomes can act as vaccines by facilitating the development of immune memory in the cell.

The most acute problem of the current pandemic is the lack of specific therapy; many conventional antiviral drugs turn out to be ineffective or even toxic. Extracts and biologically active compounds from higher fungi that have gone far beyond the limits of traditional medicine can be used as safe antiviral remedies. Novosibirsk scientists have shown that a number of Siberian fungi effectively suppress viral replication on cell cultures, including such pathogens as the flu, herpes, smallpox and human immunodeficiency viruses. Chaga, a species of wood-inhabiting fungi, has demonstrated the most potent antiviral action: the most recent data show it to be effective against the novel coronavirus.

In this issue, we present an unexpected yet logical view of forest fires, which are usually thought of as disasters. Research of scientists from Irkutsk shows that forest fires are a necessary factor in the dynamics of boreal forest ecosystems, such as larch-dominated stands. They came to a stunning conclusion: to grow, boreal forests must burn!

The reader will also learn about the amazing history and variety of card games in Japan that develop intelligence and broaden the scope of knowledge of its players, and about a large-scale research of the role of dogs in the material and spiritual culture of China. Such virtual travel to far-away lands is both interesting and completely safe!

*Academician Nikolay L. Dobretsov,
Editor-in-Chief*

A handwritten signature in black ink, appearing to read 'Dobretsov'.