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Metagenomics at the crossroad of human medicine, veterinary medicine and environmental sciences

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Over 70% of emerging infectionsare linked to animal sources through zoonosis possibly as the result ofthe destruction of animal habitats and other environmental changes caused by humans.Yet, human medicine and veterinary medicine as well as environmental sciences have always functioned separately. The role played by animals as reservoirs or vectors of human diseases underscores the need for an integrated approach to address public health issues. This requires not only the sharing and mining of existing data but also to developnovel detection methods and to conduct meta-analyses to concurrently examine samples from the three entities: human, animals and the environment. Until recently, conventional techniques such as culturing or target-dependent molecular biology assays have been used to detectmicroorganisms involved in zoonosis. However, these techniques are unable to detect the vast majority of unknown viruses and bacteria. Metagenomics is a relatively novel culture-independent technique that can detect microorganisms in many types of samples and does not require a priori knowledge of the target organism to be detected.Several tools, including crAss,a bioinformatic method based on cross-assembly (http://edwards.sdsu.indu/crass/), can be used to detect the inter-relationships betweendifferent metagenomes (human, animal and environmental samples) to determine microorganisms that are unique or shared between them. This permits to trace infectious agents found in humans back to their animal and environmental sources.Given its high sensitivity, metagenomics is an ideal technique at the intersection of humanmedicine, veterinaryand environmental sciences to detect known and novel microorganisms that are unique or shared between the three entities.

Biography

Dr John Mokili completed his PhD. in Virology from the University of Edinburgh, UK and postdoctoral studies at Henry M. Jackson Foundation and Los Alamos National Laboratory in USA. He has more than 20 years experience in studies pertaining to virus diversity, including HIV, HCV and TTV. He is an Adjunct Assistant Research Professor at San Diego State University where he is conducting research on virus discovery in diseases with unknown etiology and emerging and re-emerging infectious agents. Dr. Mokili is author and co-author of more than 25 papers in reputed journals.

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Development of green technologies platform in the Russian Federation

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The focus of the paper is a research aimed at development and implementation of Green Technologies Platform in the Russian Federation, a project of Russian State Hydrometeorological University in collaboration with Moscow State University, Ministry for Economic Development of the Russian Federation, Higher School of Economics, and "Russian Geographical Society" NGO. The project has been approved by the Hi-Tec and Innovation Commission of the Government of the Russian Federation.

The basic goal of the Platform is to work out a mechanism aimed at increasing efficiency and raising competitiveness of the Russian economy on the basis of joint efforts of science, state, business and NGO communities in order to introduce green technologies, technologies to reduce previously accumulated environmental damage, and ensure environmental safety.

The basic elements of the Platform are: green production technologies, technologies to ensure environmentally safe waste management, technologies and systems to monitor, assess and predict environmental and man-made disasters and climate change implications, technologies for environmental management to ensure environmental safety and new ecological standards of human life.

The implementation of the project to be completed by 2020 will make it possible to develop a well-structured open market of ecological products and services in the Russian Federation.

Biography

Prof. Lev Karlin, PhD, DSc, has been Rector of Russian State Hydrometeorological University at St. Petersburg since 1988. He has published more than 250 papers and textbooks on oceanography, meteorology, ecology, climate change, environmental and university management. Prof. Karlin is a member of Advisory Council of marine Board and Arctic and Antarctic Board of the Russian Government and Council of the Federation, respectively.

Dr. Leonid Savelev, PhD, advisor to the Rector on international relations, has been Head of Department of Russian State Hydrometeorological University since 1987 and published more than 50 papers and textbooks on ESP.

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