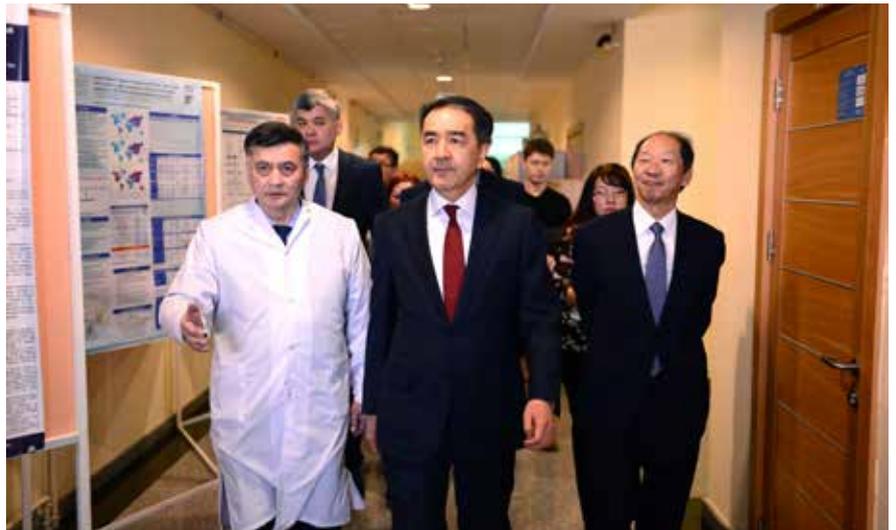


HIGH-LEVEL OFFICIALS TO VISIT NLA

On March 23, 2017 Nursultan Nazarbayev, President of Kazakhstan and Shavkat Mirziyoyev, newly elected President of Uzbekistan visited Nazarbayev University and National Laboratory Astana specifically. Earlier Bakytzhan Sagintayev, Prime-Minister of Kazakhstan with Elzhan Birtanov, Minister of Health, Yerlan Sagadiyev, Minister of Education and Science also payed attention and got acquainted with the work of NLA. High-level officials visited laboratories of NLA, got acquainted with their equipment and the conditions in which scientists conduct research on scientific projects. Zhaxybay Zhumadilov, General Director, NLA told honored guests about the most significant NLA projects that will be implemented in the nearest future.

Then, officials held the meetings with the faculty of Nazarbayev University and NLA staff, during which they noted the role of the University and its entities in the implementation of the tasks set by the President of the Republic of Kazakhstan.



In this issue:



"HÖP" to put into production, p.2



First imaging flow cytometer Imagestream X Mark II in Central Asia and Russia to start up at Nazarbayev University, p.2



Risks for tuberculosis in Kazakhstan: implications for prevention, p. 3



Phylogeography of human Y-chromosome haplogroup Q3-L275 from an academic/citizen science collaboration, p.3



NLA scientific article to win the JWOCA Clinical Manuscript Award, p.4



Announcements, p.4

“HƏP” TO PUT INTO PRODUCTION

“Astana-Ənim” JSC started to produce the “NƏR” synbiotic beverage on the basis of its existing dairy plant. This year a trial launch of the beverage and its sale is expected around the territory of Astana and Akmola region.

It is need to mention that “NƏR” was created by the scientists from the Life Science Center, NLA. The production of this synbiotic, which is a product for the high-quality longevity, is a long-awaited event for the National Laboratory Astana. The probiotic leaven is recommended as an auxiliary therapy for diabetes mellitus, arterial hypertension and obesity. The drink will also be recommended as the part of a five-day diet into Kazakhstan’s pre-school and

school educational institutions, medical and social institutions, health resorts and sanatoriums of the country.

This synbiotic yogurt drink consists of probiotic leaven, pectin, prebiotic ingredient inulin, fish collagen, which is a source of essential amino acids, vitamins, trace elements, and completely natural milk.

The effectiveness of “NƏR” has been confirmed in pre-clinical and two phases of clinical trials, the drink has also the biosafety report.

At present measures are initiated to register and certify the product, and to prepare the premises for the installation of a new technological line for the production of functional food products.

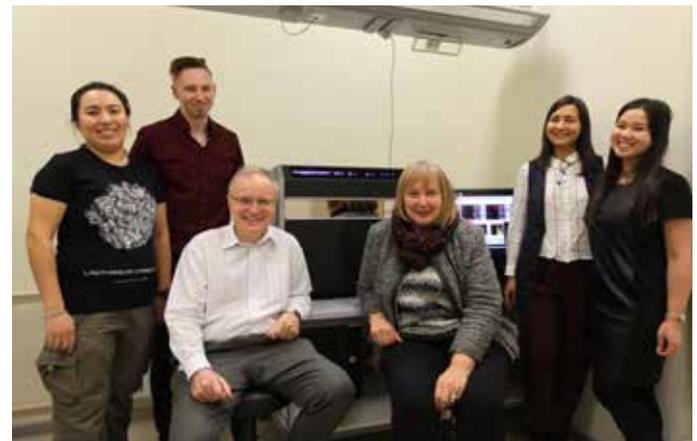


FIRST IMAGING FLOW CYTOMETER IMAGESTREAM X MARK II IN CENTRAL ASIA AND RUSSIA TO START UP AT NAZARBAYEV UNIVERSITY

First state-of-the art imaging flow cytometer (Amnis-Merck) in Central Asia, Russia and post-soviet region was successfully installed and started-up at Nazarbayev University on February, 16, 2017 through a long-term collaboration of Professor Ivan Vorobjev (Dept Biology, School of Science and Technology) and researchers from Laboratory of Fluorescent Methods, National Laboratory Astana with an Adjunct Professor from Harvard Medical School, Dr. Natalie Barteneva.

The primary idea behind this collaboration was to create a complimentary research infrastructure at Nazarbayev

University and to promote development of joint research projects and technology transfer between researchers from NU and Harvard University. The first milestone was achieved when an advanced 6-lasers flow cytometer/sorter SORP FACSaria II (BD Biosciences, USA) was acquired by Nazarbayev University in 2014. Exploitation of SORP FACSaria II has brought a boost of research capabilities and competitive scientific results. In 2015, the flow cytometer/sorter was presented to The President of Republic of Kazakhstan, Nursultan Nazarbayev, during his visit to Nazarbayev University by Veronika Dashkova, a

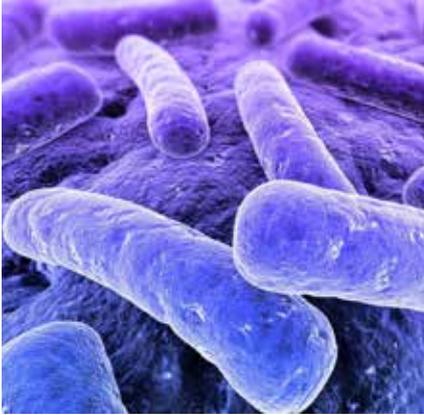


young Bolashak alum, who recently visited Harvard for 3 months after winning Kazakhstani-American CRDF grant in collaboration with Dr. Barteneva. Young scientists from Dept Biology SST, Zarina Sautbayeva and Yeldar Baiken also worked at Harvard on fellowships from International Union against Cancer (Switzerland) and Talap scholarship (NU) learning nuts and bolts of state-of-the-art technologies.

The possible applications of currently acquired ImageStream X Mark II imaging flow cytometer will include research on the role of programmed cell death in age-related, advanced screening of

target therapy programs for the development of personalized medicine, studying of development mechanisms of multiresistance of tuberculosis and other intracellular pathogens, detection and characterization of exosomes and other extracellular vesicles, screening of bioactive compounds of microalgae and many others. Future plans of creating the Center of Excellence in conjunction with Amnis-Merck and invite our colleagues from Europe and South-East Asia for joint scientific conferences and training workshops on imaging flow cytometry and its applications are under way.

RISKS FOR TUBERCULOSIS IN KAZAKHSTAN: IMPLICATIONS FOR PREVENTION



Zhaxybay Zhumadilov, General Director, NLA and Saule Rakimova, Leading researcher, NLA published their new research on tuberculosis in Kazakhstan in the *International Journal of Tuberculosis and Lung Disease* in cooperation with scientists from Columbia University, New York, USA, Columbia University Global Health Research Center of Cen-

tral Asia, Almaty, Kazakhstan and National Center for Tuberculosis, Almaty, Kazakhstan. The objective of the study was to examine associations between incarceration history and tobacco, alcohol, and drug consumption, and human immunodeficiency virus (HIV) infection and diabetes mellitus (DM) with TB.

This matched case-control study included 1600 participants who completed a survey on sociodemographics, history of incarceration, tobacco, alcohol and drug use, and HIV and DM diagnosis. Conditional logistic regression analysis was used to examine associations between a TB diagnosis and risk factors.

Participants who had ever smoked tobacco (aOR 1.73, 95%CI 1.23–2.43, P 0.01), ever drank alcohol (aOR 1.41, 95%CI 1.03–1.93, P 0.05), were HIV-positive (aOR 36.37, 95%CI 2.05–646.13, P 0.05) or had DM (aOR 13.96,

95%CI 6.37–30.56, P 0.01) were more likely to have TB. The association between TB and tobacco use, alcohol use, HIV and DM in Kazakhstan suggests a need for comprehensive intervention and prevention approaches that also address tobacco and alcohol use, DM and HIV.

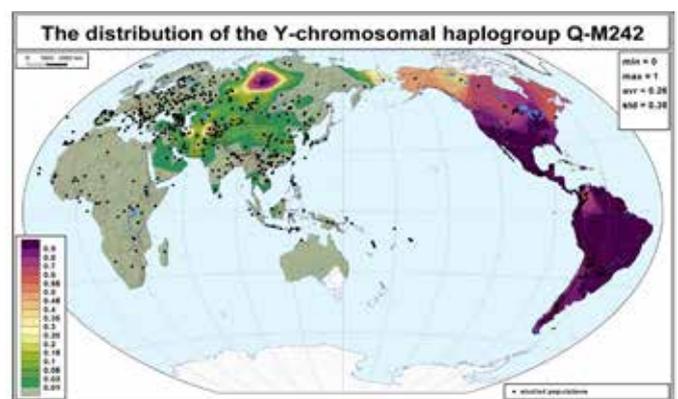
The *International Journal of Tuberculosis and Lung Disease* (IF 2.148) publishes articles on all aspects of lung health, including public health-related issues such as training programs, cost-benefit analysis, legislation, epidemiology, intervention studies and health systems research. The IJTLD is dedicated to the continuing education of physicians and health personnel and the dissemination of information on tuberculosis and lung health world-wide. Certain IJTLD articles are selected for translation into French, Spanish, Chinese or Russian.

PHYLOGEOGRAPHY OF HUMAN Y-CHROMOSOME HAPLOGROUP Q3-L275 FROM AN ACADEMIC/CITIZEN SCIENCE COLLABORATION

Maxsat Zhabagin, researcher, Laboratory For Population Genetics, NLA in cooperation with well-known scientists Oleg Balanovsky, Rebecah Canada, Nadia Al-Zahery and others published a new study in *BMC Evolutionary Biology* (IF 3,6) on the potential of full Y-chromosome sequencing for reconstructing haplogroup Q3 phylogeography.

Researchers analyzed 47 fully sequenced Y-chromosomes and reconstructed the haplogroup Q3 phylogenetic tree in detail. Haplogroup Q3-L275, derived from the oldest known split within Eurasian/American haplogroup Q, most likely occurred in West or Central Asia in the Upper Paleolithic period. During the Mesolithic and Neolithic epochs, Q3 remained a minor component of the West Asian Y-chromosome pool and gave rise to five branches (Q3a to Q3e), which spread across West, Central and parts of South Asia. Around 3–4 millennia ago (Bronze Age), the Q3a branch underwent a rapid expansion, splitting into seven branches, some of which entered Europe. One of these branches, Q3a1, was acquired by a population ancestral to Ashkenazi Jews and grew within this population during the 1st millennium AD, reaching up to 5% in present day Ashkenazi.

This study dataset was generated by a massive Y-chromosome genotyping effort in the genetic genealogy community,



and phylogeographic patterns were revealed by a collaboration of population geneticists and genetic genealogists. This positive experience of collaboration between academic and citizen science provides a model for further joint projects. Merging data and skills of academic and citizen science promises to combine, respectively, quality and quantity, generalization and specialization, and achieve a well-balanced and careful interpretation of the paternal-side history of human populations.

NLA SCIENTIFIC ARTICLE TO WIN THE JWOCN CLINICAL MANUSCRIPT AWARD



The scientific paper *A Comprehensive Review on Current Status of Topical Odor Controlling Therapies for Chronic Wounds* which has been published in the *Journal of Wound Ostomy & Continence Nursing* has won a prize of this journal *JWOCN Clinical Manuscript Award*. The authors of this paper are NLA researchers: Talgat Nurgozhin, Director, Center for Life Sciences, Timur Saliyev, Head of Laboratory of Transla-

tional Medicine and Life Sciences Technologies, NLA, and Alma Akhmetova, Junior researcher, NLA.

The prize will be given at the *Conference of Wound, Ostomy and Continence Nurses Society*, which will be held on May, 2017 at Calvin L. Rampton Salt Palace Convention Center in Salt Lake City, Utah, USA.

In this study our researchers analyzed the process of wound healing, which is often accompanied by bacterial infection or critical colonization, resulting in protracted inflammation, delayed reepithelization, and production of pungent odors. The malodor produced by these wounds may lower health-related quality of life and produce psychological discomfort and social isolation. Current management focuses on reducing bacterial activity within the wound site and absorbing malodorous gases. For example, charcoal-based materials have

been incorporated into dressing for direct adsorption of the responsible gases. In addition, multiple topical agents, including silver, iodine, honey, sugar, and essential oils, have been suggested for incorporation into dressings in an attempt to control the underlying bacterial infection. This review described options for controlling malodor in chronic wounds, the benefits and drawbacks of each topical agent, and their mode of action. Authors also discussed the use of subjective odor evaluation techniques to assess the efficacy of odor-controlling therapies. The perspectives of employing novel biomaterials and technologies for wound odor management were also presented.

To read more visit:
<https://www.ncbi.nlm.nih.gov/pubmed/27684356>,
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5098468/>

ANNOUNCEMENTS:



National Laboratory Astana, Nazarbayev University and the International Science and Technology Center (ISTC) conduct preparatory works for the organization of Antibiotic Resistant Strains workshop that will be held on June 21 – 22, 2017 in Astana, Kazakhstan.

More than 20 scientists from different countries (USA, Italy, Sweden, Japan, Israel, Armenia, Kyrgyzstan, Georgia and Kazakhstan) will come together to discuss several aspects of antibiotic resistance (ABR): on molecular methods of studying antibiotic resistance strains, on the problem of antibiotic resistance in pediatrics, alternative ways of antibiotic use, and influence of antibiotic resistance to society and environment.



National Laboratory Astana is pleased to announce the launch of the IV Asian Congress on Radiation Research, which will be held under the EXPO 2017 program in Astana on August 16-18, 2017. The purpose of the Congress is to dis-

cuss the most important achievements and trends in the peaceful use of the atom, radiation safety of personnel of radiation-hazardous enterprises and modern methods of reducing radiation risk during work with sources of ion-

izing radiation. The lecturers and speakers of the Congress are leading scientists and radiobiologists from Kazakhstan and foreign states. All information about the Congress is available at www.acrr2017.kz