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IN THIS ISSUE

NU PRESIDENT HAS BEEN AWARDED THE STATE PEACE AND PROGRESS PRIZE OF THE FIRST PRESIDENT OF THE REPUBLIC OF KAZAKHSTAN

On December 8th Mr. Shigeo Katsu has been awarded the State Peace and Progress Prize of the First President of the Republic of Kazakhstan – Elbasy 2020 for his contributions to the development of education and science, strengthening peace, friendship and trust among the people.

Shigeo Katsu became President of Nazarbayev University in 2010. In this role, he focused on setting the strategy and policies of the University, developing sustainable partnerships with national and international organizations. One of the key missions of NU is to improve Kazakhstan's workforce through educating a new generation of leaders in government, industry, academia and research.

Another mission is to establish a hub for science and technology innovation supporting collaboration within and across disciplines with regional and international partners. Important to note that NU students can participate in faculty research at an early stage. This is a great opportunity not only to observe but also to perform actual research activities, attend prestigious conferences, and co-author scientific publications.

We congratulate Mr. Katsu on receiving this distinguished award, which is an important acknowledgement of the collective effort of the whole NU community.

NU HAS WON THE WEB OF SCIENCE «LEADER OF SCIENCE 2020» AWARD

Every year Clarivate Analytics presents the Web of Science Award "Leader of Science" to educational establishments, research institutions, scientific journals, and individual scholars, whose contribution to the development of higher education and scientific research is the most impactful and meaningful.

This award is often referred to as one of the most prestigious in global and regional academic communities and the number of awardees in any year never exceeded 500 worldwide.

Since 2011, these awards have been presented in Kazakhstan at the annual award ceremony, featuring well-known scientists and researchers as well as representatives of public authorities and mass media.

We are pleased to announce that Nazarbayev University has won the independent Web of Science Award "Leader of Science" in the following nominations:

1. "*Publication Leader in Web of Science Core Collection in the last three years among universities of the Republic of Kazakhstan*"
2. *Authors from Kazakhstan of a highly cited article in Nanotechnology* - Zhumabay Bakenov and Aliya Mukanova
3. "*Top peer reviewer*"– Abduzhappar Gaipov, Timur Atabaev and Ruslan Kalendar
4. "*Publication Leader in social sciences*" – Aliya Kuzhabekova and Maxat Kassen

We congratulate all the winners and wish them even more success in future!

STATE SCHOLARSHIPS AND AWARDS FOR YOUNG RESEARCHERS

Aishuak Konarov, Postdoctoral scholar at the School of Engineering and Digital Sciences, has received the State Scientific Scholarship granted by the Ministry of Education and Sciencefor young researchers who are under the age of thirty-five (inclusive). Aishuak has obtained his PhD degree in Nanotechnology and Advanced Materials from Sejong University and has a strong research background in Chemical Engineering, Electrochemistry and Solid-state Chemistry.

NU PhD Candidate Assem Ashimova has earned the Government Youth Award in Science- Daryn 2020. Her research interests are in cell biology, immunobiology, biochemistry, and gene therapy. Assem is conducting her research project titled «Delivery of monoclonal antibodies from microencapsulated mesenchymal stem cells» supervised by Dr. Gonzalo Hortelano.

NLA RESEARCHERS WERE AWARDED ACADEMIC RANKS

WRITTEN BY ZHAZIRA BUKINA

On November 27th, Serik Irsaliev, Chairman of the Committee for Quality Assurance in the Sphere of Education and Science of the Ministry of Education and Science, announced that the following five NLA researchers were awarded new academic ranks:

• Ainur Akilzhanova and Almagul Kushugulova were awarded the academic ranks of Professor in the specialty «Medicine»
• Ulan Kozhamkulov and Saule Rakhimova were awarded the academic rank of Associate Professor in the specialty «Medicine»
• Bakhyt Matkarimov was awarded the academic ranks of Professor in the specialty «Informatics, Computer Science and Management»

The announcement can be accessed via the link.

NU RESEARCHERS AMONG TOP TWO PERCENT OF THE SCIENTISTS OF THEIR MAIN SUB-FIELD DISCIPLINE

PREPARED BY DR. SHAZIM MEMON

According to a recent study led by Dr. Loannidis from Stanford University, eight of the currently NU affiliated researchers were among the top two percent of scientists of their main sub-field discipline. Researchers were classified into 176 sub-fields. The names of NU researchers are as follows.

Massimo Pignatelli
Oncology &
Carcinogenesis

Saffet Yagiz
Geological &
Geomatics Engineering

Shazim Memon
Building &
Construction

Jean-Jacques Zondy
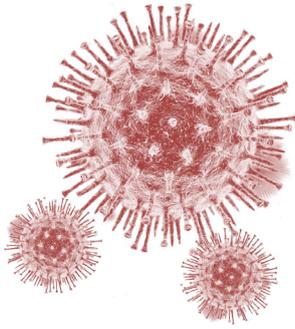Optics

Anton Desyatnikov
Optics

Konstantinos Valagiannopoulos
Networking &
Telecommunications

Alex Ruderman
Electrical & Electronic
Engineering

Daniele Tosi
Optoelectronics &
Photonics

TRAFFIC LIGHT SYSTEM AS A TOOL ON ASSESSING RISK LEVEL ASSOCIATED WITH COVID-19 IN KAZAKHSTAN

Dr. Paolo Colet
Project PI

Alua Yeskend
Research Assistant

Dr. Antonio Sarria-Santamera
Project Co-PI

The project "**Clinico-epidemiological assessment of COVID 19 infection in Kazakhstan**" (Award number: 280720FD190) is one of the projects funded by Nazarbayev University to contribute to fight the COVID-19 pandemic in the country.

The group of researchers participating in this project (health practitioners, epidemiologists, and public health professionals) have developed a «traffic light» color-coding system to monitor the evolution of the COVID-19 infection. The color-coding system gives an overview of the coronavirus epidemiological situation in the at Nur-Sultan and at the country level.

The color code reflects the epidemiological situation based on two critical criteria: the number of new positive cases in the last 14 days per 100 000 population and the percentage of positive cases out of the total number of tests administered in the last 7 days. Based on these criteria, the country or city is assigned to one of the color-coded categories: green, yellow, or red. Green indicates minimal spread, while yellow indicates the virus's moderate spread in the county/city. Red indicates that the virus is widespread in the county/city and demands more strict measures to keep the pandemic under control.

The traffic light system to assess the risk levels associated with COVID-19

Green area: low risk
Less than 25 cases / 100 000 people
Positive test: less than 4%

Orange area: medium risk
Less than 50 cases / 100 000 people
Positive test: 4% or more

Between 25 and 150 cases / 100 000 people
Positive test: less than 4%

Red area: high risk
More than 50 cases / 100 000 people
Positive test: 4% or more

More than 150 cases / 100 000 people
Positive test: n/a

A "traffic light" color-coding system gives a better overview of the coronavirus situation in the country. The system allows to guide authorities on Covid-19 measures to limit the spread of the virus and develop an effective strategies to prevent further transmission of the infection.

According to the model country is assigned into one of the three categories depending on the incidence per 100,000 population in the previous 14 days and the test positivity rate in the last 7 days.

This approach allows to predict the prognosis of COVID-19 and timely take measures to prevent high community-level transmission.

A color-coding framework for COVID-19 can be used for risk management. This approach with color-coded zones based on risk levels works as an alert system, which predicts the prognosis and development of COVID-19. When the county/city is shown in green, it does not mean that there are no risks. It just indicates a lower comparative risk in the ongoing coronavirus pandemic. This color-coded system can quickly inform the community about the level of threat associated with COVID-19. Moreover, it provides individuals with guidance on how to act at different risk levels.

Матрица оценки эпидемиологической ситуации в регионах Казахстана (на 06.01.2021)
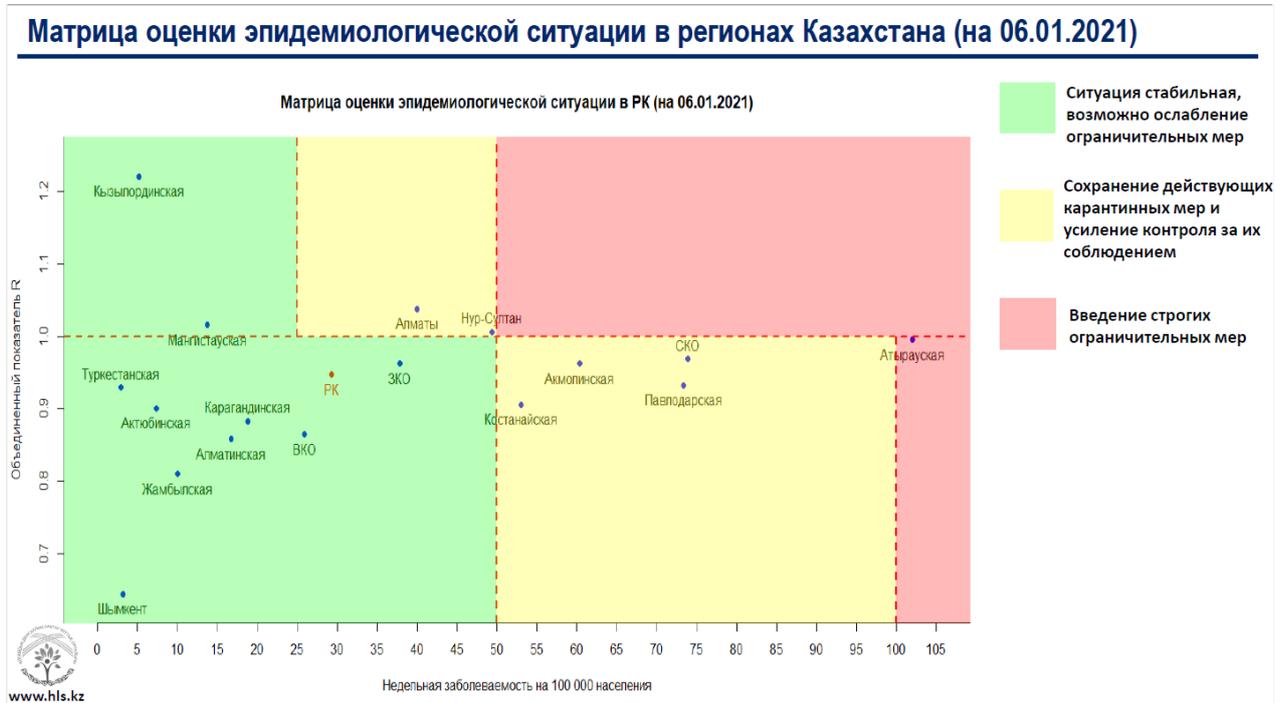
Weekly updates of the "traffic light" indicators, together with all the relevant information provided by the Ministry of Health as well as with the data of the COVID-19 testing strategy implemented by the University, is permitting Nazarbayev University authorities a continuous assessment of the evolution of the pandemic and make informed decisions to guarantee the safety and wellness of our community, students, staff, and faculty, while maintaining the academic activities and business operations, adapted to the specific epidemiological situation and strengthening if necessary the intensity of preventive measures.

Nazarbayev University started to use a "traffic light system" to monitorize the evolution of the pandemic in October as part of the weekly COVID risk assessment, which also include the cases detected among members of our community. In November the National Center for Public Health of the Ministry of Health also started to use a "traffic light system". This risk assessment is based on two criteria, including R or the basic reproduction number and the number of new positive cases in the last 7 days per 100 000 population. Matrix for assessing the epidemiological situation in the regions of Kazakhstan has been updated daily since November 17, 2020 and is available on the web page (hls.kz) of the National Center of Public Health Care of the Ministry of Health.

Nazarbayev University weekly "traffic light system" uses the indicators proposed by the European Center for Disease Control adopted in support of the Council Recommendation on a coordinated approach to the restriction of free movement in response to the COVID-19 pandemic by EU Member States on 13 October 2020. The EU maps are based on data reported by EU Member States every Tuesday (link).

This green traffic light status applies to regions or a country with less than 25 new positive cases per 100,000 population in the last 14 days and where the percentage of positive tests is less than 4%. Yellow applies to regions having less than 50 new positive cases, and the test positivity rate is over 4%, or the number of new cases is between 25 and 150 and test positivity is lower than 4%. The red traffic light status is assigned when the number of new cases is 50 or more and the test positivity rate is 4% or higher or the test positivity rate is below 4% and the incidence is equal to or more than 150 cases per 100 000 population.

THE TRAFFIC LIGHT MODEL FOR KAZAKHSTAN
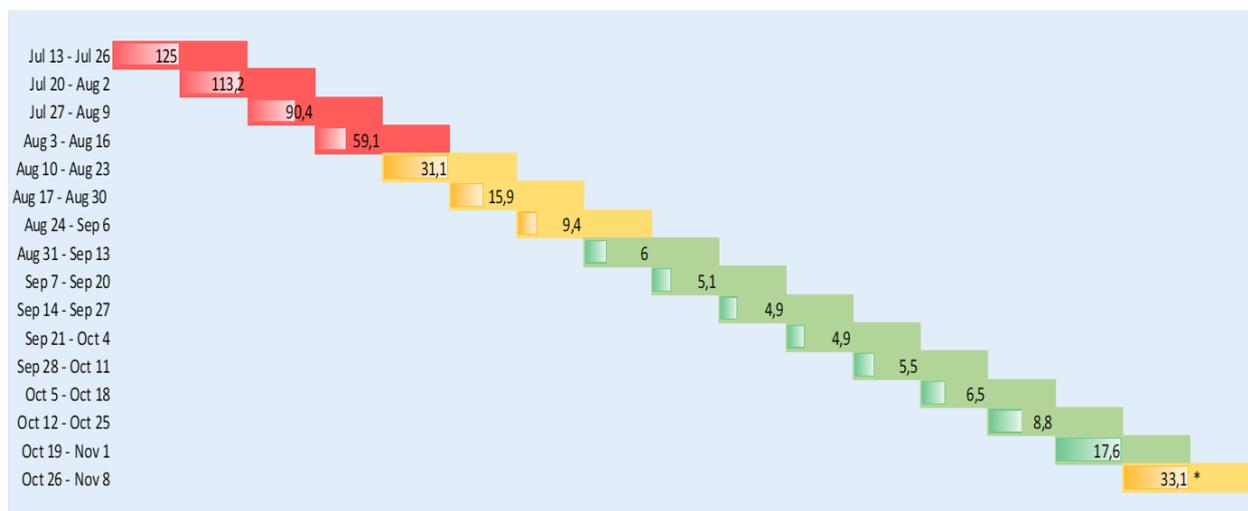
*A risk mapping was done only based on the cumulative number of cases per 100 000 population

The validity of the «traffic light» was tested retrospectively using available data from Kazakhstan, and it provided a good estimation of the pandemic's impact. In the figure we could see how the traffic light would have looked like during the summer, when both the country and the city suffered a significant surge in cases.

SHARED BY PROF. ANTONIO SARRIA-SANTAMERA

Dr. Faye Foster

THE IMMEDIATE AND LONG-TERM MENTAL HEALTH EFFECTS OF PROVIDING FRONT-LINE HOSPITAL MEDICAL CARE DURING THE CORONAVIRUS PANDEMIC IN KAZAKHSTAN

«it is extremely important to think about innovative ways to target and treat frontline health professionals, especially in Kazakhstan, which has an ill-equipped mental healthcare system»

The COVID- 19 pandemic is having a substantial psychological impact on medical workers providing care to COVID-19 patients (Lai, Ma & Wang et al, 2020). It is now extremely important for us to think about ways to prevent their mental health from deteriorating while also coming up with innovative ways to target and treat the more at-risk groups, such as those have been quarantined, or worked in high-risk locations. In order to do so however, we need to evaluate their mental health now and in the long term in order to know how/where to target interventions.

At present our country is focused on providing medical care and services to treat those infected with this highly contagious virus, and perhaps understandably, not preparing for a second potential 'epidemic' of mental health issues. What is additionally disconcerting is that Kazakhstan's mental health system is inadequate and understaffed and is in no way prepared to manage the onslaught of mental health issues both during and after such a mass crisis. Given the large treatment gap in addressing common symptoms of mental distress in the country, identification of front-line professionals most in need of mental health interventions is important and beneficial for the society as a whole.

We know that mental health problems are inevitable, results of a recent survey study by Lai, Ma, Wang et al (2020), show that health care workers in Wuhan and other regions of China are experiencing psychological burden related to the coronavirus pandemic; in Wuhan, nurses and frontline health care workers directly engaged in the diagnosis, treatment and care of patients with COVID-19 were especially affected. Pappa, Ntella, & Giannakas et al (2020) conducted a systematic review and meta-analysis prevalence of depression, anxiety and insomnia among healthcare workers during the COVID-19 pandemic. Thirteen studies were included in the analysis with a combined total of 33062 participants. Anxiety was assessed in 12 studies, with a pooled prevalence of 23.2%, depression in 10 studies, with a pooled prevalence rate of 22.8% and insomnia in 5 studies with a pooled prevalence of 34.3% . The authors conclude by stressing the need to establish ways to mitigate mental health risks and adjust interventions under pandemic conditions. These findings are consistent with those of studies in health care workers in the context of severe acute respiratory syndrome (SARS) and botulism outbreaks and in fact, research conducted on the long-term detrimental impact of SARs on mental health of health care workers, provides an insight as to what we can expect a long term consequence of this coronavirus pandemic (Maunder et al, 2003; Cohen & Anderson, 1986).

Currently, a research team from Nazarbayev University School of Medicine is conducting a study entitled "The Immediate and Long-term Mental Health Effects of Providing Front-Line Hospital Medical Care During the Coronavirus Pandemic in Kazakhstan". The purpose of the study is to establish the prevalence of anxiety, depression and insomnia among frontline medical professionals in Kazakhstan who are treating patients with coronavirus disease; to look at what factors and events (front line traumatic events) are associated with depression and anxiety outcomes; then, to follow change over time in professionals within the smaller cohort to identify interpretable patterns of depression and anxiety symptoms. For participation in our study, we plan to recruit frontline medical staff engaged in the diagnosis, treatment and care of patients with COVID-19 in Nur-Sultan, Almaty and Karaganda. The research methods include an online survey as well as a follow-up longitudinal cohort study (a survey and semi-structured, in-depth telephone interviews) involving a smaller subsample of hospital frontline medical workers.

Questions will be assessing exposure to a wide range of factors and events which may contribute to anxiety and/or depression of health care workers including the following: emotional strain and physical exhaustion when caring for growing numbers of acutely ill patients of all ages who have the potential to deteriorate rapidly, concerns about infecting family members with coronavirus from workplace exposures, especially family members who are older, immunocompromised, or chronically ill; anxiety about assuming new or unfamiliar clinical roles and expanded workloads in caring for patients with COVID-19; accessible mental health services for managing depression, anxiety, and psychological distress and many more.

Study results are intended to support the future development of targeted programs and effective health policies and strategies for front-line health professionals who are at risk of distress and in need of mental health support now and in the long-term.

«developing effective health policies and strategies aiming at those front-line health professionals who are at risk of distress is beneficial for the society as a whole»

As already mentioned, it is extremely important to think about innovative ways to target and treat frontline health professionals, especially in Kazakhstan, which has an ill-equipped mental healthcare system. It is prudent therefore, to consider mental health assessment measures that can be easily adopted in routine public health services for screening, selection of high-risk groups, and ongoing monitoring. The shorter the screening measures the more readily they can be applied in busy and stretched health care environments. In that regard, it remains to be clarified whether instruments that contain lists of both common depressive and anxiety symptoms are necessary to achieve the outcome of defining persons in distress. In cross-sectional studies, symptoms of anxiety and depression commonly overlap; it may also be the case that there is a pattern of transition from one symptom pattern to the other over time (Lamers et al, 2012; Forbes et al, 2015) If so, it may be sufficient to measure one domain only, for example, symptoms of depression, allowing inferences to be drawn about the likely prevalence and trajectory of anxiety.

As said, a second important consideration to ensure capacity for translation into effective health policy within Kazakhstan is the identification of front-line professionals most in need of mental health interventions given the large treatment gap in addressing common symptoms of mental distress in the country; a problem arising from an scarcity of skills and resources. One partial solution is to look to applying targeted programs to those most in need and those particularly vulnerable in the long-term. To do so it is important to define subpopulations that follow distinctive symptom trajectories over time. It is important to identify and characterize subpopulations for example, those with persisting symptoms and those at risk of new onset distress. In addition, from a health and translational perspective, it is vital to identify potentially modifiable factors that shape symptom trajectories, knowledge that will direct intervention programs for front-line health professionals toward strategies that are most likely to mitigate or prevent mental distress in the population as a whole.

In the long term, developing effective health policies and strategies aiming at those front-line health professionals who are at risk of distress is beneficial for the society as a whole. Thus, it is vital to identify potentially modifiable factors that shape symptom trajectories, knowledge that will direct intervention programs for front-line health professionals toward strategies that are most likely to mitigate or prevent mental distress in the population as a whole. Our study will have the capacity for translation into effective health policy within Kazakhstan: it is intended for the results to support the development of targeted programs for frontline health care workers in need of mental health support.

PREPARED BY PROF. FOSTER FAYE

HOW IS COVID-19 EXPERIENCE TRANSFORMING SUSTAINABILITY REQUIREMENTS OF RESIDENTIAL BUILDINGS?: A REVIEW

«existing building sustainability rating methods that mainly favor 'environmental impact' and 'energy performance' of buildings will receive a significant shift towards emphasizing 'social and health'»

Dr. Ferhat Karaca

December 2019 marked the beginning of a novel disease outbreak. In a short time, rapidly propagating COVID-19 has forced people to spend most of their time at home to prevent the risk of viral spread. This study addresses a critical question to the community of building sustainability research: «What can we learn from the recent pandemic to modify the building suitability criteria to promote more sustainable living conditions during such difficult periods affecting entire populations?» We specifically expect that existing building sustainability rating methods that mainly favor «environmental impact» and «energy performance» of buildings will receive a significant shift towards emphasizing «social and health» aspects.

Category	Current problems	Expected changes
Health & Safety	• Existing buildings have many surfaces of contact (elevators, doors, ladders) which can transmit the virus among occupants. • Lockdowns tend to increase the frequency of domestic violence, and most existing residential buildings lack any service or facility that could help the victims. • Housings that lack proper comfort can lead to a decline in both physical and psychological health.	• Self-cleaning spaces and touchless technologies to decrease the contact with infected surfaces. • Surfaces that inactivate the viruses. For example, copper and its alloys can kill the microorganisms and viruses. • Addition of green spaces into residential building designs will enhance mental health of the residents decreasing the stress, anxiety, depression during lockdowns. • Constant ventilation of the air is essential for maintaining clean indoor air conditions to prevent spread of virus.
Environment	• Increased energy usage due to global lockdowns (e.g., cooking, the use of ICTs, laundry, entertainment) creates a greater and need for sustainable energy sources. • Households are not ready to manage the possibly infected waste. • Increased water consumption due to lockdowns might lead to water shortages. • Proper wastewater management becomes more important since the virus is able to transmit via human feces, contamination the pipelines.	• Application of energy consuming technologies and smart systems, which would increase the efficiency of the home. • Careful management of potentially infected solid waste such as masks, and gloves. • Wastewater needs to be properly treated and sanitized to diminish virus spread.
Comfort	• Unavailable ICTs lead to a deficient use of necessary services (e.g., medical consultation, food/medicines delivery). • Lack of independent local stores and pharmacies might create a crisis during lockdowns due to an insufficient amount of necessary reserves.	• Easy, fast, and smart control of home environment via automotive technologies. • Well-designed layout should provide comfortable and safe condition for working and relaxing at the same time. • All family members should have a personal space for some private time.

COVID-19 pandemic and lockdown measures have revealed the deficiencies in the existing residential buildings in terms of health & safety risks, environmental resources excess consumption, and lacking personal comfort. To improve health & safety in houses, following changes are expected: widened use of touchless and automotive technologies; selection of finishing materials with regards to viral survivability; development of green spaces. As a response to environmental needs, sustainable technologies are needed to improve increased consumption of energy and water. For comfort enhancement, residential houses need to improve communication technologies for better use of the remote services, and use automotive technologies for better regulation of air quality, light, temperature, humidity, etc.

Future scenarios cannot be precise, as the coronavirus nature and its behavior are still being researched. Nevertheless, humanity should be ready for possible outbreaks. Therefore, it is crucial to understand the requirements under pandemic scenarios and design resilient solutions. Future work can proceed in either development of novel building codes and green certificates for the post-pandemic residential buildings or modification of existing ones considering pandemic needs.

WRITTEN BY PROF. FERHAT KARACA

BATTLING HOST PROTEASES TO PREVENT PRODUCTIVE INFECTION BY SARS-COV-2 AND SEVERE COMPLICATIONS OF COVID-19
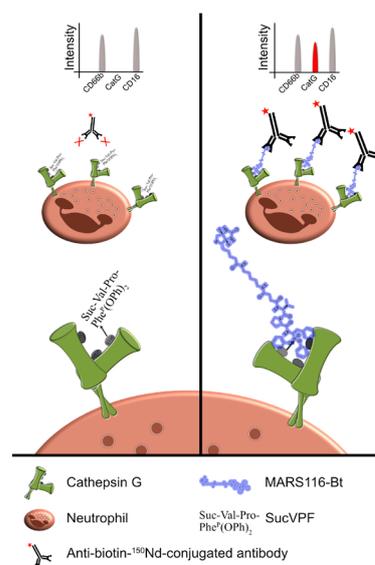
Dr. Timo Burster

In naso-oropharyngeal swap samples of SARS-CoV-2 positive patients were found that neutrophil elastase (NE) and cathepsin G (CatG) were significantly upregulated at the site of infection 1. This is not surprising since during an immune response NE, CatG, proteinase 3 (PR3), and neutrophil serine protease 4 (NSP4) are secreted by neutrophils. Neutrophils are immune cells which infiltrate to the location where the infection takes place 2. In addition to secreted CatG, this protease binds also to the cell surface of neutrophils as well as other immune cells and is proteolytically active 3. The failure of tightly regulated proteolytic activity of proteases can cause harm and are responsible for pathophysiology conditions 4. For instance, inflammation, fibrosis, and thrombosis are severe outcome of COVID-19 and might be supported by neutrophils 5. Whether CatG is involved in COVID-19 is unclear. In order to investigate neutrophils and CatG, first we established a new method to analyze proteolytic active CatG in complex biological samples.

So far, the analysis of proteases by mass cytometry by time-of-flight (CyTOF) has been limited to analysis at the protein level. Here we applied an activity-based probe to detect CatG activity on the cell surface of neutrophils in complex biological samples by CyTOF. CyTOF is the next generation of flow cytometry with multiplexed profiling of up to 100 surface markers and can be used to observe the activation or inhibition status of neutrophils during inflammation. This method enables an accurate data acquisition from complex biological samples with a huge panel of cell subset markers in a single cell profiling. The Activity-based probe-biotin-anti-biotin-150Nd-antibodies are used for profiling and evaluation of catalytically active CatG, its regulation, or inhibition on the cell surface of neutrophils (figure). CyTOF and the application of activity-based probes can be extended to other neutrophil serine proteases, such as NE. Indeed, NE has be shown to be crucial in the infection rate of SARS-CoV-2 just recently (DOI: 10.1101/2020.06.20.161323).

Fabian Gärtner, Uwe Knippschild, and Timo Burster. Application of an activity-based probe to determine proteolytic activity of cell surface cathepsin G by mass cytometry data acquisition. 2020. Oct 19;5(43). ACS Omega. IF: 2.87 SJR: 0.77, Q1

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# EXTENSIVE TESTING AND CONTACT TRACING MIGHT BE MORE EFFECTIVE IN SUPPRESSING COVID-19 – A NEW DEVELOPMENT OF ISSAI SCIENTISTS

With the use of their new development, scientists from the Institute of smart systems and artificial intelligence have revealed that the joint use of mass testing, and contact tracing of the infected people using a special mobile application, can effectively suppress the epidemic spread and avoid strong restrictions and quarantine regime.
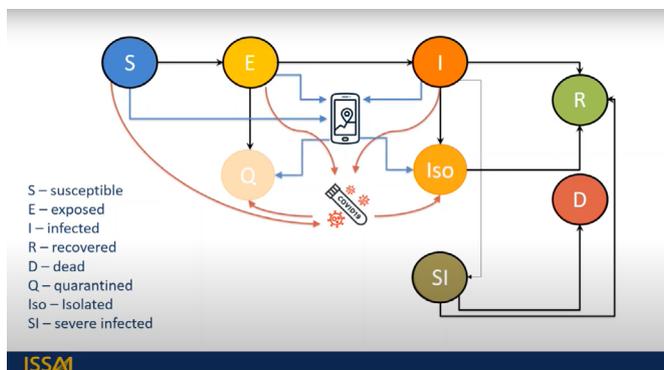
In their work, the scientists used their new development - a particle-based COVID-19 simulator. It presents people as small particles on a 2D map with their position, velocity, and epidemiological state (infection state), availability of contact tracing application that informs in case of contacting the particles that is later found to be infected, and the results of the COVID-19 testing.

In their study, researchers used the real data from the province of Lecco in the Lombardy region, which was the epicenter of the infection in Italy. In the course of modelling the spread of infection, the researchers found that the use of the above two measures as contact tracing of infected people and population testing would significantly reduce infection and mortality rates.
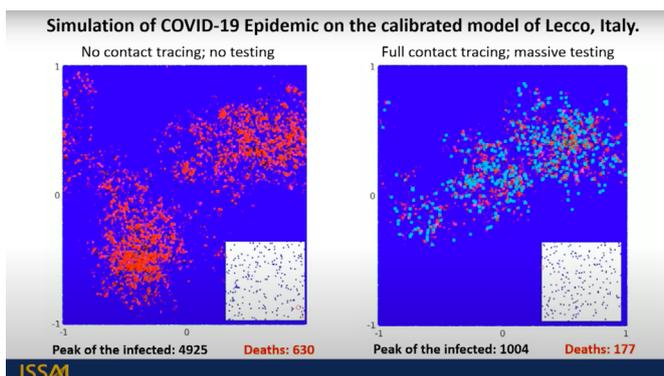
In the model, particles (or people) are divided into different categories, each with different color, depending on their epidemiological status/infection state. On a 2D map the model visually presents and divides people into infected and healthy ones by color, and shows their movement and the spread of disease. This, in turn, helps to have an idea of the volume of infected and healthy citizens on the 2D map, the number of people in each epidemiological status, the speed of infection spread, and also to understand the effectiveness of the measures taken.

The results can be presented as a graph or as in a visual interface (2D map).

Short video of the project is available via the link.

For more information, please visit the ISSAI website
Follow ISSAI on Social Media

DR. MICHAEL RYAN TO SERVE AS SERIES EDITOR FOR ROUTLEDGE'S "THE COVID-19 PANDEMIC" SERIES

Dr. Michael Ryan (Assistant Professor of Sociology) is now the series editor for Routledge's new "The COVID-19 Pandemic" series. The series examines the impact of the COVID-19 pandemic on individuals, communities, countries, and the larger global society from a social scientific perspective. It represents a timely and critical advance in knowledge related to what many believe to be the greatest threat to global ways of being in more than a century. It is imperative that academics take their rightful place alongside medical professionals as the world attempts to figure out how to deal with the current global pandemic, and how society might move forward in the future. This series represents a response to that imperative.

You can find out more about the series on Routledge's series page or through the official Facebook page. Those interested in potentially submitting a proposal or finding out more about the series can contact Dr. Ryan at michael.ryan@nu.edu.kz
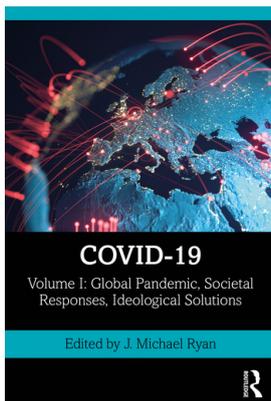
DR. MICHAEL RYAN HAS EDITED TWO NEW COVID-19 RELATED VOLUMES

Dr. Michael Ryan (Assistant Professor of Sociology) has recently edited two new volumes related to the COVID-19 pandemic – COVID-19: Global pandemic, societal responses, ideological solutions (Routledge 2021) and COVID-19: Social consequences and cultural adaptations (Routledge 2021).

The scholarship included in these volumes provides critical insights into the ethics and ideologies, inequalities, and changed social understandings that lie at the heart of this pandemic.
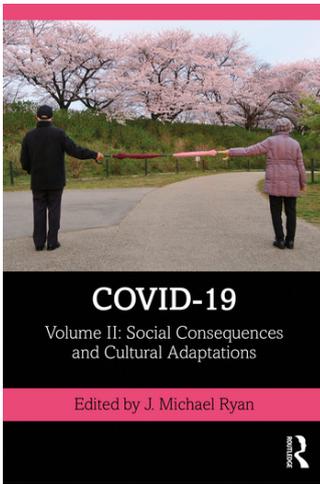
The twin volumes map out the ways in which the pandemic has impacted (most often disproportionately) societies, the successes and failures of means used to combat the virus, and the considerations and future possibilities – both positive and negative – that lie ahead. While the pandemic has brought humanity together in some noteworthy ways, it has also laid bare many of the systemic inequalities that lie at the foundation of our global society. These volumes represent a significant step toward better understanding these impacts.

The work presented in the two volumes represents a remarkable diversity and quality of impassioned scholarship and is a timely and critical advance in knowledge related to the pandemic. The volumes are the result of the collaboration of more than 50 of the leading social scientists from across five continents. The breadth and depth of the scholarship is matched only by the intellectual and global scope of the contributors themselves. The insights presented in these volumes have much to offer not just to an understanding of the ongoing world of COVID-19, but also to helping us (re-) build, and better shape, the world beyond.

RECENT BOOK BY DR. MICHAEL RYAN NAMED A 2020 CHOICE OUTSTANDING ACADEMIC TITLE

Dr. Michael Ryan's recent edited collection (with Helen Rizzo), Gender in the Middle East and North Africa: Contemporary Issues and Challenges (Lynne-Rienner Press, 2020), has been named a 2020 CHOICE Outstanding Academic Title. It was among 531 books and digital resources chosen by the CHOICE editorial staff from among the more than 3,500 titles reviewed by CHOICE during the past year. CHOICE reviews are considered the premier source for reviews of academic books, electronic media, and internet resources of interest for those in higher education.

NU PROFESSORS INVOLVED IN AN INTERNATIONAL AND INTERDISCIPLINARY PROJECT SUPPORTING BETTER EDUCATION PROVISION IN CONFLICT AFFECTED COUNTRIES

NU professors Dr. Naureen Durrani (Graduate School of Education) and Dr. Helene Thibault (School of Sciences and Humanities) have won a prestigious and highly competitive grant in collaboration with three international universities.

Members of the PEER Network meeting with Professor Shose Kessi, Dean of Humanities at the University of Cape Town

Their project is funded by the Global Challenge Research Fund (GCRF) and awarded by the UK Research and Innovation (UKRI). Titled 'The PEER Network', the project is a three-year initiative led by four universities (Nazarbayev University, Ulster, Cape Town, and Sussex) aimed at improving the quality of political analysis of education in conflict-affected countries. The core objective of the PEER Network is to develop a critically and locally grounded approach to Political Economy Analysis (PEA) of Education that will help national, regional and global level policymakers and practitioners to make socially just decisions about education that benefit children in contexts of conflict and crisis. The project builds on the previous research of Professor Durrani on the relationship between education, conflict and social cohesion.

THE POLITICAL ECONOMY OF EDUCATION AT NU

In collaboration with Dr Thibault, Professor Durrani will direct the development of a regional hub of political economy analysis (PEA) of education expertise across Central Asia. Professor Durrani and Dr Thibault will review commissioned PEA research studies in Central Asia and mentor successful PEA research teams. Both will produce a synthesis report based on the commissioned PEA research in Central Asia and disseminate findings across Central Asian countries and at the global level to influence change in global practice in PEA for the benefit of children and young people in conflict-affected countries.

Professor Durrani said, "This project will provide a hub for education researchers, activists, policy-makers and civil society organisations to develop and share their expertise and knowledge for developing innovative and locally grounded ways that ensure education systems in Central Asian countries contribute towards social justice and peacebuilding".

In connection to this project, a postdoctoral position will be announced shortly.

Watch the introductory lecture here.

A NOVEL WINS THE ALL-RUSSIA STATE LIBRARY «GLOBUS» PRIZE
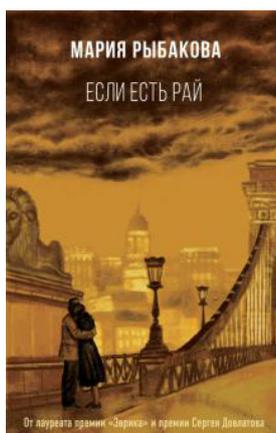
Maria Rybakova's novel «If There's Paradise» («Esl est rai») was published by Eksmo, one of the largest publishing houses in Russia, in August 2020. This novel has received the «Globus» prize awarded by the All-Russia State Library of Foreign Literature. Inspired by the work of the Hungarian emigre writer Sandor Maria (author of «Embers») and by the 60th anniversary of the 1956 Uprising in Hungary, the novel takes place in Budapest. There, the Russian protagonist, in thrall to a forbidden love, re-thinks a treason she had committed in her youth, as well as the sinister pages of the history of her own country.

Maria is an Associate Professor at the Department of Languages, Linguistics and Literatures. Her research interests include Literature, History of religions (especially Mircea Eliade), and Memory Studies.

GEN•CON• The Consortium of Gender Scholars

THE CONSORTIUM OF GENDER SCHOLARS YEAR IN REVIEW

The primary purpose of GenCon is to generate research designed to make meaningful change in various areas of society with regard to gender equality and the advancement of women. During the unprecedented disruption, we took time to regroup and determine the needs of the GenCon community. We found great interest and need for continued gender scholarship. The following provides highlights of the expanded research, interdisciplinary collaboration, and extended networks locally and internationally.

Executive, Organizing, and Advisory Team

Anna CohenMiller (Graduate School of Education, NU)

Jenifer Lewis (Graduate School of Business, NU)

Loretta O'Donnell (Vice Provost, Academic Affairs, NU)

Zhanna Izekenova (Graduate School of Education, NU)

Douglas CohenMiller (Umbrella Works Design Studio)

Joseph Yap (Subject Librarian for GSE, GSB, GSPP, NU Library)

Almira Tabaeva (Independent scholar, GenCon)

Sejin Koo (Political Science, Inha University, Korea)

Yulia Kaufman (NU Graduate School of Education Alumni)

Zumrad Kataeva (Graduate School of Education, NU)

Anara Sandygulova (Robotics & Mechatronics, NU)

Naureen Durrani (Graduate School of Education, NU)

Neil Collins (Political Science & International Relations, NU)

Aray Saniyazova (GSE PhD Alumni, Higher School of Economics, Moscow, Russia)

Expansion of Local and International Networks

Multiple steps have been taken by The Consortium of Gender Scholars to expand the local and international networks for mentorship and scholarship.
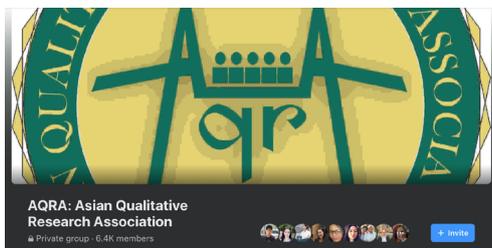

Nazarbayev University Repository

With the permission of presenters, research talk presentations and publications are being added to the official NU Repository.

AQRA: Asian Qualitative Research Association
Private group · 6.4K members

Development of International Networks

GenCon has become a network member with the Asian Qualitative Research Association, an association of over 6,000 members. This expanded network of scholars has led to scholarly outputs, mentorship, research talks, and conference presentations.

Naureen Durrani was an invited speaker on an international webinar organized by a London-based Organization, The Maple Advisory Group. Professor Durrani discussed the ways textbooks construct gender in a range of contexts and what educational measures could help ensure that education plays a transformative role in supporting gender equality.

Social Media

GenCon has expanded the social media reach to the local, regional, and international community through Facebook, Instagram, and most recently to LinkedIn and YouTube where you can find the most recent GenCon research talks.

GenCon RESEARCH TALKS

During the Fall 2020 semester, GenCon presented virtual Research Talks with participants from over 10 countries, including Kazakhstan, Spain, UK, Philippines, Korea, India. The following provides a brief overview of each talk and a link to the presentation. The recordings can be found on YouTube and the presentations at the NU Repository.

NU GenCon Research Talk, Ainur Kenebayeva, 10 October 2020

Stress Factors for Female Teachers at Remote-Online Environment in Conditions of COVID-19: the Case of Central Asia
Ainur Kenebayeva, Director of the Research Institute for Social & Gender Studies, Kazakh National Women's Teacher Training University, presented about the ongoing empirical exploratory study, using the mixed-method analysis to uncover stressors that teachers undergo pre and post-pandemic periods. The online questionnaire includes to date over 700 potential respondents in Kazakhstan and Kyrgyzstan, with next steps expected to include UNESCO support and an expansion to include Tajikistan and Uzbekistan through adapting the pilot testing to each specific region in Central Asia.

Stress Factors for Female Teachers at Remote-Online Environment in Conditions of COVID-19: the Case of Central Asia

Ainur Kenebayeva, Director of the Research Institute for Social & Gender Studies, Kazakh National Women's Teacher Training University, presented about the ongoing empirical exploratory study, using the mixed-method analysis to uncover stressors that teachers undergo pre and post-pandemic periods. The online questionnaire includes to date over 700 potential respondents in Kazakhstan and Kyrgyzstan, with next steps expected to include UNESCO support and an expansion to include Tajikistan and Uzbekistan through adapting the pilot testing to each specific region in Central Asia.

Changing personal care and healthcare behaviour by physicians during the COVID-19 pandemic: Evidence from Kazakhstan

Dana Bazarkulova, Assistant Professor in the Economic Department at NU, examined the gender differences in self-reported stress, anxiety, and behaviors of doctors and the effect of COVID-19 on the frequency of doctor visits. The emphasis was on the probability of self-treatment and informal physician consultations. Results have shown that married women doctors were more likely to experience stress during the pandemic compared to unmarried ones without children (dual role of professional mothers). In contrast, married men doctors are less likely to experience stress and anxiety during the pandemic, compared to unmarried ones. Overall, there was no strong evidence that doctors in Kazakhstan changed their personal behaviors as the result of COVID-19 pandemic.

Gender stereotypes about managers: a comparative study of CE Europe and Central Asia

Anastassiya Lipovka, PhD Candidate at Almaty Management University, noted that in Central Eastern Europeand Central Asia regions there is significant potential for women (ILO 2018), yet found a slow growth in management. Lipovka suggested a reconsideration of gender policies in Kazakhstan to separate gender and family issues to differentiate between family discourse and women involvement in management (OECD 2017a).

AWARDS

AQRA Award

On December 10th, Anna CohenMiller was selected for an honorary gold membership conferred by the Asian Qualitative Research Association (AQRA) for service, mentorship, and expertise in qualitative research.

Inclusive Teaching and Learning Award

The Nazarbayev University Inclusive Teaching and Learning Award was presented to Anna CohenMiller in the late Spring 2020, semester highlighting her work to respond to student differences, connect educators locally and internationally to address equity and inclusion and respond to immediate pedagogical needs during COVID-19.
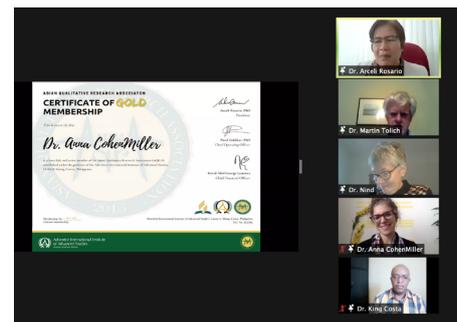
SELECTED RESEARCH by GenCon Team

New Grants

- **Equitable access to education in the time of COVID 19 in Kazakhstan: Experiences, outcomes, challenges and Possibilities** (2021-2023). Team: **Durrani, N**. (PI); NU Co-investigators: Polat, F. (GSE), Helmer, J., Qanay, G., Akhmetova, S. (SSH); external co-investigators: Shakirova, S. (National Kazakh Women Teacher Training University).

- **Graduate student mothers: A comparative case study of Kazakhstan and Uzbekistan**. PI: **Tabaeva A.** (2020-2021). Gender Economics Research Center sponsored by Soros Foundation Kazakhstan.

- **Policy enactment of mainstreaming gender equality in higher education and civil service in Kazakhstan** (2021-2023). Team: **Kataeva, Z.** (PI); NU Co-investigators: **Durrani, N.**, Janenova, S. (GSPP); external co-investigators: Shakirova, S. (National Kazakh Women Teacher Training University), Shedenova, N. (Al-Farabi Kazakh National University).

Ongoing Grants

- **Co-Writing Kazakh: Learning a new script with a robot (2020-2022).** PI: **Sandygulova, A.,** Co-PI: **CohenMiller**, A. Addressing the national reform to transition writing Kazakh in Cyrillic to Latin letters. NU co-investigators include: Tohid Alizadeh (Robotics & Mechatronics), Zhandos Yessenbayev (lab of computational materials science for energy application). External co-investigators include: Danna Summers (Co-PI, Baishev University, Aktobe); Wafa Johal (University of New South Wales); Pierre Dillenbourg (Ècole Fédérale Polytechnique).

- **Gender and schooling in Kazakhstan: A mixed methods study.** (2019-2022). PI: **Durrani, N.**; Co-PIs: **CohenMiller, A. & Kataeva, Z.** A multiphase study involving textbook analysis, interviews, focus groups, and surveys throughout the regions of Kazakhstan.

New Research Projects

- **The Impact of COVID-19 on the Student Experience.** (2020-2021). PI: **Saniyazova, A.**, Co-PI: **CohenMiller, A.** Comparative research study of university student experience in collaboration with SERU Consortium, Berkeley, California.

- **Beyond work/life balance during quarantine: Using an innovative arts-based approach to address issues of equity and inclusion in higher education**. (2020-2021). PI: **CohenMiller, A.** Co-PI: **Izekenova, Z.** Photos from the study are being shared via Instagram @motherscholar and related project, The Motherscholar Project.

Photo of motherscholar with two young children during the lockdown, sitting at a table collectively learning side-by-side.

SELECTED PEER-REVIEWED PUBLICATIONS by GenCon Team

Articles

CohenMiller, A. (2020). Spiraling. Academic Motherhood and COVID-19. Journal of the Motherhood Initiative. 11(2), 9-20. https://jarm.journals.yorku.ca/index.php/jarm/issue/view/2317

CohenMiller, A. S. (2020). Performing, passing, and covering motherhood in academia: A heartful autoethnography. LEARNing Landscapes, 13(1), pp. 97-114. https://doi.org/10.36510/learnland.v13i1.1006

CohenMiller, A. S., Smat, N., Yenikeyeva, A., & Yassinova, K. (2020). Analyzing social media with a gender audit: Pedagogy and practice in the qualitative research classroom. The Qualitative Report. 25(5). https://nsuworks.nova.edu/tqr/vol25/iss5/4/

CohenMiller, A. S. & Peterson, K. (2020). Can popular culture speak to issues of equity in educational spaces? Dialogue: The Interdisciplinary Journal of Popular Culture and Pedagogy, 7(2). Link

Collins, N. (2020) "Campaigning by Human Branding: Associating with American Presidents", Fudan Journal of the Humanities and Social Sciences, 13 (4), 495-515.

Humphreys, S., Dunne, M., **Durrani, N**., Sankey, S., & Kaibo, J. (2020). Becoming a teacher: Experiences of female trainees in initial teacher education in Nigeria. Teaching and Teacher Education, 87, 102957.

Koo, S. (2020). Does policy motivation drive party activism? A study of party activists in three Asian democracies. Party Politics. (OnlineFirst). https://doi.org/10.1177/1354068820908021. Link(pre-print full text)

Koo, S. (2020). Can intraparty democracy save party activism? Evidence from Korea. Party Politics. 26 (1): 32-42. https://doi.org/10.1177/1354068818754601. Link(pre-print full text)

Peterson, K. & **CohenMiller, A. S.** (2020). Making the invisible visible through popular culture. Dialogue: The Interdisciplinary Journal of Popular Culture and Pedagogy, 7(3). Link

Yap, J.M., & Kamilova, Y. (2020). Toward becoming an inclusive library: Integrating Sustainable Development Goal 5 in the library agenda. Library Management, 41(⅔), 53-66. https://doi.org/10.1108/LM-08-2019-0057

Yap, J.M., & Manabat, A. (2020). Managing a sustainable work-from-home scheme: Library resiliency in times of pandemic.International Journal of Librarianship, 5(2), 61-77. https://doi.org/10.23974/ijol.2020.vol5.2.168

Yap, J.M., & Peñaflor, J. (2020). The amazing library race: Developing students' media and information literacy skills through games. Journal of Information Literacy, 14(1), 66–82. https://doi.org/10.11645/14.1.2708

Yap, J.M. (2020). Not all students are online: The case of business graduate students in Kazakhstan. Business Information Review, 37(1), 25–29. https://doi.org/10.1177/0266382120906683

Yap, J.M. (2020). Common referencing errors committed by graduate students in education. Library Philosophy & Practice, 4039.https://digitalcommons.unl.edu/libphilprac/4039/

Zhexenova, Z., Amirova, A., Abdikarimova, M., Kudaibergenov, K., Baimakhan, N., Tleubayev, B., Asselborn, T., Johal, W., Dillenbourg, P., **CohenMiller, A.,** & **Sandygulova, A.** (2020). A comparison of social robot to tablet and teacher in a new script learning context. Frontiers in Robotics and AI, Section Robot Assisted Education, Human-Robot Interaction. (Authorship in reverse order of primary involvement) https://www.frontiersin.org/articles/10.3389/frobt.2020.00099/abstract

Bool Chapters

Chen, J. Y. Yuwen & **Collins, N.** (2020) «Website-Feature Analysis of Irish Parliamentarians' Performance in Web 2.0 Technologies.» Handbook of Research on Recent Developments in Internet Activism and Political Participation, edited by Yasmin Ibrahim, IGI Global, pp. 275-289. http://doi:10.4018/978-1-7998-4796-0.ch017

Collins, N. (2020) "Players or Spectators? Central Asia's Role in BRI", in Hing Kai Chan, Faith Ka Shun Chan and David O'Brien, International Flows in the Belt and Road Initiative Context, London: Palgrave Macmillan, pp. 147 – 169

Halai, N. & **Durrani, N.** (2020). School Education System in Pakistan: Expansion, Access and Equity. In: P. Sarangapani & R. Pappu (Eds.) Handbook of Education Systems in South Asia. Global Education Systems. Springer, Singapore. https://doi.org/10.1007/978-981-13-3309-5_17-1

Sandygulova, A., CohenMiller, A. S., Oralbayeva, N., Johal, W., Asselborn, T., Dillenbourg, P. (2020). Cognitive Learning with a Robot: The Case of Script Acquisition. Software Engineering and Formal Methods, SEFM 2019 Collocated Workshops: CoSim-CPS, ASYDE, CIFMA, and FOCLASA, Oslo, Norway, September 16–20, 2019, Revised Selected Papers. 10.1007/978-3-030-57506-9_12

ASSOCIATE PROFESSOR STEFANOS XENARIOS HAS GIVEN AN INTERVIEW IN TENGRI NEWS ABOUT THE PREPAREDNESS ON NATURAL DISASTERS IN KAZAKHSTAN AND CENTRAL ASIA

Dr. Stefanos Xenarios

Stefanos Xenarios advised that Kazakhstan shall create a Civil Protection Agency to protect the interests of citizens who have lost property or crops during emergency events, correspondent of Tengrinews.kz reports.

Considering the collapse of the dam on the Sardoba reservoir in Uzbekistan, which caused large-scale flooding in the Turkestan region this spring, the NU professor said that Kazakhstan needs a new Agency that will contact the state bodies of neighboring countries, monitor the safety of citizens and at the same time communicate not only with officials but also regularly discuss current and possible natural problems with residents of the regions.

«In Europe, when danger is imminent - landslides or drought, experts contact representatives of local communities. The problem will be aggravated by climate change, so local people need to be timely warned. Some experts go there with politicians, meet with local residents, and consult and think together to solve or alleviate the situation. Citizens take an active part in solving problems»- as Assoc. Professor Xenarios mentioned.

He explained that the Ministry of Emergency Situations is solving the problem by the fact, saving lives in case of a real threat. While a new Agency will help prevent tragedies in the future, by also contacting colleagues from neighboring countries, jointly discuss problems, such as transboundary rivers, prepare for possible emergencies, and ensure that all citizens receive compensation for the damage received.

«When you involve local people, they will take care of the situation better than officials and experts who may live in other regions, and are not always aware of what is happening on the ground. I am not saying that officials should be left at rest and shift the responsibility to local residents, but I highlight that officials and experts from the agency should consult with people, and share responsibility, and not only in a control order» - explained the expert from Nazarbayev University.

The new agency may be subordinate to the Ministry of Internal Affairs or the Ministry of Ecology, Geology, and Natural Resources. The personnel, 10-15 people, should include geologists, economists, activists, government officials, and other specialists.

The original post is available via this link.

GSPP PROFESSORS PUBLISHED A CHAPTER IN A BOOK BY INTERNATIONAL SPRINGER PUBLISHER

Dr. Zhanibek Arynov, Post-doctoral fellow, and Dr. Dina Sharipova, Assistant Professor, at the Graduate School of Public Policy, have recently published a chapter titled Russia in Central Asia in the book "Die politischen Systeme Zentralasiens" (Political Systems in Central Asia). The book is published in German language in 2020.

In the chapter, the scholars examine the evolution of Russia's policies in post-Soviet Central Asia, outline turning points and changes in Russia's strategy, and summarize Moscow's key achievements and failures in the region.

Dr. Zhanibek Arynov

Dr. Dina Sharipova

This chapter also focuses on Russia's interaction with the US and China in Central Asia. It argues that Moscow lacks a strategic vision, and its attempts to return its once privileged position in the region have reached mixed results. On the one hand, Russia still remains a key partner for the majority of Central Asian states; on the other, its influence is not absolute, but rather limited given the complex geopolitical reality in the region.

The book can be found here.

School of Medicine News

THE IDENTIFICATION OF NOVEL DIABETES MELLITUS SUBTYPES: A STEP TOWARDS PRECISION MEDICINE

In our previous newsletter, we have published some introductory information about the project «The identification of novel Diabetes Mellitus subtypes: A step towards precision medicine». Now the research group would like to share their first published systematic review. It is an open access publication that is available via the following link.

Dr. Antonio Sarria-Santamera

The Identification of Diabetes Mellitus Subtypes Applying Cluster Analysis Techniques: A Systematic Review

Authors: Antonio Sarría-Santamera, Binur Orazumbekova, Tilektes Maulenkul, Abduzhappar Gaipov, and Kuralay Atageldiyeva

Abstract: Diabetes Mellitus is a chronic and lifelong disease that incurs a huge burden to healthcare systems. Its prevalence is on the rise worldwide. Diabetes is more complex than the classification of Type 1 and 2 may suggest. The purpose of this systematic review was to identify the research studies that tried to find new sub-groups of diabetes patients by using unsupervised learning methods. The search was conducted on Pubmed and Medline databases by two independent researchers. All time publications on cluster analysis of diabetes patients were selected and analysed. Among fourteen studies that were included in the final review, five studies found five identical clusters: Severe Autoimmune Diabetes; Severe Insulin-Deficient Diabetes; Severe Insulin-Resistant Diabetes; Mild Obesity-Related Diabetes; and Mild Age-Related Diabetes. In addition, two studies found the same clusters, except Severe Autoimmune Diabetes cluster. Results of other studies differed from one to another and were less consistent. Cluster analysis enabled finding non-classic heterogeneity in diabetes, but there is still a necessity to explore and validate the capabilities of cluster analysis in more diverse and wider populations.

SHARED BY TILEKTES MAULENKUL
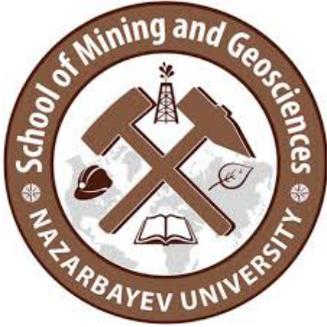
DR. SAFFET YAGIZ AND HIS MSC STUDENTS PUBLISHED PROCEEDINGS PAPERS IN ONE OF THE MOST PRESTIGIOUS SYMPOSIUM

Aitolkyn Yazitova (M.Sc.)   Timur Massalov (MSc. Student)   Assoc. Prof. Saffet Yagiz

Dr. Saffet Yagiz and his MSc students; T. Massalov and A. Yazitova, published proceedings papers in one of the most prestigious symposium: ISRM International Symposium, Eurock 2020-Hard Rock Engineering Trondheim, Norway, 14-19 June 2020.

1. **Estimation of drilling rate of diamond driller using rock properties and driller specifications**

The aim of the paper is to examine the rock properties and driller specifications to estimate the rate of drilling (DR) for diamond drillers. For the aim, raw data from 63 diamond drilling cases were collected and examined to obtain the dataset. Dataset has two parts; rock properties include uniaxial compressive strength (UCS), Brazilian tensile strength (BTS), density (D) and brittleness (BI). Also driller specifications composing of thrust (Th), speed rate (RPM) and bit diameter (BitD). After dataset was constructed, simple, multiple linear and non-linear regression analyses were carried out to predict the DR. Concluding remark is that the estimation of DR are multiple non-linear task. It is found that BI, D, Th, RPM and BitD have a great effect on the DR estimated as a function of rock and driller parameters with correlation coefficient (r) of 0.89.

Yazitova, A., Yagiz, S. (2020) Estimation of drilling rate of diamond driller using rock properties and driller specifications, ISRM International Symposium Eurock 2020 – Hard Rock Engineering Trondheim, Norway, 14-19 June 2020. https://www.onepetro.org

2. **Relationship between key rock properties and Cerchar abrasivity index for estimation of disc cutter wear life in rock tunneling applications**

Disc cutters are the dominant cutting tools used on tunnel boring machines (TBM), as well as many other mechanical excavation units. One approach to estimate disc cutter wear life is to use Cerchar Abrasivity index (CAI). In this paper, the relationship between key rock properties including uniaxial compressive strength (UCS) and Brazilian tensile strength (BTS), density (D) and brittleness index (BI) of rock and Cerchar abrasivity index (CAI) are evaluated. For this aim, 80 mechanized tunnel cases was examined and then simple and multiple linear regression analysis were carried out to obtain the possible relations between CAI and relevant rock properties. It is found that each rock

property mentioned herein have an influence on the CAI that is one of the main rock properties to estimate cutter wear life, however none of them by itself is not enough to estimate the CAI. So, the best equation was obtained via multiple regression analysis to estimate CAI as a function of BTS, D and BI of rock with correlation coefficient (r) of 0.81. The limited study shows that while CAI is one of the good indicators to estimate the cutter wear, rock properties including UCS, BTS, D and BI also have a great influence on disc cutter wear.

Massalov, T., Yagiz, S., Rostami, J. (2020) Relationship between key rock properties and Cerchar abrasivity index for estimation of disc cutter wear life in rock tunneling applications, ISRM International Symposium Eurock 2020-Hard Rock Engineering Trondheim, Norway, 14-19 June 2020. https://www.onepetro.org

PREPARED BY PROF. SAFFET YAGIZ

Advanced Center for PhD Students and Young Researchers in Informatics

AN ERASMUS+ CBHE GRANT

SHARED BY PROF. MARTIN LUKAC

While NU has a special status within Kazakhstan, a lot of research potential remains distributed across the country. In order to provide methodology, connections and research directions, the ACeSYRI project was created. The main goal of ACeSYRI is thus to establish a tool allowing to Kazakh young researchers, PhD students and graduate educators to connect with international research community, to internationalize their research through reaching out to international tutors and co-advisers and, to provide teaching content to tutors and educators on methodology reinforced by a series of summer schools and seminars. Nazarbayev University being already an international higher education institution and therefore is well suited to lead this initiative both from the experience acquired since its inception as well as from the leadership point of view.

Figure 1: Welcome Page of the Prototype Portal of ACeSYRI Project

In this article I would like to present you ACeSYRI; the Advanced Center for PhD Students and Young Researchers in Informatics co-funded by the Erasmus+ CBHE program. The center, is focused on interna- tionalization of young Kazakh PhD and Researchers by providing a framework for networking, looking for research topics and research co-advisers while working/studying in Kazakhstan.

The ACeSYRI project involves three international partners; the PI from university of Zilina, Slovakia, one partner form Poland (University of Lodz) and one partner from France (University of Lorraine). There are nine Kazakh partners including the regional coordination from Nazarbayev University.

The center has several activities:

- First, a software platform, that will eventually be hosted at Nazarbayev University, provides a frame- work to search, enter and join research programs. The platform is currently developed by the PI and a test version can be accessed for evaluation. Title page of the platform is shown in Figure 2.

- Second, an exchange program for Kazakh educators was established. This framework consists of a series of planned visits to European universities (Slovakia, Poland and France) organized as summer schools and research seminars. The content of these visits is precisely the learning of international research methodology.

- Finally a set of organized events for PhD students and young researchers for presenting, publishing and sharing their work in an international environment and workspace. One of the facilities for promoting the research of young Kazakh researcher is also the establishment of a journal.

The ACeSYRI project is intended to not only provide an international platform for Kazakh educators and young researchers but also helps to construct a database of international tutors interested in research topics and co-advising young Kazakh talents.
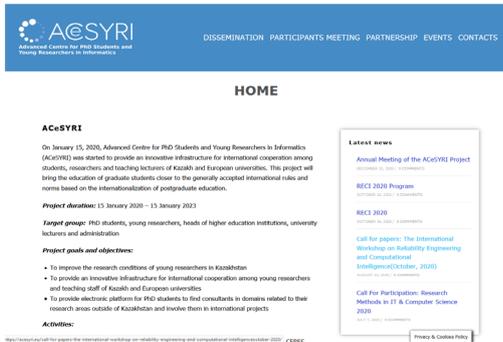
Figure 2: The main website of the ACeSYRI Project (acesyri.eu)

Currently the project is starting after the rst year of establishing the structure, team construction and starting the work ows of the various initiatives. We are actively looking for research topics to be included in the database, collaborators and tutors interested in participating in mentoring PhD students and young researchers.

Several events are planned in 2020 including a seminar about the usability of the ACeSYRI portal, a PhD forum organized long the 51st IEEE ISMVL (virtual) and hopefully (depending on the COVID-19 situation) a summer school in University of Zilina.

For further information and progress please visit acesyri.eu or send email to martin.lukac@nu.edu.kz

DEFENSIVE RESOURCE ALLOCATION IN SOCIAL NETWORKS AGAINST MULTIPLE ATTACKERS

Today different defender-attacker game models have been developed to study resource allocation in social networks. One of the main purposes of such studies is the determination of the optimal defense strategies against the attackers. For the defensive side players, allocating resources effectively and properly is important to maintain the winning position.

We develop one defender - multiple attackers non-cooperative game model to determine the defensive strategy based on the Nash equilibrium and Stackelberg leadership equilibrium solutions. This game model can be designed and studied in two scenarios: simultaneous and sequential modes. Firstly, we consider that the defender reacts simultaneously without knowing the arrival of the attackers. Secondly, we define the strategy when the defender is

Balzhan Azibek (M.Sc. student)

aware of the attackers. The budget constraints are analyzed for both cases: 1) when the defender's budget is twice less, 2) when the defender's budget is the same, and 3) when the defender's budget is twice more compared with the attackers' budget.
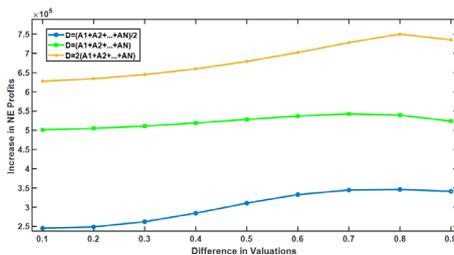
In Fig. 1 and Fig. 2, we can observe the best response of the defender depending on three budget cases against multiple attackers for scenarios 1 and 2, respectively.
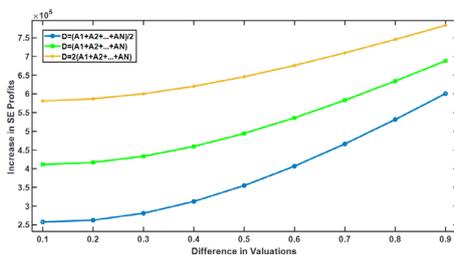
We learn that the profit-customer relationship can be investigated by the budget constraints. Having three cases allowed analyzing the Nash and Stackelberg equilibrium profits and define the best defensive strategy. It can be concluded that when the defender's budget is twice more, maintaining its customers is easier. In the other two cases, the defender can defeat the game by choosing the Stackelberg strategy and acting in the sequential mode.

We observe that after a threshold value the profit of the defender in Nash equilibrium decreases. It can be explained by the concept of the marginal cost limit and the definition

of Nash equilibrium. In Nash equilibrium, every player tries to make its best strategy, which can take place when the defender and attackers set prices slightly above the marginal cost. Indeed, players profit when the prices are much higher than the marginal cost. However, to allocate more resources in the same market the incumbent and the challengers are tempted to lower prices just slightly until the marginal cost limit. We conclude the Stackelberg equilibrium for one defender-multiple attackers guarantees the optimal defense strategy, as it aims to gather information about new attackers and prepare for "the attack".

WRITTEN BY BALZHAN AZIBEK
SHARED BY ARESH DADLANI

Laboratory of Functional Materials and Computational Chemistry (fmc2)

ENERGY AND ENVIRONMENTAL RESEARCH PUBLICATIONS

The fmc2 laboratory headed by Dr. Mannix P. Balanay of the Department of Chemistry, School of Science and Humanities has recently published research article in Chemical Communications (ChemComm) which is a journal from the Royal Society of Chemistry (RSC). ChemComm is a journal for urgent communications of outstanding significance from across the chemical sciences for more than 50 years. It is considered to be RSC's most cited journal. The research paper is entitled "Nanostructured flower-shaped $CuCo_2S_4$ as a Pt-free counter-electrode for dye-sensitized solar cells". This research addresses two-main concerns of the problems of counter-electrodes used in the 3rd generation solar cells which is cost and stability. The researchers utilizes an earth-abundant ternary transition metal sulfides t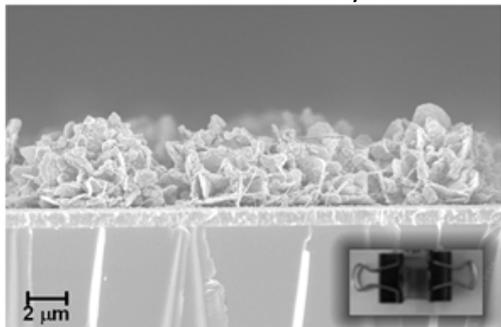hat replaces the expensive Platinum electrodes which are commonly used in dye-sensitized solar cells (DSSCs). Their results revealed that the new counter-electrodes produced comparable photoelectric conversion efficiency than the standard reference electrode and it was very stable after 6 months of aging. Dye-sensitized solar cells which was developed by Prof. Michael Grätzel in 1991 which uses an organic dye that is adsorbed in the semiconductor layer that will act as photon collector does not require the semiconductor to have a perfect crystalline structure unlike the conventional silicon solar cells. Although the current efficiencies of DSSCs are still lower that other 3rd generation solar cells like the polymer and perovskites solar cells, it is still very promising since it has the best efficiency of all solar cells in low light conditions that is why it can be a potential photovoltaic technology for the self-powered internet of things applications. This paper is co-authored by Dr. Bakhytzhan Baptayev, who received his Ph.D. in Science, Engineering, and Technology last June 2020 under Dr. Balanay's supervision. Other co-authors are Diaz Mustazheb, a 4th year Chemistry student and Zamilya Abilova a research assistant of the project. To further read the paper click on the link.

Enoch Adotey, a Ph.D. student of Science, Engineering, and Technology of the School of Engineering and Digital Science (SEDS) with his lead advisor Dr. Mehdi Amouie Tokmahalleh (Assistant Professor of the Department of Chemical and Materials Engineering) and Dr. Mannix Balanay, the internal co-supervisor (Associate Professor in Chemistry) has developed a rod-like shaped metal-organic framework (MOF) based on 3-pyridinecarboxaldehyde and trimesic acid with zinc as the metal for selective detection of Chromium (VI) ions in aqueous solution which has the second lowest limit of detection as compared to other zinc-based luminescent-MOFs. But their MOF was prepared by readily available ligands which makes it cost-effective and could easily be applied to the industry. The as-prepared MOF is very stable from pH 2 to 10 and it not much affected with cations and anions commonly present in water. The detection of Cr(VI) in natural waters is very important since it is considered to be hazardous and was identified to be as a potential carcinogen that causes various respiratory diseases.

The team is currently undergoing further study to further lowering the detection limit to a sub-ppb level which can be also utilized to detect Cr(VI) in air particulates. To read the full article, please click on the link.
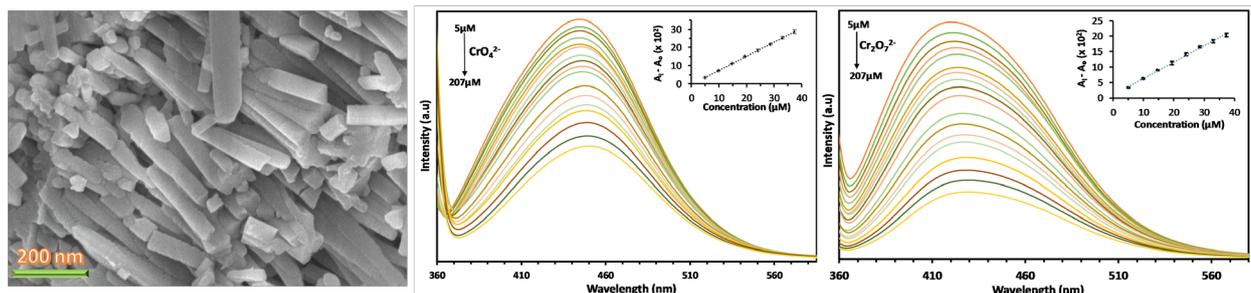
A collaborative research between the members of the fmc2 laboratory and the research groups of Dr. Annie Ng (Assistant Professor from the Department of Electrical and Computer Engineering, SEDS), Prof. Aleksandra Djurišić of the Department of Physics, The University of Hong Kong, Prof. Shu Kong So of the Department of Physics, Hong Kong Baptist University, and Prof. Paras N. Prasad from the Department of Chemistry and Institute of Lasers, Photonics, and Biophotonics, University at Buffalo, The State University of New Year on the development of hysteresis-free mixed perovskites solar cells by using interfacial engineering and defect passivation employing a multilayer structure for the electron-transport layer. The efficiency of the solar cell can be further improved by incorporating an organic cross linker (2,2'-(ethylenedioxy)bis(ethylammonium iodide) into the layer of the mixed perovskite absorber. The results of this research is published in the Solar Energy Materials and Solar Cells which has an impact factor of 6.984 (JCR, 2020 Clarivate Analytics). To read the full article, please click on the link.

WRITTEN BY DR. MANNIX BALANAY

RESEARCH PERFORMANCE EVALUATION USING SCIVAL
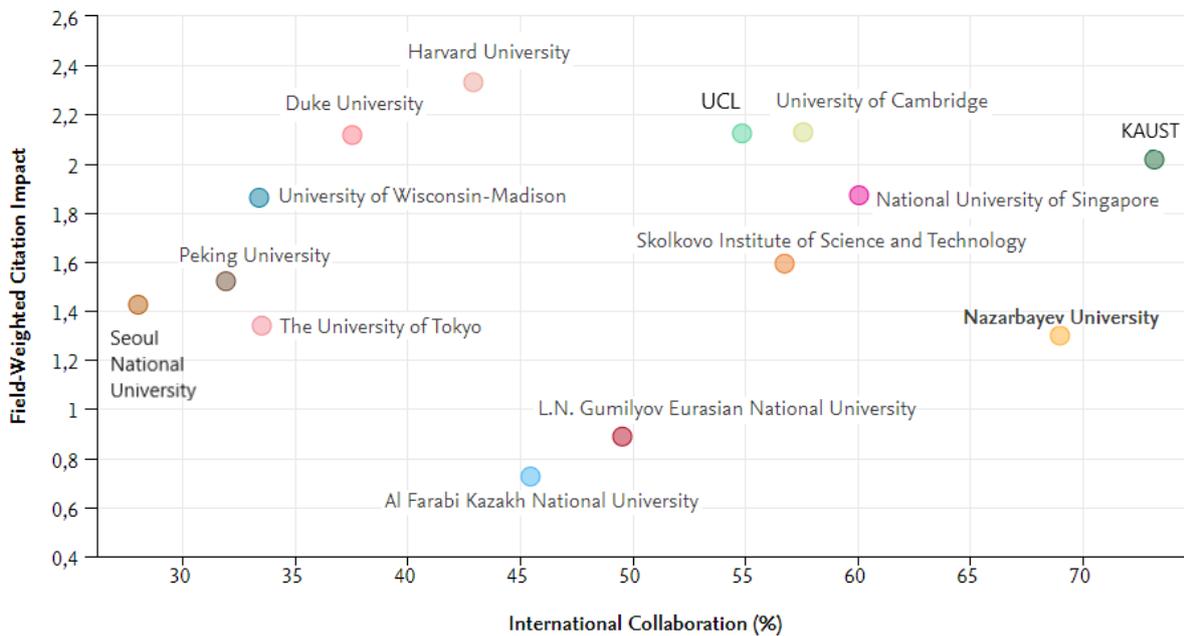
In this issue, we are delighted to present you an overview of research activities conducted under the auspices of Nazarbayev University.

Since its inception in 2011, Nazarbayev University faculty members and researchers have released 4,478 peer-reviewed publications indexed by Scopus, and have been cited 28,145 times for 2011-2021 period (Source: Scopus, January 4th). The approximate number of citations per peer-reviewed publication is 6.29. The overall H-index of NU is 56, whereas H5-index is 33. The field-weighted citation impact is 1.32, meaning that our publications have been cited 32% more than would be expected based on the world average for similar publications.

For getting more comprehensive information on the research performance at NU, please have a look at the following presentation prepared using SciVal research evaluation platform.

If you have any questions regarding the provided information, please contact Saule Sadykova (ssadykova@nu.edu.kz)

FUNDING OPPORTUNITIES

#	Opportunity	Funder	Deadline	Source link
1	Utilizing In Vitro Functional Genomics Advances for Gene-Environment (G x E) Discovery and Validation (R01 Clinical Trial Not Allowed)	National Institutes of Health	1/2/2021	URL
2	Alzheimer's Clinical Trials Consortium (ACTC) Clinical Trials (R01 Clinical Trial Required)	National Institutes of Health	1/5/2021	URL
3	Solution Search: Water Pollution & Behavior Change Contest	Rare's Center for Behavior and the Environment, 11th Hour Racing, The Circulate Initiative, Inter-American Development Bank, Lonely Whale, The Nature Conservancy and Ocean Conservancy	1/10/2021	URL
4	Racial Equity Special Research Grants	Spencer Foundation	1/12/2021	URL
5	Global Disruptive Tech Challenge 2021:Restoring Landscapes in the Aral Sea Region	Global Landscapes Forum	1/15/2021	URL
6	Drug Development Grants	FightMND	1/15/2021	URL
7	Science for Peace and Security Programme	NATO	1/15/2021	URL
8	Law & Science	National Science Foundation	1/15/2021	URL
9	Digital Humanities Advancement Grants	National Endowment for the Humanities	1/15/2021	URL
10	Discovery of the Genetic Basis of Childhood Cancers and of Structural Birth Defects: Gabriella Miller Kids First Pediatric Research Program (X01 Clinical Trial Not Allowed)	National Institutes of Health	1/19/2021	URL
11	2021 TechWomen Program	US Department of State	1/21/2021	URL
12	Women and Minorities in Science, Technology, Engineering, and Mathematics Fields Program (WAMS)	United States Department of Agriculture	1/21/2021	URL
13	Understanding the Role of the M. Tuberculosis Granuloma in Tuberculosis (TB) Disease and Treatment Outcomes (R01 Clinical Trial Not Allowed)	National Institutes of Health	1/22/2021	URL
14	Materials and Chemical Sciences Research for Quantum Information Science	Office of Science	1/27/2021	URL
15	Osseointegration Foundation Research Grants	Osseointegration Foundation	1/29/2021	URL
16	DRL FY2020: The Global Equality Fund	US Bureau of Democracy Human Rights and Labor	2/5/2021	URL
17	2021-Keeling Curve Prize	Global Warming Mitigation Project	2/10/2021	URL

FUNDING OPPORTUNITIES

#	Opportunity	Funder	Deadline	Source link
18	Clinical Translation of Activated Optical Fluorescence Methods and Technologies for Sensitive Cancer Detection in Vivo (R01 Clinical Trial Optional)	Department of Health and Human Services	2/10/2021	URL
19	NIDCR Small Grant Program for New Investigators (R03 Clinical Trial Not Allowed)	National Institutes of Health	2/16/2021	URL
20	Discovery of Cell-based Chemical Probes for Novel Brain Targets (R21 Clinical Trial Not Allowed)	National Institutes of Health	2/16/2021	URL
21	Advanced Development and Validation of Emerging Molecular and Cellular Analysis Technologies for Basic and Clinical Cancer Research (R33 Clinical Trial Not Allowed)	National Institutes of Health	2/22/2021	URL
22	Innovative Biospecimen Science Technologies for Basic and Clinical Cancer Research (R21 Clinical Trial Not Allowed)	National Institutes of Health	2/22/2021	URL
23	Application of Artificial Intelligence and Machine Learning for Advancing Environmental Health Sciences (R43 Clinical Trial Not Allowed)	National Institutes of Health	2/28/2021	URL
24	Evolutionary Therapy (Trials)	Anticancer Fund	3/1/2021	URL
25	Grants to Support New Investigators in Conducting Research Related to Preventing Interpersonal Violence Impacting Children and Youth	Centers for Disease Control and Prevention - ERA	3/12/2021	URL
26	ISTC grants	International Science and Technology Center	3/15/2021	URL
27	Enabling Discovery through GEnomics	National Science Foundation	3/16/2021	URL
28	Humanities, Arts and Social Sciences (HASS) Research	Australian Research Council	3/17/2021	URL
29	NHMRC e-ASIA 2021 Joint Research Program funding commencing in 2022	Australian National Health and Medical Research Council (NHMRC)	3/29/2021	URL
30	Contraceptive Development Research Centers Program (P50 Clinical Trial Optional)	National Institutes of Health	3/30/2021	URL
31	2021 BREP	Department of Commerce	4/1/2021	URL
32	Higher Education for Leadership, Innovation, and Exchange (HELIX), A New Partnerships Initiative (NPI)	US Agency for International Development	4/2/2021	URL
33	Announcement of Anticipated Availability of Funds for Research on Research Integrity Conferences	Department of Health and Human Services	4/5/2021	URL
34	Announcement of Anticipated Availability of Funds for Research on Research Integrity	Department of Health and Human Services	4/5/2021	URL

FUNDING OPPORTUNITIES

#	Opportunity	Funder	Deadline	Source link
35	Translational Research in Maternal and Pediatric Pharmacology and Therapeutics (R21 Clinical Trial Optional)	National Institutes of Health	4/9/2021	URL
36	World Knowledge – Structural Support for "Rare Subjects"	Volkswagen Foundation	4/12/2021	URL
37	Biological Technologies	DARPA - Biological Technologies Office	4/22/2021	URL
38	Cancer Grand Challenge	Cancer Research UK and the US National Cancer Institute	4/22/2021	URL
39	Innovative Research in Cancer Nanotechnology (IRCN) (R01 Clinical Trial Not Allowed)	Department of Health and Human Services	5/6/2021	URL
40	Multidisciplinary Studies of HIV/AIDS and Aging (R01 Clinical Trial Optional)	National Institutes of Health	5/7/2021	URL
41	Advanced Development of Informatics Technologies for Cancer Research and Management (U24 Clinical Trial Optional)	National Institutes of Health	5/8/2021	URL
42	Aging Effects on Osteoimmunology (R01 Clinical Trials Not Allowed)	National Institutes of Health	5/15/2021	URL
43	Victor Rabinowitch Memorial Award for Young Leaders in International Scientific Cooperation		5/31/2021	URL
44	Post-Acute Interventions for the Treatment of Anorexia Nervosa (R34 Clinical Trial Required)	National Institutes of Health	6/15/2021	URL
45	BRAIN Initiative: Data Archives for the BRAIN Initiative (R24 Clinical Trial Optional)	National Institutes of Health	7/14/2021	URL
46	Global Infectious Disease Research Training Program (D43 Clinical Trial Optional)	National Institutes of Health	8/3/2021	URL
47	Geometric Analysis	National Science Foundation	11/2/2021	URL
48	Revision Applications to Support the Application of Informatics Technology for Cancer Research (R01 Clinical Trials Optional)	National Institutes of Health	11/17/2021	URL
49	Collaborative Research in Computational Neuroscience (CRCNS)	National Science Foundation	11/23/2021	URL
50	Investigation of the Transmission of Kaposi Sarcoma-Associated Herpesvirus (KSHV) (R01 Clinical Trial Optional)	Department of Health and Human Services	12/14/2021	URL
51	Microsystems Technology Office (MTO) Office-wide	DARPA - Biological Technologies Office	3/13/2022	URL

FUNDING OPPORTUNITIES

#	Opportunity	Funder	Deadline	Source link
52	MOMENTUM	US Agency for International Development	9/30/2025	URL
53	Plant Genome Research Program	National Science Foundation	Proposals Accepted Anytime	URL
54	Transitions to Excellence in Molecular and Cellular Biosciences Research (Transitions)	National Science Foundation	Proposals Accepted Anytime	URL
55	Between Europe and the Orient – A Focus on Research and Higher Education in/on Central Asia and the Caucasus	Volkswagen Foundation	Proposals Accepted Anytime	URL
56	Artificial Intelligence and the Society of the Future	Volkswagen Foundation		URL
57	AsiaGlobal Papers	Asia Global Institute		URL

New research publications indexed by Scopus (count: 258)

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