Journal Partner:

Journal of Personalized Medicine

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INTERNATIONAL

# PRECISION MEDICINE CONFERENCE

APRIL 19-20, 2021 | VIRTUAL EVENT

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IPMC 2021

BOOK OF ABSTRACTS

INTERNATIONAL

# PRECISION MEDICINE CONFERENCE

APRIL 19-20, 2021 | VIRTUAL EVENT

**Theme:**

Latest Innovations in Precision Medicine

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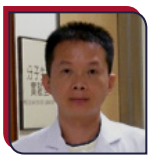

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Thank You All...

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# Publishing Partner

## Journal of Personalized Medicine

All the accepted full length papers are published in SCOPUS Indexed Journal with 50% discount. Publishing is optional for presenters.

**Publication Information:**

Selected conference papers will be recommended to be published in the "Journal of Personalized Medicine - Open access journal by MDPI". All submissions will be provided with 50% discount on article processing charges and they will be subject to customary peer review of MDPI before they are considered for publication. As an Editorial Board Member of MDPI and a Scientific Committee of the conference, Prof. Dr. Sergey Suchkov will be responsible for the recommendation of conference papers after discussion with the conference committee and the journal editorial board members.

For more information about publishing procedure please visit: https://www.mdpi.com/journal/jpm/special_issues/IPMC_2021

**About the Journal:**

Journal of Personalized Medicine (JPM; ISSN 2075-4426) is an international, open access journal aimed at bringing all aspects of personalized medicine to one platform. It focuses on "omics"-level studies that seek to define the basis of interindividual variation in susceptibility for a disease, its prognosis or definition of clinical subsets, and response to therapy (pharmacogenomics). We are also interested in systems biology as it relates to interindividual variation, and research on new methodologies, informatics, and biostatistics, in the aforementioned areas. JPM is indexed in ESCI-Emerging Sources Citation Index, PubMed and Scopus. Its CiteScore is 3.59 in 2018.

**Note:** Participants can submit their manuscripts to the "Journal of Personalized Medicine - Open access journal by MDPI" and avail 50% discount on article processing charges. Submitted papers will be peer reviewed once again and selected papers will be published as special issue.

**For further details, contact us at** precision@magnus-event.com

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# *About* MAGNUS GROUP

**Magnus Group (MG)** is initiated to meet a need and to pursue collective goals of the scientific community specifically focusing in the field of Sciences, Engineering and technology to endorse exchanging of the ideas & knowledge which facilitate the collaboration between the scientists, academicians and researchers of same field or interdisciplinary research. Magnus group is proficient in organizing conferences, meetings, seminars and workshops with the ingenious and peerless speakers throughout the world providing you and your organization with broad range of networking opportunities to globalize your research and create your own identity. Our conference and workshops can be well titled as 'ocean of knowledge' where you can sail your boat and pick the pearls, leading the way for innovative research and strategies empowering the strength by overwhelming the complications associated with in the respective fields.

Participation from 90 different countries and 1090 different Universities have contributed to the success of our conferences. Our first International Conference was organized on Oncology and Radiology (ICOR) in Dubai, UAE. Our conferences usually run for 2-3 days completely covering Keynote & Oral sessions along with workshops and poster presentations. Our organization runs promptly with dedicated and proficient employees' managing different conferences throughout the world, without compromising service and quality.

# *About* IPMC 2021

**Magnus Group** is pleased to invite you to participate in the ONLINE EVENT - '**International Precision Medicine Conference** (IPMC 2021) during **April 19-20, 2021.**

**IPMC 2021** is the International conference that brings together the collection of investigators who are at the forefront in the field. The scientific program will include oral presentations of sub-disciplines, keynote sessions led by eminent scientists, and poster sessions presented interactively by junior scientists and graduate students. It is the ultimate meeting place for all the experts worldwide for new interdisciplinary scientific collaborations and networking. With different scientific sessions, you are provided assurance to explore the latest technologies and breakthroughs that are specific to your area of work. No doubt the event has a broad scope of topics and continued in parallel sessions relative to the specific area of research.

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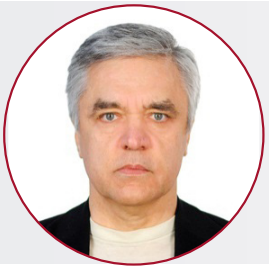
# KEYNOTE FORUM | DAY 1

## INTERNATIONAL PRECISION MEDICINE CONFERENCE

APRIL 19-20, 2021



**Sergey Suchkov**
Sechenov University, Russia

## Personalized and precision medicine as a unique healthcare model through the view of bio-design and translational armamentarium of the newest generation

A new systems approach to diseased states and wellness result in a new branch in the healthcare services, namely, personalized and precision medicine (PPM). To achieve the implementation of PM concept, it is necessary to create a fundamentally new strategy based upon the subclinical recognition of bio predictors of hidden abnormalities long before the disease clinically manifests itself. Each decision-maker values the impact of their decision to use PPM on their own budget and well-being, which may not necessarily be optimal for society as a whole. It would be extremely useful to integrate data harvesting from different databanks for applications such as prediction and personalization of further treatment to thus provide more tailored measures for the patients resulting in improved patient outcomes, reduced adverse events, and more cost effective use of health care resources. A lack of medical guidelines has been identified by the majority of responders as the predominant barrier for adoption, indicating a need for the develop-ment of best practices and guidelines to support the implementation of PPM! Implementation of PPM requires a lot before the current model "physician-patient" could be gradually displaced by a new model "medical advisor-healthy person-at-risk". This is the reason for developing global scientific, clinical, social, and educational projects in the area of PPM to elicit the content of the new branch.

**Biography:**

Dr. Sergey V Suchkov was born in the City of Astrakhan, Russia graduated from Astrakhan State Medical University and MD in 1980 and PhD at the I.M. Sechenov Moscow Medical Academy his Doctor Degree at the Nat Inst of Immunology in Russia. He is a member of New York Academy of Sciences, USA, American Chemical Society (ACS), USA, American Heart Association (AHA), USA, European Association for Medical Education (AMEE), Dundee, UK EPMA (European Association for Predictive, Preventive and Personalized Medicine), Brussels, EU, ARVO (American Association for Research in Vision and Ophthalmology), ISER (International Society for Eye Research), Personalized Medicine Coalition (PMC), Washington, DC, USA and also the Editorial Boards of Open Journal of Immunology, EPMAJ, American J. of Cardiovascular Research and Personalized Medicine Universe.

**Huiqin Yang**
University of Exeter Medical School, UK

# Evaluation of clinical effectiveness of using enzyme-linked immunosorbent assay (ELISA) tests for measuring drug levels and/or anti-drug antibodies for the purpose of monitoring treatment response and guiding decisions about the use of tumour necrosis factor-alpha (TNF-a) inhibitors in patients with rheumatoid arthritis (RA): Findings from systematic review and methodological challenges

This research assessed the clinical effectiveness of using Enzyme-Linked Immunosorbent Assay (ELISA) tests to measure drug levels and/or their anti-drug antibodies for monitoring response to TNF-α inhibitors in rheumatoid arthritis patients who had achieved treatment target (remission or low disease activity), or experienced a primary non-response or a secondary non-response. A range of bibliographic databases including MEDLINE and EMBASE were searched from inception to November 2018. Both randomised controlled trials and non-randomised controlled studies comparing therapeutic drug monitoring by using ELISA tests with standard care were included. The eligible ELISA test kits (Promonitor, IDKmonitor, LISA-TRACKER, RIDASCREEN, MabTrack and Sanquin) for monitoring response to TNF-α inhibitors were used to measure drug levels and/or their anti-drug antibodies. The eligible populations were patients with rheumatoid arthritis who were being treated with a TNF-α inhibitor (adalimumab, etanercept, infliximab, certolizumab pegol or golimumab) and had achieved treatment target (remission or low disease activity), or experienced a primary non-response or a secondary non-response. The risk of bias was assessed using the Cochrane (ROBINS-1) tool for non-randomised studies with adaptations as appropriate. A narrative synthesis approach was employed due to considerable clinical heterogeneity between included studies. This talk will give an overview of research findings and highlight methodological challenges and its important implications for future research.

**Take away notes:**

- Learn research topic within precision medicine.
- Improve understanding of methodological limitations and learn approaches to addressing methodological challenges.
- Improve study design.

**Biography:**

Dr. Huiqin Yang is senior research fellow in health technology assessment and deputy director of the Peninsula Technology Assessment Group (PENTAG) at the University of Exeter, UK. She has over 13 years research experience in health services research and she has undertaken a range of Health Technology Assessment (HTA) projects for the National Institute for Health and Clinical Excellence (NICE) and the National Institute for Health Research (NIHR), hta programme within a wide range of areas. She has PhD in medical decision making from the University of York and she is an associate editor of BMC health services research.

**Gad Rennert**
Technion-Israel Institute of Technology, Israel

## Implementing a comprehensive precision medicine paradigm into primary care clinics

**Background:** Precision medicine is promoted as a promising new medical approach leading to better health outcome. The term precision is used liberally to describe a wide variety of tools aimed at adding patient-specific information to the responsible physician. However, in-spite of point demonstrations of one technology or another in a specific medical situation, the employment of the full paradigm has never been demonstrated as leading to a better overall health.

**Aim:** Our project intends to demonstrate the benefit, or lack there-of, of evaluating all members registered in a primary care-clinic for a variety of markers, on the overall health status of the local community.

**Methods:** Unselected, full population cohort of adults insured in several multi-physician primary-care practices are invited to participate. This is done in the context of a Randomized Controlled Trial where clinics are selected and randomly allocated to genome-driven (intervention) clinics and usual-care clinics (controls). Preliminary steps include the training of the clinic medical teams to deal with results of extensive genomic and pharma co-genomic tests. The target clinic population is also undergoing education about the new approach. Each participant is undergoing a genomic evaluation (spectrum: NGS panels, GWAS, WES, WGS), microbiome testing, as a planned use of wearable sensors. These test results are provided to the primary care physicians in the form of genetic risk-alleles of various diseases, pharmaco-genomic variants and informatics findings, potentially leading to medical action resulting in better health indicators (disease rates, use of health service, health economics, quality of life/satisfaction/adherence). A plethora of findings (prevalence of genetic variants, ethnic diversity, clinical associations with incidence/survival/disease-control) and insights (degree of acceptance by population, medical providers, health systems providers) is already available after recruiting the first 1500 participants.

**Take away notes:**

- The paradigm of precision medicine is a new multi-modality approach to be employed in the population and in the medical community which are largely unfamiliar with the involved technologies and their promise.
- Precision medicine needs to be implemented as a comprehensive concept and not as an individual test for an individual disease.
- Physicians need to be trained in triage of genetic test results to findings handled in the clinic and cases referred to counseling services.
- Physicians need to be further trained in clinical actions resulting from these findings such as preventive measures in identified high-risk cases or medication changes (dose changes, exclusion) based on pharmaco-genetic results (resistance, side effects, slow to ultrafast metabolizers).

**Biography:**

Prof. Rennert studied Medicine at Ben-Gurion University of the Negev, in Beer Sheba, Israel where he received his MD degree in 1984. He trained in Public Health/Preventive Medicine at Carmel Medical Center in Haifa, Israel, and further received a PhD degree from the University of Northern Carolina at Chapel Hill in 1988. His studies concentrate on understanding the genetic background of chronic diseases, especially malignancies and he has been involved in the publication of some 350 papers in molecular epidemiology/genetics, cancer control and public health policy. He is the Weissman Chair of Precision Medicine at the Technion-Israel Institute of Technology.

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SPEAKERS | DAY 1

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**Ming-Chung Jiang**
Targetrust Biotech Ltd, Taiwan

## Reagent for monitoring cancer therapy resistance in real-time (Tumor Signal-Liquid biopsy)

Therapy resistances in cancer are often detected too late or undetectable by current methods (CT scan & common liquid biopsy), cause patient death and huge expenses in the medical, economic, and the Medicare systems. The tumor signal transduction onco-proteins insides tumor cells control tumor survival. Based on the world's first invention "Tumor Signal - Liquid Biopsy" method (to assay tumor signal transduction activity in blood from cancer patients), clinical trials showed our innovative diagnostic product (cancer therapy resistance detection reagent) can early and real-time monitor cancer therapy response. Our method enables an early, real-time, sensitive, and cost-saving way in monitoring the therapy resistance of all cancer types and all therapy methods. Our method also enables real-time guiding the optimal doses of drug/radiation in cancer therapy to reduce side-effects, especially for childhood cancer. Our invention resolves the problems of CT scan and common liquid biopsy in monitoring cancer therapy. It can help patients to get the correct drug in time to avoid patients spending huge money in taking ineffective drugs and losing the golden period of cancer treatment.

**Biography:**

Ming-Chung Jiang is CEO of Targetrust Biotech Ltd. He has obtained a PhD in Biochemistry from the College of Medicine, National Taiwan University. He has Patents Granted: USA, China, Taiwan, Japan, Canada, Indonesia, and India. He received many honors: Gold Award-Taipei International Invention and competition in 2014, Silver Award- the National Invention Award, Taiwan ROC, 2016, SBIR Program Grant support, Ministry of Economic Affairs, Taiwan, 2016. TTA Prototyping Program Grant support, Ministry of Science and Technology, Taiwan, 2019, Innovation Awards, 2019 Tech Connect World Innovation Conference, Boston USA.

**Jeffrey K. Mills**
Medler Ferro Woodhouse & Mills, USA

## Update on patent eligibility in the United States: Precision medicine in the cross-hairs

Patenting discoveries in the precision medicine space is critical so that companies and research institutions can recoup their investments made in this area of innovation. Since the United States Supreme Court's decision in 2012 in Mayo v. Prometheus, the laws regarding patent eligible subject matter (35 USC § 101) have wreaked havoc on inventions in the personalized medicine space. Developments in precision or personalized medicine rely on the use of unique information from individual patients or a patient population. This information can relate to a patient's genetic background or biomarkers, the response of a patient to a particular treatment or other characteristics of a population. The Supreme Court determined that the use of information related to "natural processes" or "natural relationships" - The information at the core of precision medicine cannot be patented unless the claims of the patent integrate the processes or relationships "into a practical application". What has followed over the past 7 years is a battle between the lower courts, lawmakers and policy writers at the United States Patent & Trademark Office, each pulling in different directions as they try to make sense of the decision. It has also left researchers and companies practicing in this area continuing to look for clarity and guidance. This talk will provide an update on the moving target that is patent eligibility, including a discussion of where the law stands now and considerations and guidance for those trying to protect precision medicine-based methods in the United States.

**Take away notes:**

- Update on the changing US laws regarding patent eligibility.
- How to craft patents for submission in the US regarding personalized medicine methods.
- Other types of patent claims to consider until the law becomes clearer.

**Biography:**

Jeffrey K. Mills is a Principal with the firm whose practice focuses on nanotechnology, pharmaceutical, biotechnology and medical device matters. He has extensive legal experience in patent prosecution, licensing, due diligence and opinion work, as well as experience in litigation support and interference proceedings. He is graduated from Duke University (B.S.E. in biomedical engineering; certificate in genetics) and received his PhD in mechanical engineering and materials science, also from Duke University. He received his J.D. from the George Washington University Law School with honors.

**Pamela D.Price**
The Balm In Gilead, USA

## Aging while black: Understanding the role of faith & culture to address health disparities among African Americans across the lifespan

There is a profound relationship between faith and health particularly in the African-American population. Studies have found that African-Americans are one of the most "religious" racial and ethnic groups in the US. Through the development and utilization of effective mobilization and partnership with faith institutions across the country, there is a tremendous opportunity to replicate and implement evidence-based programs. This session aims to help public health organizations and healthcare professionals understand the role and impacts of culture particularly faith among African-Americans and how to use this dynamic to; Address a variety of health disparities, social determinants of health, and health literacy.

African Americans continue to be disproportionately impacted by health conditions ranging from HIV/AIDS to Alzheimer's to Diabetes. Rates of disease and deaths for many health problems in the AA community are consistently higher than other races. While a lack of awareness, access and utilization of health services is an issue, African-Americans continue to have strong religious beliefs and rely on their faith leader's input on health decisions and behaviours. Research shows that the African American population tend to be more religious on the following measures than the U.S. population as a whole:

- Nearly eight in ten (79%) say religion is very important in their lives, compared to 56% among the general US population.
- More than half of African-Americans (53%) report attending religious services at least once a week, compared to 39% of the general population.
- More than three quarters (76%) say they pray on at least a daily basis, compared to 58% of the general population.

For more than 30 years, The Balm In Gilead has worked to build a bridge between public health and faith. We have designed and implemented community mobilization models to address health disparities and provided training and leadership development to healthcare professional, partners and leaders within the faith community. In 2015, we launched our Healthy Churches 2020 Coalition Initiative. This regional initiative focused health initiative works with area churches, local health departments, community organizations and key stakeholders to provide resources, training, and capacity building to address a variety of health issues from chronic disease to HIV to breastfeeding. Healthcare professionals and public health leaders need an understanding of how to use faith as a vehicle to promote, facilitate, and address health issues in the African American community, and to create strong relationships with the faith community in a meaningful and impactful way.

Our framework for bridging the gap incorporates the following components:

**Historical Significance of the Black Church**

A. Cultural beliefs

B. Distrust of Health System

**Impact of Health Disparities on African-American Communities**

A. Low Access of Healthcare Services

B. Lack of Culturally Tailored Health Messages

**Getting from awareness to action**

A. Importance of building relationships with faith community

B. Leveraging strength of faith community to address health disparities by gaining an understanding of how to connect the faith and spirituality of African-Americans and health, public health leaders can be better equipped to provide culturally centered health education, care, and outreach. They are then able to leverage that understanding to identify strategies and new approaches to support behaviour change, Increased health awareness and promote healthier minds, bodies and spirits.

**Outcomes:** Building upon the successes its Healthy Churches Coalition initiative, in 2016, The Balm In Gilead developed and implemented an educational program and mobilization campaign to address healthy aging and Brain Health within the African American community. The National Brain Health Center for African Americans focuses on two target audiences the faith community and public health. In 2016, through partnerships with the National Black Nurses Association, the National Medical Association, the organization provided cultural competency and educational trainings to over 500 healthcare professionals. Evaluation from these trainings showed a significant increase in providers awareness regarding the need for improved cultural practices and attitudes and more than 80% reported that the information provided was "very useful" in helping identify strategies to incorporate cultural assessments into their practice and care delivery. In addition to the provider trainings, The Balm also conducted 23 faith-based workshops providing information, tools, and resources to the African American community to raise awareness about issues related to healthy aging, Alzheimer's, and other chronic disease. Trainings also included effective strategies to partner with local healthcare and public health Organizations to support programs and services being provided by local congregations.

**Take away notes:**

- Discuss the unique role and historical significance of faith among African- Americans.
- Discuss relationship between faith, culture, and health behaviours among African-Americans.
- Identify possible strategies for healthcare professionals and organizations to work with faith organizations to develop and implement health initiatives that address health disparities and improve health equity.
- Share best practices, lessons learned, and approaches to overcoming challenges within healthcare among African Americans and other marginalized populations.

**Biography:**

Pamela D.Price currently serves as the Deputy Director for The Balm In Gilead managing the various health initiatives of the organization. Under her leadership, the organization provides support to faith institutions in areas of program design, implementation and evaluation, which strengthen their capacity to deliver programs and services that contribute to the elimination of health disparities. In addition to her role as Deputy Director, she also serves as the Director for The National Brain Health Center for African-Americans. In 2016, she co-developed a six-part educational curriculum for nurses and allied healthcare professionals aimed at addressing knowledge gaps related to Alzheimer's disease and other dementias. She holds a Bachelor's of Science degree in Public Health and has more than 20 years of experience in public health, epidemiology, and healthcare. As a registered nurse, she has served as a member of the U.S. Army Nurse Corp and excelled in both government and non-governmental agencies providing leadership and guidance on program management, quality improvement and project development. She frequently conducts workshops and trainings across the country at various conferences and events in addition to providing technical assistance and capacity building services to community-based organizations.

**Frances Mary Johnson**
Matrix Medicao Group, USA

## The process of oncology nurse practitioner patient navigation: A grounded theory approach towards a navigation theory

Nurse practitioner (NP) navigation, in general, has been shown to achieve cost effective quality care, while saving millions of dollars. Research has shown that oncology nurse practitioner navigators' improve clinical outcomes. For purposes of this study, oncology NP navigators are nurse practitioners with a certification in oncology who utilize navigation processes to care for cancer patients along any aspect of the cancer care continuum. Navigation process is defined as "a series of actions or steps taken in order to achieve a particular end". The purpose of this study was to answer the question: What processes do oncology nurse practitioner navigators use in caring for cancer patients? In this parent study, twenty oncology nurse practitioner navigators were interviewed through the use of a semi-structured interview utilizing grounded theory methodology. This resulted in a well-defined set of concepts and theoretical framework for the process of ONP navigation which lays the groundwork for program evaluation and role delineation. This presentation will briefly describe the study, as well as the major theoretical concepts, and assumptions. This presentation places the theory within a metaparadigm perspective suggesting a structured framework and worldview for ongoing research and clinical practice. Additionally suggestions for research designs that can be used for validation of this navigation theory are presented. This research can serve to provide valuable insight in designing studies that provide a link between theory and practice in a cohesive manner, the goal of which is to identify global practices within a structured framework, and ultimately improving patient outcomes.

**Take away notes:**

- Delineate the major concepts, and theoretical assumptions of the ONP navigation process.
- Discuss how the navigation process can be viewed globally within its metaparadigm components.
- Define key areas of the theory in need of further research.
- Give examples of the hypothesis testing and related statistical analysis of significant research questions.

**Biography:**

Frances Mary Johnson has completed her PhD from Texas Woman's University, Masters in Nursing from Boston University, and BSN form Fairfield University in Connecticut. She currently practices as a Nurse Practitioner with Privia Medical Group in Texas City, Texas. She has published 7 papers and co-authored a book chapter on patient navigation. She has presented abstracts derived from this study at the 42nd and 43rd and 44th Oncology Nursing Society National Conferences pertaining to "Carving the ONP Navigation Role", and "Triage an Essential Component of the Navigation Process", as well as "Towards a Theory of Navigation". She has worked as an advanced practice nurse and worked in both primary care and oncology. Her areas of interest include chemotherapy, cancer survivorship, program development, patient navigation systems, as well as all aspects of hematology.

**Bruce K. Kowiatek**
Blue Ridge Community and Technical College, USA

## S-Adenosyl Methionine as a precision adjunct therapy to chemotherapeutic alkylating agents in attenuating side effects and improving outcomes in various cancers

Although the non-enzymatic methylation of cytosine by S-Adenosyl Methionine to 5-methylcytosine and its subsequent spontaneous deamination to thymine in DNA at physiologic pH and temperature has been implicated in some cytosine to thymine point mutagenic cancers, cancers in general display a global hypo methylation of their DNA. S-AdenosylMethionine, therefore may still possibly play a role as a potential rescue adjunct therapy to attenuate side effects and/or improve outcomes in certain cancers, particularly those treated with alkylating chemotherapeutic agents, much in the same way that folic acid is used as a rescue adjunct therapy when using anti folate chemotherapeutic agents. Clinical trials in support of this prospectus are therefore justified and any evidence obtained from such ongoing and/or concluded trials will be presented.

**Take away notes:**

- Specific scheduled dosage regimens of S-Adenosyl Methionine as adjunct rescue therapy for each chemotherapeutic alkylating agent will be presented for clinicians and practitioners to make use of in their application of these agents to various cancers.
- Despite the precise specifics of such scheduled dosage regimens, the versatility of the alkylating chemotherapeutic agents in treating an array of different cancers allows for widespread application of this protocol throughout the field of oncology.

**Biography:**

Dr. Bruce K. Kowiatek earned his Bachelor's in English writing from the University of Pittsburgh in 1998 and his Doctorate in Pharmacy and Master's in Business Administration from Shenandoah University in 2002. In addition to researching and investigating the origins of life for over 20 years, he has also published books and papers on a variety of topics, worked as a clinical pharmacist and are currently full-time Allied Health Faculty at Blue Ridge Community and Technical College in Martinsburg, WV.

**Ingrid Vasiliu-Feltes**
MEDNAX, USA

## Empowering precision medicine via block chain and AI

The dual application of Block chain technology and AI could be a paradigm-changing solution in our quest to move from an industry based on "sick-care" towards a truly global population health and precision medicine-based approach. Block chain technology's unique characteristics and the complex opportunities offered by ML, NN and predictive analytics would allow us to address some of the major challenges within the healthcare system such as privacy, access, data ownership etc. They can also address the massive computational requirements for the large healthcare datasets generated daily as well as the need for improved interoperability in a complex multi-stakeholder healthcare industry. Leveraging the full capabilities of these technologies and the latest scientific advances in genomics could also serve as the foundation for developing a global precision medicine database that can spark further preclinical, clinical and translational research, and act as a driver for continuously optimizing population health.

**Take away Notes:**

- To identify the unique benefits of block chain and AI.
- To understand how to apply these technologies in medicine.
- To learn how the dual utilization of these technologies and latest advances in genomics can facilitate the design and development of state of the art precision medicine solutions.
- How these technologies can be deployed for optimizing clinical research for developing new precision medicine treatments to improve speed, efficiency, computational power, accuracy, accessibility and impact global population health.

**Biography:**

Ingrid Vasiliu-Feltes is a healthcare futurist who has extensive experience in the healthcare industry as a founder, executive, consultant or speaker. She currently is serving as the Chief Quality and Innovation Officer at MEDNAX Healthcare Solutions. In this capacity she provides oversight for all quality and innovation initiatives across the enterprise, such as Block chain, AI, Genomics, precision medicine, population health, tele health, medical simulation and value based care. Additionally, she provides leadership to the MEDNAX Center for research, education, quality and safety. Prior to her current role, she held several leadership positions within the academic, corporate and not-for-profit healthcare arena, most notably serving as VP-Education, Quality and Safety, Chief Patient Safety and Quality Officer, Chief of Compliance and Quality Assurance, Medical Director of Clinical Research Trials and Medical Director-Managed Care. Her consulting engagements have included healthcare systems, VC funds, angel investment funds, not for profit entities and corporations. She is a member of numerous prestigious professional organizations and holds several certifications and Certified Risk Management Professional by the American Society for Healthcare Risk Management.

**Arezou A. Ghazani**
Harvard Medical School, USA

## Pathogenicity of cancer alterations when the genotype and expected phenotype do not match: An integrated evaluation of germ line and somatic genomic results

Cancer patients present a unique population in medical genetics, as they have two sets of genomes, somatic and germline. Traditionally, somatic and germline genetic findings in cancer patients are separately analyzed and interpreted for therapeutic and cancer risk assessments respectively. However, understanding of genome data from the somatic workflow can be much enhanced when done in the context of patient's constitutional genetic data. Conversely, the full extent of the consequence of germline findings can be correctly appreciated when they are examined with somatic genetic data in unison. This presentation demonstrates the role of somatic data in determining the pathogenicity of germline findings in cancer patients who do not exhibit the expected phenotype. Findings from our institution on the RET, VHL and APC germline variants will be presented. Despite the expected high penetrance of pathogenic alterations in these genes, the patients presented with no personal or family history of medullary thyroid carcinoma, Von Hippel-Lindau syndrome, and APC-associated polyposis respectively. In these cases, somatic profiling revealed additional variants in the genome that provided further insight in understanding the phenotypes. Our findings highlight the role of somatic genetics on the backdrop of patients' germline genetic make-up in the interpretation of the genome. The robust investigation of somatic and germline genome data from our cases presents a revised penetrance and a wide phenotypic spectrum associated with RET, VHL, and APC. The result emphasizes the need for the integration of somatic and germline genomic findings in individual cancer patients. The interaction between these two sets of genomes enables understanding of tumorigenicity, refined interpretation of germline variants, and revised phenotypical spectrums associated with cancers.

**Take away Notes:**

- Will be educated about the advances of integrated somatic and germline platforms and application in genetics and genomics research and scientific community.
- Will learn of real examples of benefits to cancer patients and cancer community.
- Will learn about methodologies, limitations and considerations of such systems.
- Highlight opportunities in performing integrated analysis and interpretation of somatic and germline genome data in research.
- Describe examples that can aid in clinical management of cancer patients.
- Share novel methods that can overcome current limitations in cancer assessing genome data in oncology.

**Biography:**

Dr. Ghazani is the Director of Clinical Genomics at Brigham Genomic Medicine, a faculty member at Harvard Medical School and a geneticist at Brigham and woman's Hospital and her interests include the integration of somatic and germline interpretation of cancer data. She investigates the relationship between hereditary and non-hereditary genomic variants and their effects on tumorigenicity and medical management. She received her M.Sc. and Ph.D. degrees from the University of Toronto and completed her medical genetics fellowship at Harvard Medical School and research fellowship at Massachusetts General Hospital. She is board-certified by the American Board of Medical Genetics and Genomics.

**Laura Kelly**
Opal Health, USA

## Precision medicine in chronic disease - Using genetics and personalized medical nutrition to activate underperforming mechanisms in disease

As of 2020, 157 million Americans are living with at least 1 chronic condition with 81 million having multiple chronic conditions. Concurrently it is understood that epigenetics partnered with genetics play a large part in this, with the epigenetic factors largely within our control. With the advent of inexpensive access to the genome and the increasing understanding of personalization in medicine, the time is ripe for creating a foundational, personalized approach to chronic disease. The inflammatory mechanisms that underlie all disease are understood - autophagy/mtor, oxidative stress response, NAD+ pathways, etc. These pathways are genetically driven and combine to impact the cell danger response. These mechanisms are first-line factors and create the environment that surrounds our genetic predisposition to disease, as well as our epigenetic influences. Nutritional factors are in fact the prime movers of these mechanisms, suggesting that a patient's ability to transform nutritional factors significantly impacts chronic disease avoidance and/or resolution. Targeting these mechanisms through personalized medical nutrition can positively impact pathway function and create the foundation for chronic disease avoidance/resolution.

**Biography:**

Dr. Laura Kelly practices integrative medicine on the West side of Los Angeles, combining Eastern and Western methodologies to create lasting good health. She is the author (along with her mother) of The Healthy Bones Nutrition Plan and Cookbook which has been translated into several languages, and is the CEO of Opal Health, a company driven to help people understand and care for their own unique bodies.

**Angelo Michele Carella**
T. Masselli-Mascia Hospital, Italy

## Role of gut microbiota in obesity and diabetes

Gut Microbiota (GM), a microbial community gathering more than 100 trillion microorganisms in gastrointestinal tract, plays specific functions as nutrient metabolism, gut mucosa integrity, immunomodulation and protection against pathogens; GM also controls adipose tissue expansion and food intake. There is evidence of correlation between alterations of GM composition and several gastrointestinal disorders, as Irritable Bowel Syndrome, Inflammatory Bowel Disease (IBD), Celiac Disease and Colorectal Cancer (CRC), as well as metabolic disorders and brain-related disorders, although GM role in their pathogenesis is poorly understood yet. One of the major difficulties in GM study is the ability to culture its microorganisms; since GM encodes over 3 million genes producing thousands of metabolites, recent technologies have allowed phylogenetically identifying and quantifying GM components by analyzing nucleic acids directly extracted from stools. Discovery of microRNAs (miRNAs) easily measurable in plasma, other body fluids and stool, led to the hypothesis of their potential role as disease indicators. miRNAs are short noncoding RNA sequences regulating biological, metabolic and cellular processes; miRNAs may also have a role in molecular mechanisms linked to pathways of some diseases, including diabetes and obesity. Moreover, there is evidence that several miRNAs can have specific effects on gut bacterial growth and influence survival and composition of gut bacteria. For this reason fecal miRNAs, whose profile can dependent on functionally relevant GM alterations, could be used as a new tool to assess microbiota healthiness. It was also observed as the composition of gut microbiota is different in obese and lean individuals, therefore it has been hypothesized that modification in gut microorganisms might play an important role in the pathogenesis of obesity and type 2 diabetes. Specific bacterial phyla, class, or species or bacterial metabolic activities may be beneficial or detrimental to the onset of obesity and insulin resistance; moreover, the observation that diet can modulate host-microbiota interactions heralds a promising future therapeutic approach. Through diet using prebiotics and probiotics, antibiotics and novel procedures as gut microbiota transplantation, encouraging results are apparently achieved.

**Take away notes:**

- Additional studies are needed to understand the potential role of miRNAs detection in gut dysbiosis and further research, based on large and long-term clinical trials, will be helpful to evaluate a greater variety of food components in making specific dietary recommendations.
- This review focus on: 1) role of Gut Microbiota in Obese and Diabetic patients 2) potential future role of microRNAs in the Gut Microbioma study; 3) possible application of microRNA detection as disease indicators; 4) potential of application in the treatment of diseases related to Gut dysbiosis using synthetic specific miRNAs (gene-targeting therapy.
- This work could further stimulate the Researchers; if presented data will be confirmed in more extensive studies including a larger number of patients, they could improve early diagnosis, follow-up and treatment of Gut dysbiosis and its relate diseases.
- Next step will be to evaluate whether microRNAs detection can be applied in future daily clinical practice and routine examinations.

**Biography:**

A.M. Carella graduated in Medicine and postgraduate in Diabetes and Obesity, specialist in Internal Medicine obtained second-level university Master's Degree in Healthcare Management. He operates at the "Internal Medicine Department" (currently "Medical Semi-Intensive COVID Area") of "T. Masselli - Mascia" Hospital in San Severo (Foggia), Italy. He held teaching assignment in the Degree Course in "Health Professions" at Medical Faculty of Foggia University and he took part as researcher/co-researcher in clinical studies, published in international journals, as DAVID, ESPORT, ATA-AF and DIAMOND studies. He is Editorial Board Member and Reviewer of several scientific journals and he is Author of several scientific publications as a speaker in several national and international scientific congresses and meetings and he is member of some scientific societies as "Italian Association of Diabetologists" and "Italian Association of Dietetics and Clinical Nutrition". He is registered on Google Scholar, Research Gate, Publons and ORCID; His research areas and field of expertise include Internal Medicine, Diabetology, Obesity and its complications; Nutrition and Metabolism.

**Sean Hall**
Medlab Clinical LTD, Australia

## Pain: An opioid epidemic requiring a non-opioid alternative

Precision Medicine (PMED) once synonymous with cancer treatment now has potential in a vaster field including infectious diseases, mental health, and age-related illnesses. Whilst PMED holds such vast promise, current day "pitfalls" include high patient costs, high potential for over diagnosis, data sensitivities (legal, ethical) and time as evidence to support PMED use is still developing, as well as addressing disease co-morbidities that can significantly influence patient health outcomes and/or ongoing compliance. For PMED to realise its potential in human healthcare, equal consideration for addressing disease comorbidities, such as pain must be addressed. Pain today continues to represent a significant problem in both physician and patient centres. Current opioid use has had a long effective analgesic history but within the last decade, concerns have been raised over heightened abuse and toxicity profile suggesting a strong need for effective non-opioid analgesic alternatives. This presentation will share data resulting from clinical work for a potential non opioid treatment program, called NanaBis for cancer pain, a proprietary equimolar submicron delivery of CBD and THC.

**Take away notes:**

- Be able to understand NanaBis, its research progression, and determine its (and or cannabis in general) usefulness in pain management.
- Be able to potentially participate in ongoing trials under IND.
- Address pain as a general concern as it relates to disease management whilst further their interest and involvement in PMED.

**Biography:**

Dr. Sean Hall founded Medlab in August 2012. He has over 20 years' experience in nutraceutical sales and development, as well as early drug discovery in Australia, Asia and the US. He inspired his teams to author multiple patents, write peer reviewed articles and deliver lectures at global scientific conferences. His passion is leading his researchers into novel areas and strong commercialisation opportunities. He is also an active member of Medicines Australia, AusBiotech, American Federation of Medical Research (AFMR), American Academy of Anti-Ageing Medicine (A4M), World Medical Associated (WMA), Special Operations Medical Association (SOMA), and a Board Member of the International Probiotics Association (IPA).

**Antonina Mitrofanova[1,3]*, Nusrat J. Epsi[1], Sarra Rahem[1], Sukanya Panja[1], Sharon R. Pine[2], Frederick Coffman[1]**

[1]Department of Health Informatics, Rutgers School of Health Professions, USA.
[2]Rutgers Cancer Institute of New Jersey, Robert Wood Johnson Medical School, Departments of Pharmacology and Medicine, USA.
[3]Rutgers Cancer Institute of New Jersey, Rutgers, The State University of New Jersey, USA.

## Pathway-Centric approaches to uncover markers of treatment response in cancer patients

Prioritization of patients based on the risk of resistance to treatment plays a significant role in personalized therapeutic planning and improving disease course and outcomes. We have developed a series of computational algorithms to utilize patient molecular profiles to predict their favourable or poor response to therapy. We have demonstrated that a Pathway-Centric approach is superior compared to gene-level analysis alone. Further, we have shown that multi-level big data analysis to elucidate dysregulated pathways that govern therapeutic response is superior to using any single data type. We applied our approaches to chemotherapy resistance in lung adenocarcinoma and colorectal cancer, alongside tamoxifen resistance in breast cancer and have demonstrated their robustness, high accuracy, significant ability to predict treatment response and generalizability. Importantly, our predictions were not affected by common co-variates or markers of overall disease aggressiveness. We propose that the identified pathway markers can be utilized to prioritize patients who would benefit from specific treatments and patients at risk of resistance that should be offered alternative regimens.

**Take away notes:**

- It is essential to look at the pathway-level dysregulations, as opposed to gene-level only.
- Pathway dysregulations hold a key to understanding treatment response and identifying novel therapeutic targets.
- Looking at multi-level (i.e., multi-omic) dysregulations increases predictive accuracy.

**Biography:**

Dr. Mitrofanova is an Assistant Professor in Biomedical and Health Informatics at Rutgers University, School of Health Professions. She received her PhD in Computer Science from NYU Courant Institute of Mathematical Sciences and PostDoctoral training in Computational Cancer Biology from Columbia University Cancer Center. Her main research interests are in developing computational algorithms to elucidate mechanisms of cancer progression and treatment resistance in cancer patients. Her publications span Cancer Cell, Nature Communications, Cell Reports, Nature Cell Biology, PNAS, EBioMedicine, and Nature Communications Biology. She is a recipient of the NSF Computing Innovation Fellowship and a Prostate Cancer Foundation Young Investigator Award.

**Jawad Alzeer**
University of Zurich, Zurich, Switzerland

## Halalopathy: A precise medicine for precise patient

Enormous advances in the human health system have been achieved however, diseases like cancer still required treatment options beyond therapeutic drugs, mainly surgery and radiation. Most of the newly approved drugs have limited added therapeutic value and designing a brand-new drug can take up to 10 years and cost billions of dollars. The challenging question is how to make the existing drugs more effective. One possibility, if the concept of cure is deepened and expanded to include all elements of disease. Human is not only made of cells, tissues and organs but feeling and sensations are part of his nature. Linking mental state with physical health is essential to include all elements of disease. For this purpose, halalopathy has been introduced as a new model to integrate mind, behavior and health, where psychology, spirituality and rationality can be integrated together to generate a well-organized, regulated and connected health system. Halalopathy is based on mind-trust-drug and mind-trust-belief, compatibility between drug and belief would intensify trust and initiate a domino chain effect to activate the placebo effect, lower body's entropy and increase potential energy, favorable circumstances will be created to promote the healing process, and with a prescribed therapeutic drug, complete recovery can be achieved. The healing approach may well affect non-genetic changes that human genome experiences as a result of interaction with the environment. Halalopathy acts as a source of education and motivation for patients to assume more personal responsibility for their health by adapting and enriching certain values to achieve more effective treatment. The concept promotes precise therapy and opens a new window for more effective treatment.

**Biography:**

Dr. Alzeer has completed his PhD in Organic Chemistry in 1995, from ETH The Swiss Federal Institute of Technology, and Postdoctoral Studies from School of Pharmacy, Michigan University, USA. He is the Director of Swiss Scientific Society for Developing Countries and founder of Halalopathy. He has published more than 35 papers in reputed journals and has been serving as a director of Halalopathic research unit. He is a docent and senior scientist at Zurich University and his research is mainly involved in the synthesis of valuable compounds.

**Jiandi Zhang**
Quanticision Diagnostics Inc, USA

## Absolute quantitation of protein biomarkers to improve the accuracy of breast cancer diagnostics

Accurate assessment of protein biomarkers is an integral component of breast cancer diagnostics. For example, overexpression of Her2 is the sole determinant of suitability of Trastuzumab for the patients, and Ki67 levels are critical to determine the necessity of cytotoxic therapy in immunohistochemistry (IHC)-based surrogate assay worldwide. Yet, until now, the prevailing method of protein biomarker assessment is IHC, a method known to be plagued with subjectivity and inconsistency. While extensive efforts have been devoted to improve the consistency of Her2 assessment, Fluorescence in situ hybridization (FISH) remains the golden standard for Her2 assessment. Yet, FISH is not without its own issues. Likewise, it is a challenge for pathologists worldwide to achieve reproducible assessment of Ki67 levels in breast cancer specimens. We propose that while IHC is irreplaceable for morphological assessment of the protein biomarkers, it is not suitable for their quantitation. Instead, objective quantitation of these protein biomarkers should be adopted in clinical fields to improve the accuracy and consistency of the results. Using Quantitative Dot Blot (QDB) method, we have been able to measure both Her2 and Ki67 levels absolutely and quantitatively. We were able to convert Her 2 levels dichotomously using a cutoff at 0.267 nmole/g to achieve concordance with IHC at 93.3% (n=1546), and FISH at 94.2%. This method also eliminated the equivocal cases to improve the efficiency of the assay. For Ki67, using an validated cutoff at 2.31 nmole/g, we were able to significantly improve the performance of surrogate assay based on overall survival (OS) analysis of Luminal-like breast cancer patients in two independent cohorts. It demonstrated the necessity and readiness to assessment protein biomarkers objectively and quantitatively in daily clinical practice. More importantly, the acceptance of this practice provides the basis for "big data" based clinical diagnostics in the near future.

**Biography:**

Jiandi Zhang is a Chief Scientist in Quanticision Diagnostics, Inc. Shandong University, Jinan, China. He completed his BS Biology in Duke University, Durham NC, Cancer Biology in UT Southwestern Medical Center and working as a Professor in Binzhou Medical University, Yantai, China.

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# KEYNOTE FORUM | DAY 2

## INTERNATIONAL
# PRECISION MEDICINE CONFERENCE

APRIL 19-20, 2021

**Alexander G. Haslberger**
University of Vienna, Austria

## Importance of personalized precision nutrition and functional foods in healthy aging

Health preservation and disease prevention are central objectives for establishing a healthy lifestyle and nutrition. Molecular mechanisms of aging, premature aging and the development of aging correlated complex diseases are step by step analyzed by scientific disciplines addressing the hallmarks of aging. Studies using the epigenetic clock show the beneficial effects of fasting and diets on healthy aging and recently the definition of ageotypes indicates personal different drivers of aging.

The concepts of healthy aging and attempts to increase longevity have resulted in remarkable innovations in precision medicine and precision nutrition. The highly individual regulation of gene expression and DNA integrity by environmental factors and nutrition is shown in the developments of genetics and epigenetics. Also, the detailed characterization of personal aspects of the human microbiome shows the need for systemic OMIC approaches to understanding pathological mechanisms and markers for them. The fields of nutrigenetics and nutri-epigenetics are analyzing mechanisms and markers in this area.

The use of molecular markers enables the detection of ongoing pathological mechanisms and interventions already before the onset of symptoms. Medical and nutritional- or dietary prevention and intervention are more often using personalized aspects. These developments result in preventive and personalized health care. Markers from the areas of genetics, epigenetics, microbiota, gene expression, and metabolomics need to be integrated for the assessment of optimized personal pre- and intervention. Medical drugs, functional foods, and nutrition are more and more used for personalized treatment of identified molecular mechanisms of concern. The terms personalized medicine and precision medicine or nutrition are somehow overlapping.

A worldwide fast increased awareness of ways for health preservation or recently the resistance against viral infections have boosted the development of functional foods and nutritional concepts. This includes also science-based ways of caloric restriction and fasting. Selected bacteria, algae, cells, or plants and their metabolites or extracts are screened for health-promoting effects and developed into functional foods.

We report that the analysis of a combination of genetic, CPG methylation and miRNA markers in liquid biopsy samples can detect and monitor early cancers and the analysis of genetic, CPG methylation, and miRNA markers in blood spots can indicate personal dispositions to diets and sport and help to monitor the personal effects of epigenetic active nutraceuticals such as EGCG, Phloretin or anthocyanins on aging relevant molecular mechanisms.

**Biography:**

Alexander G. Haslberger was born in 1956, March 10th in Vienna, Austria. Currently working in Dep. for Nutritional Research, University of Vienna and he is a 2016 Visiting professor ship, Univ. Teheran. From 1983-1985 he completed his Post doctoral fellow, microbial immunology, Sandoz Research Institute, Vienna. From 1985-1992: Head of pharmaceutical research laboratory in the field of microbiology, Immunology and cell biology, Sandoz Research Institute, Vienna. In 1986 he worked as a Senior scientist, leader of working group and

lecturing at the University of Vienna; microbial immunology, food safety, ecology. From 2002- 2004 Research scientist, World Health Organisation, department for food safety, work on WHO study GM food safety. His main recent research projects are on ROS, DNA mutations in metabolic syndrome and epigenetic regulation of repair enzymes by Nutrition, FWF, end 12/ 2016 Bacterial diversity in the GI tract of immune-compromised consumers. Austrian National Bank Microbiota and Probiotics, FWF, Austria PHGEN, Public health genomics, EU research Network Metabolic syndrome and bacterial GI communities, FFG. He has peer reviewed many publications from last 5 years.

**Guangju Zhai**
Memorial University of Newfoundland, Canada

## The role of metabolomics in precision medicine of osteoarthritis: Where are we now?

The wide heterogeneity of osteoarthritis (OA) is the biggest challenge for classifying OA, predicting disease progression and developing effective therapeutics. Present OA clinical classifications fail to subset the disease and these results in inconsistent response to therapeutics. This is most likely due to the fact that the different OA clinical phenotypes consist of overlapping molecular endotypes, which are yet to be defined. The application of metabolomics approach in our research has generated much promising results. Specifically, we found that the conversion pathway of phosphatidylcholines (PCs) to lysophosphatidylcholines (lysoPCs) was over activated in OA patients and plasma/serum lysoPCs to PCs ratio was significantly associated with OA risk. Patients with higher plasma lysoPCs to PCs ratio was 2.3 times more likely to undergo total knee joint replacement surgery in 10 years follow-up. The ratio was also significantly associated with knee cartilage volume loss measured by MRI over two years, and the ratio can predict who would respond well to symptomatic drugs including licofelone and naproxen. We found that high blood phenylalanine level was associated with both unilateral and bilateral radiographic knee OA progression in 5 years follow-up. Thus, OA patients should be advised to avoid any food/drinks containing large amount of aspartame which could raise blood phenylalanine levels. Arginine deficiency was also found in OA patients, suggesting arginine supplement may help slow down OA progression. Total joint replacement therapy (TJR) is by far the most effective treatment for end-stage OA patients; however, up to one third of TJR patients either do not achieve symptomatic improvement or deteriorate after TJR. We found that three metabolic ratios (C2 to PC ae C40:1, PC aa C36:4, and glutamine to isoleucine) related to inflammation and muscle breakdown could predict non-responders to TJR. More recently, we found in a large OA cohort that OA had at least three distinct endotypes characterized by different metabolic markers. The results are novel and have potential in developing precision medicine tools for OA management.

**Take away notes:**

- Will learn about the much-updated knowledge on the application of metabolomics in osteoarthritis.
- Will learn about newly identified and potentially clinical actionable metabolomic markers for osteoarthritis.
- Will learn about endotypes of osteoarthritis which could help develop precision medicine tools for osteoarthritis.

**Biography:**

Dr. Guangju Zhai is Full Professor at Division of Biomedical Sciences (Genetics), Faculty of Medicine, Memorial University of Newfoundland, Canada. He is also an adjunct senior researcher at Menzies Research Institute, University of Tasmania, Australia. He has over 20 years research experience primarily on osteoarthritis with more than 110 original scientific research publications in major medical journals and has h-index of 60. He established the Newfoundland Osteoarthritis Study (NFOAS: https://www.med.mun.ca/NFOAS/Home.aspx), which has a primary goal of creating a biobank of human joint tissues and has produced a world-class resource to support multiple osteoarthritis projects and attract national and international collaborators. His research is largely supported by Canadian Institutes of Health Research. He is the recipient of the President's Award for Outstanding Research in 2017-2018.

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SPEAKERS | DAY 2

INTERNATIONAL

# PRECISION MEDICINE CONFERENCE

APRIL 19-20, 2021

IPMC 2021

**Xuemei Zhao**
Merck & Co, USA

## A machine learning approach to identify a circulating micro RNA signature for Alzheimer disease

Accurate diagnosis of Alzheimer's disease (AD) involving less invasive molecular procedures, and at reasonable cost is an unmet medical need. From the Oxford Project to Investigate Memory and Ageing (OPTIMA) study, a cohort of serum samples was profiled by a multiplex microRNA (miRNA) reverse transcription quantitative PCR analysis. Clinical diagnosis of a subset of AD and the controls was confirmed by post-mortem (PM) histologic examination of brain tissue. In a machine learning approach, a 12-miRNA signature for AD identification was constructed. Using a subset of AD and control subjects with PM confirmed diagnosis status, a separate 12-miRNA signature was constructed demonstrating improved accuracy. The miRNA signature appears to be a promising blood test to diagnose AD.

**Take away notes:**

- Machine learning approach for clinical biomarker discovery.
- Considerations on gold standard samples for biomarker discovery.
- Novel blood microRNA markers for Alzheimer disease.

**Biography:**

Xuemei is currently a Senior Principal Scientist in the Translational Molecular Biomarkers Department at Merck & Co., Inc. in Kenilworth, NJ. She received her Ph.D. in Chemistry from Columbia University and performed her postdoctoral research at Cold Spring Harbor Laboratory. Afterwards, she joined the Proteomics Department in Molecular Profiling at Merck in 2004. She led the biochemistry group focusing on sample preparation for LC-MS based proteomics profiling for biomarker discovery and new target identification. In 2012, she transitioned to clinical biomarker development. Currently, she leads the immunoassay group to develop, validate, and deploy immunoassay-based biomarkers in all phases of clinical development and all therapeutic areas at Merck & Co., Inc.

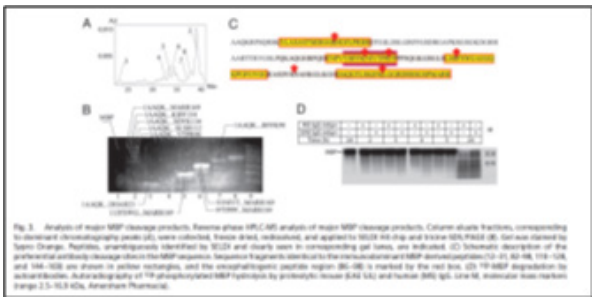
**Sergey Suchkov[1,2*], Noel Rose[3], Aleks Gabibov[4], Harry Schroeder[5]**

[1]I.M.Sechenov First Moscow State Medical University, Moscow, Russia.
[2]EPMA (European Association for Prediction, Prevention and Personalized Medicine), Brussels, EU.

[3]Johns Hopkins Center for Autoimmune Disease Research and PAHO/WHO Collaborating Center for Autoimmune Disorders, Johns Hopkins Medical Institutions, Baltimore, MD, USA.
[4]Institute for Bioorganic Chemistry, Russian Academy of Sciences, Moscow, Russia.
[5]Division of Immunology & Rheumatology, Director UAB Program in Immunology, UAB, Birmingham, ALA, USA.

## Antibody-Proteases as a novel biomarker and a unique target to suit translational tools to be applied for biodesign, bioengineering and regenerative medicine

Catalytic Abs (catAbs) are multivalent immunoglobulins (Igs) with a capacity to hydrolyze the antigenic (Ag) substrate. In this sense, proteolytic Abs (Ab-proteases) represent Abs to provide proteolytic effects. Abs against myelin basic protein/MBP with proteolytic activity exhibiting se-quence-specific cleavage of MBP are of great value to monitor demyelination whilst in MS. The activity of Ab-proteases was first registered at the subclinical stages 1-2 years prior to the clinical illness. And the activity of the Ab-proteases revealed significant correlation with scales of demyelination and the disability of the patients as well. So, the activity of Ab-proteases and its dynamics tested would confirm a high subclinical and predictive (translational) value of the tools as applicable for personalized monitoring protocols of tremendous value are Ab-proteases directly affecting remodeling of tissues with multilevel architectonics (for instance, myelin). By changing sequence specificity one may reach reduction of a density of the negative proteolytic effects within the myelin sheath and thus minimizing scales of demyelination. Ab-proteases can be programmed and re-programmed to suit the needs of the body metabolism or could be designed for the development of new catalysts with no natural counterparts. Further studies are needed to secure artificial or edited Ab-proteases as translational tools of the newest generation to diagnose, to monitor, to control and to treat and rehabilitate MS patients at clinical stages and to prevent the disorder at subclinical stages in persons-at-risks to secure the efficacy of regenerative manipulations.



**Biography:**

Dr. Sergey V Suchkov was born in the City of Astrakhan, Russia graduated from Astrakhan State Medical University and MD in 1980 and PhD at the I.M. Sechenov Moscow Medical Academy his Doctor Degree at the Nat Inst of Immunology in Russia. He is a member of New York Academy of Sciences, USA, American Chemical Society (ACS), USA, American Heart Association (AHA), USA, European Association for Medical Education (AMEE), Dundee, UK EPMA (European Association for Predictive, Preventive and Personalized Medicine), Brussels, EU, ARVO (American Association for Research in Vision and Ophthalmology), ISER (International Society for Eye Research), Personalized Medicine Coalition (PMC), Washington, DC, USA and also the Editorial Boards of Open Journal of Immunology, EPMAJ, American J. of Cardiovascular Research and Personalized Medicine Universe.

**Laurent Metzinger**
Universite de Picardie Jules Verne, France

## MicroRNAs are biomarkers of cardiovascular events due to chronic kidney disease

Cardiovascular disease (CVD) is a major cause of morbidity and mortality in chronic kidney disease (CKD). Better knowledge of the physiopathology of this disease and its underlying genetic mechanisms is needed to improve diagnosis and therapy. The latest research shows a number of deregulations of miRNA in pathologies, making miRNAs possible new biomarkers of CVD associated with CKD. miRNAs are an important, recently identified class of post-transcriptional regulators of gene expression and are known to be involved in CKD. These endogenous, small, noncoding RNAs may have applications as noninvasive biomarkers and therapeutic tools in clinical practice. As will be discussed below, knowledge is sparser in the nephrology field. We and others have published in the last decade that several miRNAs are deregulated during the onset of chronic kidney disease (CKD) and associated with CVD. Their association with clinical outcomes remains poorly evaluated. We used real-time qPCR to measure serum levels of miR-126 and miR-223 in a large cohort of 601 CKD patients (CKD stage G1 to G5 patients or on renal replacement therapy – CKD G5D) from Ghent University Hospital and 31 healthy controls. All-cause mortality and cardiovascular and renal events were registered as endpoints over a 6-year follow-up period. miR-126 levels were significantly lower from CKD stage G2 on, compared to controls. The serum levels of miR-223 were significantly lower from CKD stage G3B on. When considering overall mortality, patients with levels of either miR-126 or miR-223 below the median had a lower survival rate. Similar results were observed for CV and renal events. The observed link between the two miRNAs' seric levels and mortality, cardiovascular events or renal events in CKD appears to depend on eGFR. We also tried to reach a proof of concept for a treatment involving miR-223 modulation in a restenosis pre-clinical model. Restenosis consists in a neointimal hyperplasia resulting from progression and migration of vascular smooth muscle cells (VSMC) into the vessel lumen. We assessed the impact of miR-223 modulation on restenosis in a rat model of carotid artery after balloon injury. The over and down-expression of miR-223 was induced by adenoviral vectors, containing either a pre-miR-223 sequence allowing artificial miR-223 expression or a sponge sequence, capturing the native microRNA to inhibit it. Restenosis was quantified on stained rat carotid sections. We found that down-expression of miR-223 significantly reduced neointimal hyperplasia by 44% in carotids, and was associated with a 2-3-fold overexpression of MEF2C, RhoB and NFIA in a murine monocyte macrophage cell line, RAW 264.7 cells. Thus, down-regulating miR-223 could be a potential therapeutic approach to prevent restenosis after angioplasty.

We need new solutions to improve diagnosis and monitoring in modern nephrology and miRNAs are prime candidates to be developed as innovative biomarkers in the early diagnosis and prognosis of patients afflicted with kidney disorders. The development of new pharmacologic therapies enabling the modulation of miRNA levels should be considered to provide possible therapies of most common kidney diseases in an expanding world population of ageing and diabetic patients.

**Take away notes:**

- Renal diseases are consecutive to a deregulation of gene expression, regulated by non-coding RNAs.
- We and others have published in the last decade that several miRNAs are deregulated during the onset of Chronic kidney disease (CKD) and associated with cardiovascular damages.
- miRNAs are innovative potential biomarkers of cardiovascular events due to Chronic Kidney Disease.
- miRNAs are potential targets to prevent or treat complications of the CKD pathogenesis.

**Biography:**

Pr. Metzinger has completed his PhD in Biological Sciences and Pharmaceutical studies in Strasbourg, France and was a postdoctoral fellow from the University of Oxford (UK) in a leading lab on Duchenne muscular Dystrophy. He works on microRNA regulation in the HEMATIM team in Amiens, and focuses on anemia and related vascular disorders associated with Chronic Kidney Disease. He has authored some of the first papers showing a role for microRNAs in CKD and published in reputed journals, including Nature and Cell. He teaches Biochemistry, Genetics and Molecular Biology in the Pharmacy School of Amiens (Universite de Picardie Jules Verne).

**Xu Chen**
Ashford University, USA

## Keeping cancer in remission - A consensus from patients

During recent forty years, thyroid cancer rates had gone up constantly. Generally, the best treatment for thyroid benign or malignant nodules is surgery, but surgery is very costly. This paper was about how to manage thyroid cancer through food and medication. To understand this topic, this researcher went through more than five thousand threads/emails online long-term thyroid cancer survivors' group. Among the survivors, this researcher picked out five typical cases that survived thyroid cancer from eight years to close to 50 years. From these five cases' discussion, this researcher tentatively summarized the best practices in diet and medication in improving thyroid health, and consequently keeping thyroid cancer in remission.

**Take away Notes:**

- For people with limited income, what should they eat to keep a healthy thyroid?
- When treating a cancer patient, the medical treatment is important, but other factors are also important. Is the patient having a balanced diet? Where is this patient living? Is the treatment actually increasing the chances of cancer? Are there some everyday foods or practice worsening the problems? Or is the patient in an abusive relationship?
- As a practicing physician, you should think of all the aspects of a patient's life, chemo and radiation and hospital stay are the only small portions of the time that doctors can be in control.

**Biography:**

Xu Chen has a Bachelor's Art in Biology and a Master's of Science Degree in Exercise Physiology from the College of St. Scholastica. Currently, she is working on a Doctor of Psychology though University of the Rockies, which is now part of Ashford University. Also, she is a performing artist in Boston area. So far, she has six publications and she is working on more.

**Benjamin Longo Mbenza[1]*, Gabriel Muanda Mabiala[2], Herman Ndilu[3]**

[1]Faculty of Medicine, University of Kinshasa, DR Congo.
[2]Head, PHARMALAB SARL, DR Congo.
[3]Technical Manager, PHARMALAB SARL, DR Congo.

# Predictive, precise, personalized and prognostic medicine for NAFDL, nash and liver cancers in Sub-Saharan Africa: Challenges, solutions and perspectives

**Background:** Five P Medicine (Predictive, Personalized, Preventive, Participating, and Precise, Evidence-Based) for the Management of NAFDL, NASH, Fibrosis, Compensated Cirrhosis, Liver Cancer, HCC Risk and Prognosis, is well established in Rich Western Countries. However, Innovations and Artificial Intelligence such as Glycomics, Genomics, Molecular biology are lacking in Democratic Republic of the Congo (DRC). Thus, this lecture of the Art reports the natural history, the pathogenesis, and the prognostic value of Metabolic Hepatic Steatosis (NAFDL and NASH) for Subclinical Hypothyroidism with Insulin Resistances, Metabolic Syndrome, Ischemic Atherosclerosis, Type 2 Diabetes Mellitus, and HCC Complex Liver diseases (CLD) among Central Africans in Kinshasa from 2000 to 2018.

**Methods:** Methods Cross-Sectional, Comparative, and Prospective Approaches were used between 1999 and 2004 for inclusion of 228 adults aged >= 40 years after rural - urban migration and CLD. A prospective study of incident comorbidities CLD was undertaken from 2005 to 2018.

**Results:** All participants were aged 59.1 ± 11.1 yr with 114 men and 114 women, 75 % (n = 171) and 74.1 % (n = 171) occurred with Insulin Resistance / Metabolic syndrome – subclinical Hypothyroidism and Metabolic Hepatic steatosis (MHstea respectively in the MHstea, 66 % n = 113) and 34 % (n = 58) presented NAFDL and NASH, respectively the Most Important and Independent predictors of Metabolic Hepatic were physical inactivity, smoking Non O – ABO groups, low intake of fruits – vegetables, and diet rich in sugar, fat, salt and highly processed foods. The most important and independent predictors of comorbidities CLD were Metabolic Hepatic Steatosis Insulin, Hypovitaminosis D, elevated CRP, low selenium, and Hypoalbuminemia Compared to Histopathology (Gold Standard), Ultrasound, Metabolic Hepatic steatosis showed excellent diagnostic performances of HCC (Sensitivity = 94 % and Specificity = 95 %).

**Conclusion:** As the diagnosis of HCC is epidemic and late in Kinshasa, Glycomics will anticipate the prevention, the diagnosis and the treatment of NAFDL, NASH, and HCC among poor Congolese Central Africans facing nutrition transitions.

**Take away notes:**

- Demonstration of Leadership in Training, Supervision of Master/Phd Theses, Mentoring, Coaching, Awards, Patents, and Engagement for Development, Human Rights, and medicine of 4P to control traditional endemic or pandemic communicable infectious diseases.
- Explaining the improvement, wellness and satisfaction of general community, staff, students, and patients indeed and Bio – clinical governance.
- M - Medicine of 4P to control traditional endemic or pandemic communicable infectious diseases – Malaria, HIV – infections, Tuberculosis, Nutritional deficiencies, emerging and reemerging infectious/outbreaks of Chikungunya, Ebola, and Non-communicable diseases – chronic diseases (cardiovascular diseases, Metabolic syndromes, diabesity (Type 2 Diabetes, Insulin resistances, Obesity, Lipids/Lipoproteins disorders), Cancers, Sickle Cell Diseases, and Mental Chronic

Kidney diseases (Neurobiology and Neurosciences – Cognitive declines, Alzheimer's diseases, Schizophrenia, Anxiety, Depression, Suicidal ideas) related to Globalization (Climates changes, Variability, Biodiversity destruction, pollution, wars, ethnic conflicts, migrations).

**Biography:**

Professor Benjamin Longo – Mbenza is the Vice Chancellor for Academic and Research, LOMO MEDICAL OMECO, Kinshasa in DR Congo / DRC. He is Honorary Dean of the faculty of medicine at the University of Kinshasa, professor and head in the Department of Community Medicine, School of Medicine, Walter Sisulu University, Mthatha, South Africa and president of Board of Directors of the Congolese Society of Primatology. He demonstrated leadership in Training, Supervision of Master/Phd Theses, Mentoring, Coaching, Awards, Patents, and Engagement for Development, Human Rights, and Medicine of 4P to control traditional endemic or pandemic communicable infectious diseases.

**Hans-Ulrich Kauczor[1,3]*, Alvard Ter-Karapetyan[1,3], Simon M. F. Triphan[1,2,4], Bertram J. Jobst[1,3], Angela F. Anjorin[1,3], Julia Ley-Zaporozhan[1,2,5], Sebastian Ley[1,2,5,6], Oliver Sedlaczek[1,3], Jurgen Biederer[1,2,7], Peter M. Jakob[4,8], Mark O. Wielputz[1,3]**

[1]Department of Diagnostic & Interventional Radiology, University Hospital of Heidelberg, Heidelberg, Germany.
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[3]Department of Diagnostic and Interventional Radiology with Nuclear Medicine, Thoraxklinik at University of Heidelberg, Heidelberg, Germany.
[4]Research Center Magnetic Resonance Bavaria (MRB), Wu rzburg, Germany.
[5]Institute for Clinical Radiology, Ludwig-Maximilians-University Hospital Munich, Munich, Germany.
[6]Diagnostic & Interventional Radiology, Chirurgisches Klinikum Mu nchen Sud, Munich, Germany.
[7]Radiologie Darmstadt, Department of Radiology, County Hospital Gross-Gerau, Gross-Gerau, Germany.
[8]Department of Experimental Physics Julius-Maximilians Universita¨t, Wu rzburg, Germany.

## Towards quantitative perfusion MRI of the lung in COPD: The problem of short-term repeatability

**Background:** 4D perfusion magnetic resonance imaging (MRI) with intravenous injection of contrast agent allows for a radiation-free assessment of regional lung function. It is therefore a valuable method to monitor response to treatment in patients with chronic obstructive pulmonary disease (COPD). This study was designed to evaluate its potential for monitoring short-term response to hyperoxia in COPD patients.

**Materials and Methods:** 19 prospectively enrolled COPD patients (median age 66y) underwent paired dynamic contrast-enhanced 4D perfusion MRI within 35min, first breathing 100% oxygen (injection 1,O2) and then room air (injection 2, RA), which was repeated on two consecutive days (day 1and 2). Post-processing software was employed to calculate mean transit time (MTT), pulmonary blood volume (PBV) and pulmonary blood flow (PBF), based on the indicator dilution theory, for the automatically segmented whole lung and 12 regions of equal volume.

**Results:** Comparing O2 with RA conditions, PBF and PBV were found to be significantly lower at O2, consistently on both days ($p<10–8$). Comparing day 2 to day 1, MTT was shorter by 0.59±0.63 s ($p<10–8$), PBF was higher by 22±80 ml/min/100ml ($p<3,10–4$), and PBV tended to be lower by 0.2±7.2 ml/100ml ($p = 0.159$) at both, RA and O2, conditions.

**Biography:**

Prof. Dr. med. Hans-Ulrich Kauczor, M.D.is Medical Director of Clinic for Diagnostic and Interventional Radiology, Director of Translational Lung Research Center Heidelberg, Investigator in Translational Lung Research Center Heidelberg, Head of Department Department of Translational Pneumology. Heidelberg. Prof. Dr. med. Mark Wielputz has been working as Senior Consultant in Charge of Clinic for Diagnostic and Interventional Radiology, Section Head of Pulmonary Radiology Section, Deputy Research Group Leader of Structural and Functional Airway Imaging.

**Andres D. Klein[1]*, Macarena Las Heras[1], Anyelo Durán[1], Gonzalo H.Olivares[2], Valeria Olguin[1], Valeria Olguin[1], Silvana Zanlungo[3], Patricio Olguin[2]**

[1]Centro de Genetica y Genomica, Facultad de Medicina, Clinica Alemana Universidad del Desarrollo, Santiago, Chile.

[2]Program in Human Genetics, Institute of Biomedical Sciences, Biomedical Neuroscience Institute, Department of Neuroscience, Facultad de Medicina, Universidad de Chile, Santiago, Chile.
[3]Departamento de Gastroentrologia, Facultad de Medicina, Pontificia Universidad Catolica de Chile Departamento de Biologia, Facultad de Quimica y Biologia, Universidad de Santiago de Chile, Santiago, Chile.

## Genomic variability of animal models as platforms for accelerating precision medicine: Applications for Lysosomal storage diseases and Parkinson's disease

We are all similar, but a bit different. These differences are partially due to variations in our genomes and are related to the heterogeneity of symptoms and responses to treatments that patients can show. Most studies in animal models are performed in one single strain with one manipulation. When the knowledge is applied to humans the results are not always reproducible, probably due to the lack of variability of the models studied. Instead, we perform population-based analyses, which allow us to study the contribution of combinations of thousands of variants at the same time, which is closer to what happens in humans (Klein, AD (Physiol Genomics 2017). We are uncovering gene networks underlying variation of the activity of lysosomal enzymes in mice. These modifier genes may help to design novel therapies for several disorders with lysosomal dysfunction. Furthermore, we are modelling diseases in several inbred yeast, flies, and mouse lines, analysing their phenotypic variability, and using it to map genes and to study their responses to drugs (precision medicine). We are focusing on Gaucher and Niemann-Pick C diseases (Klein et al. Cell Rep 2016; Calderon & Klein Mol Gen Metabol 2018;), and Parkinson's disease (Klein & Mazzulli Brain 2018, Olivares et al. Trends in Mol Med 2019). In addition, we are studying families of patients bearing identical genetic mutations, but presenting with different disease severity, including asymptomatic people. We are particularly interested in uncovering the modifier genes of asymptomatic patients, since they have the molecular secrets to treat the symptomatic ones. In conclusion, we are using systems genetics strategies, where we integrate animal models and human clinical phenotypes with genetic data, transcriptomes, cell biology, and others to understand biology and design novel therapies customized for each patient.

**Take away notes:**

- Population-based studies are closer to human analyses because they study the contribution of thousands of variants at the same time.
- Understanding the genetic basis of phenotypic variability can help us to predict what subtype of disease a patient will develop and design customized therapies for each person based on their own biology.

**Biography:**

Andres D. Klein received his B.Sc in Biochemistry and his PhD in Cellular and Molecular Biology at the Pontificia Universidad Catolica de Chile. He did a postdoc at Stanford University (2009-2011) and a second postdoc (2011-2015) at the Weizmann Institute of Science. Currently he directs the Center for Genetics and Genomics at the Universidad del Desarrollo in Chile. He was awarded with the young Chilean innovator prize by MIT technology reviews (2013), he was selected as one of the top 100 young Chilean leaders (2013), and recently received the Pew Innovation Fund (2018), among other recognitions.

**Milena Cavic[1]*, Mladen Marinkovic[2], Aleksandra Stefanovic[1], Marija Ostojic[1], Vladimir Nikolic[3], Suzana Stojanovic-Rundic[2,4], Radmila Jankovic[1]**

[1]Department of Experimental Oncology, Institute for Oncology and Radiology of Serbia.
[2]Clinic for Radiation Oncology and Diagnostics, Department of Radiation Oncology, Institute for Oncology and Radiology of Serbia, Belgrade, Serbia.
[3]Clinic for Medical Oncology, Institute for Oncology and Radiology of Serbia, Belgrade, Serbia.
[4]Faculty of Medicine, University of Belgrade, Belgrade, Serbia.

## Profiling the response to neoadjuvant chemo radiotherapy in locally advanced rectal cancer

**Background:** Neoadjuvant chemoradiotherapy (CRT) is the golden standard in locally advanced rectal cancer (LARC), although the response is not uniform among patients. Profiling the response to CRT in patients with LARC would enable more adequate selection of patients who would benefit most from CRT while minimizing adverse effects and toxicity. The aim of this research was to identify a set of genes with predictive potential in LARC patients treated with neoadjuvant CRT.

**Methods:** Gene Set Enrichment Analysis (GSEA) was performed on selected data sets, and Hallmark, KEGG, and Reactome gene sets were used to compare expression levels in LARC patients who responded well to therapy versus those who did not, according to pathohistological tumor regression grading (TRG) categories (responders TRG 1-2, non-responders TRG 3-5). Gene expression patterns were analyzed using the public database NCBI Gene Expression Omnibus (GEO). The interactive publicly available databases the Human Protein Atlas and UALCAN were used to analyze the Cancer Genome Atlas (TCGA) transcriptome data and confirm the expression of selected gene candidates in rectal cancer. The analyzed patient cohort consisted of 102 patients (68 males and 34 females, age range 38-76 years) with clinically and pathologically confirmed locally advanced rectal adenocarcinoma (stage II/III, ECOG PS≤2). Patients were treated with preoperative chemoradiotherapy for 5 weeks (5-fluorouracil/leucovorin/50.4 Gy in 28 fractions) and the pathological response was evaluated using the Mandard tumor regression grading (TRG) system. Gene expression was determined by qRT-PCR from FFPE biopsy samples. Receiver operating characteristics (ROC) analysis and area under the curve (AUC) with 95% confidence interval (CI) was applied for the investigation of the discriminatory potential of gene expression with significance set at $p < 0.05$.

**Results:** GSEA highlighted the significance of gene expression sets of E2F targets, G2M checkpoint, DNA repair, fatty acid metabolism, glycolysis and gluconeogenesis, cholesterol homeostasis and inflammatory response in this setting. As an example, we evaluated one gene candidate from these sets, the thymic stromal lymphopoietin (TSLP), which is involved in the maintenance of immune homeostasis within the gut by modulating the Th1(Th17)/Th2 balance. In silico analysis showed that high TSLP expression is an unfavorable prognostic factor in colorectal cancer, with a 5-year survival rate for high expression of 54%, and 64% for patients with low TSLP-expressing tumors ($p=0.035$, median follow up time: 1.92 years). In our patient cohort, patients who achieved a good pathological response (TRG1-2) had significantly lower pre-treatment levels of TSLP compared to patients with a partial/no response (TRG3-5), and ROC analysis showed that TSLP expression might predict an unfavorable response to preoperative chemoradiotherapy ($p<0.001$).

**Conclusions:** Using publicly available in silico data, successful prediction of gene candidates for optimized treatment in various oncological scenarios is becoming increasingly important. In this study, it was determined that increased levels of TSLP might be correlated with a poor response to preoperative chemoradiotherapy in locally advanced rectal cancer patients, by inducing a switch to Th2-mediated immunity or other mechanisms that are currently being explored.

**Take away notes:**

- Identify preferentially expressed genes using publicly available datasets.
- Validation of in silico data using patient cohorts.
- Identifying a gene set able to predict the response to chemoradiotherapy in locally advanced rectal cancer.

**Biography:**

Milena Cavic holds a Ph.D. in Biochemistry from the University of Belgrade, Serbia and is employed at the Institute for Oncology and Radiology of Serbia. Her research focus involves investigating resistance mechanisms to chemo-, radio- and targeted therapies in the oncological setting. She serves as Co-chair of the Diagnostics Working group of the Screening & Early Detection Committee of the International Association for the Study of Lung Cancer (IASLC). She is a coauthor of over 30 scientific publications and has served as a reviewer for many journals and as an expert evaluator of proposals in the H2020-MSCA-IF-2019 Life sciences panel.

**Cinzia Casu*, Germano Orru**
University of Cagliari, Italy

## Oral manifestation of COVID 19 and photodynamic therapy for SARS-CoV-2 infection

SARS-CoV-2 infection does not only affect the respiratory and gastrointestinal systems as was hypothesized until a few months ago, but manifestations can occur at different levels as well as in the oral district. The most well-known oral manifestation of COVID 19 is the alteration of taste, but in reality many other lesions on the mucous membranes have been described in the scientific literature, such as oral ulcers, migratory glossitis, tongue papillitis, opportunistic infections, erythema multiform like and Kawasaki disease like lesions, and so on. The role of the oral doctor in recognizing these, often asymptomatic, lesions is important in intercepting positive patients and reducing the spread of the virus. Several papers on the efficacy of photodynamic therapy in SARS-CoV-2 infection have been published. This treatment is given by the interaction of a photosensitizer, which selectively adheres to bacterial, fungal or viral cells, a light that activates it at a specific wavelength for each photosensitizer, and the presence of oxygen. Different types of photosensitizers are proposed against this novel coronavirus such as Methylene Blue and Curcumin, and also different wavelengths and times of illuminations. Photodynamic therapy is a non-invasive treatment and is free of side effects and could represent a valid aid in the management of the oral manifestations of COVID 19.

**Take away notes:**

- To recognize oral COVID 19 manifestations.
- To consider Photodynamic Therapy as a possible treatment for SARS CoV 2 infection.
- The cooperation with other medical figures for the management of this pandemic.

**Biography:**

Cinzia Casu a student, graduated in 2010 and works at the moment at her Private Dental Practice in Cagliari (Italy). She had concluded a biennal Master on Oral Surgery and Pathology at the University of Parma in 2015, and others courses of oral pathology. She is the author of more than 150 national and international articles and a monograph. She is the president of AIRO (Italian Academy of Oral Research). She is an editorial member of some International Journals and Reviewer for MDPI and BMJ Case Report. She is a speaker in Italian, European, and World congresses.

**Idania Gonzalez Perez**
National Institute of Oncology and Radiobiology, Cuba

## Serum EGF levels normalized by platelets count: Its potential in cancer screening and personalization of therapies directed to EGF/EGFR axis

**Problem:** Data about the diagnostic capacity of serum EGF concentrations ([EGF]) in non-small cell lung cancer (NSCLC) are scarce and controversial. The cause is mainly related to the lack of harmonization, and even standardization, in methodologies for blood processing and separation of sera, and the known dependence between clotting times and measured serum EGF concentrations, because of the release of EGF by platelets during blood coagulation. This has hampered the evaluation of the biomarker value of serum EGF levels in NSCLC and other pathologies that involve EGF.

**Methodology:** A standardized methodology for human serum EGF quantification, addressed to control the confounding factors that can bias the measurements, was employed to quantify serum EGF levels in 25 NSCLC patients and 105 healthy individuals, using an ultra-micro ELISA developed as part of the methodology (Castells et al, 2016). Patients were evaluated at diagnosis and after first-line-therapy (18/25 patients). In all cases sera were collected 1h and 4h after phlebotomy. Concentrations measured at 1h ([EGF]1h) were considered a good measure of circulating EGF, while those estimated at 4h ([EGF]4h) represent the total stock of EGF in an individual. Several EGF-related alternative variables were also estimated, obtained by the combination of primary [EGF] and/or its normalization by platelets count.

**Findings:** This work revealed that, unexpectedly, NSCLC patients and healthy individuals have the same total stock of EGF ([EGF]4h). What truly differentiates patients is a higher accessibility of EGF to serum, estimated through variables as r=[EGF]1h/[EGF]4h, the fraction that represents the circulating EGF from its total stock; the average EGF contributed to circulation per platelet ([EGF]1h/platelets/L) and the average EGF retained per platelet ([EGF]4h-[EGF]1h)/platelets/L). The EGF in circulation and that retained in platelets (d=[EGF]4h-[EGF]1h), both normalized by platelet count, discriminate patients better than absolute serum EGF levels. This indicates its most direct relationship with the biology of the tumor and suggests a better performance in predicting the efficacy of the vaccine, as well as its potential use in the screening of the disease in risk populations.

**Conclusion & Significance:** The normalized variables and particularly the average EGF retained per platelet, describe the biology of the tumor better than circulating EGF or its total stock. This performance suggests their usefulness to infer EGF-dependency in tumors/patients, before and after first-line chemo-radiotherapy. The stratification of patients with these variables might be useful for the prediction of response to therapies directed to EGF/EGFR. With values sensitive to chemoradiotherapy, these variables could be used in therapy monitoring and evaluation of response to treatment.

**Take away notes:**

- This research provides a practical solution in the arena of precision medicine in oncology. The presented theory and methodology could be useful to other researchers interested in the role of EGF in cancer, even for teaching purposes; and also, to those that work in the clinic.

- The audience will be able to implement the presented methodology for the study of serum EGF levels in other epithelial cancers or pathologies that also involve EGF. The listeners will learn a new concept of "high/low concentration" for serum EGF values.
- The audience will also know how to employ some EGF-related variables as efficacy biomarkers, using them for stratification purposes. The stratification of patients using the identified EGF-related variables with diagnostic capacity, suggestive of EGF-dependency in its tumors, will allow the prediction of response to EGF/EGFR therapies in patients.

**Biography:**

Idania Gonzalez Perez completed her BSc in Physics in Moscow State University, Russia, in 1989. In 1991 was graduated as MS in Physics and Mathematics, and defended a PhD in Medical Sciences in 2019. She is a Senior Researcher at the National Institute of Oncology and Radiobiology and Associate Professor at the University School of Medicine "Victoria de Girón", both in Havana, Cuba. Member of the International Association of Biomedical Sciences, she has published more than 25 papers in reputed journals and has been serving as Reviewer or occasional reviewer in journals as International Journal of Biomedical Sciences, Journal of Hospital and Clinical Pharmacy, International Blood Research & Reviewers, Biosciences, Biotechnology Research Asia, Asian Journal of Immunology and Current Research in Nutrition and Food Science.

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**Pisamai Natun[1]*, Krittinun Uraiwan[2], Kanyalak Kitcharoensakkul[3], Sathirakorn Pongpanich[4]**

[1]Mahidol University Amnatcharoen Campus, Amnatcharoen Province, Thailand.
[2]Srinagarind Hospital, Faculty of Medicine, Khon Kaen Province, Thailand.
[3]Department of Dentistry, Khon Kaen Hospital, Khon Kaen Province, Thailand.
[4]College of Public Health Sciences, Chulalongkorn University, Bangkok, Thailand.

# A randomized controlled trial of wooden tongue depressor exercise therapy versus usual care to improve mouth opening ability among head and neck cancer patients

Cancer treatment among head and neck cancer (HNC) patients affect the maximum interincisal mouth opening (MIO). Exercise therapy could improve the MIO of HNC who received cancer treatment. This study is randomized controlled trial (RCT) aimed to study the effectiveness of wooden tongue depressor exercise (WTDE) to improve mouth opening ability among HNC patients. The 80 HNC patients in 2 tertiary hospitals in Khon Kaen Province, Thailand, were recruited into intervention (n=40) and control (n=40) by used simple random sampling. The intervention had received WTDE plus usual care (UC) compared with the control group had received UC alone. The MIO was measured by using ruler in millimetres (mm) at a baseline before the intervention, and after cancer treatment at 1 month, 3 months, and 6 months from May 2016 until June 2019. Statistical used were descriptive statistics and repeated measure ANOVA to test the effectiveness of intervention. This study had an ethical approved. Results show that the baseline characteristics of most HNC patients were female in both intervention (60.0%), and control group (50%) ($p>0.05$). The average age of the intervention was 54.6 years old (S.D=11.0), and the controls were 56.8 years old (S.D.=13.0) ($p>0.05$). Most HNC had received surgery plus radiotherapy (interventions 30.0% vs controls 45.0%). The median radiation dose in interventions was 66.0 Gy (IQR=6.0, n=34), and controls was 66.7 Gy (IQR=10.0, n=31) ($p>0.05$). The interventions most found cancer site at nasopharynx (42.5%), and floor of mouth in the control group (17.5%). The stage of HNC was at T3 (interventions 70.0% vs controls 75.0%), N1 (interventions 30.0% vs controls 25.0%), M0 (100% both). The median of MIO was 38.0 mm interventions (IQR=3.0), and controls was 37.0 mm (IQR=4.0) ($p>0.05$). The average of MIO after interventions were 32.6 mm in the intervention vs 29.2 in the controls at 1 month ($p>0.05$), 35.0 mm vs 29.3 mm at 3 months ($p<0.05$), and 37.4 mm vs 29.8 mm at 6 months respectively ($p<0.05$). There was a significant different among intervention and control group and the following tine at 1 month, 3 months, and 6 months ($p<0.05$). WTDE plus UC is better than a UC alone to improve mouth opening ability among HNC patients. It may promote to using WTDE plus UC among HNC patients to reduce MIO loss after cancer treatment.

**Take away notes:**

- The wooden tongue depressor exercise has more benefits to improve the MIO among HNC patients, should be promote to HNC patients from the initial diagnosis.
- The loss of MIO could immediately occur at before or after cancer treatment, it may relate with the disease factors, or the clinical factors. It should have the study to emphasize the association between them.
- The rehabilitation of MIO may affect the quality of life among HNC patients. The further study should report the quality of life among HNC patients after received exercise therapy.

**Biography:**

Pisamai Natun, Ph.D. candidate in Public Health at College of Public Health Sciences, Chulalongkorn University, Bangkok, Thailand and graduated as M.P.H. in Epidemiology at Faculty of Public Health, Khon Kaen University, Khon Kaen Province, Thailand in 2013. She works as a lecturer at Mahidol University Amnatcharoen Campus, Amnatcharoen Province, Thailand.

**Mohammad A Y Alqudah[1]*, Marwah Azaizeh[1], Aref Zayed[2], Leen Asaad[1]**

[1]Department of Clinical Pharmacy, Jordan University of Science and Technology, Irbid, Jordan.
[2]Department of Department of Medicinal Chemistry and Pharmacognosy, Jordan University of Science and Technology, Irbid, Jordan.

# Calcium-Sensing receptor antagonist NPS-2143 inhibits breast cancer cell proliferation, migration and invasion via down regulation of p-ERK1/2, Bcl-2 and Integrin β1 and induces Caspase 3/7 activation

**Purpose:** Calcium-sensing receptor (CaSR) has been associated with breast cancer metastasis to the bone. Targeting chemoattractant factors, such as calcium, that are released in response to bone resorption could prevent metastasis and induce apoptosis of cancer cells. In the present study, we investigated the potential caspase 3/7 activation following treatment with a CaSR antagonist, NPS-2143, in breast cancer cells. In addition, the effects of NPS-2143 on breast cancer cell proliferation, migration and invasion were assessed.

**Methods:** Colorimetric MTT assay was used to evaluate cell viability. Apo-one homogeneous caspase-3/7 assay was used to measure caspase 3/7 activities in breast cancer cells. Cell migration and invasion were assessed using scratch wound assay and matrigel invasion chambers, respectively. The protein expressions of p-ERK1/2, integrin β1 and Bcl-2 were evaluated using western blotting.

**Results:** Our study revealed that NPS-2143 significantly reduced cell proliferation with half maximal (50%) inhibitory concentration (IC50) values of 4.08 and 5.71 μM in MDA-MB-231 and MCF-7 cells, respectively. NPS-2143 induced caspase 3/7 activation in MDA-MB-231 breast cancer cells which was accompanied with a remarkable reduction in the expression of Bcl-2 antiapoptotic protein. NPS-2143 suppressed migratory and invasive abilities of MDA-MB-231 cells with a significant reduction in the expression of p-ERK1/2 and integrin β1 proteins.

**Conclusion:** Our study confirms the ability NPS-2143 to suppress proliferative, migratory and invasive effects of breast cancer cells which was accompanied by caspase 3/7 activation and suggests the potential of NPS-2143 as a promising anti-cancer molecule in breast cancer.

**Take away notes:**

- Our studies allowed the identification of a subset of population that may benefit from Anti-CaSR- based therapies. This may lead to the design of novel strategies to improve therapeutic outcome of patients with breast cancer by establishing medical and scientific basis for personalized medicines.

**Biography:**

Dr. Mohammad A Y Alqudah is an Associate Professor in the college of pharmacy at Jordan University of Science and Technology (JUST) where he has been a faculty member since 2013. In addition, he is a chairman of clinical pharmacy department at King Abdullah University Hospital. He completed his PhD at the University of Iowa and his PharmD at JUST. His research interests lie in cancer therapeutics ranging from basic science to pharmacogenomics. He has published more than 20 research articles in SCI(E) and Scopus journals.

**Rahma A.[1], Elbarazi I.[1], Ali B.,[1,2] Patrinos G.[2], Ahmed L.[1,2] and Al Maskari F.[1,2]**

[1]Institute of Public Health Institute, College of Medicine & Health Science, UAE University, United Arab Emirates.

[2]Zayed Center for Health Sciences, UAE University, United Arab Emirates.

# Stakeholders' interest and attitudes toward genomic medicine and Pharmacogenomics implementation in the United Arab Emirates: A qualitative study

**Introduction:** Mapping the power, interest and stance of stakeholders is a cornerstone for genomic medicine implementation. In this study, we aimed at mapping the power/interest of various stakeholders in United Arab Emirates (UAE) and exploring their attitudes toward pressing health genomics aspects.

**Aims & Objectives:** The overarching aim of this study is to facilitate the construction of a roadmap for the full implementation of genomic medicine and pharmacogenomics in the UAE with potential applicability to many healthcare systems around the world.

**Materials & Methods:** A qualitative approach using in-depth interview was employed. Heterogeneous stakeholders were identified by experts in the field. The analysis of the data was a hybrid of deductive and inductive approach using NVivo software for coding and analysis. Institutional Review Board (IRB) from UAEU social science was granted.

**Results:** 13 interviews were conducted. Following mapping the Mendelow's matrix we categorized the stakeholders in UAE to promoter, latent, defender and apathetic. Most of the interviewed stakeholders emphasized the clinical demand for genomic medicine in UAE. However, many of them were less inclined to articulate the need for pharmacogenomics at the moment. The majority of stakeholders in UAE were in favor of building infrastructure for better genetic services in the country. Stakeholder from an insurance sector had contradicting stance about the cost-effectiveness of genomic medicine; the majority were concerns with the legal and ethical aspects of genomic medicine and had an opposing stance on direct-to-consumer kits.

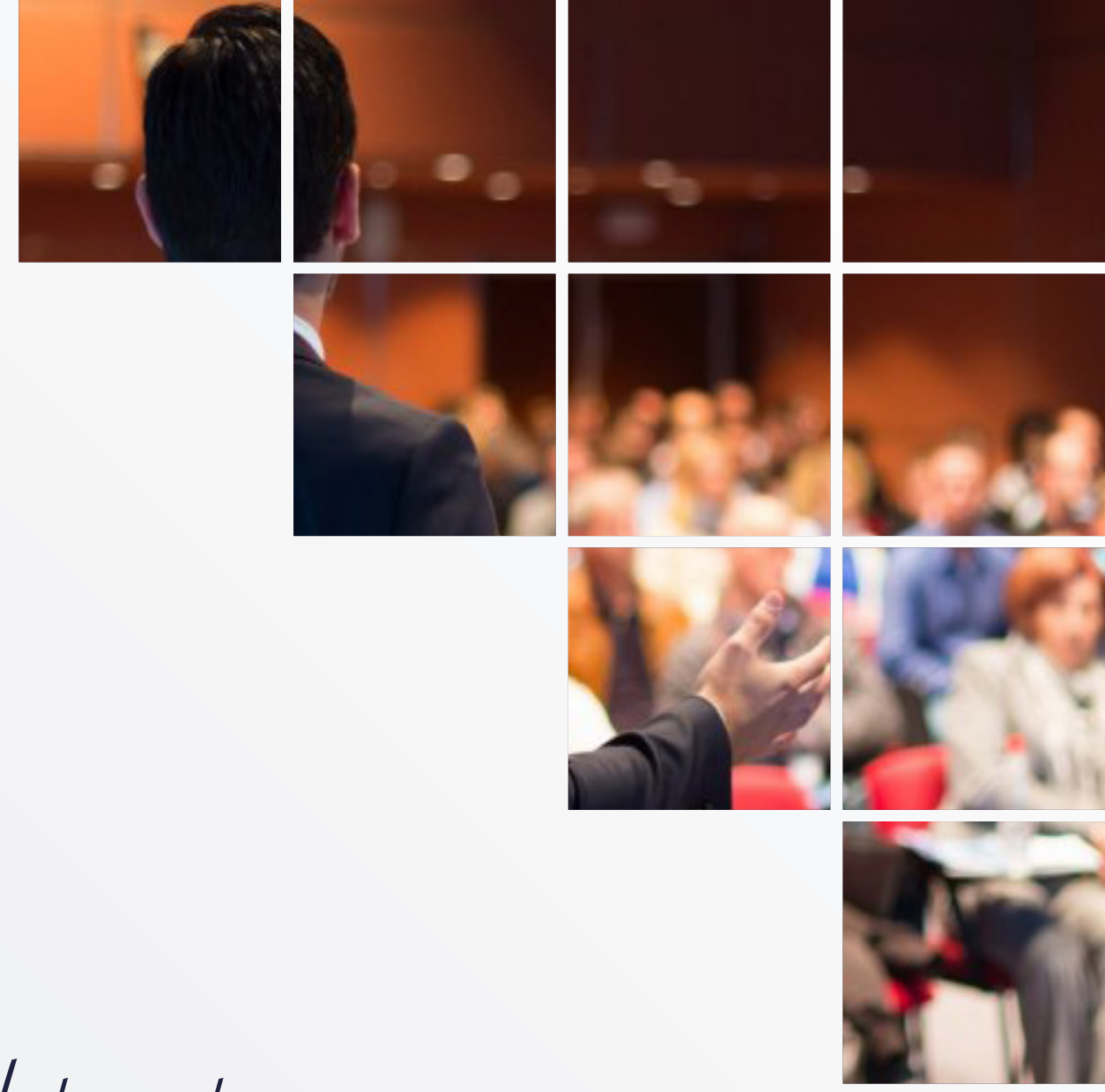
**Conclusion:** Implementing the Mendelow's model will allow the systematic strategy for implementing genomic medicine in UAE. This can be achieved by engaging the key players (promoters and defenders) as well as engaging and satisfying the latent stakeholder.

**Biography:**

Azhar Talal, B sc. Pharmacy, MPH, Senior Pharmacist, Tawam Hospital/Johns Hopkins International, Al Ain, UAE. Azhar obtained her B sc. Pharmacy degree, from the Faculty of Pharmacy, AUST -UAE, and then had her (MPH), from the United Arab Emirates University – UAE. She also obtained her CPPS (Certified Professional of Patient Safety) from The National Patient Safety Foundation and her American board in medical quality. She worked as teaching assistant at AUST from 2001 till 2006. She joined Tawam Hospital in 2007 and during her tenure has gained experience in many pharmacy sections of the department, 2nd in-charge in the Polyclinic pharmacy and covered in the Material management section – Tawam Hospital. Currently she is the Unit Dose pharmacy supervisor at Inpatient Pharmacy-Tawam Hospital as well as a BLS instructor at American Heart Association. Currently, Azhar is a PhD candidate in the Institute of Public Health, Zayed Bin Sultan Center for Health Sciences, United Arab Emirates University, Al Ain, UAE and her area of research is Pharmacogenomics in United Arab Emirates. Azhar had published 4 papers about the implementation of genomics and pharmacogenomics in UAE, and her abstracts accepted in many national and local conferences.

# PARTICIPANTS LIST

# PARTICIPANTS LIST



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