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Personalized and Precision Medicine (PPM) as a Unique Healthcare Model to Secure the Human Healthcare, Wellness and Biosafety: through The View of Infectious Disease Management

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Policy formation in the field of individual health promotion and protection is one of the priority tasks of national healthcare systems. Canonical health care is becoming increasingly unaffordable in most of the countries, yet it remains ineffective in preventing or effectively treating chronic diseases (including infectious ones). The medicine of the XXI century is **Personalized & Precision Medicine (PPM)**, by protecting and preserving human health throughout the life. In this regard, an upgraded model of healthcare service, which includes the philosophy, principles and armamentarium of PPM and aimed at identifying the disorder at its early (subclinical) stage, is being created and set up.

PPM focuses on predictive and preventive measures that contribute to the development of individualized strategies for managing a healthy lifestyle that stabilize morbidity rates and can help to improve the working capacity of the population. PPM provides procedures for disease prediction and for the prediction of consequences and complications. In this regard, the biomarker-based analysis is intended as a first step towards a more personalized and precision treatment and clinical utility.

With the increase in antimicrobial agent resistance and a decreasing antimicrobial pipeline, there is a need for coordinated efforts to promote appropriate use of antimicrobial agents. Such "antimicrobial agent stewardship" measures encourage the appropriate use of antimicrobials by promoting the selection of the optimal drug regimen. PPM can help solve the crisis of antimicrobial resistance (AMR) by changing the way antimicrobial agents are developed and prescribed.

Improved patient (or persons-at-risk) outcomes with the application of the above-mentioned biomarker tests must consider not only increased survival or quality of life, but also improved **clinical decision support (CDS) & making** leading to the avoidance of unnecessary therapy or toxicity captured within the rapid learning system.

Opportunities exist at every stage of disease initiation and progression to develop a Personalized Health Plan (PHP) addressing lifestyle, risk modification and disease management, and later, Personalized Health Management & Wellness Program (PHM&WP). So, a combination of genomic and phenome-related biomarkers is becoming of great significance to be applied in PPM and need to be translated into the daily practice to predict risks of the disease chronification and thus of disabling.

Meanwhile, advances in biomedical informatics and IT technologies brought on and suiting the goal by applying mathematical modeling to secure constructing and maintaining unified biobanks and databanks necessary for personal health monitoring, for instance, by the increasing availability of electronic medical records (EMRs), electronic patient registry (EPR, telemedicine and mHealth tools and cloudy technologies have allowed for the proliferation of data-centric tools and inter-hospital network communications armamentarium, especially in the context of

personalized & precision healthcare (PPH).

Advances in genomics and computing are transforming the capacity for the characterization of biological systems. The set would include the use of genome-based approaches to inform molecular diagnosis and individual-level treatment regimens. In addition, advances in the speed and granularity of pathogen genome generation have improved the capability to track and understand pathogen transmission, leading to potential improvements in the design and implementation of population-level public health interventions. So, we outline several trends that are driving the development of PPM-based epidemiology of infectious disease and their implications for the ability to respond to outbreaks.

Going beyond the detection of the pathogen is crucial to transforming the diagnosis of microbial infections. Consideration of the evolutionary and ecological principles between the host and their microbiome might provide "new strategies for restoring and maintaining human health." Innovative diagnostics that can identify host, microbiome, environmental and pathogen biomarkers are crucial to PPM-based approach. That Big Data can then be used to design optimal therapeutic strategies for patients that can restore them to health by coordinating agents that can target the pathogen, the host and the microbiome thereby intervening appropriately in the ecological balance in the patient. These strategies bring us a step closer to developing personalized therapies that exclusively remove disease-causing infectious agents. And we would advocate the preservation of our beneficial microbes and provide an overview of promising alternatives to broad-spectrum antimicrobials. Specifically, we emphasize that the newest approaches can not only improve patient care, but preserve antimicrobial agents for the future. We can advance directly to the phase of preclinical validation of disease biomarkers and their underlying mechanisms, and the results can be translated into precision diagnosis enabling patient stratification for individualized therapy. Taken together, the activities proposed will demonstrate the clinical feasibility and advantages of PPM in managing chronic and acute infectious diseases.

As you might see from the above-mentioned, PPM has drastically changed and is keeping on changing the landscape of healthcare. In reality, PPM is the new revolution in medicine which is dramatically modifying the traditional paradigm in medicine with huge consequences for health care systems. And putting PPM-tools in a public health perspective requires an apprehension of the current and future public health challenges.

A symbiotic relationship between infectious diseases, their risks, epidemiological studies, public health and PPM may exist. And this approach will be possible only with the integration of data across levels of influence and analytic wisdom in using those data toward better identification of disease and lifestyle risks. So, often overlooked, is the most fully realized application of PPM so

far: in infectious diseases, where advances in genomics are already changing both medical and public health practice.

PPM has indeed arrived for the diagnosis of infectious diseases. More than that, it has arrived once and for all in the areas of clinical microbiology, molecular epidemiology and many other areas. Epidemics of the most diverse viruses will continue to occur due to factors that we are not completely able to control. The difference now is that we have powerful PPM-based technologies and tools to win this fight. In this connection, the healthcare providers, public policy sector, and consumer industries will be required to develop new and creative models and products. And, no doubt, next generations will speak about the XXI century as a time, when medicine became preventive and personalized, and its outcomes – predictive and guarantied.

BIOGRAPHY:

Dr Sergey Suchkov, MD, PhD was born in 11.01.1957, a researcher-immunologist, a clinician, graduated from Astrakhan State Medical University, Russia, in 1980. Suchkov has been trained at the Institute for Medical Enzymology, The USSR Academy of Medical Sciences, National Center for Immunology (Russia), NIH, Bethesda, USA, and British Society forImmunology to cover 4 British university facilities. Since 2005, Dr Suchkov has been working as Professor of I.M. Sechenov First Moscow State Medical University and of

PPPM Politics and Management of the University of World Politics and Law. In 1991-1995, Dr Suchkov was a Scientific Secretary-in-Chief of the Editorial Board of the Interna-tional Journal"Biomedical Science" (Russian Academy of Sciences and Royal Society of Chemistry, UK) and TheInternational Publishing Bureau at the Presidium of the Russian Academy of Sciences. In 1995-2005, Suchkov was a Director of the Russian-American Program in Immunology of the Eye Dis-eases.Dr Suchkov is a member of EPMA (European Association of Predictive, Preventive and Person-alized Medicine,Brussels-Bonn), a member of the NY Academy of Sciences, a member of the Editorial Boards for Open Journal of Immunology, EPMA J., and Personalized Medicine Universe, and others. Dr Suchkov is known as a co-author of the Concept of post-infectious clinical and immunological syn-drome, co-author of a concept of abzymes and their impact into the pathogenesis ofautuimmunity conditions, and as one of the pioneers in promoting the Concept of PPPM into a practical **branchof health services.** Now r Suchkov is a Chair of Dept for Personalized & Translational Medicine, and Director, Center for Personalized & Translational Reproductology, I.M.Sechenov First Moscow State Medical University. Prof Sergey Suchkov, MD, PhD Chair, Dept for Personalized and Translational Medicine, Director, Center for Personalized Reproductology & Pediatrics, I.M.Sechenov First Moscow State Medical University, Moscow, Russia Member, EPMA, Brussels, EU Member, PMC, Washington, DC, USA Member, ISPM, Tokyo, Japan Member, New York Academy of Sciences Member, ACS, USA Member, AHA, USA Member, AMEE, Dundee, UK Secretary General, UCC, Cambridge, UK.

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