

Personalized and Precision Medicine (PPM) as a unique healthcare model to be set up via Translational applications and upgraded business modeling to secure the human healthcare, wellness and biosafety.

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Abstract

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 PPM concept, it is necessary to create a fundamentally new strategy based upon the recognition of biomarkers and thus the targets to secure the grand future of drug design and drug discovery.

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 the latest health care resources including diagnostic (companion ones), preventive and therapeutic (targeted molecular and cellular) etc.

PPM, genomics and AI are those of the most rapidly emerging areas of biomedical research and the most promising technologies for improving health care and health outcomes. Examples include the use of AI for improved DNA sequencing and SNP analysis to target specific cell and tissue types, biosensors for specific molecules in vivo, and point-of-care molecular diagnostic devices enabled by genomics- and AI tools.

The enormous development of genomics research has raised great expectations concerning its impact on PPM aiming to customize medical practice with a focus on the individual, based on the use of genetic tests, identification of genomic biomarkers, and development of targeted drugs. Personal genomics is an area of genomics focusing specifically on the sequencing and analysis of one person's genome, and then giving them their genomic information.

The emphasis on individuals and genomic knowledge needs to be counterbalanced with the subjects' understanding in their sociocultural, political, and economic contexts and with the equivalent investment in actions on the social determinants of health. The above-mentioned areas being an integral part of PPM is really an interdisciplinary research field that results from the application of the innovative genomic and AI tools to medicine and has the potential to significantly improve some canonical treatments, prevention, prophylaxis and

rehabilitation. Specifically, in the field of PPM, it is expected to have a great impact in the near future due to its multiple advantages, namely its versatility to adapt a drug to cohorts of patients and/or persons-at-risk. For instance, multimodal genomic and AI-driven approaches may indeed become a key driver in harmonizing the needs of the various stakeholders by allowing cost-effective delivery and monitoring of drug efficiency and safety, and close-meshed high-quality data collection.

Personal genomics can be used to advise couples wanting to have children. By knowing the risk of passing on a genetic disorder to their child, they may decide to investigate other ways of having a baby, such as in vitro fertilisation (IVF).

Meanwhile, personalized genomic medicine and surgery (PGMS) represents a new approach to health care that customizes patients' medical treatment according to their own genetic information. This new approach is the result of increased knowledge of the human genome and ways this information can be applied by physicians in the medical and surgical management of their patients.

Currently, personal genome sequencing and testing is a relatively niche market with a number of services available over the internet. However, the commercialization of personal genome sequencing is set to grow and, in future, it could become a routine part of clinical practice.

Genomic research and thus the market offer clinicians new techniques for risk assessment and disease classification. However, the scope of this new testing paradigm remains to be determined. Genetic tests should be seen as the latest set of tools to assist clinicians and patients in the decision-making process. Some genetic tests will undoubtedly play an important role in identifying individuals with high risks for preventable disease, or in refining clinical diagnoses. Irrespective of the number of genetic tests that prove clinically useful, genomic research will continue to provide essential new information about how and why diseases occur.

The promise of PPM is well understood and exists at the convergence of genomic sequencing, biomarker research, and big data analysis. One of the big challenges to bringing more lifesaving PPM-based treatments to patients is that the vast networks of hospitals, foundations, and other organizations working toward new treatments and cures lack consensus on how to pursue their common goal.

As a consequence, duplicative efforts and inefficiencies proliferate in this network. It will take a business mindset to overcome these obstacles.

By virtue of treating each person's condition as unique, personal genomics and PPM require health professionals to understand the nature of the data, its health implications, and its limitations. But the public understanding of the scope and impact of genetic variation has not kept up with the pace of the science or technology. We examine several venues for information, including print and online guides for both lay and health-oriented audiences, and summarize selected resources in multiple formats. We also stress that implementation of PPM thus 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. In short, PPM will transform the way doctor's practice and will shake up the entire pharmaceutical value chain.

Biography:

Sergey Suchkov was born in the City of Astrakhan, Russia, in a family of dynasty medical doctors. In 1980, graduated from Astrakhan State Medical University and was awarded with MD. In 1985, Suchkov maintained his PhD as a PhD student of the I.M. Sechenov Moscow Medical Academy and Institute of Medical Enzymology. In 2001, Suchkov maintained his Doctor Degree at the National Institute of Immunology, Russia. From 1989 through 1995, Dr Suchkov was being a Head of the Lab of Clinical Immunology, Helmholtz Eye Research Institute in Moscow. From 1995 through 2004 - a Chair of the Dept for Clinical Immunology, Moscow Clinical Research Institute (MONIKI). In 1993-1996, Dr Suchkov was a Secretary-in-Chief of the Editorial Board, Biomedical Science, an international journal published jointly by the USSR Academy of Sciences and the Royal Society of Chemistry, UK.



Speaker Publications:

1. Sergey Suchkov (2013) Predictive, preventive and personalized medicine (PPPM) as illustrating biomarkers and bio-predictors and as being an integrative part of healthcare services to move ahead. Proceedings of The 5th International Conference on Biomarkers and Clinical Research, April 15-17, St. Hilda's College – University of Oxford, Oxford, UK, P.32
2. I.A. Sadkovsky et al. (2014) PPPM (Predictive, Preventive and Personalized Medicine) as a New Model of the National and International Healthcare Services and Thus a Promising Strategy to Prevent a Disease: From Basics to Practice. Int Journal of Clin Med, 5, 855-870.
3. M.Studneva et al.(2015) Strategic aspects of higher education reform to cultivate specialists in diagnostic and biopharma industry as applicable to Predictive, Preventive and Personalized Medicine as the Medicine of the Future. The EPMA Journal, 2015, 6:18. PP. 2-14.
4. V.M.Zemskov et al. (2016) A Composite Biomarker Panel as a Highly In-formative and Reliable Tool for Predicting Septic Complications. Jacobs Journal of Biomarkers, 2(1), 1-10

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