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Predictive, Preventive and Personalized Medicine (PPPM) as being a global challenge for the medical and biopharma community to move ahaed in strategic direction

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Any innovations in healthcare services are an important driver to move medicine and thus biopharma forward. In this sense, a new systems approach to disease would result in a new trend in the healthcare services, namely, predictive, preventive and personalized medicine (PPPM). The latter is defined as: "…the capacity to predict disease development and influence decisions about lifestyle choices or to tailor medical practice to an individual."

All chronic disorders develop gradually over a period of time to take years for a process to reach a level where it could be diagnosed definitively and treatment initiated properly and in time before changes are irreversible! But a majority of medical interventions occur late in the pathological process, when treatment outcome can be less predictable and effective. Moreover, those interventions used led to so-called "chronification" of complex, previously fatal diseases. And despite the benefits of being able to offer such treatments to patients (but not to persons-at-risk), the intervention and maintenance of treatment at this level of disease progression was and still is inefficient and expensive. With healthcare costs amounting to US$2.6 trillion in 2010, and three out of four treatment dollars being spent on the management of chronic conditions (e.g., Parkinson's costs society $27 billion per year in medical bills and lost wages; worldwide, projected cases of Parkinson's will more than double by 2030!), the need for new approaches to address these issues has never been more pressing. The above-mentioned would highlight the need for new precise and preventive (PPPM-based) therapeutic development strategies.

To achieve the implementation of PPPM concept, it is necessary to create a fundamentally new strategy based upon the subclinical recognition of biomarkers and biopredictors of hidden abnormalities long before the disease clinically manifests itself. This strategy would give a real opportunity to secure preventive measures whose personalization could have a significant influence on demographics!

Two key objectives of PPPM are:
(i) detection of subclinical abnormalities with a selection of suitable targets for the next step of PPPM protocol, i.e., drug-based prevention;
(ii) drug-based correction of the abnormalities detected under the heading of preventive measures.

PPPM is thus a medical model being tailored to the individual and dictates a construction of PPPM algorithms to diagnose, to predict, and to prevent in time whilst following a concept of biomarkers impact into the daily practice!

The key benefits of PPPM include new abilities:

I. to detect disease at a subclinical stage, when it is easier and less expensive to treat effectively;
II. to stratify patients into groups that enable the selection of optimal preventive treatment;
III. to reduce adverse drug effects by more effective early assessment of individual drug responses;
IV. to improve the selection of new molecular targets for drug discovery;
V. to shift the emphasis from illness to wellness.

Despite an increasing ability to compare and contrast different disease entities at a range of biological levels of organization, an important challenge lies in translating this into clinical decision making tools. And translational armamentarium and thus its tools are appearing to become well-positioned to contribute to the many challenges inherent in bridging this gap between our current reactive methods of healthcare delivery and the intent of PPPM.

The first discriminatory step illustrating the PPPM-oriented survey and positive outcome of translational efforts is estimating of the correlation strength between genetic polymorphism and risks of the disease, and subsequent construction of the groups at risks. Those goals can be solved by using of BioChip methodology (each disease has specific genomic biomarkers and thus the individual fingerprints). As a result, a patient becomes a data carrier (i.e., he/she knows about possible risks of