

Unmet Need and Future of Medicine:

The paradigm shifts of personalized medicine by the European Center of Personalized Medicine (ECPM)

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To some extent it is unbelievable how historic medical approach looks like. Although there are very worthwhile achievements of traditional evidence-based medicine along with scientific standardisation and scaling of biologic processes it only recently has come to our attention in daily medical practice that individual heterogeneity cannot be neglected. It is not just anatomy and physiology assumed to be uniform in every human being but complex individual process in a more holistic and also functional way to be considered. An also quite innovative approach in this sense is neuropsychimmunology that recognizes complex neurophysiologic together with psychologic items complimented by a huge spectrum of immunologic reactions including such as disastrous autoimmunopathies. In many cases, evidence-based medicine also does not provide any answers to the so far unresolved question who will originate any malignant disease and who will not. So far there are hardly any reasonable predictors identified. Further, and even required in placebo-controlled studies the placebo as well as nocebo effect is just taken as existing without any convincing explanation why in whom to which extent it will occur. Pharmacotherapy is another open question; although medication is prescribed in a standardised manner there is often dramatic heterogeneity. Some individuals do not respond and may have side-effects, for which there are hardly any predictors. It is a paradox that despite evidence-based approach medical doctors must restrict and reduce their treatments to a trial-and-error approach.

Prof. Dr. Uwe Nixdorff is enthusiastically involved in preventive medicine for which – as medical population-wide provision does not provide any structure for its approach so far – he had grounded the European Prevention Center (EPC). For this, he struggled on to identify the most advanced medical technologies such as cross-sectional imaging modalities (like high-end ultrasound (US), multi-detector computed tomography (MDCT), or magnetic resonance imaging (MRI)) to detect already subclinical disease such as atherosclerosis. Therefore, the utilisation of those modalities is integrated in an algorithm of risk stratification to justify the earliest characterisation of the phenotype.

Professor Dr. Karim Nayerian is enthusiastically involved in molecular medicine, molecular analyses which enables information on the genotype just beyond the already existing phenotype, i.e., the principal, individual identification of predisposition for which he had grounded the International Center of Personalized Medicine (ICPM). This approach extends the timeline of disease detection beyond the phenotype. It may define the more individual, i.e., personalized approach for detecting pre- or subclinical disease predispositions. Thus, the rationale of combining the approaches of genotype as well as focussed early phenotyping resembles a paradigm shift in medicine, i.e., personalized medicine. It is very well established that as earlier as possible a biological problem is detected in an individual as more effectively any treatment can be elaborated, and side effects be omitted in this individual. Also, patients may be better engaged in lifestyle choices and active health maintenance to compensate for genetic susceptibilities. That is the reason why sometimes personalized medicine is also called precision medicine.

Therefore, Professors Nixdorff and Nayernia have tailored individualized programs:

- in a first line (Check-Up as PERCHECK®),
- a second line (Consultation as PERLIFE®),
- ending up in monitoring (Follow-Up as PERLIFE®)
- and all three combined as LIFE^{UP}®,

for which they have grounded the **European Center of Personalized Medicine (ECPM)**. This Center relies on scientific breakthroughs in our understanding of how a person's unique molecular and genetic profile makes them susceptible to certain diseases. Not any longer the treating physician has relied and focus on symptoms and signs, but also the molecular profile. Therefore, the age of personalized medicine has begun, and we are delighted delivering and propagating it. A focus may be directed to cardiovascular disease, cancer disease or lifestyle aspects like sports, nutrition, or psychology (stress medicine) (to differentiate the 3 major lifestyle columns). As an interaction of different medical specialisations are mandatory in this holistic approach has to be multifaceted different experts are included in those programs.

Personalized medicine is impacting patient care in many diseases, for instance:

Breast Cancer: About 30% of patients with breast cancer provide an overexpression of a protein called HER2, for which they are responsive by Trastuzumab. In others, this compound does not have any effects. Furthermore, there are many molecular subtypes which need personalized treatment approaches.

Melanoma: BRAF as a human genome produces B-Raf involved in sending signals inside cells to direct cell growth and being mutated in cancers. Vemurafenib, a B-Raf protein inhibitor, has been approved for the treatment of late-stage melanoma.

Cardiovascular diseases: Nowadays gene expression profiling tests may identify heart transplant recipients' probability of rejecting instead of earlier myocardial biopsies. The gene information allows more sophisticated long-term patient management and guides more tailored immunosuppressive drug regimes.

Since very recently, a tremendous spectrum of available genetic and molecular information has been originated and is still ongoing which is utilized at the ECPM. Due to its scientific background and lively networking with university clinics it is enabling a significant shortening of the bench-to-bedside interval for the sake of our patients. Therefore, we are more and more shifting from reaction to prevention and proactive; enabling selection of optimal therapy and reducing trial-and-error prescribing; making the use of drugs safer by avoiding adverse drug effects; and increasing life quality of patients.

We cordially welcome all who are interested in a maximal, vital as well as sustainable health and it's prevention together with longest possible life expectancy / longevity and increased life quality.



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