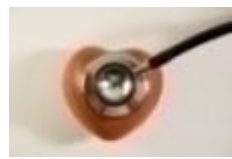


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Personalised healthcare: a gateway to truly individualised medical treatments

Medical treatments are already personalised, in that patients are assessed before a suitable treatment is selected for them. But did you know that a large portion of treatments are ineffective being applied to the wrong community of patients? Or that conventional drug therapies currently in use do not take into account individual genetic variations and differences in response to drugs?



It is widely known that any drug can be therapeutic for some individuals but ineffective for others, triggering adverse effects in some patients while others remain unaffected. Fortunately enough, a revolutionary and truly personalised concept for healthcare is currently being debated in

medical, scientific and political fora: a new approach to medicine that would come at the crossroads of major breakthrough technologies dealing with genetic information and patients' response to drug treatment.

A unique treatment for a unique genetic profile

Personalised healthcare can be defined as the management of a patient's disease – or disease predisposition – using molecular analysis and the individual's genetic profile to tailor drug treatments that achieve optimal medical outcomes. The association of individuals with a particular gene variant will be used in the future to prescribe the most efficient drug treatment and avoid adverse reactions. But a more targeted therapy is not the only benefit of personalised healthcare. This medical revolution based on genetic information is expected to predict disease risk and address individuals while they are still healthy, shifting towards a prevention-focused healthcare system, and stimulating proactive behaviour among the population.

Breast cancer as an example of personalised healthcare

'Personalised' breast cancer research demonstrates a paradigm shift from traditional methods of patient diagnosis and treatment, towards a more targeted and patient-centred approach. While conventional radio and chemotherapy are used to treat all cases of breast cancer with varying outcomes, advances in genetics and molecular biology led scientists to identify that – of all sub-types of breast cancer – 30% of women carry a mutation in the HER-2/neu gene leading to uncontrolled cell growth. Within this 30%, conventional chemotherapy is far less effective than a drug treatment targeting the abnormality caused by this particular gene mutation.

Pharmaceutical industry: to take or not to take the risk

Personalised healthcare could provide society great benefits such as the avoidance of adverse drug effects and a reduction in unnecessary medical interventions and diagnostic errors. Yet, multiple barriers are to be overcome in order to bring this revolutionary science from the lab to the clinic, and to make it available for patients. These obstacles stem from the far-reaching implications that personalised healthcare is predicted to have on pharmacology, diagnostics, therapies, current approaches to clinical trials, drug design and validation – to name just a few. By tailoring therapies to the patient's unique genetic profile, personalised healthcare triggers a broader dilemma for the pharmaceutical industry: whether or not to take the risk and invest in development of specific drugs for smaller groups of patients based on genetic variations; abandoning – at the same time – the blockbuster drugs with lower efficacy, and the conventional model of drug treatment based on 'one size fits all'. The personalised approach is particularly challenging for the pharmaceutical industry: it disrupts the traditional business models of drug development, clinical trials, health management and delivery by addressing large patient populations, irrespectively of the potential genetic variations.

Governments: to reimburse or not to reimburse

The Experts' Voice

Experts at the 'Health for All, Care for You' conference – organised in London on 22 April 2010 by the Karolinska Institutet and Science | Business – stated that there is insufficient confluence of technologies and information coming from the emerging fields of molecular biology. Knowledge management and selection of meaningful data seem to be some of the challenges in building up a 'bigger picture' of molecular events in an organism.

Maire Geoghegan-Quinn, European Commissioner for Research, Innovation and Science



A strong science base is not enough on its own. We must also tackle the bottlenecks that prevent bright ideas from reaching the market. This is particularly important given Europe's poor track record in this respect. It is essential to hitting the private sector component of our R&D target. So, we must build a fully functioning 'Single Market for Innovation'.



Related Links

- ▶ [COST Action BM0606 Collaborative Association Studies in Breast Cancer](#)
- ▶ [COST Action BM0703 Cancer and Control of Genomic Integrity](#)
- ▶ [COST Action BM0907 European Network for Transnational Immunology Research and Education \(ENTIRE\): From Immunomonitoring to Personalised Immunotherapy](#)
- ▶ [COST Action IS0903 Enhancing the Role of Medicine in the Management of European Health Systems - Implications for Control, Innovation and User Voice](#)
- ▶ [COST Action TD0905 EPIGENETICS: Bench to Bedside](#)

Contact Information

Dr Magdalena Radwanska
Acting Senior Science Officer Life Sciences
Science Officer Biomedicine and Molecular Biosciences
COST Office
Belgium
▶ magdalena.radwanska@cost.eu

▶ http://www.cost.eu/domains_actions/bms

The price to pay might be well worth spending: it is estimated that, while in the first years of implementation personalised healthcare will result in an increase of medical costs for healthcare – especially in diagnostics – long-term benefits will decrease the spending, thanks to reduction of medical errors and unnecessary interventions. Uncertainty arises when discussing whether or not the newly developed drugs and companion diagnostic tests will be a part of future reimbursement schemes. This is a major issue preventing a smooth and fast development of personalised healthcare, since in the EU many different healthcare systems are in place, and they all foresee different healthcare reimbursement policies.

Knowledge-management and R&D: the fundamental points

COST has been working on a number of initiatives to drive EU research and science coordination on personalised healthcare, and has successfully become a gateway to researchers' networks in this field. Offering its unique scientific insight and networking capacity, COST is knowledge-partner in a cutting-edge consortium of industrial, non-profit and professional partners guided by Science|Business and Stockholm's famed medical university Karolinska Institutet. This consortium is promoting personalised healthcare and supporting the dialogue between policymakers, institutions and the scientific community in order to accelerate its deployment into mainstream medicine. Karolinska Institutet and Science|Business recently conducted a survey on the future of personalised healthcare. Through their answers, European scientists in academia and industry indicated that a lack of understating of basic biology is among the obstacles on the path towards fully implemented personalised healthcare. Most importantly, the study pointed out that the main structural barrier is – not surprisingly – insufficient funding in R&D. Coordination of research programmes and fostering of multi-disciplinarity are thus top priorities to make significant and fast advancements in this cutting-edge field.

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