

## **Biobanks, biomolecular resources and healthcare innovation**

K. Zatloukal, Institute of Pathology, Medical University of Graz, Austria

Human biological samples, such as blood, tissues or DNA including associated medical data are key resources in unraveling genetic and environmental factors causing diseases and influencing their outcome. Furthermore these resources are required for biomarker discovery and development, identification of new targets for therapy, and may help to reduce attrition in drug discovery and development.

The change from an organ to a biology-based definition of disease categories will enhance the development of more specific and effective treatments and at the same time reduce undesired side effects of drugs; developments that are collectively designated as personalized medicine. Furthermore it may improve success in clinical trial design, and will lead to new concepts of disease prevention. A major challenge in this context is the better understanding of complex diseases that are caused by a large number of small, often additive effects of genetic predisposition, lifestyle and the environment.

Revealing these complex interactions will depend critically on the availability of well-documented, high quality biological samples from large numbers of patients and healthy persons, collected and made available by biobanks. National collections typically suffer from fragmentation of the biobanking-related research community, variable access rules, the lack of commonly applied standards, lack of interoperability of clinical, analytical and -omics datasets, and a diversity of legal and ethical requirements. This hampers the collation of biological samples and data from different biobanks which is a prerequisite to achieving sufficient statistical power and to avoid selection bias. Moreover, the lack of coordinated biobanking solutions results in duplication of effort and jeopardises sustainability because of the lack of long-term comprehensive funding approaches. There is an urgent need for coordinated efforts at the national and international levels. This need is specifically addressed by the OECD Global Biological Resource Centre Network and the European Research Infrastructure for Biobanking and Biomolecular Resources (BBMRI).