


Exploiting research outcomes and application potential of the human microbiome for personalised prediction, prevention and treatment of disease

The aim is to achieve understanding of balanced states of health and on that basis to deliver personalised approaches and clinical tools for predicting and preventing diseases. Proposals should integrate and use high quality microbiome, metabolome and other -omics data produced by large scale international initiatives. They should combine and expand these data with approaches including disease-oriented functional analysis, endogenous and exogenous factors, innovative imaging, functional, structural and lifestyle, ageing, dietary data, environmental data, mental disorders and/or any other comorbidity.

Proposals should build on data from existing microbiome projects and, as appropriate, on data from other international initiatives. Focussed production of new data should make subject coverage more comprehensive with the aim of delivering more valuable clinical tools. Proposals should address relevant ethical implications, take into account sex and gender differences, the effect of country-specific issues and should include a section on research data management. The proposed work should be connected to the future European Open Science Cloud[[In particular, microbiome data sharing is relevant for the future Health Research and Innovation Cloud, which will be a thematic component of the European Open Science Cloud: https://ec.europa.eu/research/openscience/pdf/realising_the_european_open_science_cloud_2016.pdf.]]  to enable sharing and re-use of resources as well as interoperability with other types of data and tools across disciplines. Proposals should contribute to standardisation of sample collection and storage, methods (Standard Operating Procedures) and study designs. SMEs participation is encouraged.

Proposals addressing rare diseases are not in scope of this action.

The Commission considers that proposals requesting a contribution from the EU of between EUR 10 and 15 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

The human microbiome plays an important role for health. Many different projects in 'metagenomics' and epidemiological research in recent years have delivered new knowledge on associations between the microbiome and a wide range of diseases. International initiatives such as the International Human Microbiome Consortium (IHMC) have generated large-scale data. These research efforts were first of all made to identify host-microbe-interactions and links of the microbiome with diseases. Now the challenge is to accelerate the translation of data and knowledge to define balanced healthy conditions and to predict and prevent diseases through the development of personalised approaches and clinical tools. Building on existing data it is necessary to produce also new data with the aim to make the research more comprehensive or more holistic and to achieve more valuable clinical tools. Whilst the promise of such tools is evident, they need to be validated and be part of personalised medicine.

This topic will focus on the clinical aspects of personalised prediction and prevention of disease. Other aspects of microbiome research in relation to food/nutrition will be addressed by a cluster of topics in Societal Challenge 2. Further topics may be launched under the IMI2 JU.

- Personalised medicine approaches for the prediction and prevention of diseases through exploitation, integration and combination of data from existing microbiome projects and appropriate other international -omics studies.
- More valuable clinical tools built on existing data and new complementary data in relevant repositories.
- Identification and validation of microbial functionalities; robust healthy conditions and determinants of resilience for defined populations at specific body sites.
- Better prediction and prevention of diseases through validated novel clinical tools that are helpful for end-users.
- More intensive collaboration and strategic synergies between scientists across disciplines and sectors.

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