

Microbial Communities in Health and Environment

Microbiomes

National Centre of Competence in Research

Brief overview

Microorganisms are generally considered as dangerous pathogens. This rather simplistic view does not tell the whole story. Human, animal and plant life is closely linked to the unseen world of microorganisms, and is highly dependent on the way this world functions. Each human being, animal and plant is populated by complex and diverse communities of microorganisms. These communities, known as microbiomes, play a major role in our lives and our environment, influencing important processes such as protection against disease, nutrient absorption and maintaining a healthy environment. If these microorganisms become imbalanced, this can compromise the health of living things, leading to complex disorders and affecting the way whole ecosystems function. Microbiomes are therefore a core element in agriculture, the maintenance of biodiversity and human health. Currently just 15 per cent or so of microorganisms making up microbiomes are known to us.

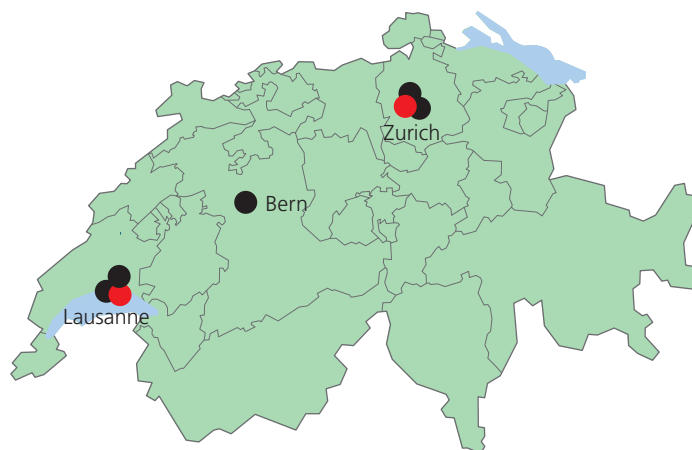
The Microbiomes National Centre of Competence in Research (NCCR) proposes an experimental approach to investigating the interaction of microorganisms in a range of systems (human, animal, plant and the environment). This comprehensive approach has been judged to be innovative and unique by the international panel of experts involved in evaluating the project. The project is highly interdisciplinary, embracing the life sciences, medicine, bioinformatics, nutritional science and environmental science. In the medium term, this research has the potential to create new bases for ground-breaking innovation in major sections of the economy and society, such as nutrition, personalised medicine, medical diagnostics, agriculture and the environment. For example, properly constituted microbiomes can protect against salmonella infections, and specially adapted microbial communities can be used to purify wastewater or decontaminate polluted environments in the wake of an environmental disaster. Analysing the composition of microbiomes also allows us to identify disorders in diagnostics, both in medicine and in agriculture.

The NCCR is based at the University of Lausanne (primary home institution; seven research groups) and at the ETH Zurich (second home institution; five research groups). The national network includes further research groups at the EPF Lausanne (3), the Vaud University Hospital (2), the Swiss Federal Institute of Aquatic Science and Technology Eawag (1), the University of Bern (1) and the University of Zurich (1).

Further information
<https://eemlab.org>
www.sbf.admin.ch/nccr-e

Facts and figures

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Home institutions ●
(number of groups)
University of Lausanne (7)
ETH Zurich (5)

Network
(number of groups)
EPF Lausanne (3)
University Hospital Vaud (2)
Eawag (1)
University of Bern (1)
University of Zurich (1)