# Eawag – Aquatic Research

Eawag is the Swiss Federal Institute of Aquatic Science and Technology and is part of the ETH Domain, which includes the two universities of ETH Zurich and ETH Lausanne (EPFL), the four independent research institutions of Empa, PSI, WSL and Eawag. Firmly anchored in its home country of Switzerland, but with a global network, Eawag is concerned with concepts and technologies for dealing sustainably with water bodies and with water as a resource. In collaboration with universities, other research institutions, public bodies, industry and non-governmental organisations, Eawag works to harmonise ecological, economic and social interests in respect of water usage. The Institute thus serves as a bridge between the scientific world and the 'real world'.

**Department of Aquatic Ecology**
Eawag Department of Aquatic Ecology is currently home for eleven research groups that cover the broad disciplines of ecology and evolution from the individual to the community and ecosystem level, utilizing a wide range of tools and techniques from microscopes to molecular genetics.
We emphasize strong theoretical and empirical research on environmentally relevant issues with broad national and international interest. Collaborations with other Eawag departments in interdisciplinary and trans-disciplinary projects are maintained and we work with numerous collaborators both within Switzerland and internationally.

=> Stream Ecology Group (Group Leader: Chris Robinson)
We focus on basic and applied questions in the ecology of running waters. A primary research interest is the ecology of alpine waters with a current emphasis on the effects of glacial recession on colonization dynamics and evolutionary dynamics of aquatic insects. Specific applied research topics include dispersal dynamics in river restoration, the use of experimental flows for improving river integrity, and long-term monitoring of alpine waters. Current research topics range from the biodiversity and functioning of alpine microbes, the effects of multiple stressors on stream flora and fauna, the functional characteristics of riverine floodplains, and population genetic structure of various stream macroinvertebrates.

**Link Department of Aquatic Ecology: http://www.eawag.ch/en/department/eco/**

**Department of Environmental Microbiology**
Our research focuses on microbial life and activities in the environment. We strive to understand the basic rules and principles that govern the functioning of microbes and microbial communities, and then apply those principles to solve pressing applied problems. Our core interests are:

- Basic principles of the evolutionary ecology of microorganisms in their natural environment.
- The assembly, dynamics, and functionality of microbial communities.
- Microbial degradation and transformation of chemicals, and in particular anthropogenic pollutants.
- The occurrence, activities and ecology of microbes in drinking water resources.

Our research groups combine expertise in environmental biochemistry, physiology, single-cell microbiology, molecular genetics, evolutionary ecology and environmental engineering.

Drinking Water Microbiology (Group Leader Frederik Hammes)
Our research focuses on measuring and understanding the behaviour of bacteria in drinking water from source to tap, using state of the art detection methods and bridging basic research questions

with real life applications. In source water, we investigate long-term and short-term bacterial dynamics as influenced by natural processes (e.g., seasonal changes, rainfall) and engineered processes (e.g., water extraction). In drinking water treatment, we study the kinetics of bacterial cell damage during various disinfection processes (e.g., chlorine and ozone) and bacterial growth in biological filters.
In distribution systems, we investigate the principles of bacterial growth at low nutrient concentrations, focusing on assimilable organic carbon, biofilm development, and pathogen growth potential. Finally, in premise plumbing systems, we study the development of unique microbiomes as influenced by materials in contact with drinking water.

**Link Environmental Microbiology: http://www.eawag.ch/en/department/umik/**