Zurich University
of Applied Sciences

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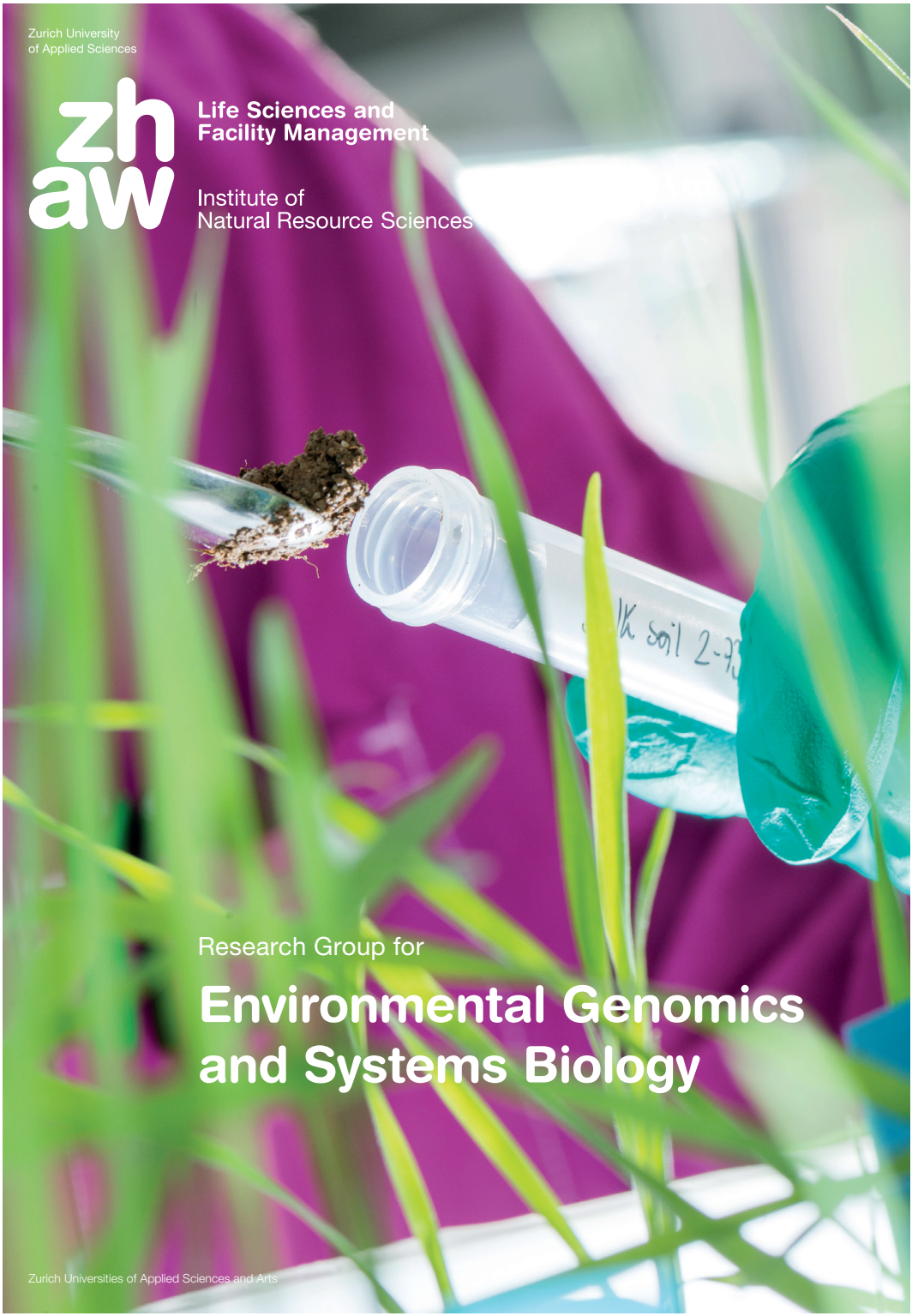
Life Sciences and Facility Management

Institute of
Natural Resource Sciences



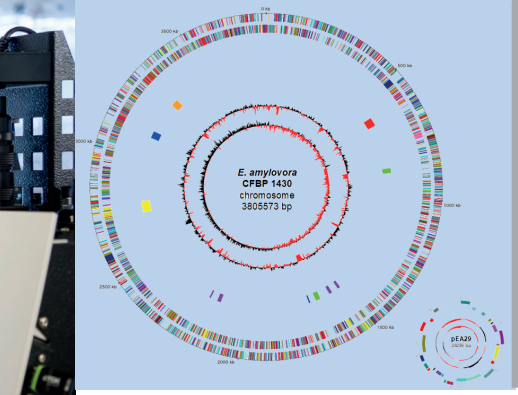
Research Group for

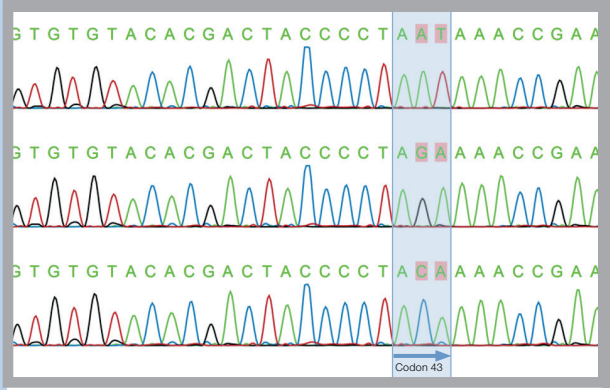
Environmental Genomics and Systems Biology

The Environmental Genomics and Systems Biology Research Group applies molecular biological methods in order to understand organisms and how they interact with the environment. The development of DNA sequencing and protein analysis techniques opens up new ways of understanding biological systems in their entirety. With the help of bioinformatics, the data can be used to develop molecular biological tools for pathogen identification as well as to describe the role of individual species within a biological system. Close collaboration with partners in industry and research at both a national and an international level ensures application-oriented research.

Competencies

- Molecular biological detection of various organisms or pests
- DNA sequencing (Sanger and Next Generation Sequencing)
- Bioinformatics: analysis of sequence data
- Study of gene and protein expression
- Metagenomics as a tool for biodiversity analyses





Reference project 1

Ralstonia solanacearum in surface waters

Potato brown rot can potentially become one of the most destructive plant diseases for Swiss agriculture. The aim of the project is to develop a rapid molecular biological test for the detection of the most serious *Ralstonia* species from samples of surface water. The involvement of the Swiss Federal Plant Protection Service (SPPS) and Agroscope underlines the importance of this monitoring tool. Partners such as EAWAG and WSL are also supporting the project with their expertise.

Reference project 2

Protection of apple forest ecosystems in Central Asia

Fire blight is a highly contagious bacterial disease in the cultivation of pome fruit. In Central Asia, the apple tree, as the dominant species in low mountain forests, forms the basis of this unique ecosystem as well as of local agriculture. This r4d project carried out by the Swiss Agency for Development and Cooperation (SDC) is investigating the causes of fire blight's spread and ways of controlling it in the forests of Central Asia. Together with project partners in Kyrgyzstan and Kazakhstan, molecular diagnostic methods are being tested, and phytosanitary measures adapted to local conditions are being developed.

Reference project 3

On the trail of the pathogen *Xanthomonas*

The bacteria of the *Xanthomonas hortorum* group cause bacterioses in cultivated plants such as carrots and are also increasingly found in ornamental plants. The reasons for the more frequent occurrence are unclear. Using molecular biological methods, the project focuses on classifying the various isolates within the *hortorum* group to elucidate its diversity. With the development of simple diagnostic tests, producers and consultants can efficiently make an exact diagnosis on site and stop the spread at an early stage.

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