



Eidgenössische Technische Hochschule Zürich  
Swiss Federal Institute of Technology Zurich



Schweizerische Eidgenossenschaft  
Confédération suisse  
Confederazione Svizzera  
Confederaziun svizra

Département fédéral de l'économie,  
de la formation et de la recherche DEFR  
Agroscope

# Ph.D. student positions in nutritional breath metabolomics

**100%, Zurich/Bern, fixed term**

We seek to fill 2 Ph.D. positions in the framework of a project funded by the Swiss National Science Foundation in the areas of on-line exhaled breath analysis and nutrition. The primary scientific aim of the Lactobreath project is to apply metabolomics technologies for identifying and quantifying metabolites associated with lactose metabolism and present in exhaled breath. The project will be carried out in collaboration with Agroscope (Liebefeld Campus), University Hospital Zurich, and the Swiss Allergy Centre (aha!). The duration of the position is three years, and starting date is expected to be **immediately or upon mutual agreement**.

## Project Background

Food intolerances are a major cause of functional gastrointestinal disorders, and while they can be managed by dietary intervention, correct diagnosis is essential for effective treatment. This interdisciplinary project will investigate the molecular composition of human exhaled breath as a potential source of biomarkers reporting on the clinical traits associated with lactose malabsorption (LM) (Lactobreath profiles) as a proof-of-concept for future application of this technology in the diagnosis of food intolerance. The identified breath biomarkers will be investigated in relation to lactose malabsorption symptoms, usual diet, and clinical traits associated with lactose malabsorption, including genetic polymorphisms regulating the expression of the lactase gene, breath hydrogen, and lactose-derived urinary metabolites. Lactobreath profiles will be mechanistically linked with metabolic traits associated with lactose malabsorption, including colonic gases and urine metabolome.

## Job description

You are expected to conduct interdisciplinary research in human nutrition and analytical chemistry. Affinity for human nutritional interventions and laboratory work is essential. The job duties include:

- to conduct a nutritional intervention study;
- to conduct lab analysis;
- to conduct statistical analysis of the acquired data;
- to publish and present your research findings.

The distribution of the research tasks will be determined based on the complementarity of the profiles of the two recruited Ph.D. students.

**Prerequisites:** M.Sc. degree in chemistry or nutrition, a strong background in analytical chemistry, nutritional science, biochemistry, or related area, experience in bioinformatics, and interest in developing modern mass spectrometry. Communication capability in English is a must.

**Please send** your CV, publication list/transcripts & grades, a statement (up to 1,000 words) describing your motivation, experience, and planned contributions to the position, and 2 letters of recommendation to **Dr. Stamatios Giannoukos** ([giannoukos@org.chem.ethz.ch](mailto:giannoukos@org.chem.ethz.ch)) and/or **Prof. Dr. Renato Zenobi** ([zenobi@org.chem.ethz.ch](mailto:zenobi@org.chem.ethz.ch)). If you are interested in and want to find out more about our research, visit our group webpage: <https://zenobi.ethz.ch/research/ambient-mass-spectrometry.html>