Post graduate Course

Stable isotope applications in microbiology and environmental studies

An overview, theoretical background and current applications of stable isotopes, stable isotope fractionation and tracers – the different concepts and objectives, techniques and approaches: how to apply stable isotope concepts in your own research.

11-14 December 2017

Lecturers:

Ivonne Nijenhuis, Axel Horst, Nico Jehmlich, Niculina Musat (*Helmholtz Centre for Environmental Research – UFZ, Germany)*
Caroline Plugge *(Wageningen University & Research)*
Boris van Breukelen *(Delft University of Technology)*
David Berry *(University of Vienna, Austria)*
Paul Bodelier *(Netherlands Institute of Ecology)*
Francien Peterse, Paul Mason, Jack Middelburg, Lubos Polerecky *(Utrecht University)*
Markus Egert *(Furtwangen University, Germany)*

Scope

Stable isotope concepts currently are being used for the investigation of microbial processes in natural and contaminated environments. Stable isotope fractionation allows characterising microbial reactions in laboratory studies as well as in the environment, for instance for the investigation of the fate of groundwater contaminants.

Stable isotope tracer concepts furthermore provide insight in microbial networks and interactions and degradation pathways in e.g. bioreactors and gut microbiomes. This four day course intends to provide an overview of current stable isotope applications and concepts in form of lectures, case studies and exercises and laboratory visits.

Learning goals

- Understanding of the theoretical background and applications
  - How to apply compound-specific stable isotope analysis (CSIA) in the assessment of organic contaminant degradation for investigation of microbial reactions
  - CSIA for assessment of organic compounds in contaminated environments
  - CSIA for the analysis of element cycling, including S, Fe and methane
  - Stable isotope tracer concepts for analysis of microbial communities and metabolism
  - Stable isotope tracer concepts for the analysis of single-cells and interactions
- Grasping the main principles, methods and techniques of stable isotope applications
- Application in case studies and your own research: how to interpret and analyse stable isotope values, designing a stable isotope tracer experiment

Course set-up

Day	*activities*	*focus*	*Lecturers*
Monday, Dec. 11th	Lectures, exercise and laboratory visit	Introduction to CSIA, Isotope-ratio mass spectrometry, basic principles and interpretation	Ivonne Nijenhuis, Axel Horst, Paul Bodelier
Tuesday Dec. 12th	Lectures, case studies	Application of CSIA in assessment of groundwater contamination, modeling approaches, paleoclimate, metal stable isotopes & others	Boris van Breukelen, Ivonne Nijenhuis, Axel Horst, Francien Peterse, Paul Mason and others
Wednesday Dec. 13th	Lecutures, excercises, discussion	Tracer concepts – application for investigation of microbial communities and interactions	Nico Jehmlich, Markus Egert, Caroline Plugge, Dave Berry, Niculina Musat
Thursday Dec. 14th	Laboratory visit at Utrecht University	IRMS and nanoSIMS laboratory	Francien Peterse, Paul Mason, Jack Middelburg, Lubos Polerecky

Target group

The course is intended for PhD candidates and other scientists who want to get an overview and basic understanding of current stable isotope methods and applications and are interested to apply these concepts in their research. Max number of participants is 20.

Registration

Please register online by 21 October 2017 (early bird deadline) by submitting your one page CV as well as a motivation (max. 250 words) for taking part in this course. Please indicate your current experience as well as future interests in applying stable isotopes.
Link to the registration page: http://www.sense.nl/stable-isotopes

Course fees

	Early bird Fee * (deadline: 21-10-2017)	Fee * (deadline: 15-11-2017)
SENSE, PE&RC, WASS PhD candidates with an approved TSP	€ 150	€ 175
HIGRADE PhD students	Paid by HIGRADE	Paid by HIGRADE
Other PhD candidates/students and academic staff	€ 300	€ 325

** Including lunches, coffee/tea breaks, dinner on Tuesday, and excluding accommodation costs. If you need overnight accommodation, please contact Marjolijn Dannenburg - marjolijn.dannenburg@wur.nl*

Coordinators

Dr. Ivonne Nijenhuis Helmholtz Centre for Environmental Research – UFZ
Dr. Alette Langenhoff Wageningen University & Research – WUR
Dr. Hauke Smidt Wageningen University & Research – WUR

Location

Wageningen University
ORION Building, Room C4042 (fourth floor)
Bronland 1, 6708 WH Wageningen

Information

For more information and registration see:
http://www.sense.nl/stable-isotopes

or contact:

Dr. Ivonne Nijenhuis @: ivonne.nijenhuis@ufz.de

SENSE is the Research School for Socio-Economic and Natural Sciences of the Environment

HIGRADE is the Helmholtz Interdisciplinary GRADuate School for Environmental Research