

Mercury workshop – May 25th 2022

“New insights into microbial diversity related to mercury bioconversion brought by high-throughput omics”

Venue : Fondation “Les Bois Chamblard” – Buchillon, Switzerland



Recent studies identified the *hgcAB* gene cluster in microorganisms with the ability to methylate Hg^{II} and revealed a wider range of species and environmental conditions producing MMHg than previously thought. However, most studies were conducted on DNA so far and, as such, do not reflect the activity of the protein, but only the possibility that a strain may methylate Hg^{II}.

Hg^{II} methylation is a riddle in which the efficiency of the biological Hg^{II} methylation appears to depend on many bio-physico-chemical processes and parameters. Therefore, a better understanding of the complexity of microbial communities is essential to describe all the metabolic processes that can directly or indirectly affect Hg^{II} methylation.

This workshop aims to bring together scientists involved or interested in discussing the latest results, constraints and limitations of using advanced high-throughput biological analysis, i.e. metagenomics, metatranscriptomics and metaproteomics to identify microbial structure and functionality, to enable a better mechanistic understanding of biological processes related to Hg methylation.

This workshop will be structured in two parts, the morning devoted to presentations of current knowledge on the subject, and the afternoon to group discussions on specific points.



Preliminary Programme

09h00 Welcome coffee and croissants

09h20 Opening remarks – Jean-Luc Loizeau (University of Geneva, Switzerland)

09h30 - Innovative approaches in proteogenomics and metaproteomics - Jean Armengaud (CEA, France)

10h05 - Applying molecular tools to unravel microbial transformations of mercury in aquatic and terrestrial ecosystems - Eric Capo (Institute of Marine Sciences, Barcelona, Spain).
<https://www.youtube.com/watch?v=RrOm4WbbW9E>

10h40 Break

11h00 – Using global marine metagenomics to understand mercury microbial associated processes – Andrea Garcia Bravo (IDAEA-CSIC, Barcelona, Spain)

11h35 - New omics approaches to explore microbial communities in the context of mercury cycling in Lake Geneva - Claudia Cosio (University of Reims, France)

12h10 – 13h30 Lunch

13h45 Group discussion

- Group 1 How to gain knowledge on the biology, physiology and ecology of the identified actors; how to validate their functioning?
- Group 2 How to link genes to functionality; how to use this information to link to Hg bioconversion?
- Group 3 What knowledge of environmental functioning is needed to assess favorable conditions for methylation/demethylation? To what extent does this support informed site management?

15h30 Sharing of discussion highlights

16h00 Concluding remarks Claudia Cosio (University of Reims)

16h30 Cocktail

Registration

The workshop is free, lunch is included, however participants are requested to register by sending an email to Jean-Luc.Loizeau@unige.ch

Transportation will be organized from nearby Aubonne train station.

The Venue

The “[Les Bois Chamblard](#)” Foundation occupies the former villa of Dutch meteorologist Erico-Charles Nicola, who bequeathed the property to the EPFL in 2001 with the aim of creating a place for small-scale meetings devoted to research initiatives focused on environmental issues. The Bois Chamblard



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Fondation aims to encourage fundamental and applied research in the
field of engineering activity related to the preservation of the biosphere

and its resources.