

- Presentation sheet :

UMR CNRS 6023 Laboratoire Microorganismes : Génome et Environnement, Université Clermont Auvergne (D. Debroas)

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Study of biological, physiological, genetic and phenotypic traits of model species of diatoms inhabiting radioactive mineral sources in Auvergne.

The Zone Atelier Territoires Uranifères (ZATU, <https://zatu.org/>) aims to remove principal scientific challenges in determining and understanding the effect of radioactivity on biocenoses inhabiting aquatic biotopes. In radioactive mineral spring of the Massif Central, the frustule of diatoms shows numerous deformations raising the query of the impact of radioactivity on these microalgae. The thesis will consist in studying and collecting diatoms resistant and sensitive to radioactivity in order to carry out in laboratory Experimental evolution experiments (i.e. exposed or not to low doses of radioactivity) for several tens of generations, and also to carry out *in situ* monitoring for 2 years of at least 3 factors (i.e. level of radioactivity of the biotope, season, species). Laboratory experiments and those *in situ* will consist in making comparative studies between so-called "sensitive" and "resistant" diatoms with regard to their physiology (eg: photosynthesis, respiration), their macromolecular composition (eg: quantity of DNA, proteins, pigments (chlorophyll, carotenoids, ..)), their epigenetic response as well as their phenotypic variability (abundance, volume of diatoms).

Lampe, et al. 2017. Understanding low radiation background biology through controlled evolution experiments. *Evol. Appl.* 10 (7):658-666.

Millan, et al. 2020. The effect of natural radioactivity on diatom communities in mineral springs. *Bot. Lett.* 167(1): 95-113.