Post-Doc in Aquatic Ecology/Ecotoxicology: analyzing the influence of toxic chemical contamination on stream invertebrate communities.

Hosting lab:	INRAE, UR RiverLy, Laboratoire d'écotoxicologie, Lyon-Villeurbanne. www.ara.inrae.fr/lyon-riverly-ecotox
Contact :	Arnaud Chaumot arnaud.chaumot@inrae.fr

Keywords: chemical pollution, streams, aquatic invertebrates, diversity, species sensitivity, traits, biomonitoring

This 18-month post-doc position is in line with the dynamic of the team's work on the use of the sentinel species *Gammarus fossarum* in the field of biomonitoring the effects of chemical pollution in rivers. The caging of gammarids (active biomonitoring) is now recognized as a relevant approach for monitoring contamination and toxicity of waterbodies. These tools integrate the bioavailability of contaminants and report on the toxicity of mixtures of substances towards a sentinel species of ecological interest. They are now used and deployed by water agencies in their monitoring networks. Based on these new ecotoxicological indicators and hydrobiological monitoring, initial results on a national scale have demonstrated the possibility of describing the influence of chemical pressure on the abundance of populations or the taxonomic and functional diversity of benthic invertebrates in rivers (Alric et al 2019, 2022). These results make it possible to re-interrogate, based on in situ data, the existence and determinisms of differences in sensitivity between species and the vulnerability of communities to chemical contamination. However, they call for refocusing these initial statistical analyses on finer spatial scales (hydro-region, basin, sub-basin) in order to 1/ control as much as possible the natural factors that influence the geographical distribution of species and 2/ guarantee the operational value of the links that can be uncovered between ecotoxicological quality and taxonomic or functional modification of communities in a given geographical context. This study will first mobilize the active biomonitoring data acquired within the regulatory monitoring by the RMC water agency, to confront them with the hydrobiological monitoring data existing in the basin.

You will be in charge of 1/ an inventory of the available data on the hydro-regions covered by the RMC basin in order to define different study areas presenting a homogeneity of the expected species assemblages; 2/ the study on different spatial scales of the relationship "ecotox indicators vs. species abundance/diversity"; 3/ the identification for sensitive and tolerant taxa to toxic chemical pressure, thus questioning the phylogenetic or functional determinants of species vulnerability; 4/ the analysis of the faunistic lists observed in the monitoring networks in order to identify a possible impact of chemical pressure on the stations not currently monitored by gammarid caging; 5/ the communication of the results (writing of scientific articles for international journals, communication at conferences, writing of report).

REFERENCES: Alric et al (2019) Multisubstance indicators based on caged Gammarus bioaccumulation reveal the influence of chemical contamination on stream macroinvertebrate abundances across France. **Environmental Science and Technology**, 53(10):5906-5915; **Alric et al** (2022) Metal bioavailable contamination engages richness decline, species turnover but unchanged functional diversity of stream macroinvertebrates at the scale of a French region. **Environmental Pollution**, 119565; **Sarkis N et al** (2023) Identifying the impact of toxicity on stream macroinvertebrate communities in a multi-stressor context based on national ecological and ecotoxicological monitoring databases. **Science Of The Total Environment**, 859:160179

Profil recherché : PhD in ecology or ecotoxicology – skills in biology and community ecology , particularly in freshwater invertebrates ; skills in statistical modeling to decipher ecology/environment relationships.

Conditions:	18-month position Starting spring 2023
Application:	by e-mail arnaud.chaumot@inrae.fr ; deadline February 2023