LABEX Diversités biologiques et culturelles : Origines, Evolution, Interactions, Devenir, Muséum National d'Histoire Naturelle, Paris

Post-doctoral project: SULFOR « Impact of SULfur dioxide on bio-calcification of FORaminifera: experimental approach to better understand the mechanisms of the past mass extinction and biocalcification crises »


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Foraminifera with calcareous tests are among the largest producers of calcium carbonate on the planet, and play a primary role in the global carbon cycle and regulation of the climate. Presently, Foraminifera and other calcium carbonate shell/skeletal forming organisms are affected by ocean acidification, a phenomenon that might have contributed to the past mass extinction and biocalcification crises. A major part of these crises coincides with massive volcanic eruptions responsible for the emission of large quantities of CO₂ and SO₂ into the ocean-atmosphere system. Although, current research focuses mainly on the effects of CO₂, as the principal factor, on ocean acidification and biomineralisation crisis of the past and present, the inherent challenge of this project is to explore and understand the impact of SO₂ in this context.

The two principal objectives of the project are: (i) analyze the impact of the variation in sulfate concentration on the biology and bio-calcification of the foraminifers; (ii) contribute to the knowledge about the incorporation of sulfur in the tests of foraminifera. Sulfur geochemical analyses coupled with morphology analyses will be carried out using living organisms and later to foraminifers dating back to the Cretaceous-Paleogene major biological crisis.

This project has an important method development component pertaining the setting up of foraminifera cultures and their biological monitoring in a controlled environment. In addition, the candidate will carry out investigations using techniques related to morphology and biogeochemistry (micro CT-scan, laser ablation ICP-MS, nano-SIMS, proteomics, etc.). The candidate should be motivated to explore simultaneously the biogeochemical aspect of sulfur in both organic and mineral compartments and the variation in shell morphology. The project is essentially multi-disciplinary and the candidate is expected to have experience in at least one of the following disciplines: biochemistry, geochemistry and micropaleontology of foraminifers.

To apply for this position, the candidates should have obtained their doctoral degree (PhD) before 1st September 2016. The applicants should send (as pdf files) a detailed CV, motivation letter and two referees to Annachiara Bartolini (bartolini@mnhn.fr) before 20th May 2016. The selected candidates will be called for an oral presentation between 9th-17th June. The project will start from 1st September 2016 and is a fixed-term contract awarded by the CNRS (24 months). Salary will be adapted to the professional experience of the successful candidate.