



Subject offered for a contract starting September 2015

SUBJECT TITLE: *Evaluating the biomineralization and chemical differentiation of modern brachiopod archives*

Advisor: **Rollion-Bard, Claire, IR - HDR, rollion@ipgp**

Host lab/ Team : *please fill in and leave out meaningless information*

IPGP- Géochimie des Enveloppes Externes – UMR7154

Financing: ITN contract

For more information go to <http://ed560.ipgp.fr>, section: Offres de these (PhD offer), You must apply on the Doctoral School website

SHORT DESCRIPTION: This PhD project focuses on the determination of the biomineralization processes and their impact on geochemical proxies in brachiopods in order to evaluate their potential use as a chemical archive for geochemical proxies in ancient seawater. Measurements will essentially be performed on brachiopod specimen grown under controlled laboratory conditions (T, pH). The ultimate goal is to decipher the vital effects on the proxy record.

FULL JOB DESCRIPTION

This PhD project focuses on the determination of biomineralization processes related to brachiopod shell formation and their impact on geochemical proxies in brachiopods in order to evaluate their potential use as chemical proxies in paleo-seawater. The main goals are to determine the transport, the elemental discrimination and isotope fractioning processes of trace metals and their isotopes from seawater to the site of calcification. This will include, at least, measurements of Boron, Lithium, Magnesium and Calcium by in situ measurements using the ion microprobe technique on shells from brachiopods grown under constant laboratory conditions. Latter measurements will be combined with scanning electron microscopy study of the brachiopod shells. We aim at deciphering the influence of the vital effects superimposing the original proxy record thereby improving proxy calibration and paleo-environmental reconstructions.

The project will be embedded into the research group of Geochemistry of External Envelopes, as part of the "Institut de Physique du Globe de Paris" (IPGP-<http://www.ipgp.fr/en>), France. The department hosts numerous analytical facilities, including a scanning electron microscope, laser MC-ICP-MS, but also ultra-clean laboratories, and one thermal ionization mass spectrometer (TIMS). Analyses will also be performed at Nancy (France) using the ion microprobe available as a national facility (<http://www.crgp.cnrs-nancy.fr/Sonde/intro-sonde.html>). Study and research periods at other institutions linked to the *BASE-LiNE Earth* project will allow for comprehensive topical expansion of the PhD study. A tight collaboration amongst the *BASE-LiNE Earth* nodes will set an ideal basis for this and all the other related PhD projects in the frame of this study.

Qualifications:

As a successful candidate you should have

- A MSc degree in a relevant field such as geochemistry of stable isotopes, environmental proxy, carbonate geochemistry
- The ability to work in an internationally oriented environment
- A broad interest in geosciences, and the willingness and capacity to work independently
- The willingness to travel
- You should be fluent in oral and written English, since the host group is highly international in composition and publication aims
- Interest to biology and knowledge of mass spectrometry technique are very welcomed

In order to be eligible, each applicant must simultaneously fulfil the following criteria at the time of recruitment:

- Mobility:** At the time of recruitment, the applicant must not have resided or carried out his/her main activity (work, studies, etc...) in the country of the host organization for more than 12 months in the 3 years immediately prior to his/her recruitment. Compulsory national service and/or short stays such as holidays are not taken into account.
- Qualifications and research experience:** The applicant must fulfil the requirements defined for Early Stage Researchers (ESRs): ESRs are researcher who, at the time of recruitment, has **NOT yet been awarded the doctorate degree** and is in the first 4 years (full-time equivalent) of his/her research career.

Additional information on *BASE-LiNE Earth* and further job descriptions can be found on our website, <https://www.baseline-earth.eu/>.

Please submit your complete application (including a CV [max. 3 pages], a letter of motivation for the position and a statement of your research interests [max. 1 page], relevant certificates, plus contact details of at least two referees) to the advisor quoting ***BASE-LiNE Earth_ESR02***. Applications are accepted until the positions are filled, but we intend to conduct a first evaluation by **May 31st 2015**