



Subject: Opening of a PhD position in RNA silencing in diatoms

The Institute of Marine Biology, Biotechnology and Aquaculture of the Hellenic Center for Marine Research (IMBBC-HCMR) in Heraklion, Crete, is seeking a PhD candidate within the frame of the ELIDEK-funded research project “RNA silencing in Diatoms” (HFRI-funded project RADIO number 483).

Diatoms are prevalent unicellular eukaryotic algae responsible for a fourth of the earth’s oxygen and playing a pivotal role in the marine food web. RNA silencing is a conserved mechanism of regulation of gene expression mediated by small non coding RNAs (sRNAs). Intracellular double-stranded RNAs are cleaved by RNase III-like ribonuclease enzyme Dicer (DCR) into sRNAs which are incorporated into an ARGONAUTE (AGO)-containing ribonucleic complex (RISC) to guide the sequence-specific targeting of complementary RNAs. In plants and animal RNA silencing has been shown to play a pivotal role in growth and development, maintenance of genome integrity and response to abiotic stressors. Recent studies suggest that diatoms present an original repertoire of RNA silencing encoded genes which may contribute to their acclimatory capacity to various environmental conditions (De Riso *et al NAR* 2006, Veluchamy *et al Nat. Com.* 2013, Rogato *et al BMC Genomics* 2014). Direct evidences for the mode of actions and physiological roles of DCR and AGO homologues in diatoms, however, is still lacking. The PhD candidate will undertake the molecular, biochemical and physiological characterization of diatom AGO homologues using a reverse genetic approach in the model diatom species *Phaeodactylum tricorutum*.

The PhD project will include the following objectives:

- Determine AGO subcellular localization by confocal microscopy
- Characterize AGO-bound sRNA by RNA-immunoprecipitation and high throughput sequencing (RIP-Seq)
- Characterize AGO-interacting proteins by Co-IP and MS/MS analysis
- Characterize the consequence of AGO-KO for the cell acclimatory response to environmental stresses

The proposed research work will provide unprecedented insights into key epigenetic mechanisms controlling endogenous gene expression and genome stability in diatoms contributing to better understand their adaptation and acclimatory response in the marine environment.

The environment at IMBBC-HCMR comprises a laboratory equipped for molecular biology and microbiology, next generation sequencers, a phytoplankton culture room, a bioinformatics team with expertise in genomics and molecular evolution, and access to the marine environment. IMBBC-HCMR is collaborating with several universities across the country in various research projects including the establishment of a distributed multi-omics infrastructure and the joint graduate program “Environmental Biology” run at the University of Crete. The PhD student will be enrolled at the University of Crete or any other recognized establishment of higher education in Greece. She/he will work in close collaboration with the Laboratory of Plant Molecular Biology of Prof. Kriton Kalantidis from the University of Crete and Institute of Molecular Biology and Biotechnology (FoRTH-ITE). Previous experiences in microbiology, molecular biology and recombinant protein purification will be considered as an advantage. Salary is 900 euros gross per month for 18 months. Complementary funds will be granted through PhD scholarship from the IKI and ELIDEK foundations.

Candidates should send their applications by email to fverret@hcmr.gr with their Master degree and transcripts, and the contact details of two referees. The pre-announcement will close the first of November 2019.