PhD position in the framework of the Marie Slovodska ITN EvoCELL “Animal evolution from a cell type perspective: multidisciplinary training in single-cell genomics, evo-devo and in science outreach”, to carry out interdisciplinary training at the Stazione Zoologica Anton Dohrn in Naples (Italy) in the lab of Maria Ina Arnone.

General information

EvoCELL is a Marie Slovodska Curie Innovative Training Network aiming at laying the foundation for a new branch of evo-devo focussing on cell types. Early Stage Researchers (ESR) will enjoy a multi disciplinary and international environment with plenty of training opportunities and exchange with all labs involved in the Network.

Project description

The project entitled "The neuropeptidergic system of the sea urchin larva: insight into the evolutionary origins of pancreatic and photoreceptor cell types" will be part of the EvoCELL Work package 1, Whole-animal single-cell transcriptome data for marine species, WP4, Origin and evolution of neural cell types and tissues and WP6, Outreach.

Objectives: The sea urchin primary feeding larva, consisting of about 1500 cells, displays a simple yet sophisticated sensory system composed of a few hundred neurons interconnected with a few ganglia around the apical organ and ciliary band that allows the animals to catch food, sense light and move as plankton in the water column for a few months before settlement. Many of these neurons are secretory cells and the neuropeptides they produce have been recently identified. The fellow will study the molecular neurobiology of the neuropeptidergic system of the sea urchin *Strongylocentrotus purpuratus* larva. S/he will establish protocols for dissociation of sea urchin larvae and use single-cell transcriptomics to characterize their sensory system, primarily focusing on two previously identified neuropeptide-expressing cell types: one bearing a pancreatic signature and one photoreceptor cell expressing a Go-opsin. Functional analyses will be performed by CRISPR/Cas9-based knock-down experiments coupled with behavioural measurements. Finally, taking advantage of the single-cell transcriptomics data produced within the network, the ESR will search for putative homologous of these two cell types in other species (incl. hemichordates, annelids, crustaceans, flatworms, cnidarians) through collaborations with other EvoCELL labs. Training will be given in molecular biology, developmental genetics and microscopy techniques. The project will provide insights into the evolutionary origin of pancreatic cell types and light sensitive organs in Bilateria.

Eligibility criteria

Candidates should ideally possess a Master’s degree in a relevant academic field or a degree that allows them to embark in a PhD, and relevant experience of molecular biology. Experience in developmental and/or evolutionary biology, bioinformatics or neurobiology is advantageous.

At the time of recruitment, the candidate must not have resided or carried out their main activity (work, studies, etc.) in the country of their recruiting organisation for more than 12 months in the 3 years immediately prior to start of the project. Short stays such as holidays and/or compulsory national service are not taken into account.

Candidates can be of any nationality, but are required to undertake transnational mobility. Candidates must be within the first four years of their research career. Applications from candidates who already possess a doctoral degree will not be considered.