Title: Reconstructing cardiovascular cell lineage evolution, one cell at a time (NCN/OPUS).

Supervisor: Cecilia L. Winata, PhD, DSc. habil.
Institute: International Institute of Molecular and Cell Biology in Warsaw
Laboratory: Laboratory of Zebrafish Developmental Genomics
www: https://shorturl.at/96TRF

Project description:

The project aims to elucidate the mechanisms driving cell lineage decisions in the anterior lateral plate mesoderm leading to the formation of various cardiopharyngeal structures. You will establish and perform lineage tracing analyses using single-cell lineage barcoding (Raj et al., Nat. Biotechnol. 36:442–450, 2018) to model gene expression trajectories during lineage specification (Farrell et al., Science 360:6392, 2018), and to identify key molecular transition points that lead to the commitment of distinct cell fates. This project offers a unique opportunity to engage in cross-disciplinary research by integrating cutting-edge single-cell transcriptomics with bioinformatics, in close collaboration with team members and external partners. The ideal candidate should be self-motivated, capable of tackling complex challenges, and eager to collaborate effectively within a research team.

Aim:

As a PhD student, you will be responsible for developing zebrafish tools for cell lineage tracing using the GESTALT system (Raj et al., Nat. Biotechnol. 36:442–450, 2018), and applying this approach to perform single-cell analysis to model the cardiopharyngeal cell lineage trajectory. This study is expected to provide critical insights into the development of cardiopharyngeal structures and their related diseases.

Requirements:

- Master's degree in biology, biotechnology, biochemistry or related field
- Solid knowledge of the principles of cell and molecular biology, genetics, and/or biochemistry
- Hands-on experience in molecular biology, cell biology, genetic engineering, and/or fluorescent microscopy
- Keen interest in developmental biology, epigenetics, and gene regulation
- Prior experience or knowledge in next generation sequencing, cell sorting, bioinformatics, and/or working with animal models will be an advantage.
- Written and spoken fluency in English
- Willingness to learn and take new challenges, ability to work independently, analytical thinking
- Good interpersonal skills and a collaborative attitude

Number of positions available: 1

Contact: cwintata@iimcb.gov.pl