Position Offered: UNIVERSITY GRADUATE Project: Exploring tumor heterogeneity with morphocynetic analysis: tools for live imaging

Technological and scientific fields: Computational Biology, Image Analysis, Artificial Intelligence

Location: Madrid, Comunidad de Madrid, Instituto de Investigaciones Biomédicas Sols-Morreale CSIC-UAM. https://www.iib.uam.es/en/#gsc.tab=0

Research Group/PI: Machine Learning for Biomedical Imaging Analysis and Multi-Omics Integration, Dra Maria Alieva, <u>www.imAIgene-lab.com</u>

PROJECT SUMMARY

Cancer cells undergo morphological changes during tumor progression, such as increased migration, invasion, and proliferation, indicating aggressiveness. Analyzing these variations helps discover new cell phenotypes and understand underlying mechanisms. Conventional image analysis software struggles with this complexity, necessitating advanced digital methods like artificial intelligence for better segmentation, tracking, and classification of videomicroscopy images, unsupervised learning, dynamic network and modelling for interpratation. This project aims to create automated digital tools for processing and analyzing videomicroscopy data to investigate crucial aspects of cancer, such as cell migration and chromosomal instability. The objective is to understand how these factors contribute to tumor heterogeneity, aggressiveness, and therapy resistance. The project will focus on developing efficient and user-friendly tools accessible to biomedical researchers, featuring intuitive interfaces, cloud computing capabilities, and optimized data management to ensure broad applicability beyond the project's scope.

PROFESSIONAL PROFILE

Minimum requirements:

Master's degree in one of the relevant fields or similar: Biomedicine, Bioinformatics and Computational Biology, Biostatistics, Data Science in Artificial Intelligence, Biomedical Physics, Big Data, Deep Learning, Image Analysis.

Merits to be considered:

Knowledge of English; Eexperience in image data analysis or Artificial Intelligence

WHAT IS OFFERED

This project provides a unique chance to develop skills in microscopy data analysis and software implementation. The hired individual will collaborate in an interdisciplinary environment, bridging computational and biomedical groups to create microscopy analysis tools. Results will be submitted to prestigious open-access journals, and presented at national and international conferences and symposia on cancer research, microscopy, and computational biology. During the project, the hired individual will complete two three-month bioimaging training stays (40 ECTS credits). Over four years, they will earn 90 ECTS credits in digital competencies and 20 ECTS credits in complementary training areas like microscopy, spatial analysis, and data visualization.

Contract conditions:

Indefinite contract for a University Graduate associated with the Momentum Project of 4 years' duration according to Spanish science law. Gross annual salary (37.000 € - 41.000 €).

Start of contract: before 31 December 2024

PRINCIPAL INVESTIGATOR CONTACT

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