Type d'offre : Corporate offer

Post date : 04.03.26

Inria

Integrating Transcriptomics Data into Agent-Based Tissue-Level Models

Informations générales

Contract type : Stage

Contract length : 6 mois

Contact :

Inria.fr

Starting date : Wed 01/04/2026 - 12:00

Inria :

Founded in 2008, the Inria Saclay Research Centre is located at the heart of the Paris-Saclay scientific and technological excellence hub, which alone accounts for

15% of French research activity.
Supporting the development of Université Paris-Saclay and the Institut Polytechnique de Paris, the Inria Saclay Research Centre brings together 80 staff members working in research support services and 500 scientists representing 54 nationalities.

Address :

Paris-Saclay
91000 Paris-Saclay
France

Détail de l'offre (poste, mission, profil) :

Contexte et atouts du poste

The internship will be co-supervised by Dirk Drasdo (Directeur de recherche) and Matteo Pedrazzi (PhD student).

We are advertising for 1 or 2 internship opportunities within the INRIA Saclay SimbioTX team, our lab is mainly involved in the modeling at cellular and tissue level, with long-standing expertise and experience in modeling liver damage regeneration and degeneration at tissue-level in time and space.

The goal of this project is to use available transcriptomics data within an international network project cooperation that includes biologists and clinicians, to better understand the progression of disease from cirrhosis to hepatocellular cancer in patients with chronic liver disease. The study focuses on how the cellular environment influences cell behavior by analyzing genetic pathways across different cell types and disease stages. The work contributes to building a digital liver twin.

Mission confiée

The approach we would like to pursue is based on the central idea of constructing a gene/protein regulatory network and eventually perform stochastic simulations to map cellular microenvironmental inputs to cellular phenotypes. The final structure of

the internship will be determined based on the number of interns, whether one or two.
First step is the study of an approach already found in literature for prostate cancer [1-3] but here using a dataset on cirrhotic and hepatocellular carcinoma (HCC) patients. The underlying pipeline consists of several stages:

collect patient data within the cohort and publicly available data & information
analysis of transcriptomics dataset with common tools
building the regulatory network based both on analyzed data and literature information
benchmarking of results and eventual refinement of the signaling network
optional: individuate strategy to apply personalization of the signaling network for individual patients data
optional: simulation of cell phenotypes from the initial microenvironment (stochastic Boolean/ODEs)

Bibliography

[1] Montagud A. eLife (2022)
[2] Ponce-de-Leon A. NPJ Syst Biol Appl. (2023)
[3] Ruscone M. PLoS Comput Biol. (2025)

Principales activités

Understand and analyze the initial transcriptomics dataset
Apply open source software to develop a personalized signaling network based on the dataset and prior knowledge
Iteration with experimentalists/biologists to fill the knowledge gaps
Conduct numerical experiments and devise the most robust numerical model
Write a report, contribute to a journal publication and present the results to the research group/conference if applicable
Compétences

The core competences for an ideal candidate are:

background in biology and data analysis - ideally a bioinformatics background
experience with at least one programming language (Python, R, C++, ...)
analytical skills and understanding of underlying mathematical principles
good communication skills in English
interest in mathematical modelling in the biomedical field
Previous experience with genomics and knowledge of transcriptomics data will be considered as a valuable addition.

Avantages

Subsidized meals
Partial reimbursement of public transport costs
Leave: 7 weeks of annual leave + 10 extra days off due to RTT (statutory reduction in working hours) + possibility of exceptional leave (sick children, moving home, etc.)
Possibility of teleworking and flexible organization of working hours
Professional equipment available (videoconferencing, loan of computer equipment, etc.)
Social, cultural and sports events and activities
Access to vocational training
Social security coverage

URL de l'offre : https://jobs.inria.fr/public/classic/fr/offres/2026-09801

Lien vers l'offre sur le site dataia.eu :https://da-cor-dev.peppercube.org/node/1541