

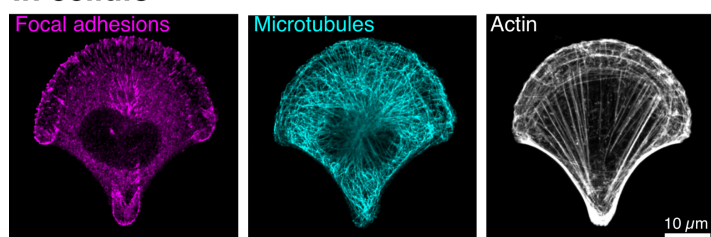
Three-year fully funded PhD position (Graduate School EUR – Chemistry, Biology and Health)

Location: Grenoble Institute of Neurosciences, Team “Neuro-Cytoskeleton Dynamics & Structure”, Chemin Fortuné Ferrini, 38700 La Tronche, FRANCE.

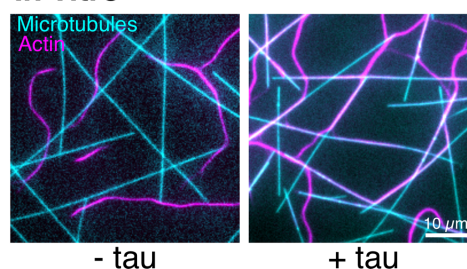
Title: Exploring the role of tau in cell adhesion dynamics: interactions between tau, the cytoskeleton and focal adhesions

Summary: Tau, a neurodegeneration-associated protein, has recently emerged as a prognostic factor in cancer. However, the molecular mechanisms linking tau and cell transformation are still poorly understood. As tau is a key player of the microtubule and actin cytoskeletons, its mis-regulation might alter several events including cell adhesion, migration and metastasis. Indeed, recent studies have highlighted a connection between the focal adhesion pathway and tau dysfunctions. This project aims to explore how altered expression and/or modifications of tau affect focal adhesions via the disruption of microtubule and/or actin networks, processes involved in tumor progression. By combining in cellulo and in vitro studies, the PhD candidate will pursue two main objectives: 1/ to correlate, in cell models, tau-mediated cytoskeleton organisation with focal adhesion assembly and distribution 2/ to reconstitute cytoskeleton properties with purified proteins and investigate how tau proteins affect the microtubule/actin interplay known to occur at the leading edge of migrating cells. Overall, results should highlight the role of tau proteins in the mechanisms that are mis-regulated in tumorigenesis and contribute to understand the link between neurodegenerative diseases and cancers.

In cellulo



In vitro



Organization & mean implemented: This collaborative project gathers two teams with complementary expertise in tau protein biology and cytoskeleton properties (Arnal & Andrieux team, Grenoble Institute of Neurosciences, GIN/INSERM/University Grenoble Alpes) and in cell adhesion dynamics (Albigès-Rizo team, Institute of Advanced Biosciences, IAB/CNRS/INSERM/University Grenoble Alpes). All equipment, tools and expertise required for the project are available in both teams and their institute’s facilities, including a collection of human pathological tau proteins, advanced light imaging methods (TIRF microscopy, confocal high-resolution and super-resolution microscopy), tools for exploring focal adhesions, micro-patterning for standardized study of intracellular organization, and biomimetic assays for in vitro cytoskeleton reconstitution. While officially hosted by one of the partner institutes (GIN), frequent exchanges and visits between the two institutes are anticipated (both institutes are 5 minutes’ walk away).

Required skills: We are seeking a highly motivated student with knowledge in cell biology and/or biochemistry, and open-minded to multidisciplinary approaches.

Contact: Candidates should send their CV, their Bachelor and Master grades, a letter of motivation and letters of recommendation to isabelle.arnal@univ-grenoble-alpes.fr and corinne.albiges-rizo@univ-grenoble-alpes.fr by 20 May 2024.

Starting date: 1st of October 2024