CRBM Centre de Recherche de Biologie cellulaire de Montpellier
CRBM / CNRS – Université de Montpellier
1919 Route de Mende, 34293 Montpellier Cedex 05

2027 Internship Offer

Master 1: YES – Duration: 3-4 months **Master 2**: YES – Duration: 5-6 months

Team, Contact	Anne Debant, Team Signaling and cytoskeleton dynamics, CRBM Supervisor: jerome.boudeau@crbm.cnrs.fr
Title	**NAV1 at the Crossroads of Axon Guidance and Neurodevelopmental Disorders**
Research Themes and questions	The formation of neuronal circuits during embryonic development relies on the precise regulation of cytoskeletal dynamics. Disruptions of this process are frequently associated with neurodevelopmental disorders, including intellectual disability and autism spectrum disorders. Our research aims to decipher the signalling pathways that regulate cytoskeletal dynamics during nervous system development and on to understand how mutations in molecular components of these pathways contribute to the onset of neurodevelopmental diseases. In recent years, we have demonstrated the central role of the microtubule-associated protein Navigator-1 (NAV1) in several key aspects of embryonic neuronal morphogenesis, including neuronal migration, axon growth, and axon guidance. We have shown that NAV1 regulates these processes by coordinating microtubule dynamics and actin cytoskeleton remodelling. We are currently investigating the role of NAV1 in the regulation of integrin-dependent cell adhesion dynamics during axon growth and guidance. In parallel, a collaboration with a consortium of clinicians has led to the identification of NAV1 gene mutations in patients with neurodevelopmental disorders. The internship project will focus on characterising the molecular mechanisms that regulate NAV1 functions in response to axon guidance cues and/or on investigating the functional impact of patient- derived mutations on NAV1 cellular activities and on neuronal development.
Methods and experimental approaches	The project will be based on complementary approaches in cell biology, biochemistry, and developmental biology, using cell lines and primary neuronal cultures, together with high-resolution live-cell imaging techniques.
2-3 Publications	Sanchez-Huertas *et al*. (2020). J. Cell Biol. 219:e201905199. Van Haren *et al*. (2014). Curr. Biol. 24:1778-1785.