

<p><b>Lab :</b>  Institut Jacques Monod  15 rue Hélène Brion  75013 PARIS</p> <p><b>Team :</b>  '<a href="#">Regulation of Actin Assembly Dynamics</a>'</p> <p><b>Team leaders :</b>  G. Romet-Lemonne &amp; A. Jegou</p>	<p><b>Supervisor :</b>  Cécile Leduc, HDR</p> <p><b>Contact :</b>  cecile.leduc@ijm.fr</p>
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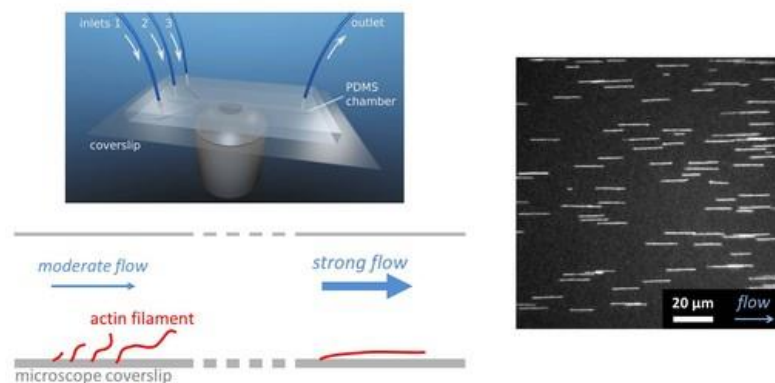
**Title of the project:**

Characterization of vimentin mechanical properties and mechanosensing by microfluidics and single molecule microscopy

**Abstract :**

Cell mechanics is mostly governed by the cytoskeleton which is composed of three types of interconnected filaments : actin, microtubules and intermediate filaments. Among those, actin forms dynamic networks that can quickly assemble and disassemble in response to its environment but are not mechanically resistant to deformation. On the contrary, intermediate filament vimentin forms long-lived networks with slow assembly/disassembly, but with remarkable mechanical properties as vimentin filaments are highly stretchable and resist breakage. While actin and microtubule properties have been extensively characterized, intermediate filaments are much less understood, despite their important role in many diseases. Vimentin is overexpressed in many different types of cancer and has been shown to promote cell migration and invasion.

The objective of this internship is to study the mechanical properties of vimentin filaments using original microfluidic approaches developed by the team, coupled with fluorescence microscopy. The impact of filament tension on the recruitment of vimentin/actin crosslinkers will be investigated in more detail in order to uncover novel molecular mechanisms of mechanosensing.



The team 'Regulation of Actin Assembly Dynamics', at the Institut Jacques Monod, is a very dynamic, multidisciplinary team, working at the interface between biochemistry, biology, and physics. It is composed of 16 persons of 5 different nationalities. Candidates should be motivated, curious, and eager to discover original experimental approaches.

**Bibliography :**

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2. Tran QD, Sorichetti V, Pehau-Arnaudet G, Lenz M+, Leduc C+, [Phys Rev X](#) (2023)
3. [Wioland H](#), [Jegou A](#), [Romet-Lemonne G](#). [PNAS](#) (2019)