

3 PhD Positions

Soft Matter, Mechanobiology & Computational Biophysics

ANR-funded HECTOR project | CNRS | Marseille & Montpellier, France

36 months

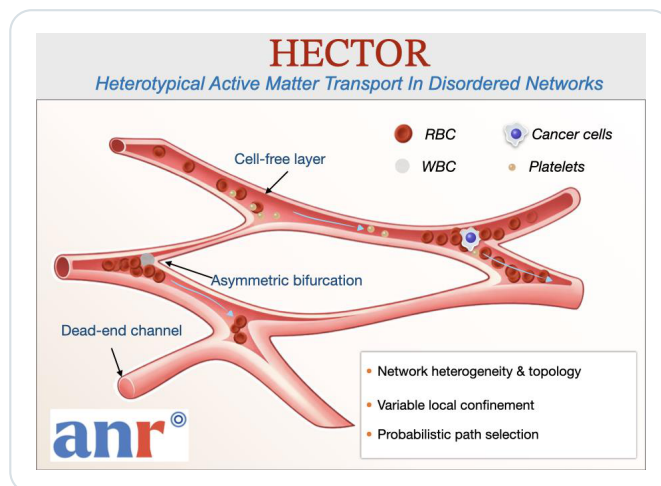
Start: January, 2027

Deadline: 1 October, 2026

The project

HECTOR (Heterotypical Active Matter Transport in Disordered Networks) aims to uncover how the interplay between mechanics, cell-cell interactions, and vascular network topology governs the transport of cells in the microcirculation.

By combining microfluidics, experiments, and numerical simulations, we will investigate how red blood cells, immune cells, platelets, and circulating cancer cells navigate complex vascular networks and how emergent transport phenomena arise from these interactions.



Open PhD positions

01 Soft Matter & Microvascular Hydrodynamics

Hydrodynamic and biophysical interactions in RBC-rich cellular flows

RBC suspensions • deformable particles/cells • microfluidics

CINaM/ IRPHE/ CNRS • Marseille

02 Cellular Mechanobiology

Mechanical and adhesive interactions of cells in microvascular environments

cancer/immune cells • adhesion • cell mechanics • microfluidics

IRPHE / CINaM / CNRS • Marseille

03 Computational Biophysics & Fluid Mechanics

Numerical modelling of heterogeneous cellular transport in vascular networks

CFD • deformable cells • numerical methods • transport

IMAG/ CNRS • Montpellier

Candidate profile & application

PhD 1 - Soft Matter & Microvascular Hydrodynamics | Marseille, France

Candidate profile

We are looking for a candidate with a strong background in physics, engineering, fluid mechanics, soft matter, biophysics or a related discipline. The project is experimental and will suit candidates interested in complex cellular flows, microfluidics and quantitative microscopy. Candidates should hold a Master's degree or equivalent, with strong hands-on skills, scientific curiosity and an ability to work in a multidisciplinary environment.

Expected background & skills

- microfluidics and experimental fluid mechanics
- soft lithography/ microfluidic device fabrication
- soft matter, deformable particles/cells
- cell mechanics or biophysical experiments
- optical microscopy; quantitative image/data analysis
- statistical upscale modeling (a plus)

Position details

LOCATION

Marseille, France

STARTING DATE

January, 2027

CONTRACT

36 months

APPLICATION DEADLINE

1 October, 2026

AFFILIATION

CNRS - AMU - IRPHE - CINaM

SCIENTIFIC ADVISERS / CONTACT

Ankur D. BORDOLOI

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How to apply

Applications should include a CV and a 1-page motivation letter describing relevant experience and interest in the position. The email subject must clearly identify the position (e.g., "PhD 1 - Soft Matter & Microvascular Hydrodynamics"). Applications that do not specify a position will not be considered.

ANR HECTOR project context

This PhD will explore the soft matter and hydrodynamic aspects of HECTOR, investigating the transport and interactions of deformable particles and cells in RBC-rich microvascular-like flows. The work connects these physical mechanisms to cellular behaviour and transport across complex vascular networks through microfluidics experiments and statistical modeling.

Candidate profile & application

PhD 2 - Cellular Mechanobiology | Marseille, France

Candidate profile

We are looking for a candidate with a strong background in biophysics, mechanobiology, cell biology, bioengineering or a related discipline. The project will investigate cellular mechanics and interactions in microvascular-like environments, with applications to cancer and immune-cell biophysics. Candidates should hold a Master's degree or equivalent and be comfortable working at the interface of quantitative biology, mechanics and microfluidics.

Expected background & skills

- quantitative biophysics & mechanobiology
- microfluidics & controlled-flow experiments
- mammalian cell culture & experimental cell biology
- fluorescence microscopy & immunostaining
- cell mechanics & adhesion
- cancer or immune-cell models (a plus)

Position details

LOCATION

Marseille, France

STARTING DATE

January, 2027

CONTRACT

36 months

APPLICATION DEADLINE

1 October, 2026

AFFILIATION

CNRS - AMU - IRPHE - CINaM

SCIENTIFIC ADVISERS / CONTACT

Ankur D. BORDOLOI

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How to apply

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ANR HECTOR project context

This PhD will explore the mechanobiological aspects of HECTOR, investigating how mechanical and adhesive interactions shape cell aggregation, transport and active migration of cells in RBC-rich microvascular-like environments. The work will focus on nucleated cells, including cancer and immune cells, and connect cellular responses under RBC flows to the underlying flow and transport processes.

Candidate profile & application

PhD 3 - Computational Biophysics & Fluid Mechanics | Montpellier, France

Candidate profile

We are looking for a candidate with a strong background in fluid mechanics, computational physics, applied mathematics, mechanical engineering or a related discipline. The project will use high-fidelity numerical modelling to study heterogeneous cellular transport in complex microvascular geometries. Candidates should hold a Master's degree or equivalent and have strong foundations in numerical methods, fluid mechanics and scientific computing.

Expected background & skills

- computational fluid dynamics & numerical methods
- multiphase, particulate or deformable-body flows
- scientific computing and quantitative data analysis
- parallel/HPC computing (a plus)
- fluid mechanics and transport phenomena
- experience with biological flows (a plus)

Position details

LOCATION

Montpellier, France

STARTING DATE

January, 2027

CONTRACT

36 months

APPLICATION DEADLINE

1 October, 2026

AFFILIATION

CNRS - IMAG - Montpellier

SCIENTIFIC ADVISER / CONTACT

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How to apply

Applications should include a CV and a 1-page motivation letter describing relevant experience and interest in the position. The email subject must clearly identify the position (e.g., "PhD 3 - Computational Biophysics & Fluid Mechanics"). Applications that do not specify a position will not be considered.

ANR HECTOR project context

This PhD will develop the computational and fluid-mechanical aspects of HECTOR, using numerical simulations to investigate heterogeneous cellular transport in complex microvascular geometries and networks. The work will complement the experimental studies and contribute to a predictive understanding of transport across different flow conditions and vascular architectures.