

## Disentangling phagocytosis complexity using chemically multi-responsive and deformable particles

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### PROJET/RESEARCH PROJECT

Phagocytosis is a mechanism of internalization of objects larger than 0.5 microns. How multiple receptors simultaneously recognize microbes, leading to a complex interplay between the signaling pathways and a fine-tuning of the fate of the internalised material, is still not well understood.

This proposal aims at untangling critical steps of phagocytosis in macrophages taking advantage of a multi-disciplinary approach and unique deformable emulsion droplets coated with novel fluorescent receptor-targeted ligands to detect by FRET receptors binding and clustering, and to monitor directly the forces generated by the phagocyte.

The project will focus on receptors for important pathogenic microbes, which have been overlooked so far, mannose receptors, and their cross talk with complement receptors. Important regulators of force generation and phagosome formation will then be identified in primary macrophages using these unique read-outs. This work will thus shed unprecedented and quantitative light on the complexity in phagocytosis mediated by multiple receptors of pathophysiological importance.

### STRUCTURE D'ACCUEIL/LOCATION

**Team** « Biology of Phagocytes, Infection and Immunity» directed by **Florence Niedergang** is part of the « Infection, Immunity and Inflammation» of the Institut Cochin located in Paris, 22 rue Méchain – 75014, France.

**Institut Cochin** is one of the biggest biomedical French Research Center located in the center of Paris that provides a multidisciplinary scientific environment and very efficient core-facilities.

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**The project is supported by the 80 I PRIME** (Projet de recherche inter-instituts multi-équipes) **CNRS programme** (<http://www.cnrs.fr/mi/spip.php?article1503>). It will be led in **close collaboration** with the teams of **Jacques Fattaccioli** (Laboratoire microfluidique Institut Pierre Gilles de Gennes – CNRS UMR 8640- **INC**, ENS, Sorbonne Université) et **Jean-Maurice MALLET** (Laboratoire des Biomolécules, CNRS UMR7203- **INC** ENS, Sorbonne Université). Jacques Fattaccioli will be co-supervisor of the PhD thesis.

## CONTRAT/FINANCIAL SUPPORT

**Type:** CDD

**Funding:** CNRS

**Début/Beginning:** summer 2022

**Durée du contrat/Length of contract:** 36 months

**Structure employeur/Organization**

INSERM

CNRS

UNIVERSITE

Applicants should send their CV, letter of motivation and name of 2 references.

Envoyez votre CV, lettre de motivation et deux contacts de recommandations à :

- Florence Niedergang
- Email : [florence.niedergang@inserm.fr](mailto:florence.niedergang@inserm.fr)