RÉPUBLIQUE FRANÇAISE
Liberté Égalité Fraternité

Inserm
La science pour la santé
From science to health

Chercheur en biology, microbiologie ou l'interaction hôte-microbe (CR ou DR) -H/F

Fonction

● Fonction de recherche

○ Fonction Accompagnement de la recherche

Corps

● CR - Chargé de recherche

☐ DR - Directeur de recherche

Profil du poste

Projet de recherche / Missions

The ERC and Gates Foundation-funded laboratory of Host-Microbiota interaction is investigating the life-cycle, host-interaction, and immunological tuning of the host intestinal immune system by the gut commensals known as Segmented Filamentous Bacteria (SFB). SFB are highly unusual *Clostridium*-related aerotolerant anaerobes that have a complex life-cycle, are present in a range of vertebrates, including humans, and potently affect the host immune system. Using gnotobiotic mouse models, it has been shown that SFB tight adhesion to the ileal epithelial surface stimulates the postnatal development of intestinal lymphoid tissue and induces a state of physiological inflammation that is characterized by a potent IgA, IL22, and The17 cell response. They are the foremost commensals associated with colonization resistance to pathogens in and outside of the gut and are implicated, and can be responsible, for the disease severity in a growing number of mouse models. However, the nature of SFB in humans and vertebrates and how SFB transmits its immunostimulatory potential remains poorly defined.
The research position can be focused on one, or more, of our three research themes, depending on the researcher's interest and expertise.

1. To shed light on SFB in humans and vertebrates using genomic and morphological characterization.
We have recently identified four main and three minor SFB lineages present in humans as well as dozens of lineages present in animals and have established collaborations to obtain SFB-containing samples that can be used to obtain the SFB genome sequences and information on the SFB morphology. This work will include genome assembly and analysis, bioinformatics, as well as scanning electron microscopy and fluorescent imaging.
Kiran et al. Schnupf P. Segmented filamentous bacteria are worldwide human gut commensals. Nature Communications. 2026

2. To identify the bacterial molecular determinants important for the life-cycle and/or host interaction. We have identified a number of interesting SFB candidates using proteomics and transcriptomics which we aim to interrogate using biochemistry, immunofluorescence and cryo-electron microscopy.
Cruz *et al.* Schnupf P. Segmented filamentous bacteria undergo a structural transition at their adhesive tip during unicellular to filament development. 2025. Nature Communications.

3. To investigate the host factors that mediate the unusual symbiosis an immunostimulatory potential. We use knock-out mouse models to characterize host factors that have been implicated in the immunostimulatory potential of SFB through our *in vitro* SFB-host cell co-culturing system and preliminary work *in vivo*.

Cherrier *et al*. Hematopoietic MyD88 orchestrates the control of gut colonization by segmented filamentous bacteria. Mucosal Immunology. 2025

This work will give critical insights into the cross-talk between the host and one of the most important but still enigmatic gut commensal bacteria, it will address mechanisms underlying gut immune homeostasis, and it will provide a better understanding of the different SFB species and present in humans and vertebrates and their co-evolution with the host.

Activités principales	**Main Responsibilities:** • Develop and carry out research projects • Determine the research methods best suited to ongoing projects • Supervise young researchers, doctoral students, technicians, interns, etc. • Ensure the validation of results and scientific integrity • Disseminate and promote results (publications, presentations at national and international conferences, patents) • Participate in fundraising and the recruitment of postdoctoral researchers • Contribute to scientific activities
Activités associées	• Develop, participate in, and/or coordinate research collaborations • Participate in research administration and the collective life of the unit
Connaissances	• Microbiology • Mucosal immunology • Biochemistry • And/Or Electron microscopy
Savoir-faire / Méthodologie	• Conduct a research project • Mobilize and lead scientific projects • Communicate and interact with collaborators • Respond to grant applications
Aptitudes	• Scientific rigor • Self-motivated • Passionate about science • Autonomy • Team-spirited • Goal-oriented • Good writing, communication and organizational skills • Student supervision (master, doctoral)
Spécificité(s) / Contraintes du poste	• Multicultural tolerance is assumed for working in The research activity will take place within Institut Necker Enfants Malades (INEM) on the Necker campus in central Paris, which also includes the Necker Hospital, Institut Imagine and the SFR Necker technological platforms. INEM is composed of twenty teams working on a range of biomedical research topics. The institute is hosted in the building of the Faculty of Medicine of the University Paris Cité. INEM is at the heart of a dynamic research and hospital campus with an active teaching and student presence. It hosts weekly national and international speakers, weekly institutional speakers and monthly social events, as well as national and international scientific events. The unit has state-of-the-art technological platforms, including: • Gnotobiology facilities • Imaging (confocal and super-resolution) • Cytometry (spectral cytometer and spectral sorter)

	• Access to genomics, proteomics, and germfree mouse platforms The team maintains a close link with the nearby Institut Pasteur and particularly its technological platforms (transmission, scanning and cryo electron microscopy, germfree mouse facility, image analysis, sequencing, bioinformatics etc.) as well as national and international collaborators. For more information on the unit's activities and collaborations, candidates are invited to consult the unit's website (https://www.institut-necker-enfants-malades.fr/equipe/interaction-hote-microbiote-intestinal).
Formation / Expérience souhaitée	• PhD, HDR is a plus
Date souhaitée de prise de fonction	As soon as possible
Structure d'accueil	
Code unité	INSERM U1151
Intitulé	INEM- The Institut Necker Enfants Malades
Directeur	Fabiola TERZI
Adresse	INEM, 160 rue de Vaugirard, 75015 Paris
Tél.	
DR de rattachement	Ile de France Paris Centre Nord
CSS de rattachement	
Institut thématique principal de rattachement	INEM- The laboratory of Host-Microbiota interaction
Site internet de la structure	
Composition de l'unité	
Équipe de rattachement	
Responsable d'équipe	
Contact	
Nom et prénom	Pamela Schnupf
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Date limite de candidature : Applications open until post is filled