What is the ExposUM Doctoral Nexus?

PhD funding opportunities in Montpellier, France : ExposUM Doctoral Nexus

A Doctoral Nexus, as proposed by the ExposUM Institute, brings together networks of three to four PhD students from diverse disciplinary backgrounds, affiliated with at least two distinct research units.

Unlike traditional PhD programmes, a Doctoral Nexus is designed to enhance collaborative skills and the ability to develop transdisciplinary projects, while allowing students to deepen their own field of expertise.

Nexus doctoral students will benefit from a dedicated training programme and will have the opportunity to organise seminars within their Nexus network.

The ExposUM Institute provides full funding for four years, covering both the PhD students' salaries and an environmental allowance.

The context of the thesis:

Humans are constantly exposed to pathogens present in their physical and social environments. In addition to physiological immunity, a **behavioral immune system** has evolved to reduce these risks by detecting cues of contamination and promoting avoidance of potential sources of infection (1). **Disgust** plays a central role in this system by triggering **avoidance responses** to perceived infectious threats (2,3).

While the adaptive function of disgust is well established, the mechanisms linking the perception of food-related pathogen cues to behavioral and physiological responses remain poorly understood. Recent work suggests, for instance, that exposure to infectious cues can elicit **anticipatory immune responses**, notably through the activation of inflammatory processes (4,5). However, these studies have mainly focused on disease cues in others (e.g., visible symptoms), largely neglecting ecologically central stimuli such as food, whether objectively contaminated or culturally perceived as repulsive.

Moreover, these responses may be modulated by **individuals' immune status**. According to the compensatory prophylaxis hypothesis, individuals adjust their avoidance behaviors as a function of their vulnerability to infection (6). Avoidance strategies may therefore vary both within individuals—depending on temporary fluctuations in immune function—and between individuals. However, empirical evidence integrating food-related disgust, immune vulnerability, physiological responses, and avoidance behaviors remains limited.

In this context, this PhD project aims to examine how the perception of food-related pathogen risk, disgust, avoidance behaviors, and physiological and immune responses interact and vary as a function of individual immune competence.

References :

(1) Schaller, M., & Park, J. H. The Behavioral Immune System (and Why It Matters). *Curr. Dir. Psychol. Sci.* 20, no. 2 (2011): 99–103.
(2) Curtis, V., Aunger, R., & Rabie, T. Evidence That Disgust Evolved to Protect from Risk of Disease. *Proc. R. Soc. B* 271, no. suppl_4 (2004): S131–S133.
(3) Sarabian, C., et al. Disgust in animals and the application of disease avoidance to wildlife management and conservation. Journal of Animal Ecology, 92 (2023), 1489–1508.
(4) Schaller, M., et al. Mere Visual Perception of Other People's Disease Symptoms Facilitates a More Aggressive Immune Response. *Psychol. Sci.* 21 (2010): 649–652.
(5) Keller, S., Wülfing, F., Wahl, S., & Diekhof, E. Disease-Related Disgust Promotes Antibody Release in Human Saliva. *Brain Behav. Immun. Health* 24 (2022): 100489.
(6) Fleischman, D. S., & Fessler, D. M. Progesterone's Effects on the Psychology of Disease Avoidance: Support for the Compensatory Behavioral Prophylaxis Hypothesis. *Horm. Behav.* 59 (2011): 2.

Planned start date: October 1st, 2026

The title of the doctoral student's position: Between Disgust and Immunity: Avoidance Strategies and Vulnerability to Foodborne Pathogen Risk

Main mission: This PhD aims to understand how disgust contributes to the adjustment of avoidance behaviors and physiological and immune responses as a function of individuals' immune vulnerability.

The specific objectives are to:

- assess the impact of disgust on food avoidance behaviors (e.g., interpersonal distance, approach–avoidance decisions);
- examine the relationship between disgust and (i) associated physiological responses and (ii) the activation of anticipatory immune responses;
- test whether increased immune vulnerability is associated with heightened disgust sensitivity and amplified behavioral, physiological, and immune responses.

Activities:

The PhD candidate will conduct an interdisciplinary research program combining behavioral ecology, experimental psychology, and psychoneuroimmunology.

Main activities include:

- designing and conducting laboratory and field experiments with human participants;
- developing immersive virtual reality experiments to simulate realistic food environments and manipulate proximity and interactions with food stimuli;
- collecting behavioral (approach–avoidance tasks, simulated food choices) and emotional data (subjective ratings of disgust, valence, desire to consume);
- recording psychophysiological measures (electrodermal activity, pupil dilation, facial activity);
- collecting and analyzing biological samples to assess immune markers (e.g., immunoglobulins, cytokines);
- performing statistical analyses (including mixed models and mediation analyses);
- writing scientific articles and presenting results at international conferences.

Expected skills and qualifications:

The candidate should have:

- a strong interest in interdisciplinary research at the interface of behavior, emotions, and health;
- skills in experimental design and statistical analysis;
- proficiency in data analysis tools (e.g., R);
- good organizational skills, autonomy, and ability to work in a team;
- strong scientific writing and communication skills.

The following will be considered an asset:

- background in experimental or behavioral psychology;
- experience in psychophysiology;
- experience with virtual reality or immersive methods / programming skills;
- knowledge of immunology or biological markers;
- good command of English (international collaborations and possible research stays abroad).

Diploma/field required:

Master's degree (or equivalent) in one of the following fields:

- Behavioral ecology, evolutionary biology
- Psychology, cognitive science, or related disciplines
- Evolutionary anthropology
- Biology / immunology

Supervision: The PhD will be co-supervised by:

- Marie Charpentier (CNRS Research Director, HDR, ISEM UMR5554 – ED GAIA)
- Arnaud Tognetti (CNRS Researcher, CEE-M UMR5211)

Key words: Biological Sciences, Behavioural sciences, Psychology, Cognitive science, Anthropology.

CNU section to which the applicant belongs: 67, 68, 69

Application procedure

The application must include the following

- A CV
- A letter of motivation
- A copy of the diploma required for enrollment or, if unavailable, the most recent transcripts from Master 2 (semester 1 and/or semester 2)
- Any specific elements **possibly** required by the GAIA Doctoral School: https://gaia.umontpellier.fr/

Applications should be sent to:

- **Marie Charpentier: marie.charpentier@umontpellier.fr**
- **Arnaud Tognetti: arnaud.tognetti@umontpellier.fr**

with **Marie-Christine Lichtlé** (marie-christine.lichtle@umontpellier.fr) and **exposum-aap@umontpellier.fr** in CC

Application deadline : Before May, 20th CET

The University of Montpellier

KEY FIGURES

RESEARCH CENTERS

From space exploration and robotics to ecological engineering and chronic diseases, UM researchers are inventing tomorrow's solutions for mankind and the environment.
Dynamic research, conducted in close collaboration with research organizations and benefiting from high-level technological platforms to meet the needs of 21st century society.
The UM is committed to promoting its cutting-edge research by forging close links with local industry, particularly in the biomedical and new technologies sectors.
More Information: https://www.umontpellier.fr/en/recherche/unites-de-recherche

SCIENTIFIC APPEAL

Open to the world, the University of Montpellier contributes to the structuring of the European higher education area, and strengthens its international positioning and attractiveness, in close collaboration with its partners in the I-SITE Program of Excellence, through programs adapted to the major scientific challenges it faces.
More Information: https://www.umontpellier.fr/en/international/attractivite-scientifique