

**PhD position: Effects of mother's age and parity on offspring behavioral phenotype and stress neuroendocrinology in the mound-building mouse**

**Application deadline: May 07<sup>th</sup> 2024**

**Applications to: [rodel@univ-paris13.fr](mailto:rodel@univ-paris13.fr)**

We are looking for a highly motivated and competent candidate for a 3-year PhD thesis in the Laboratoire d'Éthologie Expérimentale et Comparée (LEEC), Université Sorbonne Paris Nord (Campus Villetaneuse) to study "Effects of mother's age and parity on offspring behavioral phenotype and stress neuroendocrinology in the mound-building mouse".

**Context.** Characteristics of the mother, such as her age and her parity are well known to influence phenotypic traits of her offspring, as exemplified by reported effects on offspring growth, health, and survival. However, the impact of maternal age and parity on offspring behavioral phenotype and on related individual differences in physiological stress responses, despite its potential significance for an individual's later life, have rarely been explored.

Experimentation will be conducted on mound building mice (*Mus spicilegus*) of wild origin, bred in our animal facilities. This small rodent shows distinct cohorts of mothers of different ages under natural conditions, with old, overwintered mothers occurring early in the breeding season, and young mothers mainly occurring during the later season.

**Research questions.** In an experimental approach, the effects of mother's age (young versus old mothers) and of her parity (primiparous versus multiparous) on the emergence of offspring behavioral phenotypes (consistent individual differences in behavior), and on parameters of sympathetic stress response and hypothalamic-pituitary-adrenocortical (HPA) axis activity will be investigated. The comparison of within-litter variation in these parameters of behavior and stress responsiveness between offspring from young and old and from primi- and multiparous mothers will also be a main aspect of the project. Furthermore, to obtain deeper insights into the potential mechanisms driving such purported differences in offspring phenotype, it is planned to explore age-dependent and parity-dependent differences in mothers' behavioral phenotypes including in aspects of maternal behavior, as well as differences in mothers' physiological stress responses.

**Methods.** Behavioral phenotyping will be carried out by batteries of repeated standardized behavioral tests, to quantify different traits such as exploration, boldness and sociability. Short-term, sympathetic stress responses will be assessed by recordings of fine-scaled changes in body surface temperature using infrared thermography. HPA axis stress responses will be quantified via corticosteroid concentrations in blood and corticosteroid metabolite concentrations in feces by ELISA. In addition, aspects of neuroendocrine control will be assessed by determining expression in the brain of key genes involved in HPA axis regulation by qPCR.

**Candidate.** We are seeking a creative and motivated candidate with a Master in ethology, behavioral sciences or in a related field, with experience in behavioral observations and animal experimentation. The candidate should have very good English communication skills (min. B2); proficiency in French is not required. A good knowledge in applied statistics (preferably using R) will be advantageous.

**Supervision.** Prof. Heiko G. Rödel and Dr. Cédric Zimmer, *Laboratoire d'Éthologie Expérimentale et Comparée* (LEEC), *Université Sorbonne Paris, France*. Email: [rodel@univ-paris13.fr](mailto:rodel@univ-paris13.fr) | website: <http://leec.univ-paris13.fr>

**Application Procedure.** Applicants will be pre-selected based on their qualifications. Please send a short CV (incl. the marks of bachelor and master, and names + contact data of 2 referees) and a letter of interest by email to H.G. Rödel **before/until the 07 May 2024**. Do not hesitate to request further information by email.

The chosen candidate will then apply with this project to the Ecole Doctorale Galilée (Université Sorbonne Paris Nord) for funding of a 3-year contract. Candidates should be willing to come in person for the interview by the Ecole Doctorale on the 11<sup>th</sup> June 2024. The thesis will start in September 2024.