

**MASTER 2 BMC
PARCOURS GENOPATH
ANNÉE 2024-2025**

Titre : Understanding the multigenerational impact of social environment perception on *C. elegans* behaviour.

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Sujet de stage :

One of the most intriguing questions in biology is to understand if and how information perceived by the nervous system of an animal can cross the 'Weismann barrier' that separates the soma from germline and affect the next generation.

We previously discovered that information about dense social environment perceived by the nervous system of the nematode *C. elegans* is transmitted to the progeny delaying their germline development, increasing their minimum generation time and negatively impacting their fitness when growing in favourable conditions¹.

Dense social environment information in nematodes is mediated by a pheromone which when perceive early during development, promotes the formation of dauer, an alternative non reproductive and stress resistant larval stage, in response to harsh environmental conditions. We now have preliminary evidence that parental exposure to dauer pheromone increases the frequency of formation of dauer larvae in the progeny that grow in unfavourable environments. Your work would be to confirm this observation and optimize the assay by characterizing the environmental conditions under which these differences are maximal. In parallel we also want to monitor behavioural phenotypes that we suspect might also be impacted by ancestral pheromone perception. To this end you will learn to record worm movement and systematically quantify multiple behavioural phenotypes using open source software².

Modèle et techniques utilisées :

C. elegans, worm tracker, automatic behavioural analysis.

Publications d'intérêt :

1. Perez, M. F. *et al.* Neuronal perception of the social environment generates an inherited memory that controls the development and generation time of *C. elegans*. *Current Biology* (2021) doi:10.1016/j.cub.2021.07.031.
2. Javer, A., Ripoll-Sánchez, L. & Brown, A. E. X. Powerful and interpretable behavioural features for quantitative phenotyping of *Caenorhabditis elegans*. *Philosophical Transactions of the Royal Society B: Biological Sciences* 373, 20170375 (2018).

