

Supervision:

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Funding for student:

yes to be discussed no

Title of the research project:

**The psychoneuroimmune hypothesis of parasite manipulation:
reversibility of behavioural changes induced by an acanthocephalan parasite
in its amphipod host**

Key words:

parasitic manipulation – mechanistics and evolutionary processes

Brief description:

Parasites with complex life cycles are well known to alter several phenotypic traits of their intermediate hosts in ways that appear to increase trophic transmission to final hosts (1). This phenomenon of 'parasite manipulation' is interpreted as a spectacularly example of extended phenotype. Although parasite-induced alterations have been described for a wide range of species, little is known about the mechanisms and evolutionary processes underlying this phenomenon. One hypothesis is that the tight connection between immunity and behaviour has allowed parasite manipulation to evolve. Yet, this 'psychoneuroimmunological hypothesis' (2) is still largely understudied.

This research project aims at addressing this hypothesis, by using original experimental designs to neutralize the effect of infective parasites on host immunity, and investigate the consequences on a large set of behavioral traits. Two model systems will be used, the fish acanthocephalan *Pomphoyrynchus laevis* and the bird acanthocephalan *Polymorphus minutus*, parasitizing *Gammarus fossarum*.

Literature (2 references):

(1) Cézilly, F., Favrat, A., Perrot-Minnot, M.-J. 2013. Multidimensionality in parasite-induced phenotypic alterations: ultimate versus proximate aspects. *J. Exp. Biol.* 216, 27-35.

(2) Adamo, S.A. 2013. Parasites: evolutions neurobiologists. *J. Exp. Biol.* 216, 3 -10.

Technical aspects of the research project:

Collecting samples in the field, dissecting, conducting behavioural experiments under controlled conditions, biochemical assays

Essential skills and abilities desired:

Good command of English language, organizational and observation skills, adroitness. Interest in the mechanistic basis of behaviour at the physiological level is mandatory

Return to Professor Frank Cézilly (frank.cezilly@u-bourgogne.fr) and Dr Marie-Jeanne Perrot-Minnot (mjperrot@u-bourgogne.fr)