M2 bop - 2015-2016
Research project proposal

Supervisor :

Name : FAVRAT Adrien (adrien.favrat@u-bourgogne.fr)
Name co-supervisors : PERROT-MINNOT Marie-Jeanne (mjperrot@u-bourgogne.fr),
MORET Yannick (yannick.moret@u-bourgogne.fr)

Project title :

Host manipulation by parasite : are immune-neural connexions involved in behavioural alterations?

Keywords :

Parasite manipulation, psychoneuroimmune hypothesis, mecanistics and evolutionnary processes

Summary (150 words at the maximum):

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 connexion between immunity and behaviour has allowed parasite manipulation to evolve. This ‘psychoneuroimmunological hypothesis’ (2) has been largely understudied.

This research project aims at addressing this hypothesis, by using original experimental designs combining “phenotypic engineering”, and both comparative and correlative approach. Several phenotypic parameters will be recorded on uninfected gammarids and gammarids infected with acanthocephalans, including antipredatory defense, activity, metabolic rate, brain neurotransmitters level and immunity.

Relevant literature (up to two 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: evolution?s neurobiologists. J. Exp. Biol. 216, 3-10.

Techniques involved in the project:

Field collection of samples, surgery, behavioural assay, dissection, biochemical assay

Desired skills and abilities:

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

A retourner avant le 15 juin 2015 : bollache@u-bourgogne.fr