
Co-evolutionary process occurring in Sympatric / Allopatric Immune response in *Biomphalaria* *glabrata* / *Schistosoma* interactions

Anaïs Portet^{*†1}, David Duval¹, Richard Galinier¹, and Benjamin Gourbal^{‡1}

¹”Host-Pathogen-Environment Interactions” Laboratory (IHPE) – CNRS : UMR5244, Université de Perpignan Via Domitia, Université de Montpellier, Institut Français de Recherche pour l’Exploitation de la Mer (IFREMER), Organisation mondiale de la santé (OMS/WHO) – 58 Avenue Paul Alduy, Bâtiment R, France

Abstract

In the interaction between the trematode *Schistosoma*, agent of human schistosomiasis and its invertebrate intermediate host, the gastropod *Biomphalaria glabrata*, co-evolution is illustrated by a compatibility polymorphism, based on the phenotype (infective vs uninfected) of a parasite expressed as a function of the phenotype (susceptible vs unsusceptible) of a host. In interactions performed between sympatric and allopatric isolates of *B. glabrata* and *S. mansoni*, reveal high degrees of compatibility polymorphism within and between populations, varying from compatible (host infected) to incompatible (parasite killed). If main studies done until now have focused on these extreme cases comparing compatible to incompatible interactions, a lot of things need to be done to understand the co-evolutionary processes occurring in allopatric and sympatric compatible combinations.

RNAseq experiment was carried on to observe sympatric or allopatric specific immune response patterns. After a sympatric infection, a massive immunosuppression was observed while in allopatric, despite a host recognition, the parasite seems to be capable to circumvent the snail immunity. Transcriptomic effort brings new potential candidates to explain the complexity of *Biomphalaria/Schistosoma* interactions. Using flow cytometry experiments, we also demonstrate differences in the immune cellular response between sympatric and allopatric interactions and bring first evidence of the role of circulating haemocytes proliferation during parasite infection.

These results bear first molecular evidences of host/parasite co-evolution within sympatric and allopatric interactions and would help in understanding the degree of compatibility between local snails and schistosomes that represent an important phenomenon of direct relevance to the epidemiology of the transmission foci in the field.

Keywords: Coevolution, Immunity, *Biomphalaria glabrata*, *Schistosoma*

*Speaker

†Corresponding author: anais.portet@univ-perp.fr

‡Corresponding author: benjamin.gourbal@univ-perp.fr