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INSTITUT DE BIOLOGIE ET DE MEDECINE MOLECULAIRES
CAMPUS DE CHARLEROI - CP 300
DEPARTEMENT DE BIOLOGIE MOLECULAIRE
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RUE DES PROFESSEURS JEENER ET BRACHET 12
B-6041 CHARLEROI (GOSSELIES)

Post-Doctoral Position Open

Understanding the mechanisms of subversion of the complement by *Rhodnius prolixus*

The complement system of vertebrate is among the first line of defense against pathogens. It acts in a cascade through three activation pathways known as classical, lectin and alternative. The classical and the lectin pathways are initiated via the recognition proteins C1q and mannose-binding lectin, respectively while the alternative pathway is a default process that proceeds unless down-regulated. Complement activation results in production of inflammatory anaphylatoxins and chemotoxins, opsonization and assembly of the membrane attack complex which result in cell lysis. Complement system exerts significant pressure on pathogens which in response they have developed mechanism to protect themselves from its effect. The characterization of how pathogens evade complement attack is a rapidly expanding field of research and multiple evasion strategies have been described. A proteomic study conducted in our laboratory comparing gut proteins of a hematophagous vector (*Rhodnius prolixus*) of Chagas disease under starved and blood fed conditions revealed a potential hijacking of the complement regulators by the insect to evade its deleterious effect.

The first objective of the present project is to validate the proteomic results by western blotting using gut proteins and immunohistochemistry using gut tissues. Insects will be fed on human blood and the site of inhibition of complement pathways will be investigated using total gut proteins inhibition assays.

We have identified in the gut proteome of fed insects the presence of C4-binding protein (C4bp) which prevents the assembly of C4bC2a complex (a C3 convertase) thereby preventing the classical and lectin pathways. We will thus analyze the mechanism by which the insect confiscates the phase fluid C4bp. Moreover, several isoforms of calcium-binding proteins were up-regulated after feeding. Since Ca^{+2} is required for C1q and lectins binding, its sequestration suggests an impact on the classical and lectin pathways. RNAi directed against this protein will be created to decipher its implication.

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Our proteomic analysis didn't reveal the inhibition of the alternative pathway. Previous studies on hematophagous insects have shown its inhibition by the insect' saliva. This hypothesis will be tested using Rhodnius saliva glands.

The presence of these inhibitory molecules in the insect' gut could benefit for the development of the parasite *Trypanosoma cruzi* which insect's development form is sensitive to the complement. Assuming that complement inhibitors may protect parasites, it is reasonable to suppose that inactivating them could impair their development. It could thus be possible to use complement inhibitors as part of vaccines.

About the host

The Institut de Biologie et de Médecine Moléculaire is a world-wide renowned research center of the Université Libre de Bruxelles, where you will find excellence and support both in science and techniques.

We are looking for an enthusiastic post-doctoral researcher to join us in this exciting area. Applicants should have a solid record of scientific achievement and be highly committed to producing high-quality science.

The fellowship is for one year renewable once and the monthly wage of the fellowship is 2296, 85€.

Applicants full curriculum vitae and the name of two referees should be sent to Dr. Sabrina Bousbata (sabrina.bousbata@ulb.ac.be) by **30th of June**. The successful applicant would be expected to start no later than the 1st of March 2017.