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# Open Journal of Tropical Medicine

DOI <http://dx.doi.org/10.17352/ojtm.000006>

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Received: 12 January, 2018

Accepted: 25 January, 2018

Published: 26 January, 2018

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## Short Communication

# Leishmania-sandfly interactions

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There is a specific association between insect vector species and parasites [1]. The susceptibility or resistance of a species of sandfly to the development of a particular parasite depends on its ability to overcome certain barriers such as the proteolytic enzymes of the midgut, the peritrophic membrane surrounding the blood meal, and excretion of the midgut contents during digestion [2].

As for digestive enzymes, proteophosphoglycans (PPGs) and acid phosphatases form a matrix that decreases the amount of digestive enzymes in the intestine and their negative charges protect the parasite from the hydrolysing effect of nearby proteolytic enzymes [2]. To survive, *Leishmania* must be able to escape quickly from the peritrophic membrane. This membrane is, among others, composed of chitin and it seems that the parasite could lyse it through the production of a chitinase [3]. Finally, the parasite must be able to attach to the epithelial cells of the intestine in order to escape its elimination during the excretion of the blood meal. This attachment is achieved through interaction between LPG (lipophosphoglycan) and intestinal epithelial cells [4].

Thus, the galactose residue branching of LPG of *Leishmania major* would allow its attachment in its natural vector *Phlebotomus papatasi* whereas *Leishmania donovani* cannot attach to it because of its unbranched LPG [5]. In contrast, *Leishmania major* and *Leishmania donovani* cannot colonize the midgut of *Phlebotomus sergenti*, a natural vector of *Leishmania tropica*. Thus, differences in structure between LPGs of different *Leishmania* species would be responsible for their survival in their respective vectors [6]. The parasitic specificity in the *Leishmania* / sandfly pair seems to be flexible and not completely strict [7]. There may indeed be several species

of permissive sandflies. Thus, *Phlebotomus arabicus* replaces *Phlebotomus sergenti* in *Leishmania tropica* transmission in a Near Eastern focus [8]. *Phlebotomus (Adlerius) halepensis* is susceptible to *Leishmania major* and *Leishmania tropica* [9]. *Phlebotomus dubosqi* and *Phlebotomus papatasi* show the same receptor for *Leishmania major* [10].

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