

## Anti-microbial Peptides for *Plasmodium*-Blocking Mosquitoes

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The Oswaldo Cruz Foundation (FIOCRUZ) is part of the National Health Ministry and a research institute performing basic and applied research in tropical diseases. The CPqRR unit develops strong activities in the field of parasitological research, including studies on schistosomiasis, leishmaniasis, Chagas Disease and Malaria ([www.cpqrr.fiocruz.br](http://www.cpqrr.fiocruz.br)).

The Malaria laboratory conducts a number of immunoepidemiological studies in Malaria endemic areas of Brazilian Amazon. These studies include the characterization of the natural immune response against sporozoite and blood-stage antigens in different situations of transmission; prospecting phytochemicals for drug development; search for novel mosquito vector species and studies related to parasite antigen polymorphisms in different endemic areas.

In Brazil, in 1999, the governmental health agency reported more than 600,000 cases of Malaria, which after hard campaign it is been equilibrated in around 350,000 cases a year, being still a great health problem. For this reason it will be important to study the effect of different antiparasitic peptides which can interfere with parasite development in mosquitoes by independent mechanisms. Whenever we have a promising candidate, the peptide can be expressed in transgenic mosquitoes as an alternative means of malaria control or be used as a tool to study the interactions between parasites and their vectors.

We have been working with an antimicrobial peptide called gomesin, isolated from a spider previously shown to strongly affect the bacterial growth and the development of fungi and yeast and also the viability of the parasite *Leishmania amazonensis*. When testing this peptide against the *P. berghei* on mouse system by injecting intravenously different concentrations of gomesin in infected mice, 45 to 86% less oocysts were detected in mosquitoes that fed on the injected mice, in comparison with the pre-injected group of mosquitoes. We also have tested this peptide against *P. berghei* exflagellation and ookinetes, as well as *P. falciparum*, with promising results.

We are constructing an hybrid gene using midgut specific promoters linked to this gene, and we intend to adapt the *Anopheles stephensi* microinjection technique to Brazilian species of anophelines, e.g. *An. albitarsis* and/or *An. aquasalis*. Whenever we have transformed mosquitoes we will be testing their capacity of parasite blockage, in Malaria endemic areas, by using *Plasmodium vivax* and *P. falciparum* infected blood.

We will also discuss our collaboration with Dr. Paul Eggleston and Dr. Hilary Hurd to test their synthetic peptide (Vida3) against human plasmodia, by artificially feeding mosquitoes with patient infected blood, which was recently done in Rondonia, Brazil.

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