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The interface of the host antiviral response and the infection by *Leishmania amazonensis*: Role of RNA sensors and *Phlebovirus* coinfection

PKR (dsRNA activated kinase) activation, a key regulator of the antiviral pathway, occurs in *L. amazonensis* infection, leading to the expression of IL-10 and IFN1beta and favoring the parasite intracellular growth. Importantly, the immune staining of human cutaneous *Leishmaniasis* lesions revealed impressive high levels of IFN1beta/PKR positive cells from patients with untreatable diffuse cutaneous *Leishmaniasis*. We have investigated whether the endosome dsRNA receptor, TLR3, shared a similar role in *L. amazonensis* infection. The intracellular growth of the parasites was reduced in TLR3-/- macrophages and this phenomenon was accompanied by significantly reduced levels of IFN1beta and IL-10 and increased levels of IL-12. These data prompted us to test the hypothesis that arboviruses, RNA arthropods transmitted viruses, would interfere with the *Leishmania* infection. To tackle this hypothesis, we worked with *Phlebovirus*, a sub group of the *Bunyaviridae*, which is transmitted by sandflies. We tested a viral isolate of the rodent *Nectomys sp.*, a natural sylvatic reservoir of *L. amazonensis* from the Amazon region. *Leishmania* and *Phlebovirus* coinfection led to high intracellular parasite growth. Importantly, this effect required PKR, TLR3 and IFN1 signaling. *L. amazonensis* and *Phlebovirus* synergize the expression of IFN1beta and IL-10. However, the coinfection of *L. amazonensis* with the ssRNA arbovirus (DENVII) did not induce these effects. Altogether, our data revealed that the classical antiviral cellular responses mediated by PKR and TLR3 are subverted by *L. amazonensis*. We predict that specific RNA viral coinfections may enhance and sustain the activation of cellular RNA sensors, resulting in the aggravation of the parasite infection.

Biography

Ulisses Gazos Lopes is an Associate Professor at the Instituto de Biofísica Carlos Chagas Filho, Federal University of Rio de Janeiro, Brazil. He completed his MSc in Parasitology from the Federal University of Minas Gerais, Brazil and obtained his PhD in Genetics from Federal University of Rio de Janeiro, Brazil. He was a Research Fellow at Harvard School of Public Health, Boston, US, from 1984 to 1986. He did his Post-doctoral training from the Dana-Farber Cancer Institute/Harvard Medical School, Boston, US. Currently, he is a Visiting Researcher at Institut Pasteur, Paris, France.

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