# Influence of Reactive Oxygen Species (ROS) in antiviral response of *A. aegypti*.

Barletta, A.B., Nascimento-Silva, M.C.L., Oliveira, J.H.M., Oliveira, P.L. , Sorgine, M.H.F.

Instituto de Bioquímica Médica – UFRJ

Invertebrates present three main immune pathways: Toll, IMD and Jak/STAT. We have studied the expression of key immune-related genes from these pathways in Aedes aegypti trying to characterize its activation in different metabolic situations and following viral infection. We first investigated if these genes participate in the mosquito response against Sindbis virus by orally infecting the mosquito and measuring their expression in different tissues (fat body, midgut and ovary). Most of the genes showed high expression in fat body indicating an important role of this tissue in antiviral response. We also investigated if the presence of ROS in the midgut, a parameter that drastically changes following a blood meal, might influence viral infection. Thus, we infected mosquitoes using a latex solution as vehicle (a condition leading to high ROS levels in the midgut), and compared with mosquitoes infected through blood feeding. The transcriptional factors REL 1 and STAT showed lower expression in latex fed mosquitoes, while the virus's load was higher in this group. To further investigate whether the presence of ROS could be responsible for these alterations, we used an *in vitro* model, the Aag-2 cell line from *A. aegypti.* We first validated the use of this cell as a model by characterizing its immune response against fungus and bacteria, when the cell presented the same immune activation profile described for whole mosquitoes. We now aim to incubate this cell in conditions to lead to different oxidative conditions in cytoplasm such as the presence of heme or paraquat to investigate how the expression of this genes will behave and, consequently if these conditions are able to modulate the cell viral susceptibility.