Protein Tyrosine Phosphatases (PTPs) Modulate Mosquito Immune Responses.

Daumas-Filho, C. R.¹, Jablonka, W.¹, Cudishevitich C.O.¹, Moretti D.M.¹, Madan, L. L., Mesquita, R.D.³ and Silva-Neto, M. A.¹

¹Instituto de Bioquímica Médica, Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil; ²Molecular Biophysics Unit, Indian Institute of Science, Bangalore, India; ³Instituto de Química, Departamento de Bioquímica, Universidade Federal do Rio de Janeiro, Brazil.

Introduction: Aedes aegypti is a vector of yellow fever and dengue. During blood feeding, female mosquitoes can be contaminated by different pathogens and then they may act as disease vectors in the next blood meal. Besides that after a blood meal there is a huge increase on midgut microbiota. In order to eliminate invading pathogens mosquito immunity relies on different mechanism such as the production of antimicrobial peptides. The role of phosphorylation-dephosphorylation circuits of tyrosine residues in the regulation of such responses is unknown. Our group is conducting an analysis of mosquito Tyrosine Phosphatome. 48 genes coding for Protein Tyrosine Phosphatases (PTPs) were identified and their role on mosquito immunity is under evaluation. Material and Methods: In the present work following an immune challenge, we have analyzed the biology of mosquito PTPs by multiple techniques, including RT qPCR, phosphotyrosine blotting and enzymatic assay. Results: After a blood meal, there are significantly changes in the phosphotyrosine profile in the fat body and head. Also, PTP enzymatic activity is also modulated specially on the midgut and fat body. Moreover, blood feeding and antibiotic treatment implied on significant changes on the expression of the following genes AAEL003108 and Defensin. RNAi assays towards 3108 resulted in the depression of Defensin expression. Conclusion: Altogether, these data support the view that immune challenges might be transduced by phosphotyrosine signaling pathways. These data suggest that PTPs are part of such signaling pathways and thus pose such enzymes as potential targets to the development of new strategies to avoid disease transmission.

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