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Abstract:

We have made significant progress in understanding the role of the bicarbonate metabolon in the infection process in both anopheline mosquitoes as well as sand flies. Bicarbonate is an ion necessary for development of plasmodium and leishmania parasites in these vectors. However, the molecular basis of this mechanism are poorly understood. We have cloned and localized the proteins involved in this metabolon and we have identified them as key proteins that support the life cycle of these parasites in these insects.

We believe that there is potential in targetting these proteins to develop novel and very effective transmission-blocking drugs as our studies have demonstrated.

In addition, our latest results and microarray data suggest that the bicarbonate metabolon plays also a key role in the digestive and ion transport mechanism in mosquito larvae.

Upregulation of proteins such as carbonic anhydrase and bicarbonate transporters has been recently demonstrated in distinct regions of the larval midgut using microarrays. These results will increase our understanding of the digestive and ion transport mechanisms in mosquito larvae and this in turn will allow us in the future to develop mosquito larvae-specific insecticides.