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The role of the 20-hydroxyecdysone (20E) signaling pathway in modulating Anopheles arabiensis reproduction, gut microbiome and anti-bacterial immunity

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Graduation Abstract

Anopheles arabiensis is one of the main vectors of malaria in South Africa. Due to its resistance to the current insecticides used in the country, novel methods are being explored to eradicate its existence in South Africa. In this thesis, it was demonstrated that the 20-hydroyecdysone (20E) signaling pathway could be a good target for the insecticides manufactured to kill the mosquito. In fact, impairing the 20E signaling pathway with RNA interference was proven to affect the reproductive capacity, the immune responses and the gut microbiome of the mosquito, all of which are important for its vectorial capacity. From these results it is anticipated that insecticides such as methoxyfenozide or halofenozide, which target the 20E signaling pathway, could be used in the country to eradicate the mosquito species.