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Molecular characterisation of trypsin-like protease variants in female *Anopheles gambiae* reproductive pathway

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Background: Understanding the functions of the proteins responsible for reproduction are essential developments of transmission blocking agents. In *Anopheles gambiae* mosquito vector of malaria, mating is mediated by transfer of a mating plug from males to females. Pre and post-mating molecular properties of reproductive associated specific proteins in the male (transglutaminase and Plugin) and female Trypsin-Like Serine Proteases (TLSP) (AGAP005194 and AGAP005195) specifically expressed in the male accessory glands (MAGs) and female atria functional protein variations were characterized respectively.

Methods: Novel domains were identified using the Pfam search on CLC workbench V5.5 after which the localization of these proteins was carried out through immune-detection techniques using antibodies specific. RNA extraction and RT-PCR was performed on AGAP005195 cDNA amplified exonic band after which TA cloning was performed to characterize the different variants associated with this gene and finally western blot analysis.

Results: The domains identified in this study include those of plugin (Histidine Kinase A) and AGAP005195 (Response Regulator). Both TLSPs, AGAP005195 proteins showed specificity to the plug with observed secretion only in post-mated females. Three and two AGAP005195 variants were observed in the atria and spermatheca respectively and of these variants only one in the atria demonstrated a protein identity. This study showed that AGAP005195 and Plugin interact in a specific manner to drive post-mating reactions in the female.

Conclusion: Functional and genetic analyses characterized TLSP variants in *An.gambiae* and provide basis for exploiting the interactions for potential interventions in vector control.

Biography

Ernest Tambo is an Associate Professor and Research fellow at the Centre for Sustainable Malaria Control, Faculty of Natural and Agricultural Sciences, University of Pretoria, South Africa. He also currently serves as Adjunct fellow at National Institute of Parasitic Diseases, WHO Collaborating Centre on Malaria, Schistosomiasis and Filariasis. During 2005 and 2006, he was a Visiting scholar at WHO/TDR, Geneva and ICGEB, Delhi, India respectively and participated in several international and local funders projects. He received a BSc (Hons) in Human Physiology from the University of Ibadan in 1999, and an MSc in Pharmacology and Therapeutics from the same University in 2004. He received his PhD in molecular Pharmacology in 2008. Prior to his current position, he held a position of China- Africa research fellow at National Institute of Parasitic Diseases, WHO Collaborating Centre on Malaria, Schistosomiasis and Filariasis, Shanghai, PR China. In recognition of his research accomplishments, recently won the S&T equipment Gran from Ministry of Science and technology, PR China (Award: Y150,000,00).

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