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Bacterial challenge in the control measures of mosquito-borne diseases: The battle against mosquito vectors

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Malaria kills several million annually worldwide and is transmitted by anopheles mosquitoes. The recently evolved problem in the human battle against malaria is the pesticide resistance of the vector and the rapid spread of multiple anti-malarial drug-resistance of malaria parasite. Great efforts are currently being done to utilize the vector immune system (refractoriness) in this battle. This strategy is being seriously tested regardless of the concomitant reproductive cost, the price of immune induction that must be paid by the vector. This, in fact may reduce the importance of this immune-based control strategy in the battle against such mosquito-borne diseases. In spite of the research emphasis on the use of transgenic pathogen-refractory mosquitoes, insecticides are still the main method for controlling mosquito vectors, although being environmental pollutants and facing vector resistance that now threatening the effective life of these chemical compounds. Thus, recent studies have refocused interest on mosquitocidal bacteria as useful eco-friendly alternatives to conventional insecticides, suggesting them as bio-control candidates in the human battle against mosquito-borne diseases. Yet, *Bacillus thuringiensis* (*Bt*) faced no resistance from insect host due to both the interactions among its multiple toxins and their respective receptors in mosquito midgut and it is likely that these multiple intermolecular interactions are the major reasons for the absence of passive resistance to *Bt* in mosquitoes. This talk will discuss these scenarios in terms of the costs of vector immune-control strategy, *Bt* mosquitocidal mechanisms and new *Bt* isolates with enhanced mosquitocidal toxicity.

Biography

Ashraf M Ahmed has completed his PhD from Keele University, UK, in 2002 and has ongoing Research Fellowship at Keele from 2004 until now and Fellow of the Royal Society, UK, in 2004. He is a Professor of Medical Entomology at Zoology Department at El-Minia University, Egypt, (currently at King Saud University, Saudi Arabia). His current research interest is "mosquito immunity and biocontrol", aiming at utilizing the immune response of mosquito vectors against mosquito-borne disease agents and biological agents in the biocontrol measures against mosquito vectors. He has successfully achieved several grants for research projects and got two currently ongoing granted projects (1.6 million Saudi Riyals each). One grant is for isolating native mosquito *Bacillus thuringiensis* bacteria with enhanced larvicidal activities for use in the battle against mosquito vectors in Saudi Arabia. The other grant is for isolating immune peptides from honey-bees for use as natural antibiotic against the American Foal Broad disease (AFB) that threatens the global Apiary industry. He had successfully monitored undergraduate, postgraduate students and research scholars. His academic output consists of more than 26 papers in reputed journals, membership of several scientific societies, attended several local, national & international conferences and invited for main talks in many international conferences.

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