

## **Characterization of hemocyte classes in two vector mosquito species**

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The insect immune system consists of both cellular and humoral elements that innately recognize broad classes of foreign intruders. While considerable progress has been made over the last several years in identifying humoral factors like antimicrobial peptides and the signaling pathways that regulate their synthesis, much less is known about control of cellular defense responses. This is due in large part to the small size of many insects which makes collection of hemocytes and identification of hemocyte-produced effector molecules difficult. It is also often difficult to conduct manipulative experiments on hemocyte-mediated defense responses in vivo or to isolate defined populations of hemocytes for use in experiments in vitro. This is particularly true for vector arthropods like mosquitoes where little information exists on the origins, differentiation or functions of different hemocyte types. Mosquito hemocytes are classified primarily on the basis of morphology with only limited data relating these morphological characters to functional features. In the case of critically important vectors, like *Anopheles gambiae*, little is known about hemocyte ontogeny and differentiation in any life stage. Here, we describe early progress in developing a suite of morphological, molecular, and functional markers for classification and identification of hemocyte types in the mosquitoes *Anopheles gambiae* and *Aedes aegypti*. Our results indicate that both mosquito species produce multiple classes of circulating hemocytes with certain cell types sharing properties with previously established hemocyte-like cell lines. Studies also suggest mosquito primary immune cells are amenable to analysis by flow cytometry which will greatly facilitate future functional studies.