KANSAS STATE UNIVERSITY

Division of Biology Presents:

Harnessing Natural Product Chemistry for Next-Generation Mosquito-Borne Disease Prevention

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Mosquito-borne diseases represent a persistent global public health crisis, with malaria alone causing substantial morbidity and mortality despite the availability of current interventions. Contemporary vector control relies heavily on insecticidal chemistries to suppress mosquito populations and interrupt pathogen transmission. However, the rapid emergence and spread of insecticide resistance have severely undermined their efficacy, leading to increasing control failures. Current malaria vaccines provide only partial protection, reinforcing the urgent need for innovative tools to reduce community-level transmission. Mosquito attraction to volatile nectar cues governs their sugar-foraging ecology and represents a critical behavioral vulnerability. Attractive Targeted Sugar Bait (ATSB) technologies exploit this innate sugar-seeking drive, using floral attractants to lure and lethally target mosquitoes, offering a resistance-agnostic enhancement to integrated vector management frameworks. This presentation describes efforts to develop, validate, and operationalize a next-generation ATSB platform for control of malaria vectors. In addition to its role as a population suppression tool, the modular ATSB system also serves as a flexible delivery platform for novel mosquito-active chemistries and as a passive surveillance device capable of capturing data on vector feeding activity, population density, and pathogen presence. Building on insights from prior ATSB products, our work advances a membrane-covered, sugar-baited station through iterative laboratory optimization and small- to mid-scale field trials, aiming for a “design-freeze” prototype that delivers robust entomological and epidemiological performance under operational conditions in high-burden transmission settings.

If you would like to visit with Dr. Troy Anderson, please contact Dr. Kristin Michel at kmichel@ksu.edu.

Coffee & snacks served preceding the seminar in Ackert Hall, Room 225