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Our research for over two and half decades has focused on important human and animal tick- and mosquito-borne infectious diseases. We currently work on tick-borne diseases caused by Ehrlichia and Anaplasma species pathogens. Our studies involve assessing pathogen molecular structure, host responses, the effect of tick and host cell environments on the pathogens' adaptation, mutagenesis, vaccine development, and developing molecular diagnostic tests for various vector-borne pathogens and disease surveillance. Over the years, we have worked on several animal and human vector-borne pathogens, including the mosquito-borne human malaria parasite, Plasmodium falciparum; tick-borne bovine babesiosis parasites, Babesia bigemina and Babesia bovis; snail-borne liver fluke of sheep, Fasiola hepatica; mosquito-borne canine heartworm, Dirofilaria immitis; tick-borne rickettsial pathogens of the generaEhrlichia (E. ruminantium, E. canis and E. chaffeensis) and Anaplasma (A. marginale and A. phagocytophilum), and mosquito-borne West Nile Virus. Our recent research also focuses on Rickettsia and Borrelia species.