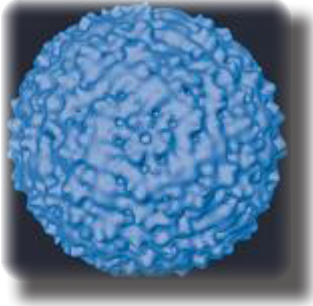


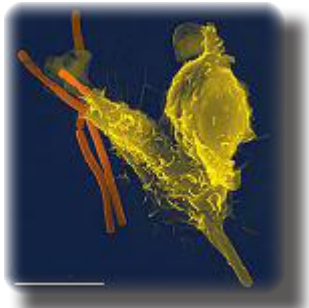
Avian Immunity: Resilience in the Face of Emerging Zoonoses and Climate Change



- **The Challenge:** In this era of predicted global climate change, when changes occur in disease prevalence and transmission, it is practical to understand which wildlife species are most resistant to disease and most resilient when challenged. Emerging infectious diseases like West Nile virus are serious public health concerns, and avian species are valuable indicators both of the presence of new diseases and differences in disease resistance.



- **The Science:** We identified the New World cowbirds as a useful model group and discovered that they have unusually strong resistance to West Nile virus and other encephalitis viruses. Cowbirds are obligate brood parasites that lay their eggs in other birds' nests, never building their own nests, but exploiting other avian species in a wide variety of habitats. Recently we found evidence at the cellular level that cowbirds show more effective innate immune defenses compared to related avian species. Now we are examining other elements of the cowbird's immune system to see which are most adaptable and how they are modified.



- **The Future:** Wild species serving as model animal systems are increasingly of interest in biomedical research. The New World cowbirds offer an interesting system in which to explore how evolution shapes the design and function of immune responses. Ecologically and behaviorally, cowbirds face heightened exposure to parasites and pathogens, which makes them candidates for strong immunity. This project is a collaboration between USDA, FWS, The Nature Conservancy and several academic partners.