West Nile Virus reproduction secrets decoded at Georgia State
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Scientists at Georgia State University studying the West Nile Virus say they have found promising leads that may one day help stop the deadly virus. Georgia State biologist Margo Brinton reports in the May 22 issue of the journal Proceedings of the National Academy of Sciences that her lab has confirmed key interactions between the virus and cell proteins that shed light on how the virus reproduces so prolifically in infected cells. Brinton said the findings will help biologists better understand both the virus and the cells it uses to reproduce. "This suggests to us that there might be a common competitor molecule that can be developed that could block not only West Nile virus, but also related viruses such as dengue, inside an infected cell," Brinton said. "If we can do that, we can help cells defeat the virus and eradicate an infection." Working under a five-year National Institutes of Health grant, research assistant Mohamed Emara in Brinton's lab used baby hamster kidney cells to verify that West Nile binds to two types of common cell proteins, TIA-1 and TIAR. These proteins normally would trigger self-defense measures within cells to ward off invaders. West Nile, however, essentially hijacks these proteins so that it can turn cells into virus-making factories. Development of a vaccine, Brinton says, is still years away. The Georgia State findings, however, suggest at least one promising avenue scientists can exploit to cut off cell resources West Nile uses once it starts an infection. "It's a step toward developing an effective antiviral," Brinton says, describing her recently published work. "You can't have new discoveries without these kinds of steps." Brinton is one of the world's foremost researchers studying the West Nile Virus. She has been studying West Nile for nearly 40 years. Her lab has 13 faculty, staff and student members and attracts nearly $1 million each year in NIH funding. West Nile Virus infects mainly birds but is known to also infect humans, horses, pets and some rodents. The virus is carried by many common mosquitoes. West Nile can cause encephalitis and even death. West Nile first appeared in the United States in 1999 after an initial outbreak in New York City. The virus has since infected more than 4,200 people and 1,100 animals in all 50 states as well as in Canada, Central and South America. There were 177 human deaths in 2006, according to the U.S. Centers for Disease Control and Prevention.