Public Lecture by Dr. Elaine A. Muchmore
"New Insight on Human Cancer and Viral Disorders from Studies of Chimpanzees"
July 17, 2002 at 6:00 p.m. in the Garren Auditorium, Basic Science Building
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Chimpanzees (Pan troglodytes) and humans share between 98-99% of their genetic sequences. Besides obvious differences in morphology and cognitive abilities between humans and chimpanzees, there are a number of these traits that are of medical interest, including the fact that they appear to be less susceptible to AIDS, malaria, hepatitis B, Alzheimer's disease and cancer. This paper will focus on the conditions about which there has been the most research work, viral infections and cancer, and describe the medical course in the chimpanzee as well as the role chimpanzees have played in contributing to our current knowledge. We will discuss the single major biochemical defect between humans and chimps described, a loss of function of CMP-Neu5Ac hydroxylase, which results in an over-production of one particular sialic acid, a carbohydrate, in humans compared to chimpanzees, and two genetic differences, both of which result in loss of function in the human. One of these is the gene corresponding to the CMP-Neu5Ac hydroxylase, one is a sialic acid binding substance thought to be active in immune function. We will speculate on how these genetic differences may contribute to differences in immunological surveillance between humans and members of the Pan genus.