Enzymes as Antivirals

Jernigan, Rebecca

Virus; like smallpox, HIV, and H1N1; have cause millions of deaths, impacted lifestyles, and caused public scares. The best method of attack for a virus is to prevent it from ever happening, usually through a vaccine. Once caught, treatment is difficult, but that doesn't mean that those who've caught it should be abandon. A simple method could be used to solve this problem. A viruses: must infect host cells to replicate, are made of proteins, and enzymes cut (or cleave) proteins. Therefore, an enzyme-antiviral could be made to cut off the protein structures the virus uses to attach to the cell. This would stop the virus from entering or infecting the cell. One subject of study is the T4 bacteriophage virus. Not only is the virus structurally complex, but it is also safe to work with as it infects the E. Coli bacterium. For this virus, the gene product 9 (gp9) protein is a protein structure that enables the virus to attach to the host cell. If an enzyme can cut the protein apart, then the virus would not be able to attach. The capA protein is structurally similar to the gene product 9 protein. The capA protein is from the F. Tularnesis bacterium (also a class A, dangerous pathogen), but acts as a sister study protein. Both the gp9 and capA protein were predicted to be cleaved the enzyme Proteinase K. The capA protein was successfully cleaved in this project which indicates that the gp9 protein is likely to be cleaved as well. This supports the idea that an enzyme could be used as an antiviral on a molecular level.