Bavituximab: A New Strategy for Fighting Viruses

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Bavituximab is a new type of antiviral drug that could work against a number of different types of viral infections—possibly even against HIV itself. According to a study published in the November 23 issue of *Nature Medicine* and reported by *Science Daily*, Bavituximab has shown promise in animal studies against Pichinde virus and cytomegalovirus (CMV).

Most antiviral drugs are designed to work specifically on proteins directly associated with a virus. This means that if the virus's proteins evolve to resist the drug's effect, the drug no longer works as well. Bavituximab represents a different approach to treating viral infections: It helps the body recognize that a cell has become infected with a virus, allowing the immune system to target and destroy the infected cell. Specifically, the drug binds to a cellular fat molecule called phosphatidylserine. The fact that it attaches to a cellular molecule rather than a viral molecule suggests that viruses won't develop resistance to Bavituximab.

When a human cell is infected with certain viruses, phosphatidylserine molecules move from their original position inside the cell to a new position on the cell's outer surface. Philip Thorpe, MD, from the University of Texas Southwestern Medical Center in Dallas, developed Bavituximab to bind to phosphatidylserine on that outer surface, thus flagging the cells for elimination. To determine the drug's effectiveness against viruses, Dr. Thorpe and his colleagues Melina Soares, MD, and Steven King, MD, treated guinea pigs infected with Pichinde virus, which causes the fatal disease called Lassa fever. Bavituximab successfully treated the infection and protected the guinea pigs from death. Thorpe's team next treated and cured mice infected with CMV, a disease that can cause blindness, pneumonia and other illnesses in people with very low CD4 cells.

Bavituximab is currently being studied in people with hepatitis C virus (HCV), and early results suggest that it is able to reduce blood levels of the virus. HIV is another virus that causes phosphatidylserine to flip to the outside of infected cells, so it, too, may be vulnerable to treatment with Bavituximab.