A team of US Researchers have edged closer to developing a vaccine to guard against HIV infection, by targeting a vulnerable piece of the virus

Washington: A team of US researchers have edged closer to developing a vaccine to guard against human immunodeficiency virus (HIV) infection, by targeting a vulnerable piece of the virus.

While most vaccines are actually made from the pathogen itself, employing weakened or inactivated organisms to stimulate antibody production, HIV is just too dangerous to use as the basis for a vaccine vehicle.

The researchers, Gail Ferstandig Arnold and Eddy Arnold, husband and wife duo and their team at Rutgers University have now been able to use the relatively innocuous cold-causing rhinovirus and attach the target portion of the HIV, reports IANS.

Arnolds and their team had previously been able to elicit effective antibodies, but only against a very limited number of HIV types.

This must be done in a way that maintains the HIV part's shape so that when the immune system sees it, it will actually mount an immune response as it would to the real HIV.

The approach taken by the Arnolds and colleagues has been to identify a part of the acquired immune deficiency syndrome (AIDS)–causing virus that is crucial to its viability–something the virus needs in order to complete its life cycle and then target this Achilles' heel.

"The part that we targeted plays a role in the ability of HIV to enter cells, and is common to most HIV varieties," Arnold said. That is a mechanism that would not be easy for the virus to reinvent on the fly, so it turns out to be a really helpful target, he added.

With HIV's known propensity to mutate, antibodies developed against one local strain may not recognise and combat mutant varieties elsewhere.

These geographic varieties with different mutations constitute one of the great challenges to finding a broad spectrum vaccine capable of protecting against HIV.

"The idea is to trick the immune system into thinking it is acting upon HIV before the virus shows actually shows up on the scene," Arnold said.

To actually accomplish this is a big problem in engineering. The goal was to take a small piece of the HIV out of its native context, put it in a completely different system (rhinovirus), and have it look the same and act the same.

Using recombinant engineering, the research team developed a method to systematically test millions of varied presentations of the HIV segment with the rhinovirus. They tried millions of different variations on how to graft (or splice) one onto the other, creating what are called combinatorial libraries.

"It's like the lottery… The more tickets you buy the better chance you have of winning," Arnold commented.

Source: iGovernment