

Basic and translational research

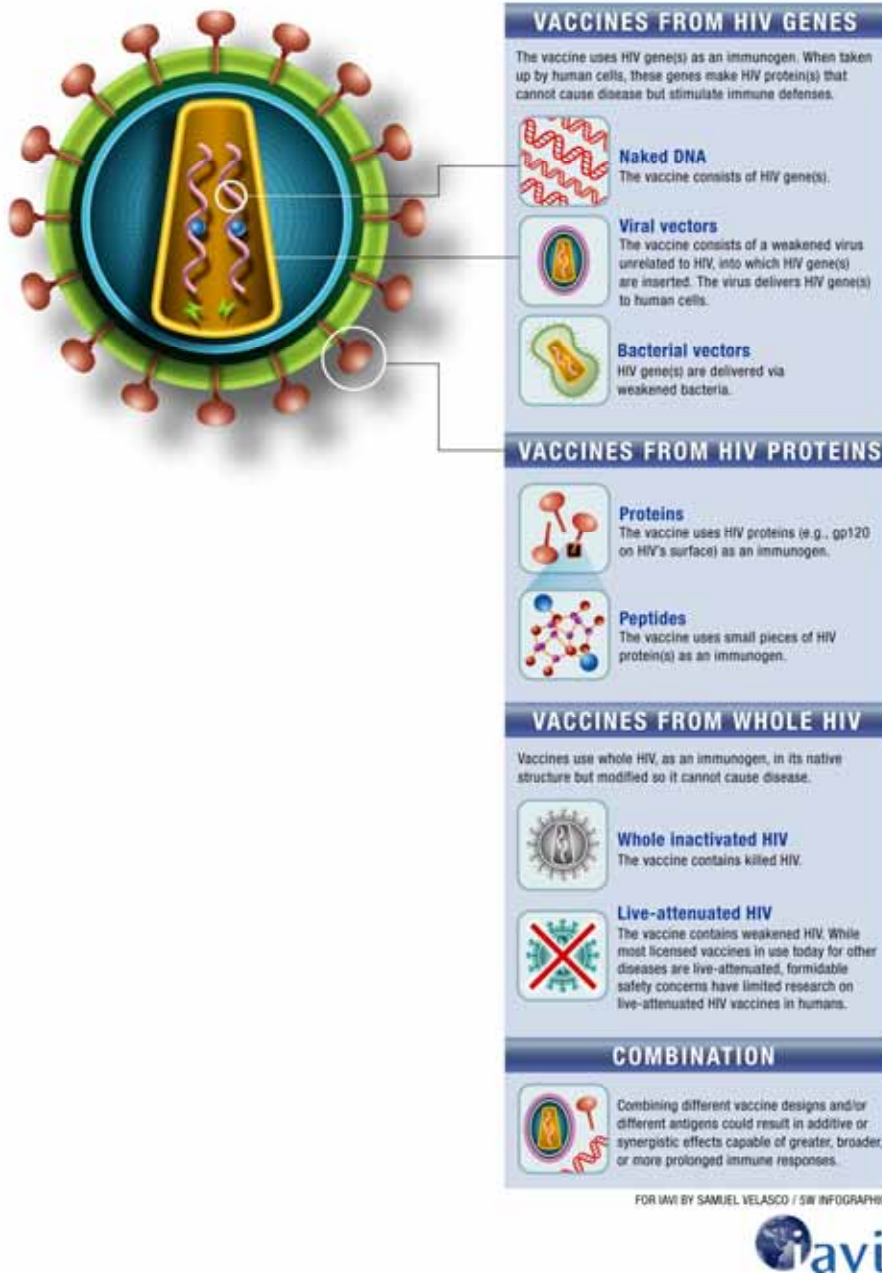
In addition to clinical research (research with human volunteers) there are also scientific efforts ongoing worldwide to solve some of the key scientific challenges in designing safe and effective AIDS vaccines. Research that aims to understand the science of HIV, immune responses and vaccines is called basic research. Research that translates the findings of this research to the development of vaccine candidates that can be tested in clinical trials is called translational research.

Scientists must explore new designs in vaccines because conventional development methods are not appropriate for HIV. Conventional vaccine design uses a so-called 'live-attenuated' or 'whole-killed' virus; this comprises the entire virus, which is weakened or killed so it can not cause infection. Such vaccines have been shown to be very effective in protecting against infection; examples are the polio vaccine, measles vaccine and influenza vaccine. However, in the case of HIV, these traditional vaccines are currently not used given safety concerns.

Scientists are therefore developing novel vaccine concepts, using for example 'recombinant DNA' structures. In these vaccines, only parts of the HIV structure are used: small pieces (proteins or peptides) from the outer shell of HIV, or copies of single HIV genes. These are inserted in carriers, also called 'vectors'. The challenge is to select the right parts of the virus and the right vectors to ensure that the vaccine provides a strong immune response that is able to effectively stop infection once the real virus enters the body.

Scientists today have a better understanding on how HIV infects cells, and what is needed to block infection; this knowledge provides important keys in developing AIDS vaccines. The majority of AIDS vaccine candidates that are currently being tested in clinical trials are all based on the 'recombinant DNA' approach.

AIDS Vaccine designs



Source: *AIDS Vaccine Blueprint 2006: Actions to Strengthen Global Research and Development*

