VACCINE STRATEGIES IN THE PIPELINE

Vaccine Component

The actual virus (killed or weakened) cannot be safely made into an HIV vaccine. Instead, scientists use carriers—like other viruses, bacteria and lab-made materials—to transport synthetic parts of HIV into the body and cells. The carrier can influence where the vaccine goes in the body and affect the immune response.

DNA	Liposome	Messenger RNA (mRNA)	Nanoparticles	Gel polymer	Vectors
Genes of HIV antigens are injected into the body, where they are made into proteins to trigger an immune response.	Spherical fat molecule enclosing water that can carry vaccine components into tissues.	Genetic information that specifies amino acid sequence of antigens. Lab-made mRNA is turned into HIV proteins in the body.	Small, multi-component structures arranged into various shapes.	Injectable gels allow for controlled diffusion of vaccine components into the body to promote sustained immune response.	Bacteria or virus that does not cause disease. Used to transport HIV genes into the body. Can be made with ability to self-replicate.

Delivery Mechanism

Scientists are studying the following methods for delivering an HIV vaccine into the body. The way in which a vaccine enters the body can impact the immune response it produces.

Intramuscular (IM)	Intradermal (ID)	Subcutaneous (SC)	Electroporation	Oral	Biojector	Sublingual
Injections delivered into the muscle.	Injections delivered underneath the upper skin layer into dermis. Can generate strong immune response because of immune cells in dermis.	Injections delivered underneath the middle skin layer (dermis) into fat. More convenient and less costly to administer.	Uses an electric field to increase the permeability of cells so vaccine can enter them more readily.	Could prompt strong responses at mucosal tissues, i.e., moist tissues lining body's openings.	Needle-free injection system to reduce pain and reactivity and increase the tissue distribution of vaccine materials.	Delivered underneath the tongue to improve systemic and mucosal immune response.

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