HVAD 2021

The Basics and Status Update

#HIVvaccineAware #HVAD2021
HIV Vaccine Awareness Day
May 2021
Vaccines Work

Vaccines are one of the most powerful public health tools available.

- Smallpox has been eradicated because of vaccines.
- Diseases such as polio and measles have become exceedingly rare because of vaccines.
- Vaccines will be essential to ending the COVID-19 pandemic, and ending the global health challenge of HIV.
Vaccine Development in History

**Time to Develop a Vaccine:** Duration between discovery of microbiologic cause of selected infectious diseases and development of a vaccine

- **HIV (1989–)**: 32 years (Research ongoing)
- **COVID-19 (2020–2021)**: 1 year
- **Measles (153-163)**: 10 years
- **Hepatitis B (1965–2006)**: 16 years
- **HPV (1984–2006)**: 22 years
- **Rotavirus (1973–2006)**: 33 years
- **Pertussis (1906–1948)**: 42 years
- **Polio (1908–1955)**: 47 years
- **Typhoid (1884–1989)**: 105 years
Why is an HIV Vaccine Needed?

- The use of available prevention and treatment has slowed HIV’s spread, but over a million people continue to get newly infected each year.
- To end the epidemic, a safe and effective HIV vaccine is needed.

Global progress is not on track to meet the target of fewer than 500,000 new HIV infections by 2020.
# Why HIV Vaccine Development is Challenging

<table>
<thead>
<tr>
<th>No roadmap of protection</th>
<th>Viral Variability</th>
<th>Immune-targeting</th>
<th>Transmission</th>
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<td>Nobody has ever eliminated HIV with their own immune system</td>
<td>HIV makes many copies of itself and mutates, making it unrecognizable to the immune system and leading to different subtypes of the virus throughout the world</td>
<td>HIV kills the very immune cells the body uses to defend against disease</td>
<td>Transmission of HIV happens in multiple different ways</td>
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Eliciting HIV Immune Responses

Scientists are exploring many types of HIV vaccines designed to elicit different immune responses

- **T cell-mediated response:** Stimulate branch of immune system (mainly T cells) that recognizes and destroys cells infected with HIV so it cannot multiply and spread

- **Neutralizing antibody response:** Induce antibodies that block HIV in the blood, preventing HIV from infecting the body’s cells

- **Non-neutralizing antibody response:** Induce antibodies that recognize HIV and recruit other immune cells to help destroy the virus

- **Combination responses:** Stimulate multiple parts of the adaptive immune system to recognize and defend the body against HIV
Sustaining HIV Vaccine Research

HIV VACCINE RESEARCH PIPELINE (FEBRUARY 2020)

Scientists are exploring many types of vaccines to try to elicit immune responses that would protect from HIV. These vaccines can be organized, imperfectly, under three buckets: vaccines designed to elicit broadly neutralizing antibodies, non-neutralizing antibodies or T-cell responses. Some vaccines are trying to elicit a combination of these responses. We don’t yet know which of these immune responses will protect against HIV. To learn more about immune responses and the vaccine regimens below, check out: www.avac.org/infographic

https://www.avac.org/infographic/vaccine-pipeline
Current HIV Prevention Trials

Vaginal ring:
- F/TAF (DISCOVER—MSM/TG WOMEN)
- MK-8591/Islatravir (NCT04003103)

Oral PrEP:
- (Daily pill)
- (Monthly pill)

Long-acting injectable:
- Cabotegravir (HPTN 083)
- Cabotegravir (HPTN 084)

Antibody:
- VRC01 (HVTN 704/HPTN 085)
- VRC01 (HVTN 703/HPTN 081)

Preventive HIV vaccine:
- ALVAC (HVTN 702/Uhambo) Immunizations halted for non-efficacy
- Ad26 (HVTN 705/HPX2008/Mmbokodo)

PrEP and vaccine:
- DNA-MVA-env or DNA-env with F/TAF or F/TDF (PREP Vacci)
Vaccine Advocacy in 2021

HIV Vaccine Research: Building on Lessons from COVID

1. Sufficient and diversified research funding
2. Enhanced global coordination and collaboration
3. Support for research innovation and novel trial designs
4. Strengthened political commitment and urgency
5. Placing communities at the center of vaccine research
6. Planning early for success and equitable access
Key Resources

- AVAC: [www.avac.org/vaccines](http://www.avac.org/vaccines)
- Center for HIV/AIDS Vaccine Immunology and Immunogen Discovery (CHAVI-ID)
  - At Duke: [www.chavi-id-duke.org](http://www.chavi-id-duke.org)
  - At Scripps: [www.cavi-id.org](http://www.cavi-id.org)
- Collaboration for AIDS Vaccine Discovery: [www.cavd.org](http://www.cavd.org)
- HIV Px R&D Database (PxRD): [http://www.avac.org/pxrd](http://www.avac.org/pxrd)
Key Resources

- HIV Vaccine Trials Network (HVTN): [www.hvtn.org](http://www.hvtn.org)
- International AIDS Vaccine Initiative (IAVI): [www.iavi.org](http://www.iavi.org)
- NIAID: [www.niaid.nih.gov/topics/hivaid/research/vaccines/Pages/default.aspx](http://www.niaid.nih.gov/topics/hivaid/research/vaccines/Pages/default.aspx)
- PrEPVacc trial: [https://www.prepvacc.org/](https://www.prepvacc.org/)
- Pox-Protein Public-Private Partnership (P5): [www.hivresearch.org/media/pnc/9/media.749.pdf](http://www.hivresearch.org/media/pnc/9/media.749.pdf)
Connect with AVAC

- Questions, comments and requests for materials should be sent to avac@avac.org
- Information about HIV prevention generally at www.avac.org and vaccines specifically at www.avac.org/prevention-option/hiv-vaccine
- For the latest news and updates, sign up for our Advocates’ Network mailing list at www.avac.org/signup or follow us on Facebook at www.facebook.com/hivpxresearch and on Twitter at www.twitter.com/hivpxresearch