Understanding the Immune System

Together, we can change the course of the HIV epidemic...one woman at a time.

#onewomanatatime  #thewellproject  www.thewellproject.org
Understanding the Immune System

*Your immune system is your body's defense system*

- Made up of **cells and organs** that protect your body from outside invaders that can cause infection and disease
- Gets rid of abnormal pre-cancerous cells, and cancerous cells that are growing out of control
- When it’s working, it fights off infection and keeps you healthy
- When it isn’t, germs and other abnormal cells in the body can more easily cause disease

[www.thewellproject.org](http://www.thewellproject.org)
**Skin:**
- Single largest organ of the body
- First line of defense against germs – provides a physical barrier that keeps bacteria and viruses from entering the body

**Bone Marrow:**
- Makes white blood cells that go on to protect the body from invaders and possibly dangerous abnormal cells
- From the bone marrow, white blood cells travel to lymph organs
Key Organs of the Immune System

**Lymph Organs:**

- **Lymph Nodes**
  - Located in the neck, armpits, abdomen, and groin
  - Contain cells ready to fight invaders
- **Spleen**
  - About the size of a fist; located at the upper left of the abdomen
  - Filters blood; identifies and gets rid of worn-out white blood cells
**Other Lymph Organs:**

- Peyer's patches
  - Clumps of tissue in the small intestine
- Thymus
- Appendix
- Tonsils and adenoids

Credit: AIDS.gov
Key immune system cells include:

- Neutrophils
- Dendritic cells and macrophages
- Helper and killer T cells
- Natural killer cells
- B cells
HIV and the Immune System

Your immune system recognizes and produces antibodies to HIV, but **antibodies alone are not enough to eliminate HIV**

- HIV changes (mutates) faster than the immune system can respond
- The HIV antibodies your body creates do not protect you against HIV
HIV and the Immune System

HIV turns CD4 T cells that would kill it into **factories for making more copies of itself**

- CD4 cells then can’t communicate with the rest of the immune system
- Without CD4 cells organizing the immune system to respond, immune cells don’t know which invaders to remove from the body
  - Opportunistic infections (OIs) and cancers usually don’t harm people with healthy immune systems
HIV Reservoirs

- Collections of inactive, “resting,” or latent HIV-infected cells
- Known reservoirs include immune cells in gut, lymphoid tissue, blood, brain, genital tract, bone marrow
- Completely eliminating HIV from the body will require emptying the reservoirs/preventing latent cells from multiplying

**Early treatment with a combination of HIV drugs can minimize the size of the reservoir**
HIV and the Immune System

• Newer HIV drugs are more effective at stopping HIV from multiplying and infecting more CD4 cells.

• Since CD4 cells are key to healthy immune response, this can give your immune system a fighting chance to replenish its supply of CD4 cells and to defend itself (you!) against OIs.
• To learn more about this topic, please read the full fact sheet on this topic:
  – Fact sheet: Understanding the Immune System
• For more fact sheets and to connect to our community of women living with HIV, visit:
  – www.thewellproject.org
  – www.facebook.com/thewellproject
  – www.twitter.com/thewellproject