



# 1<sup>st</sup> Human Immunodeficiency Virus 3D

PLACE: Ivan Konstantinov · Yury Stefanov · Aleksander Kovalevsky · Yegor Voronin Visual Science Company

At first glance, it could pass for a piece of crochet, a fluffy gray and orange ball. But its real-world counterpart is far more destructive: It claims an estimated 2 million lives a year and has wreaked more global havoc than some wars.

Ivan Konstantinov's winning illustration reduces HIV to unnerving simplicity. His team at the Visual Science Company in Moscow spent months combing through the latest research, compiling data from more than 100 papers and assembling the information into a coherent image of a 100-nanometer HIV particle. They depicted the proteins in just two basic colors: Gray equals host, orange equals virus.

HIV breaks into immune cells and hijacks their genes. The orange proteins on the outside bind to the immune cell, letting the viral core slip inside. Once in, it fuses with the cell

membrane (gray shell), turns its viral RNA into DNA, and integrates into the cell nucleus. The host cell then starts making viral proteins, turning into a virus factory.

The restrained, two-color system worked for the judges. "It uses material from the host to sort of wrap itself in this membrane," says panel of judges member Corinne Sandone. "That point is brought home much clearer than another example of that same model that might be coded with eight to 10 different colors."

In addition to the stark color scheme, the image of the particle split open to reveal its viral core itself deeply shook the panel, says panel of judges member Tom Wagner: "You have this gaping mouth that almost looks like it's ready to eat you the way AIDS is eating away at society."



## HONORABLE MENTION (3-way tie)

### AraNet: A Genome-wide Gene Function Association Network for *Arabidopsis thaliana*

Insuk Lee · Michael Ahn  
Edward Marcotte · Seung Yon Rhee  
Carnegie Institution for Science

Picture DNA on Facebook. The image to the right is a map of links between the genes of the mustard plant *Arabidopsis thaliana*. Genes involved in the same biological process are connected by lines: red for more certain links, blue for less certain links. "It's not unlike a social network," says biologist Seung Yon Rhee.

### Enterobacteria Phage T4

Jonathan Heras  
Equinox Graphics Ltd.

One judge compared this illustration of a virus attacking an *Escherichia coli* bacterium to something out of a 1950s science-fiction film. That's not too far from the creator's view, either. Before creating it, chemical engineer Jonathan Heras says he knew almost nothing about viruses. When he first saw a depiction of one in a textbook, he admits not believing it, until he looked at microscopic images: "It really did have these spindly legs and this really alien, weird appearance."

### Proposed Structure of Yeast Mitotic Spindle

The Mitotic Spindle Group\*  
University of North Carolina, Chapel Hill

This is a depiction of a yeast cell about to divide, a stage biologists call metaphase. Green microtubules prepare to pull apart 16 pairs of chromosomes (yellow) in a process scientists still don't fully understand. It's the product of 2 years of collaboration among biologists, physicists, computer scientists, and artists, but it's still a work in progress. "This is our version 20 of probably 50 we're going to end up doing," says computer scientist Russell Taylor.

\*[www.cisimm.org/research-collaborations/cell-mechanics-cluster/mitotic-spindle](http://www.cisimm.org/research-collaborations/cell-mechanics-cluster/mitotic-spindle)

