# Build a Paper Model of HIV Capsid

Viruses come in many shapes and sizes, from simple protein shells filled with RNA or DNA to membrane-enveloped particles that rival cells in complexity. HIV (shown on the right) is one of these complex viruses, surrounded by a membrane and filled with a diverse collection of viral and cellular molecules.
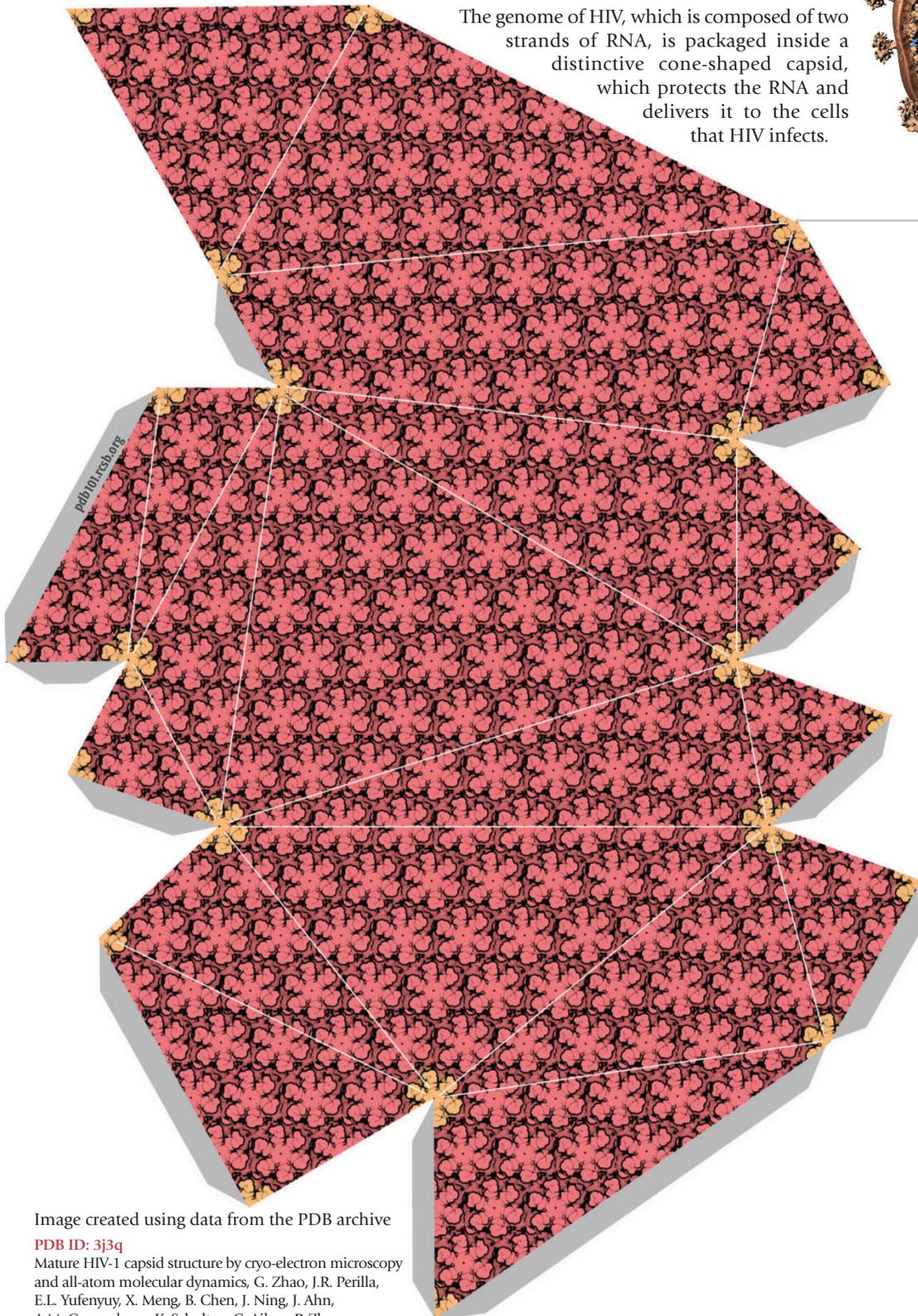
The genome of HIV, which is composed of two strands of RNA, is packaged inside a distinctive cone-shaped capsid, which protects the RNA and delivers it to the cells that HIV infects.
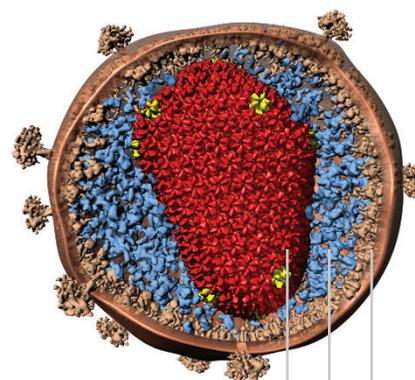
capsid

viral enzymes and accessory proteins

structural proteins and membrane

To build an HIV capsid at 1,000,000x magnification, **cut out** the model, **fold** along the white lines, and **tape** or glue the gray flaps. Add two pieces of string inside, each 3.3 meters long, to model the RNA strands.

For an extra challenge, try assembling the model **without creasing on the lines** to build a rounder model that is more similar to the actual capsid.

Go to **pdb101.rcsb.org** to:
- read the *Molecule of the Month* feature on HIV Capsid
- **download** additional copies of this model, and **watch a video demonstration** of how to build it (*Learn > Paper Models*)

Image created using data from the PDB archive

PDB ID: 3j3q

Mature HIV-1 capsid structure by cryo-electron microscopy and all-atom molecular dynamics, G. Zhao, J.R. Perilla, E.L. Yufenyuy, X. Meng, B. Chen, J. Ning, J. Ahn, A.M. Gronenborn, K. Schulten, C. Aiken, P. Zhang (2013) *Nature* **497**: 643–646