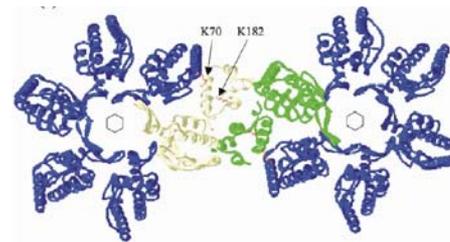


# Maturation of the HIV Virus measured using Ion Cyclotron Resonance at the NHMFL

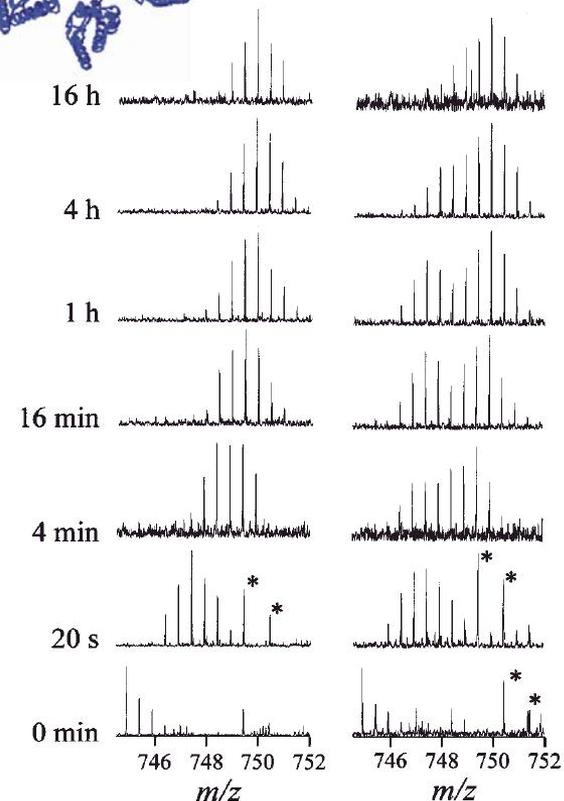


Ion Cyclotron Resonance (ICR) at the [National High Magnetic Field Laboratory](#) (NHMFL) offers a uniquely precise measurement of molecular masses, from which biological structures and processes can be deduced. An ongoing collaborative study of the AIDS virus at the NHMFL showed that the accumulation of a critical protein in the AIDS virus occurs much more gradually than originally had been thought. This critical protein (a soluble protein called “CA”) helps encapsulate and protect the RNA in the AIDS virus. In earlier work published in 2003 in the *Journal of Molecular Biology*, this same group showed how the CA protein self-assembles to form hexagonal structures that join together to form the "capsid" that surrounds and protects the RNA in the AIDS virus. That work found a previously-unknown interaction between structural protein subunits that reconciled previously conflicting biophysical and genetic data. By researching the structure and function of key components that make up the AIDS virus, the NHMFL and its collaborators are contributing to the knowledge base that will eventually lead to the control or cure of this terrible disease.

**Lanman, et al, *Nature Structural Molecular Biology*, 11 (July 2004), 676-677**



Self-assembled hexamer structure formed by CA tubes. [Schematic from *Journal of Molecular Biology* 325, 759-772 (2003)]



Time evolution of mass spectra from CA protein residues in immature (left) and mature (right) virus-like particles measured by ion cyclotron resonance.