

RNA control of HIV-1 size polydispersity

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Abstract:

Recent progresses in the characterization of physical properties of viruses allow for the first time to considering the investigation of distinct virus cycle events for complex viruses at the single particle level. Using an original combination of biological experiments, physical experiments, and theoretical modelization, we study the assembly and the disassembly of HIV-1 at the single virus level. The strategy of the physical approach is essentially twofold : (i) to use Atomic Force Microscopy (AFM) as a physical tool in order to both image at high resolution and exert mechanical constraints on viral-like particles, and (ii) to use statistical physics modelization in order to address the compatibility of various molecular scenarii with experimental measurements. This will be illustrated explicitly by recent results obtained in our group on the assembly of retroviruses.