
Data collection and processing

	Docking	Half-domed	Three-Quartered	Tethered	Released
Magnification	39,000	39,000	39,000	39,000	53,000
Voltage (kV)	200	200	200	200	300
Electron exposure (e ⁻ /Å ²)	90	90	90	90	120
Defocus range (μm)	-3 to -5.5	-3 to -5.5	-3 to -5.5	-3 to -5.5	-2 to -4
Pixel size (Å)	3.54	3.54	3.54	3.54	2.72
Symmetry imposed	C5	C5	C5	C5	lcos
Particle images	197	322	172	364	567
Map resolution @0.143 FSC (Å)	43.7	23.5	19.4	13.3	8.3

Table S1. Cryo-ET data analysis and subtomogram averaging statistics.

Helical tube environment	N	Avg. Diameter (nm)
Thin extension, neighboring budding particles with NCs	10	55.3 +/- 8.5
Thin extension, spike array, no neighboring NCs	12	65.4 +/- 4.0
Base of budding intermediate particle with NC	2	58.7 +/- 1.6

Note: diameter of virion approx. 70nm

Table S2. Average diameters of helical tubes formed by hexagonal spike arrays in different cellular contexts.