

Description of Additional Supplementary Files

File Name: Supplementary Movie 1

Description: Cryo-ET of MeV-infected HeLa cells at the assembly site. A MeV assembly site from the frozen-hydrated Edm MeV-infected HeLa cell demonstrates the viral structural organization in the context of whole-cell tomography.

File Name: Supplementary Movie 2

Description: Cryo-ET of MeV-infected MRC-5 cells at the assembly site. A MeV assembly site from the frozen-hydrated Edm MeV-infected MRC-5 cell demonstrates the viral structural organization in the context of whole-cell tomography. Scale bar is 200 nm.

File Name: Supplementary Movie 3

Description: Cryo-ET of a released MeV particle from MeV-infected cells. A released MeV particle from Edm MeV-infected HeLa cells demonstrates the viral structural organization. Note the M lattice and RNP are in register inside the native MeV particle.

File Name: Supplementary Movie 4

Description: Cryo-ET of MeV-infected cells at the assembly site. A MeV assembly site from the frozen-hydrated recMeV-(H-118741x) infected HeLa cell demonstrates the viral structural organization in the context of whole-cell tomography. Note the F lattice on the surface of the native MeV particle.

File Name: Supplementary Movie 5

Description: Subvolume average of recMeV-(H-118741x) F-M lattice.

Tomographic slices going from the bottom to the top (round trip) of the averaged recMeV-(H-118741x) F-M overlaid lattice structure. Black is density in the tomographic slices. In the segmentation view, blue is F and cyan is M. Scale bar is 10 nm.

File Name: Supplementary Movie 6

Description: Subvolume average of Edm F-M lattice. Tomographic slices going from the bottom to the top of the averaged Edm F-M overlaid lattice structure. Black is density. Scale bar is 10 nm.

File Name: Supplementary Movie 7

Description: Model of MeV structural proteins organization. Segmentation of the F-M lattice in conjunction with the RNP complex demonstrating the 3 layers of structural protein organization.

File Name: Supplementary Movie 8

Description: Clonemodel view of RNP classes within a tomogram. The subvolumes extracted from the tomogram were placed back into the original volume. The color scheme is the same as **Figure 5**. Scale bar is 100 nm.

File Name: Supplementary Movie 9

Description: RNP length quantification of a released MeV particle. Tomographic slices going from the bottom to the top (round trip) of a released MeV particle from MeV-infected cells. The color scheme is the same as **Supplementary Figure 10**. The blue lines are M-coated RNP while the pink lines are uncoated RNP. Scale bar is 200 nm.

File Name: Supplementary Movie 10

Description: RNP length quantification of a released MeV particle. Tomographic slices going from the bottom to the top (round trip) of a released MeV particle from MeV-infected cells. The color scheme is the same as **Supplementary Figure 10**. The pink lines indicate the presence of the uncoated RNP. Scale bar is 200 nm.