In Situ **Assembly and Membrane Fusion of Enveloped Viruses**

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We combine cryo-ET, cryo-EM, and mass-spectrometry for in situ structural characterization of emerging enveloped viruses, such as SARS-CoV-2 and influenza. The structure, landscape and site-specific glycan compositions of spike proteins were studied. We also captured snapshots of virus fusion in action, from which intermediate steps of spike-mediated membrane fusion were interpreted. We further explored how enveloped viruses prepare their spike proteins to mediate membrane fusion. The in situ observation and structural analysis have provided novel insights into the enveloped viral assembly and membrane fusion mechanism. Together, these findings have provided structural references of the antigens in situ, which helped with the development of novel vaccines.

References:

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