

Conformational Landscape of a Virus from Single-Particle X-ray Scattering

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Using a manifold-based analysis of experimental diffraction snapshots from an X-ray free electron laser, we determine the three-dimensional structure and conformational landscape of the PR772 virus to a detector-limited resolution of 9 nm. Our results indicate that a single conformational coordinate controls reorganization of the genome, growth of a tubular structure from a portal vertex and release of the genome. These results demonstrate that single-particle X-ray scattering has the potential to shed light on key biological processes.