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How to care for your influenza filaments

Content

Clinical isolates of influenza virus exhibit a range of morphologies, from spheres with diameters of 120 nm to filaments with lengths sometimes exceeding 30,000 nm. Despite decades of laboratory studies, the functional properties of filaments are still unclear.
Early studies of filaments suggested that they could be damaged by common laboratory manipulations, potentially skewing the results of research into their properties. Assessing the impact of this damage requires analysing large numbers of filaments, but this has previously only been achievable with laborious manual counting of electron micrographs.
To improve on manual particle counting, we applied a confocal microscopy based approach that allowed us to rapidly count and measure the lengths of large numbers of filaments. We used this platform to determine whether common laboratory manipulations, including physical stressors like pipetting and chemical stressors like pH changes, could affect the number of filaments or the distributions of their lengths.
We found that most common laboratory manipulations do not noticeably affect filament populations and so are suitable for studying filamentous influenza virus. However, we found that freezing causes structural damage to filaments, an effect most apparent when freezing dilute samples. This demonstrates that confocal methods can be used to assess the basic biophysical properties of filaments. As virus samples are routinely frozen before use, we suggest caution be exercised when interpreting past studies of the properties of filamentous influenza, and use unfrozen virus preparations in future.

Choose primary session

Visualising Flu

Choose secondary Session

Viral Replication

Contribution Type : Paper presentation