

## **Structural Properties of *Barley Stripe Mosaic Virus* Virions**

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Rod-like Barley stripe mosaic virus (BSMV) was structurally neglected for more than thirty years after the basic properties of their virions were determined. In the present work, both virions and coat protein (CP) structure were investigated using a number of physicochemical methods including intrinsic fluorescence, circular dichroism and Raman spectra measurements and differential scanning calorimetry. It has been found that intravirus CP contains a significant proportion of beta-structure elements in contrast to subunits of free CP. To explain this puzzling feature, a comparative sequences analysis of the helical plant viruses CPs was performed. On the basis of the results, the structure of CP incorporated into BSMV virions was constructed using homology modeling. Obtained results suggest that additional beta-structures are formed during virion assembly and provide intersubunit interactions between regions exposed on the virion outer surface.

Against the expectations based on the similarity of BSMV and Tobacco mosaic virus (TMV) rod-like morphology, BSMV virions were found to be considerably more labile than TMV virions. Moreover, the structural properties of BSMV virions were shown to be intermediate between those of TMV and flexuous filamentous plant viruses.

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