

Poster Presentation

MS091.P02

Structural studies on banana bunchy top virus

Sangita Venkataraman¹, Sundaram S¹, Selvarajan R², Savithri HS³

¹Amity Institute Of Integrative Sciences And Health, Gurgaon, India, ²National Research Center for Banana, Tiruchirapalli, India,

³Indian Institute of Science, Bengaluru, India

E-mail: svenkataraman@ggn.amity.edu

X-ray diffraction studies on single crystals of viruses enable visualization of the structures of intact virus particles at near-atomic resolution. These studies provide detailed information regarding the coat protein folding, capsid architecture, molecular interactions and plausible sites of receptor recognition. Such learning is pivotal in designing strategies for combating infections due to viruses in plants, animals and humans. Banana is the major staple food crop for approximately 400 million people. Of 114 million tonnes of banana that was produced globally in 2014, India accounted for 24.5 per cent of the production. Bunchy Top disease of Banana is one of the most devastating diseases caused by Banana Bunchy Top Virus (BBTV). The disease results in significant loss of yield, stunting and bunchy appearance of leaves. While a large number of isolates of BBTV from various regions of India have been characterized by different groups, no structural study exists for this important virus. In order to pursue structural studies, the coat protein gene from BBTV isolate of Hill Banana grown in lower Pulney Hills of Tamilnadu was cloned in pET28a vector and expressed in BL21(DE3) pLysS. Purification of the CP was done using Ni-NTA affinity chromatography. In vitro capsid assembly was studied using sucrose density gradient centrifugation which suggested that the coat protein does not assemble as a 60mer native particle. Studies using dynamic light scattering (DLS) indicates that the purified protein is poly-dispersed and is represented majorly as tetramers. In silico studies using both homology modelling and ab initio structure determination have given useful insights into the organization of the BBTV capsid. Efforts are currently on to crystallize the coat protein and collect X-ray diffraction data.

Venkataraman S, Reddy SP, Loo J, Idamakanti N, Hallenbeck PL, Reddy VS (2008). Structure of Seneca Valley Virus-001: an oncolytic picornavirus representing a new genus. *Structure*, 16(10):1555-1561

Sangita V, Lokesh GL, Satheshkumar PS, Vijay CS, Saravanan V, Savithri HS, Murthy MR (2004). T=1 capsid structures of Sesbania mosaic virus coat protein mutants: determinants of T=3 and T=1 capsid assembly. *J Mol Biol*, 342:987-999.

Pache L, Venkataraman S, Nemerow GR, Reddy VS (2008). Conservation of fiber structure and CD46 usage by subgroup B2 adenoviruses. *Virology*, 375:573-579. (Cover Page)

Keywords: [Virus](#), [Structure](#), [Coat Protein](#)