

# MEMBRANES & MOLECULES

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### Bacteriophage T5 tail tube structure suggests a trigger mechanism for *Siphoviridae* DNA ejection

#### Abstract

The vast majority of phages, bacterial viruses, possess a tail that functions in host recognition, cell wall perforation and safe viral DNA transfer from the capsid to the host cytoplasm. Long flexible tails are formed from the tail tube protein (TTP) polymerised as hexameric rings around and stacked along the tape measure protein (TMP). Here, we report the crystal structure of T5 TTP pb6 at 2.2Å resolution. Pb6 is unusual in forming a trimeric ring, although structure analysis reveals homology with all classical TTPs and related tube proteins of bacterial puncturing devices (type VI secretion system and R-pyocin). Structures of T5 tail tubes before and after interaction with the host receptor were determined by cryo electron microscopy at 6Å resolution. Comparison of these two structures reveals that host binding information is not propagated to the capsid through conformational changes in the tail tube, suggesting a role of the TMP in this information-transduction process.

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