File name: Supplementary Data 1

**Description:** Mass spectrometry data of the purified IFT-A complex.

File name: Supplementary Data 2

**Description:** Registered pathogenic missense mutations in IFT-A components.

File name: Supplementary Movie 1

**Description:** The flexibility of the head and base modules in the elongated state with a broader angular

distribution.

File name: Supplementary Movie 2

**Description:** Assembly of IFT-A in the anterograde train.