**Description of Additional Supplementary Files**

File Name: unresolved\_loop.pdf

Description: **Supplementary Figure S1** The structurally unresolved loop structure of NamPT**.** Sequence alignment of NamPT of different species cropped to the region around the unresolved loop structure.

File Name: protein\_query\_table.xls

Description: **Supplementary Table S1** Query proteins used for Blast searches.

File Name: kinetics\_table.pdf

Description: **Supplementary Table S2**

Overview of kinetic constants and rate laws used for the construction of the mathematical model.

File Name: MD.pdf

Description: **Supplementary Table S3** Root mean square deviation (RMSD) values between different structures.

File Name: Supplementary Data S1

Description: <MODEL FILE>

File Name: Supplementary Data S2

Description: <MODEL FILE> for fig 7

File Name: Supplementary Data S3

Description: Scripts used to run analyses.