**Table S5.** Portal protein gene sequences used for phylogenetic analysis.

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| **Phage name** | **Family** | **Host** | **Accession**  |
| Synechococcus phage S-CAM8 | *Myoviridae* | *Synechococcus* sp*.* WH7803 | YP\_008125640.1 |
| Synechococcus phage syn9 | *Myoviridae* | *Synechococcus* sp*.* WH 8012 | YP\_717798.1 |
| Cyanophage S-SSM2 | *Myoviridae* | *Synechococcus* sp*.* WH8102 | AGH57437.1 |
| Aeromonas phage 25 | *Myoviridae* | *Aeromonas salmonicida* | YP\_656382.1 |
| Vibriophage phi-pp2 | *Myoviridae* | *Vibrio parahaemolyticus* | AFN37590.1 |
| Enterobacteria phage T5 | *Siphoviridae* | *Escherichia coli* | YP\_006980.1 |
| Vibrio phage pVp-1 | *Siphoviridae* | *Vibrio parahaemolyticus* ATCC 33844 | AFB83998.1 |
| Flavobacterium phage 11b | *Siphoviridae* | *Flavobacterium* sp*.* | YP\_112492.1 |
| Marinomonas phage P12026 | *Siphoviridae* | *Marinomonas* sp*.* IMCC12026 | YP\_006560242.1 |
| Enterobacteria phage HK97 | *Siphoviridae* | *Escherichia coli* | NP\_037699.1 |
| Pseudomonas phage D3 | *Siphoviridae* | *Pseudomonas aeruginosa* | NP\_061500.1 |
| Pseudoalteromonas phage RIO-1 | *Podoviridae* | *Pseudoalteromonas marina* | YP\_008051121.1 |
| Burkholderia phage AH2 | *Siphoviridae* | *Burkholderia cenocepacia* C6433 | AEY69575.1 |
| Acidithiobacillus phage AcaML1 | *Myoviridae* | *Acidithiobacillus caldus* ATCC 51756 | AFU62881.1 |
| Vibrio phage vB\_VpaM\_MAR | *Myoviridae* | *Vibrio parahaemolyticus* | YP\_007112480.1 |
| Vibrio phage VHML | *Myoviridae* | *Vibrio harveyi* | NP\_758916.1 |
| Stenotrophomonas S1 | *Siphoviridae* | *Stenotrophomonas maltophilia* | YP\_002321454.1 |
| Halomonas phage phiHAP-1 | *Myoviridae* | *Halomonas aquamarina* | ABY90372.1 |