\*\*\*All HHPred submissions done with “PDB\_mmCIF70", "NCBI\_Conserved\_Domains", "Pfam-A", and "UniProt-SwissProt" databases\*\*\*

**Gene 1**

* Function: Hypothetical protein
* Coding Potential: Strong coding potential @bp16
* HHPred: No significant hits; called hypothetical protein
* NCBI Hits: Hypothetical Protein; phage Corgi 100% coverage

**Gene 2**

* Function: Hypothetical protein
* Coding Potential: Small coding potential @bp258
* HHPred: No significant hits
* NCBI Hits: Hypothetical Protein; phages Corgi, Cabbageman, Noely, and Idaho have query match 98% or greater

**Gene 3**

* Function: Hypothetical protein
* Coding Potential: strong coding potential @bp437
* HHPred: No significant hits
* NCBI Hits: 100% hit on phage Corgi

**Gene 4**

* Function: Terminase
* Coding Potential: Strong coding potential @bp607
* HHPred: Significant hits to several phage terminase proteins
* NCBI Hits: terminase corgi; Cabbageman; Noely greater than 90%

**Gene 5**

* Function: DNA Binding Domain
* Coding Potential: strong coding potential @bp 2243
* HHPred: Hits at 96% probability for a HTH DNA binding protein; called DNA binding protein
* NCBI Hits: 100% hit on Corgi, Noely

**Gene 6**

* Function: Portal Protein
* Coding Potential: Strong coding potential @bp 2637
* HHPred: HK97 Family Phage Portal Protein , probability 100, e-value 3.5e-35
* NCBI Hits: portal protein; 100% hit on Corgi, CabbageMan, Noely

**Gene 7**

* Function: Major Capsid and Protease Fusion Protein
* Coding Potential: Strong coding potential @bp3764
* HHPred: Major Capsid Protein Rcc01687 99.9% e-value: 2.9E-22
* NCBI Hits: 98% hits on Corgi, Cabbageman, and Noely

**Gene 8**

* Function: Head-to-tail adaptor
* Coding Potential: Strong coding potential @bp5436
* HHPred: strong hit for bacteriophage 9D94 portal and connector assembly (<https://www.rcsb.org/structure/9D94>)
* NCBI Hits: 100% on Corgi, Cabbageman, and Noely

**Gene 9**

* Function: Tail terminator
* Coding Potential: strong coding potential @bp5774
* HHPred: 97.6% probability hit on tail terminator for protein 6TE9
* NCBI Hits: Corgi and Cabbageman 100%

**Gene 10**

* Function: Major tail protein
* Coding Potential: strong coding potential @bp6199
* HHPred: strong hit for 8QHS major tail protein; <https://www.rcsb.org/structure/8QHS>
* NCBI Hits: 100% hits on Cabbageman, Corgi, and Idaho

**Gene 11**

* Function: Hypothetical protein
* Coding Potential: strong coding potential @6617
* HHPred: No significant hits
* NCBI Hits: 100% hits on Corgi and Noely

**Gene 12**

* Function: Tape Measure Protein
* Coding Potential: strong coding potential @7144
* HHPred: multiple strong hits to Tape Measure Proteins
* NCBI Hits: 100% hits on Corgi, Noely, Cabbageman

**Gene 13**

* Function: Minor tail protein
* Coding Potential: strong coding @8917
* HHPred: Strong hit to 7XYC minor tail protein in klebsiella phage; <https://www.rcsb.org/structure/7XYC>
* NCBI Hits: 100% hits on phages Piku, Whytu, Yavru

**Gene 14**

* Function: Minor tail protein
* Coding Potential: Strong coding potential @10305
* HHPred: Significant hits for minor tail protein 3CDD; <http://www.rcsb.org/pdb/explore/explore.do?structureId=3CDD>
* NCBI Hits: Minor Tail Protein: phages Corgi, Cabbageman, 100% coverage, Noely 99%, Idaho, Whytu, Yavru, Piku 97%

**Gene 15**

* Function: Hypothetical protein
* Coding Potential: Strong coding potential @11,446
* HHPred: No significant hits
* NCBI Hits: Mix of minor tail proteins in phages outside of pfam and HPs for phages in the pfam. Defauted to HP due to limited HHPred support.

**Gene 16**

* Function: Endolysin
* Coding Potential: Strong coding potential @bp 11847
* HHPred: Good hit on protein 8TZL; <https://www.rcsb.org/structure/8TZL>
* NCBI Hits: 100% hits on Corgi & Cabbageman

**Gene 17**

* Function: Membrane protein
* Coding Potential: Strong coding potential @bp 12584
* HHPred: Detected transmembrane segments; thought support for membrane protein?
* NCBI Hits: 100% Corgi, 98% Cabbageman. Membrane protein

**Gene 18**

* Function: Hypothetical protein
* Coding Potential: Strong coding potential @bp 12777
* HHPred: No significant hits
* NCBI Hits: No significant hits; most are calling HP in our pfam

**Gene 19**

* Function: DNA Binding Protein
* Coding Potential: Strong coding potential @bp13527
* HHPred: Strong hit on protein 8DGL; <http://www.rcsb.org/pdb/explore/explore.do?structureId=8C3T>
* NCBI Hits: 100% hit on Corgi, 88.52% on Noely; 80.95% hit on Idaho

**Gene 20**

* Function: Helix-turn-helix DNA binding Protein
* Coding Potential: Strong coding potential @bp 13527
* HHPred: Good hit on protein 4PT7; <https://www.rcsb.org/structure/8DGL>
* NCBI Hits: 100% hit on Corgi, 88.52% on Noely; 80.95% hit on Idaho

**Gene 21**

* Function: RepA-like replication initiator
* Coding Potential: Strong coding potential @bp13527
* HHPred: Students wanted to advocate for hits to this protein:
  + <https://www.rcsb.org/structure/4PT7>
  + <https://pmc.ncbi.nlm.nih.gov/articles/PMC7157519/>
* NCBI Hits: No strong hits for this call; open to calling HP if not supported enough.

**Gene 22**

* Function: Hypothetical Protein
* Coding Potential: Strong coding potential @bp14587
* HHPred: No significant hits
* NCBI Hits: 100% hit Corgi, CabbageMan, 95% Noely

**Gene 23**

* Function: HNH Endonuclease
* Coding Potential: Strong coding potential @bp 14800
* HHPred: Students strongly advocating; instructor supports:
  + <https://www.rcsb.org/structure/5H0M>
* NCBI Hits: 100% hit on Corgi and Noely. HNH endonuclease [Arthrobacter phage Corgi] >gb|AYN57571.1| HNH endonuclease [Arthrobacter phage Corgi] >gb|XIJ70486.1| HNH endonuclease [Arthrobacter phage CabbageMan]

**Gene 24**

* Function: DNA Binding protein
* Coding Potential: Strong coding potential @bp15205
* HHPred: Good hit to protein 3GA8; <http://www.rcsb.org/pdb/explore/explore.do?structureId=3GA8>
* NCBI Hits: 100% hit on Corgi, 91% on Noely

**Gene 25**

* Function: DNA Binding Transcriptional repressor (NrdR-like)
* Coding Potential: Strong coding potential @bp15515
* HHPred: <https://www.rcsb.org/structure/9FXK> ;
* NCBI Hits: 100% hits on Corgi and Cabbageman for HP; making a case for function of DNA Binding Transcriptional repressor (NrdR-like)