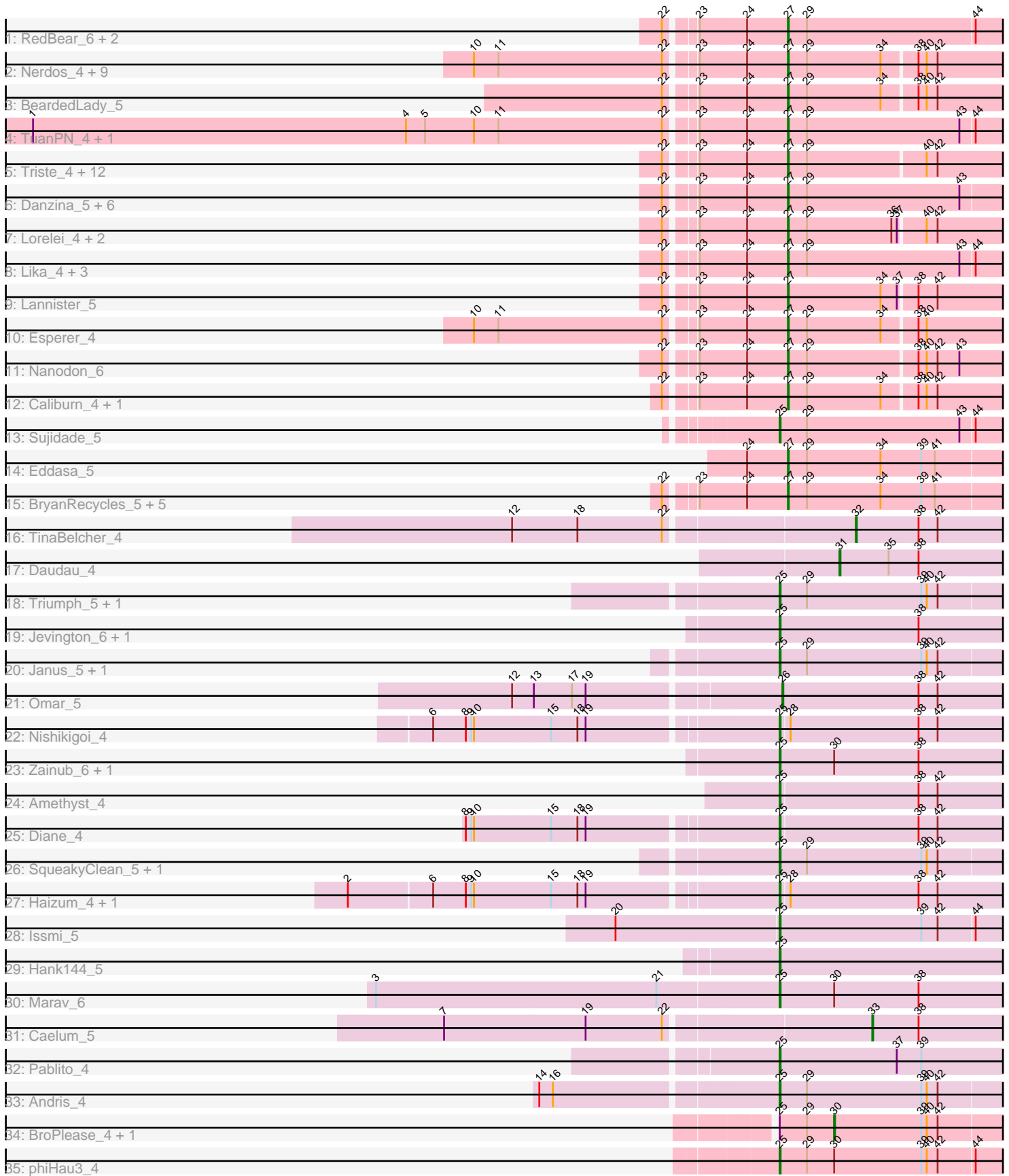


# Pham 212528



Note: Tracks are now grouped by subcluster and scaled. Switching in subcluster is indicated by changes in track color. Track scale is now set by default to display the region 30 bp upstream of start 1 to 30 bp downstream of the last possible start. If this default region is judged to be packed too tightly with annotated starts, the track will be further scaled to only show that region of the ORF with annotated starts. This action will be indicated by adding "Zoomed" to the title. For starts, yellow indicates the location of called starts comprised solely of Glimmer/GeneMark auto-annotations, green indicates the location of called starts with at least 1 manual gene annotation.

## Pham 212528 Report

This analysis was run 02/22/25 on database version 588.

Pham number 212528 has 83 members, 2 are drafts.

Phages represented in each track:

- Track 1 : RedBear\_6, Katalie\_5, South40\_5
- Track 2 : Nerdos\_4, Indigo\_4, Phettuccine\_4, Leviticus\_4, SunsetPointe\_4, Bovely\_4, Aaronocolus\_4, Legacy\_4, Unstoppable\_4, Hydra\_6
- Track 3 : BeardedLady\_5
- Track 4 : TuanPN\_4, Ejemplo\_4
- Track 5 : Triste\_4, BarryBee\_6, Emaanora\_6, Werner\_4, Dwayne\_4, Asten\_4, SarahRose\_4, Chucky\_4, Hippo\_4, OzzyJ\_5, Whatever\_4, Snorlax\_4, TagePhighter\_5
- Track 6 : Danzina\_5, Goby\_4, Dattran\_5, Brataylor\_5, Zemlya\_5, Celeste\_4, Toma\_4
- Track 7 : Lorelei\_4, Rana\_4, Nabi\_4
- Track 8 : Lika\_4, Yasdnil\_4, Godpower\_5, Maneekul\_4
- Track 9 : Lannister\_5
- Track 10 : Esperer\_4
- Track 11 : Nanodon\_6
- Track 12 : Caliburn\_4, Ozzie\_4
- Track 13 : Sujidade\_5
- Track 14 : Eddasa\_5
- Track 15 : BryanRecycles\_5, Oliynyk\_5, Izzy\_5, Rusticus\_5, Jash\_5, EnochSoames\_5
- Track 16 : TinaBelcher\_4
- Track 17 : Daudau\_4
- Track 18 : Triumph\_5, Axiom\_5
- Track 19 : Jevington\_6, Paolo\_6
- Track 20 : Janus\_5, GirlDinner\_4
- Track 21 : Omar\_5
- Track 22 : Nishikigoi\_4
- Track 23 : Zainub\_6, Puginator\_6
- Track 24 : Amethyst\_4
- Track 25 : Diane\_4
- Track 26 : SqueakyClean\_5, Animus\_5
- Track 27 : Haizum\_4, Tefunt\_4
- Track 28 : Issmi\_5
- Track 29 : Hank144\_5
- Track 30 : Marav\_6
- Track 31 : Caelum\_5
- Track 32 : Pablito\_4

- Track 33 : Andris\_4
- Track 34 : BroPlease\_4, GreenWeasel\_4
- Track 35 : phiHau3\_4

**Summary of Final Annotations (See graph section above for start numbers):**

The start number called the most often in the published annotations is 27, it was called in 54 of the 81 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Aaronocolus\_4, Asten\_4, BarryBee\_6, BeardedLady\_5, Bovely\_4, Brataylor\_5, BryanRecycles\_5, Caliburn\_4, Celeste\_4, Chucky\_4, Danzina\_5, Dattran\_5, Dwayne\_4, Eddasa\_5, Ejemplo\_4, Emaanora\_6, EnochSoames\_5, Esperer\_4, Goby\_4, Godpower\_5, Hippo\_4, Hydra\_6, Indigo\_4, Izzy\_5, Jash\_5, Katalie\_5, Lannister\_5, Legacy\_4, Leviticus\_4, Lika\_4, Lorelei\_4, Maneekul\_4, Nabi\_4, Nanodon\_6, Nerdos\_4, Oliynyk\_5, Ozzie\_4, OzzyJ\_5, Phettuccine\_4, Rana\_4, RedBear\_6, Rusticus\_5, SarahRose\_4, Snorlax\_4, South40\_5, SunsetPointe\_4, TagePhighter\_5, Toma\_4, Triste\_4, TuanPN\_4, Unstoppable\_4, Werner\_4, Whatever\_4, Yasdnil\_4, Zemlya\_5,

Genes that have the "Most Annotated" start but do not call it:

- 

Genes that do not have the "Most Annotated" start:

- Amethyst\_4, Andris\_4, Animus\_5, Axiom\_5, BroPlease\_4, Caelum\_5, Daudau\_4, Diane\_4, GirlDinner\_4, GreenWeasel\_4, Haizum\_4, Hank144\_5, Issmi\_5, Janus\_5, Jevington\_6, Marav\_6, Nishikigoi\_4, Omar\_5, Pablito\_4, Paolo\_6, Puginator\_6, SqueakyClean\_5, Sujidade\_5, Tefunt\_4, TinaBelcher\_4, Triumph\_5, Zainub\_6, phiHau3\_4,

**Summary by start number:**

Start 25:

- Found in 24 of 83 ( 28.9% ) of genes in pham
- Manual Annotations of this start: 21 of 81
- Called 91.7% of time when present
- Phage (with cluster) where this start called: Amethyst\_4 (BD2), Andris\_4 (BD2), Animus\_5 (BD2), Axiom\_5 (BD2), Diane\_4 (BD2), GirlDinner\_4 (BD2), Haizum\_4 (BD2), Hank144\_5 (BD2), Issmi\_5 (BD2), Janus\_5 (BD2), Jevington\_6 (BD2), Marav\_6 (BD2), Nishikigoi\_4 (BD2), Pablito\_4 (BD2), Paolo\_6 (BD2), Puginator\_6 (BD2), SqueakyClean\_5 (BD2), Sujidade\_5 (BD1), Tefunt\_4 (BD2), Triumph\_5 (BD2), Zainub\_6 (BD2), phiHau3\_4 (BD4),

Start 26:

- Found in 1 of 83 ( 1.2% ) of genes in pham
- Manual Annotations of this start: 1 of 81
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Omar\_5 (BD2),

Start 27:

- Found in 55 of 83 ( 66.3% ) of genes in pham
- Manual Annotations of this start: 54 of 81
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Aaronocolus\_4 (BD1), Asten\_4 (BD1), BarryBee\_6 (BD1), BeardedLady\_5 (BD1), Bovely\_4 (BD1), Brataylor\_5 (BD1), BryanRecycles\_5 (BD1), Caliburn\_4 (BD1), Celeste\_4 (BD1), Chucky\_4 (BD1), Danzina\_5 (BD1), Dattran\_5 (BD1), Dwayne\_4 (BD1), Eddasa\_5 (BD1), Ejemplo\_4 (BD1), Emaanora\_6 (BD1), EnochSoames\_5 (BD1), Esperer\_4 (BD1), Goby\_4 (BD1), Godpower\_5 (BD1), Hippo\_4 (BD1), Hydra\_6 (BD1), Indigo\_4 (BD1), Izzy\_5 (BD1), Jash\_5 (BD1), Katalie\_5 (BD1), Lannister\_5 (BD1), Legacy\_4 (BD1), Leviticus\_4 (BD1), Lika\_4 (BD1), Lorelei\_4 (BD1), Maneekul\_4 (BD1), Nabi\_4 (BD1), Nanodon\_6 (BD1), Nerdos\_4 (BD1), Oliynyk\_5 (BD1), Ozzie\_4 (BD1), OzzyJ\_5 (BD1), Phettuccine\_4 (BD1), Rana\_4 (BD1), RedBear\_6 (BD1), Rusticus\_5 (BD1), SarahRose\_4 (BD1), Snorlax\_4 (BD1), South40\_5 (BD1), SunsetPointe\_4 (BD1), TagePhighter\_5 (BD1), Toma\_4 (BD1), Triste\_4 (BD1), TuanPN\_4 (BD1), Unstoppable\_4 (BD1), Werner\_4 (BD1), Whatever\_4 (BD1), Yasdnil\_4 (BD1), Zemlya\_5 (BD1),

Start 30:

- Found in 6 of 83 ( 7.2% ) of genes in pham
- Manual Annotations of this start: 2 of 81
- Called 33.3% of time when present
- Phage (with cluster) where this start called: BroPlease\_4 (BD4), GreenWeasel\_4 (BD4),

Start 31:

- Found in 1 of 83 ( 1.2% ) of genes in pham
- Manual Annotations of this start: 1 of 81
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Daudau\_4 (BD2),

Start 32:

- Found in 1 of 83 ( 1.2% ) of genes in pham
- Manual Annotations of this start: 1 of 81
- Called 100.0% of time when present
- Phage (with cluster) where this start called: TinaBelcher\_4 (BD2),

Start 33:

- Found in 1 of 83 ( 1.2% ) of genes in pham
- Manual Annotations of this start: 1 of 81
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Caelum\_5 (BD2),

### Summary by clusters:

There are 3 clusters represented in this pham: BD4, BD1, BD2,

Info for manual annotations of cluster BD1:

- Start number 25 was manually annotated 1 time for cluster BD1.
- Start number 27 was manually annotated 54 times for cluster BD1.

Info for manual annotations of cluster BD2:

- Start number 25 was manually annotated 19 times for cluster BD2.

- Start number 26 was manually annotated 1 time for cluster BD2.
- Start number 31 was manually annotated 1 time for cluster BD2.
- Start number 32 was manually annotated 1 time for cluster BD2.
- Start number 33 was manually annotated 1 time for cluster BD2.

Info for manual annotations of cluster BD4:

- Start number 25 was manually annotated 1 time for cluster BD4.
- Start number 30 was manually annotated 2 times for cluster BD4.

### **Gene Information:**

Gene: Aaronocolus\_4 Start: 1693, Stop: 1941, Start Num: 27

Candidate Starts for Aaronocolus\_4:

(10, 1363), (11, 1390), (22, 1570), (23, 1597), (24, 1648), (Start: 27 @1693 has 54 MA's), (29, 1714), (34, 1795), (38, 1831), (40, 1840), (42, 1852),

Gene: Amethyst\_4 Start: 1422, Stop: 1682, Start Num: 25

Candidate Starts for Amethyst\_4:

(Start: 25 @1422 has 21 MA's), (38, 1572), (42, 1593),

Gene: Andris\_4 Start: 1453, Stop: 1713, Start Num: 25

Candidate Starts for Andris\_4:

(14, 1204), (16, 1219), (Start: 25 @1453 has 21 MA's), (29, 1483), (39, 1609), (40, 1615), (42, 1627),

Gene: Animus\_5 Start: 1800, Stop: 2060, Start Num: 25

Candidate Starts for Animus\_5:

(Start: 25 @1800 has 21 MA's), (29, 1830), (39, 1956), (40, 1962), (42, 1974),

Gene: Asten\_4 Start: 1665, Stop: 1913, Start Num: 27

Candidate Starts for Asten\_4:

(22, 1542), (23, 1569), (24, 1620), (Start: 27 @1665 has 54 MA's), (29, 1686), (40, 1812), (42, 1824),

Gene: Axiom\_5 Start: 1452, Stop: 1712, Start Num: 25

Candidate Starts for Axiom\_5:

(Start: 25 @1452 has 21 MA's), (29, 1482), (39, 1608), (40, 1614), (42, 1626),

Gene: BarryBee\_6 Start: 1665, Stop: 1913, Start Num: 27

Candidate Starts for BarryBee\_6:

(22, 1542), (23, 1569), (24, 1620), (Start: 27 @1665 has 54 MA's), (29, 1686), (40, 1812), (42, 1824),

Gene: BeardedLady\_5 Start: 1940, Stop: 2188, Start Num: 27

Candidate Starts for BeardedLady\_5:

(22, 1817), (23, 1844), (24, 1895), (Start: 27 @1940 has 54 MA's), (29, 1961), (34, 2042), (38, 2078), (40, 2087), (42, 2099),

Gene: Bovely\_4 Start: 1699, Stop: 1947, Start Num: 27

Candidate Starts for Bovely\_4:

(10, 1369), (11, 1396), (22, 1576), (23, 1603), (24, 1654), (Start: 27 @1699 has 54 MA's), (29, 1720), (34, 1801), (38, 1837), (40, 1846), (42, 1858),

Gene: Brataylor\_5 Start: 1666, Stop: 1914, Start Num: 27

Candidate Starts for Brataylor\_5:  
(22, 1543), (23, 1570), (24, 1621), (Start: 27 @1666 has 54 MA's), (29, 1687), (43, 1855),

Gene: BroPlease\_4 Start: 1727, Stop: 1927, Start Num: 30  
Candidate Starts for BroPlease\_4:  
(Start: 25 @1667 has 21 MA's), (29, 1697), (Start: 30 @1727 has 2 MA's), (39, 1823), (40, 1829), (42, 1841),

Gene: BryanRecycles\_5 Start: 1854, Stop: 2102, Start Num: 27  
Candidate Starts for BryanRecycles\_5:  
(22, 1731), (23, 1758), (24, 1809), (Start: 27 @1854 has 54 MA's), (29, 1875), (34, 1956), (39, 2001), (41, 2016),

Gene: Caelum\_5 Start: 1472, Stop: 1633, Start Num: 33  
Candidate Starts for Caelum\_5:  
(7, 1019), (19, 1172), (22, 1256), (Start: 33 @1472 has 1 MA's), (38, 1523),

Gene: Caliburn\_4 Start: 1673, Stop: 1921, Start Num: 27  
Candidate Starts for Caliburn\_4:  
(22, 1550), (23, 1577), (24, 1628), (Start: 27 @1673 has 54 MA's), (29, 1694), (34, 1775), (38, 1811), (40, 1820), (42, 1832),

Gene: Celeste\_4 Start: 1666, Stop: 1917, Start Num: 27  
Candidate Starts for Celeste\_4:  
(22, 1543), (23, 1570), (24, 1621), (Start: 27 @1666 has 54 MA's), (29, 1687), (43, 1855),

Gene: Chucky\_4 Start: 1666, Stop: 1914, Start Num: 27  
Candidate Starts for Chucky\_4:  
(22, 1543), (23, 1570), (24, 1621), (Start: 27 @1666 has 54 MA's), (29, 1687), (40, 1813), (42, 1825),

Gene: Danzina\_5 Start: 1865, Stop: 2116, Start Num: 27  
Candidate Starts for Danzina\_5:  
(22, 1742), (23, 1769), (24, 1820), (Start: 27 @1865 has 54 MA's), (29, 1886), (43, 2054),

Gene: Dattran\_5 Start: 1664, Stop: 1912, Start Num: 27  
Candidate Starts for Dattran\_5:  
(22, 1541), (23, 1568), (24, 1619), (Start: 27 @1664 has 54 MA's), (29, 1685), (43, 1853),

Gene: Daudau\_4 Start: 1493, Stop: 1690, Start Num: 31  
Candidate Starts for Daudau\_4:  
(Start: 31 @1493 has 1 MA's), (35, 1547), (38, 1580),

Gene: Diane\_4 Start: 1424, Stop: 1684, Start Num: 25  
Candidate Starts for Diane\_4:  
(8, 1100), (9, 1106), (10, 1109), (15, 1190), (18, 1217), (19, 1226), (Start: 25 @1424 has 21 MA's), (38, 1574), (42, 1595),

Gene: Dwayne\_4 Start: 1666, Stop: 1914, Start Num: 27  
Candidate Starts for Dwayne\_4:  
(22, 1543), (23, 1570), (24, 1621), (Start: 27 @1666 has 54 MA's), (29, 1687), (40, 1813), (42, 1825),

Gene: Eddasa\_5 Start: 1854, Stop: 2102, Start Num: 27  
Candidate Starts for Eddasa\_5:

(24, 1809), (Start: 27 @1854 has 54 MA's), (29, 1875), (34, 1956), (39, 2001), (41, 2016),

Gene: Ejemplo\_4 Start: 1667, Stop: 1915, Start Num: 27

Candidate Starts for Ejemplo\_4:

(1, 851), (4, 1262), (5, 1283), (10, 1337), (11, 1364), (22, 1544), (23, 1571), (24, 1622), (Start: 27 @1667 has 54 MA's), (29, 1688), (43, 1856), (44, 1871),

Gene: Emaanora\_6 Start: 1665, Stop: 1913, Start Num: 27

Candidate Starts for Emaanora\_6:

(22, 1542), (23, 1569), (24, 1620), (Start: 27 @1665 has 54 MA's), (29, 1686), (40, 1812), (42, 1824),

Gene: EnochSoames\_5 Start: 1850, Stop: 2098, Start Num: 27

Candidate Starts for EnochSoames\_5:

(22, 1727), (23, 1754), (24, 1805), (Start: 27 @1850 has 54 MA's), (29, 1871), (34, 1952), (39, 1997), (41, 2012),

Gene: Esperer\_4 Start: 1693, Stop: 1941, Start Num: 27

Candidate Starts for Esperer\_4:

(10, 1363), (11, 1390), (22, 1570), (23, 1597), (24, 1648), (Start: 27 @1693 has 54 MA's), (29, 1714), (34, 1795), (38, 1831), (40, 1840),

Gene: GirlDinner\_4 Start: 1463, Stop: 1723, Start Num: 25

Candidate Starts for GirlDinner\_4:

(Start: 25 @1463 has 21 MA's), (29, 1493), (39, 1619), (40, 1625), (42, 1637),

Gene: Goby\_4 Start: 1664, Stop: 1912, Start Num: 27

Candidate Starts for Goby\_4:

(22, 1541), (23, 1568), (24, 1619), (Start: 27 @1664 has 54 MA's), (29, 1685), (43, 1853),

Gene: Godpower\_5 Start: 1667, Stop: 1915, Start Num: 27

Candidate Starts for Godpower\_5:

(22, 1544), (23, 1571), (24, 1622), (Start: 27 @1667 has 54 MA's), (29, 1688), (43, 1856), (44, 1871),

Gene: GreenWeasel\_4 Start: 1727, Stop: 1927, Start Num: 30

Candidate Starts for GreenWeasel\_4:

(Start: 25 @1667 has 21 MA's), (29, 1697), (Start: 30 @1727 has 2 MA's), (39, 1823), (40, 1829), (42, 1841),

Gene: Haizum\_4 Start: 1453, Stop: 1713, Start Num: 25

Candidate Starts for Haizum\_4:

(2, 1003), (6, 1093), (8, 1129), (9, 1135), (10, 1138), (15, 1219), (18, 1246), (19, 1255), (Start: 25 @1453 has 21 MA's), (28, 1462), (38, 1603), (42, 1624),

Gene: Hank144\_5 Start: 1746, Stop: 2006, Start Num: 25

Candidate Starts for Hank144\_5:

(Start: 25 @1746 has 21 MA's),

Gene: Hippo\_4 Start: 1665, Stop: 1913, Start Num: 27

Candidate Starts for Hippo\_4:

(22, 1542), (23, 1569), (24, 1620), (Start: 27 @1665 has 54 MA's), (29, 1686), (40, 1812), (42, 1824),

Gene: Hydra\_6 Start: 2230, Stop: 2478, Start Num: 27

Candidate Starts for Hydra\_6:

(10, 1900), (11, 1927), (22, 2107), (23, 2134), (24, 2185), (Start: 27 @2230 has 54 MA's), (29, 2251), (34, 2332), (38, 2368), (40, 2377), (42, 2389),

Gene: Indigo\_4 Start: 1693, Stop: 1941, Start Num: 27

Candidate Starts for Indigo\_4:

(10, 1363), (11, 1390), (22, 1570), (23, 1597), (24, 1648), (Start: 27 @1693 has 54 MA's), (29, 1714), (34, 1795), (38, 1831), (40, 1840), (42, 1852),

Gene: Issmi\_5 Start: 1731, Stop: 1988, Start Num: 25

Candidate Starts for Issmi\_5:

(20, 1554), (Start: 25 @1731 has 21 MA's), (39, 1887), (42, 1905), (44, 1944),

Gene: Izzy\_5 Start: 1901, Stop: 2149, Start Num: 27

Candidate Starts for Izzy\_5:

(22, 1778), (23, 1805), (24, 1856), (Start: 27 @1901 has 54 MA's), (29, 1922), (34, 2003), (39, 2048), (41, 2063),

Gene: Janus\_5 Start: 1800, Stop: 2060, Start Num: 25

Candidate Starts for Janus\_5:

(Start: 25 @1800 has 21 MA's), (29, 1830), (39, 1956), (40, 1962), (42, 1974),

Gene: Jash\_5 Start: 1854, Stop: 2102, Start Num: 27

Candidate Starts for Jash\_5:

(22, 1731), (23, 1758), (24, 1809), (Start: 27 @1854 has 54 MA's), (29, 1875), (34, 1956), (39, 2001), (41, 2016),

Gene: Jevington\_6 Start: 2019, Stop: 2279, Start Num: 25

Candidate Starts for Jevington\_6:

(Start: 25 @2019 has 21 MA's), (38, 2172),

Gene: Katalie\_5 Start: 1935, Stop: 2183, Start Num: 27

Candidate Starts for Katalie\_5:

(22, 1812), (23, 1839), (24, 1890), (Start: 27 @1935 has 54 MA's), (29, 1956), (44, 2139),

Gene: Lannister\_5 Start: 1675, Stop: 1923, Start Num: 27

Candidate Starts for Lannister\_5:

(22, 1552), (23, 1579), (24, 1630), (Start: 27 @1675 has 54 MA's), (34, 1777), (37, 1795), (38, 1813), (42, 1834),

Gene: Legacy\_4 Start: 1673, Stop: 1921, Start Num: 27

Candidate Starts for Legacy\_4:

(10, 1343), (11, 1370), (22, 1550), (23, 1577), (24, 1628), (Start: 27 @1673 has 54 MA's), (29, 1694), (34, 1775), (38, 1811), (40, 1820), (42, 1832),

Gene: Leviticus\_4 Start: 1693, Stop: 1941, Start Num: 27

Candidate Starts for Leviticus\_4:

(10, 1363), (11, 1390), (22, 1570), (23, 1597), (24, 1648), (Start: 27 @1693 has 54 MA's), (29, 1714), (34, 1795), (38, 1831), (40, 1840), (42, 1852),

Gene: Lika\_4 Start: 1668, Stop: 1916, Start Num: 27

Candidate Starts for Lika\_4:

(22, 1545), (23, 1572), (24, 1623), (Start: 27 @1668 has 54 MA's), (29, 1689), (43, 1857), (44, 1872),



Gene: Lorelei\_4 Start: 1666, Stop: 1914, Start Num: 27

Candidate Starts for Lorelei\_4:

(22, 1543), (23, 1570), (24, 1621), (Start: 27 @1666 has 54 MA's), (29, 1687), (36, 1780), (37, 1786), (40, 1813), (42, 1825),

Gene: Maneekul\_4 Start: 1666, Stop: 1914, Start Num: 27

Candidate Starts for Maneekul\_4:

(22, 1543), (23, 1570), (24, 1621), (Start: 27 @1666 has 54 MA's), (29, 1687), (43, 1855), (44, 1870),

Gene: Marav\_6 Start: 2017, Stop: 2280, Start Num: 25

Candidate Starts for Marav\_6:

(3, 1579), (21, 1885), (Start: 25 @2017 has 21 MA's), (Start: 30 @2077 has 2 MA's), (38, 2170),

Gene: Nabi\_4 Start: 1666, Stop: 1914, Start Num: 27

Candidate Starts for Nabi\_4:

(22, 1543), (23, 1570), (24, 1621), (Start: 27 @1666 has 54 MA's), (29, 1687), (36, 1780), (37, 1786), (40, 1813), (42, 1825),

Gene: Nanodon\_6 Start: 1865, Stop: 2113, Start Num: 27

Candidate Starts for Nanodon\_6:

(22, 1742), (23, 1769), (24, 1820), (Start: 27 @1865 has 54 MA's), (29, 1886), (38, 2003), (40, 2012), (42, 2024), (43, 2048),

Gene: Nerdos\_4 Start: 1693, Stop: 1941, Start Num: 27

Candidate Starts for Nerdos\_4:

(10, 1363), (11, 1390), (22, 1570), (23, 1597), (24, 1648), (Start: 27 @1693 has 54 MA's), (29, 1714), (34, 1795), (38, 1831), (40, 1840), (42, 1852),

Gene: Nishikigoi\_4 Start: 1453, Stop: 1713, Start Num: 25

Candidate Starts for Nishikigoi\_4:

(6, 1093), (8, 1129), (9, 1135), (10, 1138), (15, 1219), (18, 1246), (19, 1255), (Start: 25 @1453 has 21 MA's), (28, 1462), (38, 1603), (42, 1624),

Gene: Oliynyk\_5 Start: 1854, Stop: 2102, Start Num: 27

Candidate Starts for Oliynyk\_5:

(22, 1731), (23, 1758), (24, 1809), (Start: 27 @1854 has 54 MA's), (29, 1875), (34, 1956), (39, 2001), (41, 2016),

Gene: Omar\_5 Start: 1683, Stop: 1943, Start Num: 26

Candidate Starts for Omar\_5:

(12, 1401), (13, 1425), (17, 1467), (19, 1482), (Start: 26 @1683 has 1 MA's), (38, 1833), (42, 1854),

Gene: Ozzie\_4 Start: 1673, Stop: 1921, Start Num: 27

Candidate Starts for Ozzie\_4:

(22, 1550), (23, 1577), (24, 1628), (Start: 27 @1673 has 54 MA's), (29, 1694), (34, 1775), (38, 1811), (40, 1820), (42, 1832),

Gene: OzzyJ\_5 Start: 1666, Stop: 1914, Start Num: 27

Candidate Starts for OzzyJ\_5:

(22, 1543), (23, 1570), (24, 1621), (Start: 27 @1666 has 54 MA's), (29, 1687), (40, 1813), (42, 1825),

Gene: Pablito\_4 Start: 1489, Stop: 1749, Start Num: 25

Candidate Starts for Pablito\_4:

(Start: 25 @1489 has 21 MA's), (37, 1618), (39, 1645),

Gene: Paolo\_6 Start: 2073, Stop: 2333, Start Num: 25

Candidate Starts for Paolo\_6:

(Start: 25 @2073 has 21 MA's), (38, 2226),

Gene: Phettuccine\_4 Start: 1693, Stop: 1941, Start Num: 27

Candidate Starts for Phettuccine\_4:

(10, 1363), (11, 1390), (22, 1570), (23, 1597), (24, 1648), (Start: 27 @1693 has 54 MA's), (29, 1714), (34, 1795), (38, 1831), (40, 1840), (42, 1852),

Gene: Puginator\_6 Start: 2019, Stop: 2279, Start Num: 25

Candidate Starts for Puginator\_6:

(Start: 25 @2019 has 21 MA's), (Start: 30 @2079 has 2 MA's), (38, 2172),

Gene: Rana\_4 Start: 1666, Stop: 1914, Start Num: 27

Candidate Starts for Rana\_4:

(22, 1543), (23, 1570), (24, 1621), (Start: 27 @1666 has 54 MA's), (29, 1687), (36, 1780), (37, 1786), (40, 1813), (42, 1825),

Gene: RedBear\_6 Start: 1935, Stop: 2183, Start Num: 27

Candidate Starts for RedBear\_6:

(22, 1812), (23, 1839), (24, 1890), (Start: 27 @1935 has 54 MA's), (29, 1956), (44, 2139),

Gene: Rusticus\_5 Start: 1854, Stop: 2102, Start Num: 27

Candidate Starts for Rusticus\_5:

(22, 1731), (23, 1758), (24, 1809), (Start: 27 @1854 has 54 MA's), (29, 1875), (34, 1956), (39, 2001), (41, 2016),

Gene: SarahRose\_4 Start: 1665, Stop: 1913, Start Num: 27

Candidate Starts for SarahRose\_4:

(22, 1542), (23, 1569), (24, 1620), (Start: 27 @1665 has 54 MA's), (29, 1686), (40, 1812), (42, 1824),

Gene: Snorlax\_4 Start: 1665, Stop: 1913, Start Num: 27

Candidate Starts for Snorlax\_4:

(22, 1542), (23, 1569), (24, 1620), (Start: 27 @1665 has 54 MA's), (29, 1686), (40, 1812), (42, 1824),

Gene: South40\_5 Start: 1935, Stop: 2183, Start Num: 27

Candidate Starts for South40\_5:

(22, 1812), (23, 1839), (24, 1890), (Start: 27 @1935 has 54 MA's), (29, 1956), (44, 2139),

Gene: SqueakyClean\_5 Start: 1726, Stop: 1986, Start Num: 25

Candidate Starts for SqueakyClean\_5:

(Start: 25 @1726 has 21 MA's), (29, 1756), (39, 1882), (40, 1888), (42, 1900),

Gene: Sujidade\_5 Start: 1950, Stop: 2207, Start Num: 25

Candidate Starts for Sujidade\_5:

(Start: 25 @1950 has 21 MA's), (29, 1980), (43, 2148), (44, 2163),

Gene: SunsetPointe\_4 Start: 1692, Stop: 1940, Start Num: 27

Candidate Starts for SunsetPointe\_4:

(10, 1362), (11, 1389), (22, 1569), (23, 1596), (24, 1647), (Start: 27 @1692 has 54 MA's), (29, 1713), (34, 1794), (38, 1830), (40, 1839), (42, 1851),

Gene: TagePhighter\_5 Start: 1665, Stop: 1913, Start Num: 27

Candidate Starts for TagePhighter\_5:

(22, 1542), (23, 1569), (24, 1620), (Start: 27 @1665 has 54 MA's), (29, 1686), (40, 1812), (42, 1824),

Gene: Tefunt\_4 Start: 1453, Stop: 1713, Start Num: 25

Candidate Starts for Tefunt\_4:

(2, 1003), (6, 1093), (8, 1129), (9, 1135), (10, 1138), (15, 1219), (18, 1246), (19, 1255), (Start: 25 @1453 has 21 MA's), (28, 1462), (38, 1603), (42, 1624),

Gene: TinaBelcher\_4 Start: 1557, Stop: 1736, Start Num: 32

Candidate Starts for TinaBelcher\_4:

(12, 1194), (18, 1266), (22, 1359), (Start: 32 @1557 has 1 MA's), (38, 1626), (42, 1647),

Gene: Toma\_4 Start: 1664, Stop: 1912, Start Num: 27

Candidate Starts for Toma\_4:

(22, 1541), (23, 1568), (24, 1619), (Start: 27 @1664 has 54 MA's), (29, 1685), (43, 1853),

Gene: Triste\_4 Start: 1666, Stop: 1914, Start Num: 27

Candidate Starts for Triste\_4:

(22, 1543), (23, 1570), (24, 1621), (Start: 27 @1666 has 54 MA's), (29, 1687), (40, 1813), (42, 1825),

Gene: Triumph\_5 Start: 1452, Stop: 1712, Start Num: 25

Candidate Starts for Triumph\_5:

(Start: 25 @1452 has 21 MA's), (29, 1482), (39, 1608), (40, 1614), (42, 1626),

Gene: TuanPN\_4 Start: 1667, Stop: 1915, Start Num: 27

Candidate Starts for TuanPN\_4:

(1, 851), (4, 1262), (5, 1283), (10, 1337), (11, 1364), (22, 1544), (23, 1571), (24, 1622), (Start: 27 @1667 has 54 MA's), (29, 1688), (43, 1856), (44, 1871),

Gene: Unstoppable\_4 Start: 1693, Stop: 1941, Start Num: 27

Candidate Starts for Unstoppable\_4:

(10, 1363), (11, 1390), (22, 1570), (23, 1597), (24, 1648), (Start: 27 @1693 has 54 MA's), (29, 1714), (34, 1795), (38, 1831), (40, 1840), (42, 1852),

Gene: Werner\_4 Start: 1666, Stop: 1914, Start Num: 27

Candidate Starts for Werner\_4:

(22, 1543), (23, 1570), (24, 1621), (Start: 27 @1666 has 54 MA's), (29, 1687), (40, 1813), (42, 1825),

Gene: Whatever\_4 Start: 1666, Stop: 1914, Start Num: 27

Candidate Starts for Whatever\_4:

(22, 1543), (23, 1570), (24, 1621), (Start: 27 @1666 has 54 MA's), (29, 1687), (40, 1813), (42, 1825),

Gene: Yasdni\_4 Start: 1663, Stop: 1911, Start Num: 27

Candidate Starts for Yasdni\_4:

(22, 1540), (23, 1567), (24, 1618), (Start: 27 @1663 has 54 MA's), (29, 1684), (43, 1852), (44, 1867),

Gene: Zainub\_6 Start: 2019, Stop: 2279, Start Num: 25

Candidate Starts for Zainub\_6:

(Start: 25 @2019 has 21 MA's), (Start: 30 @2079 has 2 MA's), (38, 2172),

Gene: Zemlya\_5 Start: 1664, Stop: 1915, Start Num: 27

Candidate Starts for Zemlya\_5:

(22, 1541), (23, 1568), (24, 1619), (Start: 27 @1664 has 54 MA's), (29, 1685), (43, 1853),

Gene: phiHau3\_4 Start: 1593, Stop: 1853, Start Num: 25

Candidate Starts for phiHau3\_4:

(Start: 25 @1593 has 21 MA's), (29, 1623), (Start: 30 @1653 has 2 MA's), (39, 1749), (40, 1755), (42, 1767), (44, 1806),