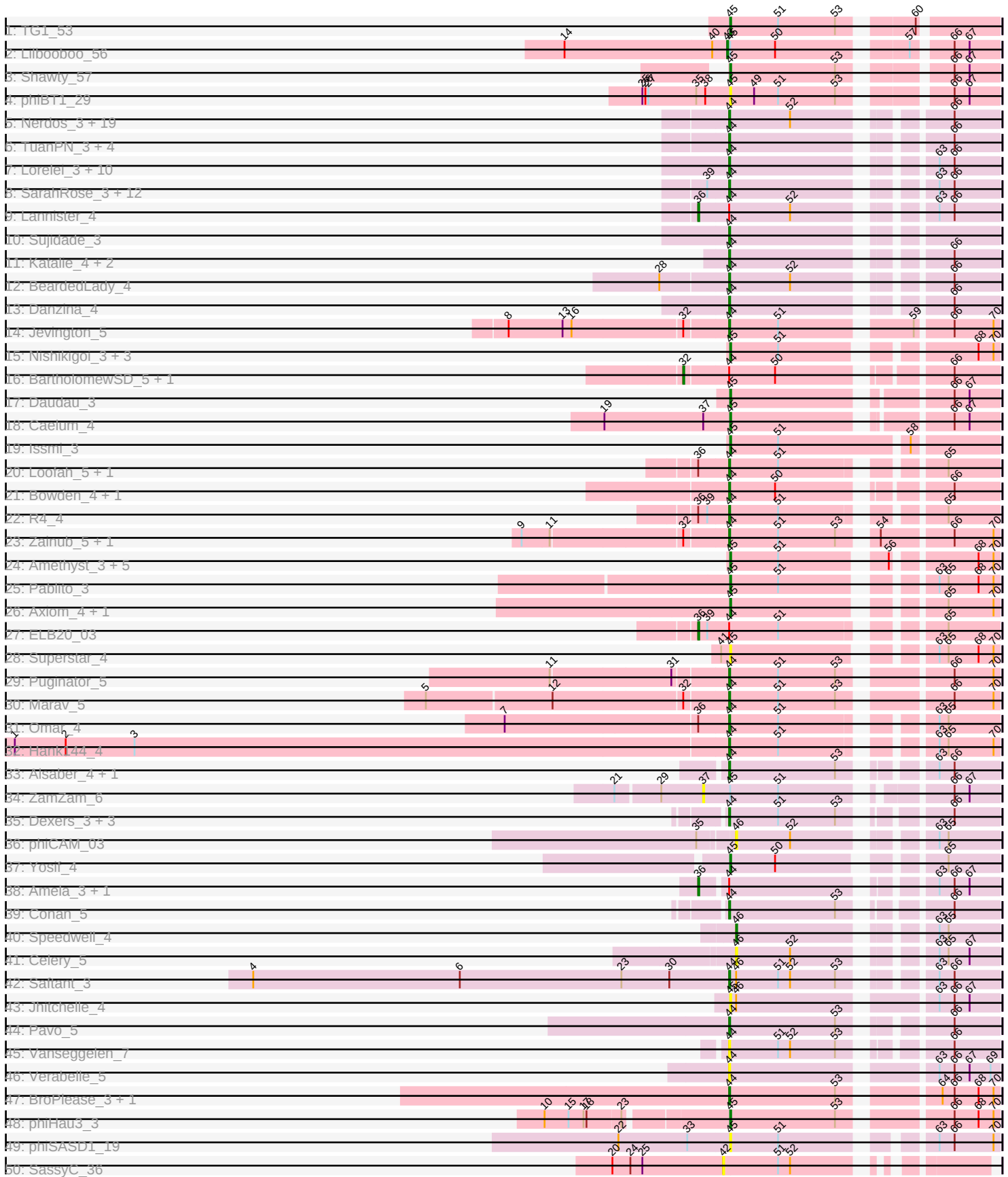
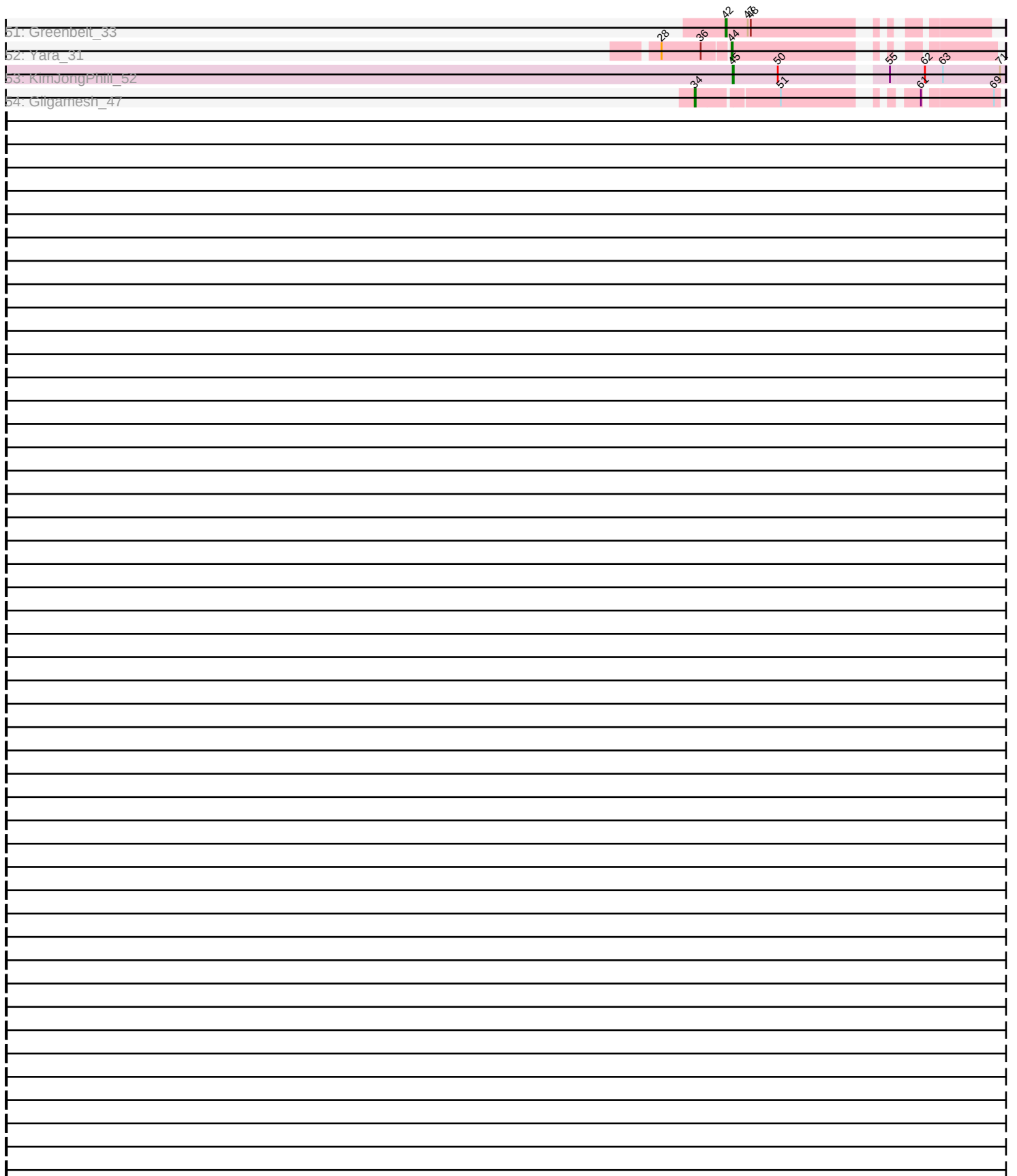






Note: Tracks are now grouped by subcluster and scaled. Switching in subcluster is indicated by changes in track color. Track scale is now set by default to display the region 30 bp upstream of start 1 to 30 bp downstream of the last possible start. If this default region is judged to be packed too tightly 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 276023 Report

This analysis was run 02/07/26 on database version 634.

WARNING: Pham size does not match number of genes in report. Either unphamerated genes have been added (by you) or starterator has removed genes due to invalid start codon.

Pham number 276023 has 120 members, 12 are drafts.

Phages represented in each track:

- Track 1 : TG1\_53
- Track 2 : Lilbooboo\_56
- Track 3 : Shawty\_57
- Track 4 : phiBT1\_29
- Track 5 : Nerdos\_3, SunsetPointe\_3, Oliynyk\_4, Leviticus\_3, Bovely\_3, BryanRecycles\_4, Phettuccine\_3, Aaronocolus\_3, Legacy\_3, Unstoppable\_3, EnochSoames\_4, Ozzie\_3, Indigo\_3, Hydra\_5, Eddasa\_4, Esperer\_3, Caliburn\_3, Jash\_4, Izzy\_4, Rusticus\_4
- Track 6 : TuanPN\_3, Yasdni\_3, Nanodon\_5, Maneekul\_3, Ejemplo\_3
- Track 7 : Lorelei\_3, Godpower\_4, Zemlya\_4, Nabi\_3, Celeste\_3, Dattran\_4, Brataylor\_4, Goby\_3, Lika\_3, Rana\_3, Toma\_3
- Track 8 : SarahRose\_3, Werner\_3, Chucky\_3, Triste\_3, OzzyJ\_4, Snorlax\_3, Asten\_3, TagePhighter\_4, Dwayne\_3, BarryBee\_5, Hippo\_3, Emaanora\_5, Whatever\_3
- Track 9 : Lannister\_4
- Track 10 : Sujidade\_3
- Track 11 : Katalie\_4, South40\_4, RedBear\_5
- Track 12 : BeardedLady\_4
- Track 13 : Danzina\_4
- Track 14 : Jevington\_5
- Track 15 : Nishikigoi\_3, Haizum\_3, Tefunt\_3, Andris\_3
- Track 16 : BartholomewSD\_5, Alvy\_5
- Track 17 : Daudau\_3
- Track 18 : Caelum\_4
- Track 19 : Issmi\_3
- Track 20 : Loofah\_5, Paedore\_4
- Track 21 : Bowden\_4, Thestral\_4
- Track 22 : R4\_4
- Track 23 : Zainub\_5, Paolo\_5
- Track 24 : Amethyst\_3, Diane\_3, SqueakyClean\_4, Animus\_4, Janus\_4, GirlDinner\_3
- Track 25 : Pablito\_3
- Track 26 : Axiom\_4, Triumph\_4

- Track 27 : ELB20\_03
- Track 28 : Superstar\_4
- Track 29 : Puginator\_5
- Track 30 : Marav\_5
- Track 31 : Omar\_4
- Track 32 : Hank144\_4
- Track 33 : Alsaber\_4, Sudan\_4
- Track 34 : ZamZam\_6
- Track 35 : Dexers\_3, Provolone\_5, Kaine\_4, ElGato\_5
- Track 36 : phiCAM\_03
- Track 37 : Yosif\_4
- Track 38 : Amela\_3, Verse\_3
- Track 39 : Conan\_5
- Track 40 : Speedwell\_4
- Track 41 : Celery\_5
- Track 42 : Saftant\_3
- Track 43 : Jhitchelle\_4
- Track 44 : Pavo\_5
- Track 45 : Vanseggelen\_7
- Track 46 : Verabelle\_5
- Track 47 : BroPlease\_3, GreenWeasel\_3
- Track 48 : phiHau3\_3
- Track 49 : phiSASD1\_19
- Track 50 : SassyC\_36
- Track 51 : Greenbelt\_33
- Track 52 : Yara\_31
- Track 53 : KimJongPhill\_52
- Track 54 : Gilgamesh\_47

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

The start number called the most often in the published annotations is 44, it was called in 77 of the 108 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

• Aaronocolus\_3, Alsaber\_4, Asten\_3, BarryBee\_5, BeardedLady\_4, Bovely\_3, Bowden\_4, Brataylor\_4, BroPlease\_3, BryanRecycles\_4, Caliburn\_3, Celeste\_3, Chucky\_3, Conan\_5, Danzina\_4, Dattran\_4, Dexers\_3, Dwayne\_3, Eddasa\_4, Ejemplo\_3, ElGato\_5, Emaanora\_5, EnochSoames\_4, Esperer\_3, Goby\_3, Godpower\_4, GreenWeasel\_3, Hank144\_4, Hippo\_3, Hydra\_5, Indigo\_3, Izzy\_4, Jash\_4, Jevington\_5, Kaine\_4, Katalie\_4, Legacy\_3, Leviticus\_3, Lika\_3, Loofah\_5, Lorelei\_3, Maneekul\_3, Marav\_5, Nabi\_3, Nanodon\_5, Nerdos\_3, Oliynyk\_4, Omar\_4, Ozzie\_3, OzzyJ\_4, Paedore\_4, Paolo\_5, Pavo\_5, Phettuccine\_3, Provolone\_5, Puginator\_5, R4\_4, Rana\_3, RedBear\_5, Rusticus\_4, Saftant\_3, SarahRose\_3, Snorlax\_3, South40\_4, Sudan\_4, Sujidade\_3, SunsetPointe\_3, TagePhighter\_4, Thestral\_4, Toma\_3, Triste\_3, TuanPN\_3, Unstoppable\_3, Vanseggelen\_7, Verabelle\_5, Werner\_3, Whatever\_3, Yara\_31, Yasdnil\_3, Zainub\_5, Zemlya\_4,

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

- Alvy\_5, Amela\_3, BartholomewSD\_5, ELB20\_03, Lannister\_4, Verse\_3,

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

- Amethyst\_3, Andris\_3, Animus\_4, Axiom\_4, Caelum\_4, Celery\_5, Daudau\_3, Diane\_3, Gilgamesh\_47, GirlDinner\_3, Greenbelt\_33, Haizum\_3, Issmi\_3, Janus\_4, Jhitchelle\_4, KimJongPhill\_52, Lilbooboo\_56, Nishikigoi\_3, Pablito\_3, SassyC\_36, Shawty\_57, Speedwell\_4, SqueakyClean\_4, Superstar\_4, TG1\_53, Tefunt\_3, Triumph\_4, Yosif\_4, ZamZam\_6, phiBT1\_29, phiCAM\_03, phiHau3\_3, phiSASD1\_19,

### Summary by start number:

Start 32:

- Found in 6 of 120 ( 5.0% ) of genes in pham
- Manual Annotations of this start: 2 of 108
- Called 33.3% of time when present
- Phage (with cluster) where this start called: Alvy\_5 (BD2), BartholomewSD\_5 (BD2),

Start 34:

- Found in 1 of 120 ( 0.8% ) of genes in pham
- Manual Annotations of this start: 1 of 108
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Gilgamesh\_47 (singleton),

Start 36:

- Found in 9 of 120 ( 7.5% ) of genes in pham
- Manual Annotations of this start: 4 of 108
- Called 44.4% of time when present
- Phage (with cluster) where this start called: Amela\_3 (BD3), ELB20\_03 (BD2), Lannister\_4 (BD1), Verse\_3 (BD3),

Start 37:

- Found in 2 of 120 ( 1.7% ) of genes in pham
- No Manual Annotations of this start.
- Called 50.0% of time when present
- Phage (with cluster) where this start called: ZamZam\_6 (BD3),

Start 42:

- Found in 2 of 120 ( 1.7% ) of genes in pham
- Manual Annotations of this start: 1 of 108
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Greenbelt\_33 (BN), SassyC\_36 (BN),

Start 43:

- Found in 1 of 120 ( 0.8% ) of genes in pham
- Manual Annotations of this start: 1 of 108
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Lilbooboo\_56 (BB1),

Start 44:

- Found in 87 of 120 ( 72.5% ) of genes in pham
- Manual Annotations of this start: 77 of 108
- Called 93.1% of time when present

- Phage (with cluster) where this start called: Aaronocolus\_3 (BD1), Alsaber\_4 (BD3), Asten\_3 (BD1), BarryBee\_5 (BD1), BeardedLady\_4 (BD1), Bovely\_3 (BD1), Bowden\_4 (BD2), Brataylor\_4 (BD1), BroPlease\_3 (BD4), BryanRecycles\_4 (BD1), Caliburn\_3 (BD1), Celeste\_3 (BD1), Chucky\_3 (BD1), Conan\_5 (BD3), Danzina\_4 (BD1), Dattran\_4 (BD1), Dexers\_3 (BD3), Dwayne\_3 (BD1), Eddasa\_4 (BD1), Ejemplo\_3 (BD1), ElGato\_5 (BD3), Emaanora\_5 (BD1), EnochSoames\_4 (BD1), Esperer\_3 (BD1), Goby\_3 (BD1), Godpower\_4 (BD1), GreenWeasel\_3 (BD4), Hank144\_4 (BD2), Hippo\_3 (BD1), Hydra\_5 (BD1), Indigo\_3 (BD1), Izzy\_4 (BD1), Jash\_4 (BD1), Jevington\_5 (BD2), Kaine\_4 (BD3), Katalie\_4 (BD1), Legacy\_3 (BD1), Leviticus\_3 (BD1), Lika\_3 (BD1), Loofah\_5 (BD2), Lorelei\_3 (BD1), Maneekul\_3 (BD1), Marav\_5 (BD2), Nabi\_3 (BD1), Nanodon\_5 (BD1), Nerdos\_3 (BD1), Oliynyk\_4 (BD1), Omar\_4 (BD2), Ozzie\_3 (BD1), OzzyJ\_4 (BD1), Paedore\_4 (BD2), Paolo\_5 (BD2), Pavo\_5 (BD3), Phettuccine\_3 (BD1), Provolone\_5 (BD3), Puginator\_5 (BD2), R4\_4 (BD2), Rana\_3 (BD1), RedBear\_5 (BD1), Rusticus\_4 (BD1), Saftant\_3 (BD3), SarahRose\_3 (BD1), Snorlax\_3 (BD1), South40\_4 (BD1), Sudan\_4 (BD3), Sujidade\_3 (BD1), SunsetPointe\_3 (BD1), TagePhighter\_4 (BD1), Thestral\_4 (BD2), Toma\_3 (BD1), Triste\_3 (BD1), TuanPN\_3 (BD1), Unstoppable\_3 (BD1), Vanseggelen\_7 (BD3), Verabelle\_5 (BD3), Werner\_3 (BD1), Whatever\_3 (BD1), Yara\_31 (BN), Yasdnii\_3 (BD1), Zainub\_5 (BD2), Zemlya\_4 (BD1),

Start 45:

- Found in 27 of 120 ( 22.5% ) of genes in pham
- Manual Annotations of this start: 21 of 108
- Called 92.6% of time when present
- Phage (with cluster) where this start called: Amethyst\_3 (BD2), Andris\_3 (BD2), Animus\_4 (BD2), Axiom\_4 (BD2), Caelum\_4 (BD2), Daudau\_3 (BD2), Diane\_3 (BD2), GirlDinner\_3 (BD2), Haizum\_3 (BD2), Issmi\_3 (BD2), Janus\_4 (BD2), Jhitchelle\_4 (BD3), KimJongPhill\_52 (BR), Nishikigoi\_3 (BD2), Pablito\_3 (BD2), Shawty\_57 (BB1), SqueakyClean\_4 (BD2), Superstar\_4 (BD2), TG1\_53 (BB1), Tefunt\_3 (BD2), Triumph\_4 (BD2), Yosif\_4 (BD3), phiBT1\_29 (BB1), phiHau3\_3 (BD4), phiSASD1\_19 (BJ),

Start 46:

- Found in 5 of 120 ( 4.2% ) of genes in pham
- Manual Annotations of this start: 1 of 108
- Called 60.0% of time when present
- Phage (with cluster) where this start called: Celery\_5 (BD3), Speedwell\_4 (BD3), phiCAM\_03 (BD3),

## Summary by clusters:

There are 9 clusters represented in this pham: singleton, BR, BN, BJ, BD4, BD1, BD3, BD2, BB1,

Info for manual annotations of cluster BB1:

- Start number 43 was manually annotated 1 time for cluster BB1.
- Start number 45 was manually annotated 2 times for cluster BB1.

Info for manual annotations of cluster BD1:

- Start number 36 was manually annotated 1 time for cluster BD1.
- Start number 44 was manually annotated 54 times for cluster BD1.

Info for manual annotations of cluster BD2:

- Start number 32 was manually annotated 2 times for cluster BD2.
- Start number 36 was manually annotated 1 time for cluster BD2.
- Start number 44 was manually annotated 12 times for cluster BD2.
- Start number 45 was manually annotated 16 times for cluster BD2.

Info for manual annotations of cluster BD3:

- Start number 36 was manually annotated 2 times for cluster BD3.
- Start number 44 was manually annotated 8 times for cluster BD3.
- Start number 45 was manually annotated 1 time for cluster BD3.
- Start number 46 was manually annotated 1 time for cluster BD3.

Info for manual annotations of cluster BD4:

- Start number 44 was manually annotated 2 times for cluster BD4.
- Start number 45 was manually annotated 1 time for cluster BD4.

Info for manual annotations of cluster BN:

- Start number 42 was manually annotated 1 time for cluster BN.
- Start number 44 was manually annotated 1 time for cluster BN.

Info for manual annotations of cluster BR:

- Start number 45 was manually annotated 1 time for cluster BR.

### **Gene Information:**

Gene: Aaronocolus\_3 Start: 1457, Stop: 1687, Start Num: 44

Candidate Starts for Aaronocolus\_3:

(Start: 44 @1457 has 77 MA's), (52, 1517), (66, 1643),

Gene: Alsaber\_4 Start: 1528, Stop: 1758, Start Num: 44

Candidate Starts for Alsaber\_4:

(Start: 44 @1528 has 77 MA's), (53, 1633), (63, 1699), (66, 1714),

Gene: Alvy\_5 Start: 1351, Stop: 1626, Start Num: 32

Candidate Starts for Alvy\_5:

(Start: 32 @1351 has 2 MA's), (Start: 44 @1393 has 77 MA's), (50, 1438), (66, 1582),

Gene: Amela\_3 Start: 1492, Stop: 1746, Start Num: 36

Candidate Starts for Amela\_3:

(Start: 36 @1492 has 4 MA's), (Start: 44 @1516 has 77 MA's), (63, 1687), (66, 1702), (67, 1717),

Gene: Amethyst\_3 Start: 1195, Stop: 1425, Start Num: 45

Candidate Starts for Amethyst\_3:

(Start: 45 @1195 has 21 MA's), (51, 1243), (56, 1333), (68, 1405), (70, 1420),

Gene: Andris\_3 Start: 1226, Stop: 1456, Start Num: 45

Candidate Starts for Andris\_3:

(Start: 45 @1226 has 21 MA's), (51, 1274), (68, 1436), (70, 1451),

Gene: Animus\_4 Start: 1573, Stop: 1803, Start Num: 45

Candidate Starts for Animus\_4:

(Start: 45 @1573 has 21 MA's), (51, 1621), (56, 1711), (68, 1783), (70, 1798),

Gene: Asten\_3 Start: 1429, Stop: 1659, Start Num: 44

Candidate Starts for Asten\_3:

(39, 1408), (Start: 44 @1429 has 77 MA's), (63, 1600), (66, 1615),

Gene: Axiom\_4 Start: 1225, Stop: 1455, Start Num: 45

Candidate Starts for Axiom\_4:

(Start: 45 @1225 has 21 MA's), (65, 1405), (70, 1450),

Gene: BarryBee\_5 Start: 1429, Stop: 1659, Start Num: 44

Candidate Starts for BarryBee\_5:

(39, 1408), (Start: 44 @1429 has 77 MA's), (63, 1600), (66, 1615),

Gene: BartholomewSD\_5 Start: 1351, Stop: 1626, Start Num: 32

Candidate Starts for BartholomewSD\_5:

(Start: 32 @1351 has 2 MA's), (Start: 44 @1393 has 77 MA's), (50, 1438), (66, 1582),

Gene: BeardedLady\_4 Start: 1704, Stop: 1934, Start Num: 44

Candidate Starts for BeardedLady\_4:

(28, 1638), (Start: 44 @1704 has 77 MA's), (52, 1764), (66, 1890),

Gene: Bovely\_3 Start: 1463, Stop: 1693, Start Num: 44

Candidate Starts for Bovely\_3:

(Start: 44 @1463 has 77 MA's), (52, 1523), (66, 1649),

Gene: Bowden\_4 Start: 1295, Stop: 1528, Start Num: 44

Candidate Starts for Bowden\_4:

(Start: 44 @1295 has 77 MA's), (50, 1340), (66, 1484),

Gene: Brataylor\_4 Start: 1430, Stop: 1660, Start Num: 44

Candidate Starts for Brataylor\_4:

(Start: 44 @1430 has 77 MA's), (63, 1601), (66, 1616),

Gene: BroPlease\_3 Start: 1345, Stop: 1587, Start Num: 44

Candidate Starts for BroPlease\_3:

(Start: 44 @1345 has 77 MA's), (53, 1450), (64, 1531), (66, 1543), (68, 1567), (70, 1582),

Gene: BryanRecycles\_4 Start: 1618, Stop: 1848, Start Num: 44

Candidate Starts for BryanRecycles\_4:

(Start: 44 @1618 has 77 MA's), (52, 1678), (66, 1804),

Gene: Caelum\_4 Start: 1143, Stop: 1376, Start Num: 45

Candidate Starts for Caelum\_4:

(19, 1017), (37, 1116), (Start: 45 @1143 has 21 MA's), (66, 1332), (67, 1347),

Gene: Caliburn\_3 Start: 1437, Stop: 1667, Start Num: 44

Candidate Starts for Caliburn\_3:

(Start: 44 @1437 has 77 MA's), (52, 1497), (66, 1623),

Gene: Celery\_5 Start: 1435, Stop: 1659, Start Num: 46

Candidate Starts for Celery\_5:

(Start: 46 @1435 has 1 MA's), (52, 1489), (63, 1600), (65, 1609), (67, 1630),

Gene: Celeste\_3 Start: 1430, Stop: 1660, Start Num: 44

Candidate Starts for Celeste\_3:

(Start: 44 @1430 has 77 MA's), (63, 1601), (66, 1616),

Gene: Chucky\_3 Start: 1430, Stop: 1660, Start Num: 44

Candidate Starts for Chucky\_3:

(39, 1409), (Start: 44 @1430 has 77 MA's), (63, 1601), (66, 1616),

Gene: Conan\_5 Start: 1533, Stop: 1763, Start Num: 44

Candidate Starts for Conan\_5:

(Start: 44 @1533 has 77 MA's), (53, 1638), (66, 1719),

Gene: Danzina\_4 Start: 1629, Stop: 1859, Start Num: 44

Candidate Starts for Danzina\_4:

(Start: 44 @1629 has 77 MA's), (66, 1815),

Gene: Dattran\_4 Start: 1428, Stop: 1658, Start Num: 44

Candidate Starts for Dattran\_4:

(Start: 44 @1428 has 77 MA's), (63, 1599), (66, 1614),

Gene: Daudau\_3 Start: 1197, Stop: 1433, Start Num: 45

Candidate Starts for Daudau\_3:

(Start: 45 @1197 has 21 MA's), (66, 1389), (67, 1404),

Gene: Dexers\_3 Start: 1526, Stop: 1756, Start Num: 44

Candidate Starts for Dexers\_3:

(Start: 44 @1526 has 77 MA's), (51, 1574), (53, 1631), (66, 1712),

Gene: Diane\_3 Start: 1197, Stop: 1427, Start Num: 45

Candidate Starts for Diane\_3:

(Start: 45 @1197 has 21 MA's), (51, 1245), (56, 1335), (68, 1407), (70, 1422),

Gene: Dwayne\_3 Start: 1430, Stop: 1660, Start Num: 44

Candidate Starts for Dwayne\_3:

(39, 1409), (Start: 44 @1430 has 77 MA's), (63, 1601), (66, 1616),

Gene: ELB20\_03 Start: 1370, Stop: 1630, Start Num: 36

Candidate Starts for ELB20\_03:

(Start: 36 @1370 has 4 MA's), (39, 1379), (Start: 44 @1400 has 77 MA's), (51, 1448), (65, 1580),

Gene: Eddasa\_4 Start: 1618, Stop: 1848, Start Num: 44

Candidate Starts for Eddasa\_4:

(Start: 44 @1618 has 77 MA's), (52, 1678), (66, 1804),

Gene: Ejemplo\_3 Start: 1431, Stop: 1661, Start Num: 44

Candidate Starts for Ejemplo\_3:

(Start: 44 @1431 has 77 MA's), (66, 1617),

Gene: ElGato\_5 Start: 1536, Stop: 1766, Start Num: 44

Candidate Starts for ElGato\_5:

(Start: 44 @1536 has 77 MA's), (51, 1584), (53, 1641), (66, 1722),

Gene: Emaanora\_5 Start: 1429, Stop: 1659, Start Num: 44  
Candidate Starts for Emaanora\_5:  
(39, 1408), (Start: 44 @1429 has 77 MA's), (63, 1600), (66, 1615),

Gene: EnochSoames\_4 Start: 1614, Stop: 1844, Start Num: 44  
Candidate Starts for EnochSoames\_4:  
(Start: 44 @1614 has 77 MA's), (52, 1674), (66, 1800),

Gene: Esperer\_3 Start: 1457, Stop: 1687, Start Num: 44  
Candidate Starts for Esperer\_3:  
(Start: 44 @1457 has 77 MA's), (52, 1517), (66, 1643),

Gene: Gilgamesh\_47 Start: 31594, Stop: 31839, Start Num: 34  
Candidate Starts for Gilgamesh\_47:  
(Start: 34 @31594 has 1 MA's), (51, 31669), (61, 31771), (69, 31834),

Gene: GirlDinner\_3 Start: 1236, Stop: 1466, Start Num: 45  
Candidate Starts for GirlDinner\_3:  
(Start: 45 @1236 has 21 MA's), (51, 1284), (56, 1374), (68, 1446), (70, 1461),

Gene: Goby\_3 Start: 1428, Stop: 1658, Start Num: 44  
Candidate Starts for Goby\_3:  
(Start: 44 @1428 has 77 MA's), (63, 1599), (66, 1614),

Gene: Godpower\_4 Start: 1431, Stop: 1661, Start Num: 44  
Candidate Starts for Godpower\_4:  
(Start: 44 @1431 has 77 MA's), (63, 1602), (66, 1617),

Gene: GreenWeasel\_3 Start: 1345, Stop: 1587, Start Num: 44  
Candidate Starts for GreenWeasel\_3:  
(Start: 44 @1345 has 77 MA's), (53, 1450), (64, 1531), (66, 1543), (68, 1567), (70, 1582),

Gene: Greenbelt\_33 Start: 24049, Stop: 24261, Start Num: 42  
Candidate Starts for Greenbelt\_33:  
(Start: 42 @24049 has 1 MA's), (47, 24070), (48, 24073),

Gene: Haizum\_3 Start: 1226, Stop: 1456, Start Num: 45  
Candidate Starts for Haizum\_3:  
(Start: 45 @1226 has 21 MA's), (51, 1274), (68, 1436), (70, 1451),

Gene: Hank144\_4 Start: 1519, Stop: 1749, Start Num: 44  
Candidate Starts for Hank144\_4:  
(1, 808), (2, 859), (3, 928), (Start: 44 @1519 has 77 MA's), (51, 1567), (63, 1690), (65, 1699), (70, 1744),

Gene: Hippo\_3 Start: 1429, Stop: 1659, Start Num: 44  
Candidate Starts for Hippo\_3:  
(39, 1408), (Start: 44 @1429 has 77 MA's), (63, 1600), (66, 1615),

Gene: Hydra\_5 Start: 1994, Stop: 2224, Start Num: 44  
Candidate Starts for Hydra\_5:  
(Start: 44 @1994 has 77 MA's), (52, 2054), (66, 2180),

Gene: Indigo\_3 Start: 1457, Stop: 1687, Start Num: 44  
Candidate Starts for Indigo\_3:  
(Start: 44 @1457 has 77 MA's), (52, 1517), (66, 1643),

Gene: Issmi\_3 Start: 1100, Stop: 1351, Start Num: 45  
Candidate Starts for Issmi\_3:  
(Start: 45 @1100 has 21 MA's), (51, 1148), (58, 1271),

Gene: Izzy\_4 Start: 1665, Stop: 1895, Start Num: 44  
Candidate Starts for Izzy\_4:  
(Start: 44 @1665 has 77 MA's), (52, 1725), (66, 1851),

Gene: Janus\_4 Start: 1573, Stop: 1803, Start Num: 45  
Candidate Starts for Janus\_4:  
(Start: 45 @1573 has 21 MA's), (51, 1621), (56, 1711), (68, 1783), (70, 1798),

Gene: Jash\_4 Start: 1618, Stop: 1848, Start Num: 44  
Candidate Starts for Jash\_4:  
(Start: 44 @1618 has 77 MA's), (52, 1678), (66, 1804),

Gene: Jevington\_5 Start: 1780, Stop: 2022, Start Num: 44  
Candidate Starts for Jevington\_5:  
(8, 1567), (13, 1621), (16, 1630), (Start: 32 @1738 has 2 MA's), (Start: 44 @1780 has 77 MA's), (51, 1828), (59, 1945), (66, 1978), (70, 2017),

Gene: Jhitchelle\_4 Start: 1439, Stop: 1681, Start Num: 45  
Candidate Starts for Jhitchelle\_4:  
(Start: 45 @1439 has 21 MA's), (Start: 46 @1445 has 1 MA's), (63, 1622), (66, 1637), (67, 1652),

Gene: Kaine\_4 Start: 1526, Stop: 1756, Start Num: 44  
Candidate Starts for Kaine\_4:  
(Start: 44 @1526 has 77 MA's), (51, 1574), (53, 1631), (66, 1712),

Gene: Katalie\_4 Start: 1699, Stop: 1929, Start Num: 44  
Candidate Starts for Katalie\_4:  
(Start: 44 @1699 has 77 MA's), (66, 1885),

Gene: KimJongPhill\_52 Start: 40917, Stop: 40666, Start Num: 45  
Candidate Starts for KimJongPhill\_52:  
(Start: 45 @40917 has 21 MA's), (50, 40872), (55, 40779), (62, 40746), (63, 40728), (71, 40671),

Gene: Lannister\_4 Start: 1409, Stop: 1669, Start Num: 36  
Candidate Starts for Lannister\_4:  
(Start: 36 @1409 has 4 MA's), (Start: 44 @1439 has 77 MA's), (52, 1499), (63, 1610), (66, 1625),

Gene: Legacy\_3 Start: 1437, Stop: 1667, Start Num: 44  
Candidate Starts for Legacy\_3:  
(Start: 44 @1437 has 77 MA's), (52, 1497), (66, 1623),

Gene: Leviticus\_3 Start: 1457, Stop: 1687, Start Num: 44  
Candidate Starts for Leviticus\_3:  
(Start: 44 @1457 has 77 MA's), (52, 1517), (66, 1643),

Gene: Lika\_3 Start: 1432, Stop: 1662, Start Num: 44  
Candidate Starts for Lika\_3:  
(Start: 44 @1432 has 77 MA's), (63, 1603), (66, 1618),

Gene: Lilbooboo\_56 Start: 40542, Stop: 40781, Start Num: 43  
Candidate Starts for Lilbooboo\_56:  
(14, 40380), (40, 40527), (Start: 43 @40542 has 1 MA's), (Start: 45 @40545 has 21 MA's), (50, 40590),  
(57, 40704), (66, 40737), (67, 40752),

Gene: Loofah\_5 Start: 1456, Stop: 1686, Start Num: 44  
Candidate Starts for Loofah\_5:  
(Start: 36 @1426 has 4 MA's), (Start: 44 @1456 has 77 MA's), (51, 1504), (65, 1636),

Gene: Lorelei\_3 Start: 1430, Stop: 1660, Start Num: 44  
Candidate Starts for Lorelei\_3:  
(Start: 44 @1430 has 77 MA's), (63, 1601), (66, 1616),

Gene: Maneekul\_3 Start: 1430, Stop: 1660, Start Num: 44  
Candidate Starts for Maneekul\_3:  
(Start: 44 @1430 has 77 MA's), (66, 1616),

Gene: Marav\_5 Start: 1778, Stop: 2020, Start Num: 44  
Candidate Starts for Marav\_5:  
(5, 1487), (12, 1610), (Start: 32 @1736 has 2 MA's), (Start: 44 @1778 has 77 MA's), (51, 1826), (53, 1883), (66, 1976), (70, 2015),

Gene: Nabi\_3 Start: 1430, Stop: 1660, Start Num: 44  
Candidate Starts for Nabi\_3:  
(Start: 44 @1430 has 77 MA's), (63, 1601), (66, 1616),

Gene: Nanodon\_5 Start: 1629, Stop: 1859, Start Num: 44  
Candidate Starts for Nanodon\_5:  
(Start: 44 @1629 has 77 MA's), (66, 1815),

Gene: Nerdos\_3 Start: 1457, Stop: 1687, Start Num: 44  
Candidate Starts for Nerdos\_3:  
(Start: 44 @1457 has 77 MA's), (52, 1517), (66, 1643),

Gene: Nishikigoi\_3 Start: 1226, Stop: 1456, Start Num: 45  
Candidate Starts for Nishikigoi\_3:  
(Start: 45 @1226 has 21 MA's), (51, 1274), (68, 1436), (70, 1451),

Gene: Oliynyk\_4 Start: 1618, Stop: 1848, Start Num: 44  
Candidate Starts for Oliynyk\_4:  
(Start: 44 @1618 has 77 MA's), (52, 1678), (66, 1804),

Gene: Omar\_4 Start: 1453, Stop: 1683, Start Num: 44  
Candidate Starts for Omar\_4:  
(7, 1234), (Start: 36 @1423 has 4 MA's), (Start: 44 @1453 has 77 MA's), (51, 1501), (63, 1624), (65, 1633),

Gene: Ozzie\_3 Start: 1437, Stop: 1667, Start Num: 44  
Candidate Starts for Ozzie\_3:

(Start: 44 @1437 has 77 MA's), (52, 1497), (66, 1623),

Gene: OzzyJ\_4 Start: 1430, Stop: 1660, Start Num: 44

Candidate Starts for OzzyJ\_4:

(39, 1409), (Start: 44 @1430 has 77 MA's), (63, 1601), (66, 1616),

Gene: Pablito\_3 Start: 1262, Stop: 1492, Start Num: 45

Candidate Starts for Pablito\_3:

(Start: 45 @1262 has 21 MA's), (51, 1310), (63, 1433), (65, 1442), (68, 1472), (70, 1487),

Gene: Paedore\_4 Start: 1456, Stop: 1686, Start Num: 44

Candidate Starts for Paedore\_4:

(Start: 36 @1426 has 4 MA's), (Start: 44 @1456 has 77 MA's), (51, 1504), (65, 1636),

Gene: Paolo\_5 Start: 1834, Stop: 2076, Start Num: 44

Candidate Starts for Paolo\_5:

(9, 1639), (11, 1666), (Start: 32 @1792 has 2 MA's), (Start: 44 @1834 has 77 MA's), (51, 1882), (53, 1939), (54, 1966), (66, 2032), (70, 2071),

Gene: Pavo\_5 Start: 1806, Stop: 2036, Start Num: 44

Candidate Starts for Pavo\_5:

(Start: 44 @1806 has 77 MA's), (53, 1911), (66, 1992),

Gene: Phettuccine\_3 Start: 1457, Stop: 1687, Start Num: 44

Candidate Starts for Phettuccine\_3:

(Start: 44 @1457 has 77 MA's), (52, 1517), (66, 1643),

Gene: Provolone\_5 Start: 1536, Stop: 1766, Start Num: 44

Candidate Starts for Provolone\_5:

(Start: 44 @1536 has 77 MA's), (51, 1584), (53, 1641), (66, 1722),

Gene: Puginator\_5 Start: 1780, Stop: 2022, Start Num: 44

Candidate Starts for Puginator\_5:

(11, 1612), (31, 1729), (Start: 44 @1780 has 77 MA's), (51, 1828), (53, 1885), (66, 1978), (70, 2017),

Gene: R4\_4 Start: 1411, Stop: 1641, Start Num: 44

Candidate Starts for R4\_4:

(Start: 36 @1381 has 4 MA's), (39, 1390), (Start: 44 @1411 has 77 MA's), (51, 1459), (65, 1591),

Gene: Rana\_3 Start: 1430, Stop: 1660, Start Num: 44

Candidate Starts for Rana\_3:

(Start: 44 @1430 has 77 MA's), (63, 1601), (66, 1616),

Gene: RedBear\_5 Start: 1699, Stop: 1929, Start Num: 44

Candidate Starts for RedBear\_5:

(Start: 44 @1699 has 77 MA's), (66, 1885),

Gene: Rusticus\_4 Start: 1618, Stop: 1848, Start Num: 44

Candidate Starts for Rusticus\_4:

(Start: 44 @1618 has 77 MA's), (52, 1678), (66, 1804),

Gene: Saftant\_3 Start: 1474, Stop: 1704, Start Num: 44

Candidate Starts for Saftant\_3:

(4, 997), (6, 1204), (23, 1366), (30, 1414), (Start: 44 @1474 has 77 MA's), (Start: 46 @1480 has 1 MA's), (51, 1522), (52, 1534), (53, 1579), (63, 1645), (66, 1660),

Gene: SarahRose\_3 Start: 1429, Stop: 1659, Start Num: 44

Candidate Starts for SarahRose\_3:

(39, 1408), (Start: 44 @1429 has 77 MA's), (63, 1600), (66, 1615),

Gene: SassyC\_36 Start: 27918, Stop: 28133, Start Num: 42

Candidate Starts for SassyC\_36:

(20, 27807), (24, 27825), (25, 27837), (Start: 42 @27918 has 1 MA's), (51, 27972), (52, 27984),

Gene: Shawty\_57 Start: 40001, Stop: 40237, Start Num: 45

Candidate Starts for Shawty\_57:

(Start: 45 @40001 has 21 MA's), (53, 40106), (66, 40193), (67, 40208),

Gene: Snorlax\_3 Start: 1429, Stop: 1659, Start Num: 44

Candidate Starts for Snorlax\_3:

(39, 1408), (Start: 44 @1429 has 77 MA's), (63, 1600), (66, 1615),

Gene: South40\_4 Start: 1699, Stop: 1929, Start Num: 44

Candidate Starts for South40\_4:

(Start: 44 @1699 has 77 MA's), (66, 1885),

Gene: Speedwell\_4 Start: 1418, Stop: 1642, Start Num: 46

Candidate Starts for Speedwell\_4:

(Start: 46 @1418 has 1 MA's), (63, 1583), (65, 1592),

Gene: SqueakyClean\_4 Start: 1499, Stop: 1729, Start Num: 45

Candidate Starts for SqueakyClean\_4:

(Start: 45 @1499 has 21 MA's), (51, 1547), (56, 1637), (68, 1709), (70, 1724),

Gene: Sudan\_4 Start: 1530, Stop: 1760, Start Num: 44

Candidate Starts for Sudan\_4:

(Start: 44 @1530 has 77 MA's), (53, 1635), (63, 1701), (66, 1716),

Gene: Sujidade\_3 Start: 1428, Stop: 1658, Start Num: 44

Candidate Starts for Sujidade\_3:

(Start: 44 @1428 has 77 MA's),

Gene: SunsetPointe\_3 Start: 1456, Stop: 1686, Start Num: 44

Candidate Starts for SunsetPointe\_3:

(Start: 44 @1456 has 77 MA's), (52, 1516), (66, 1642),

Gene: Superstar\_4 Start: 1632, Stop: 1862, Start Num: 45

Candidate Starts for Superstar\_4:

(41, 1623), (Start: 45 @1632 has 21 MA's), (63, 1803), (65, 1812), (68, 1842), (70, 1857),

Gene: TG1\_53 Start: 39763, Stop: 39999, Start Num: 45

Candidate Starts for TG1\_53:

(Start: 45 @39763 has 21 MA's), (51, 39811), (53, 39868), (60, 39928),

Gene: TagePhighter\_4 Start: 1429, Stop: 1659, Start Num: 44

Candidate Starts for TagePhighter\_4:

(39, 1408), (Start: 44 @1429 has 77 MA's), (63, 1600), (66, 1615),

Gene: Tefunt\_3 Start: 1226, Stop: 1456, Start Num: 45

Candidate Starts for Tefunt\_3:

(Start: 45 @1226 has 21 MA's), (51, 1274), (68, 1436), (70, 1451),

Gene: Thestral\_4 Start: 1295, Stop: 1528, Start Num: 44

Candidate Starts for Thestral\_4:

(Start: 44 @1295 has 77 MA's), (50, 1340), (66, 1484),

Gene: Toma\_3 Start: 1428, Stop: 1658, Start Num: 44

Candidate Starts for Toma\_3:

(Start: 44 @1428 has 77 MA's), (63, 1599), (66, 1614),

Gene: Triste\_3 Start: 1430, Stop: 1660, Start Num: 44

Candidate Starts for Triste\_3:

(39, 1409), (Start: 44 @1430 has 77 MA's), (63, 1601), (66, 1616),

Gene: Triumph\_4 Start: 1225, Stop: 1455, Start Num: 45

Candidate Starts for Triumph\_4:

(Start: 45 @1225 has 21 MA's), (65, 1405), (70, 1450),

Gene: TuanPN\_3 Start: 1431, Stop: 1661, Start Num: 44

Candidate Starts for TuanPN\_3:

(Start: 44 @1431 has 77 MA's), (66, 1617),

Gene: Unstoppable\_3 Start: 1457, Stop: 1687, Start Num: 44

Candidate Starts for Unstoppable\_3:

(Start: 44 @1457 has 77 MA's), (52, 1517), (66, 1643),

Gene: Vanseggelen\_7 Start: 1429, Stop: 1659, Start Num: 44

Candidate Starts for Vanseggelen\_7:

(Start: 44 @1429 has 77 MA's), (51, 1477), (52, 1489), (53, 1534), (66, 1615),

Gene: Verabelle\_5 Start: 1784, Stop: 2026, Start Num: 44

Candidate Starts for Verabelle\_5:

(Start: 44 @1784 has 77 MA's), (63, 1967), (66, 1982), (67, 1997), (69, 2018),

Gene: Verse\_3 Start: 1486, Stop: 1740, Start Num: 36

Candidate Starts for Verse\_3:

(Start: 36 @1486 has 4 MA's), (Start: 44 @1510 has 77 MA's), (63, 1681), (66, 1696), (67, 1711),

Gene: Werner\_3 Start: 1430, Stop: 1660, Start Num: 44

Candidate Starts for Werner\_3:

(39, 1409), (Start: 44 @1430 has 77 MA's), (63, 1601), (66, 1616),

Gene: Whatever\_3 Start: 1430, Stop: 1660, Start Num: 44

Candidate Starts for Whatever\_3:

(39, 1409), (Start: 44 @1430 has 77 MA's), (63, 1601), (66, 1616),

Gene: Yara\_31 Start: 26555, Stop: 26767, Start Num: 44

Candidate Starts for Yara\_31:

(28, 26492), (Start: 36 @26531 has 4 MA's), (Start: 44 @26555 has 77 MA's),

Gene: Yasdnil\_3 Start: 1427, Stop: 1657, Start Num: 44

Candidate Starts for Yasdnil\_3:

(Start: 44 @1427 has 77 MA's), (66, 1613),

Gene: Yosif\_4 Start: 1421, Stop: 1651, Start Num: 45

Candidate Starts for Yosif\_4:

(Start: 45 @1421 has 21 MA's), (50, 1466), (65, 1601),

Gene: Zainub\_5 Start: 1780, Stop: 2022, Start Num: 44

Candidate Starts for Zainub\_5:

(9, 1585), (11, 1612), (Start: 32 @1738 has 2 MA's), (Start: 44 @1780 has 77 MA's), (51, 1828), (53, 1885), (54, 1912), (66, 1978), (70, 2017),

Gene: ZamZam\_6 Start: 1416, Stop: 1673, Start Num: 37

Candidate Starts for ZamZam\_6:

(21, 1332), (29, 1374), (37, 1416), (Start: 45 @1443 has 21 MA's), (51, 1491), (66, 1629), (67, 1644),

Gene: Zemlya\_4 Start: 1428, Stop: 1658, Start Num: 44

Candidate Starts for Zemlya\_4:

(Start: 44 @1428 has 77 MA's), (63, 1599), (66, 1614),

Gene: phiBT1\_29 Start: 41116, Stop: 41352, Start Num: 45

Candidate Starts for phiBT1\_29:

(25, 41029), (26, 41032), (27, 41035), (35, 41083), (38, 41092), (Start: 45 @41116 has 21 MA's), (49, 41140), (51, 41164), (53, 41221), (66, 41308), (67, 41323),

Gene: phiCAM\_03 Start: 1464, Stop: 1688, Start Num: 46

Candidate Starts for phiCAM\_03:

(35, 1431), (Start: 46 @1464 has 1 MA's), (52, 1518), (63, 1629), (65, 1638),

Gene: phiHau3\_3 Start: 1271, Stop: 1513, Start Num: 45

Candidate Starts for phiHau3\_3:

(10, 1100), (15, 1124), (17, 1139), (18, 1142), (23, 1175), (Start: 45 @1271 has 21 MA's), (53, 1376), (66, 1469), (68, 1493), (70, 1508),

Gene: phiSASD1\_19 Start: 36222, Stop: 36452, Start Num: 45

Candidate Starts for phiSASD1\_19:

(22, 36111), (33, 36180), (Start: 45 @36222 has 21 MA's), (51, 36270), (63, 36393), (66, 36408), (70, 36447),