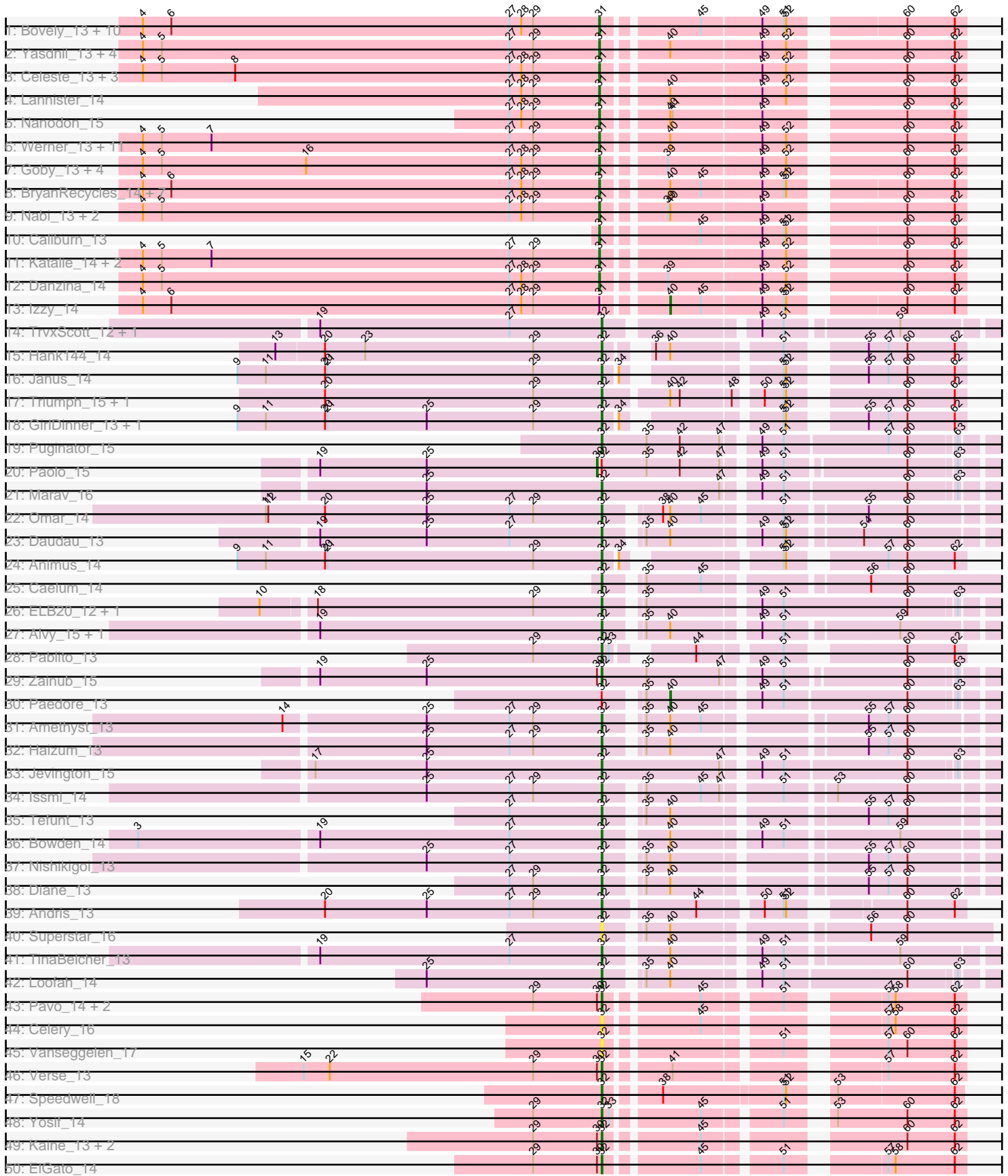
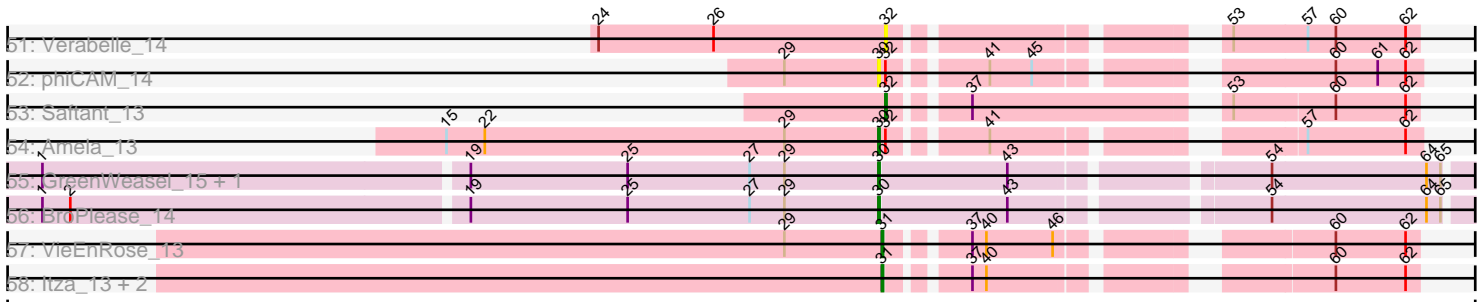


# Pham 200110



Pham 200110



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 200110 Report

This analysis was run 01/18/25 on database version 583.

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 200110 has 113 members, 7 are drafts.

Phages represented in each track:

- Track 1 : Bovely\_13, Esperer\_13, SunsetPointe\_13, Indigo\_13, Nerdos\_13, Hydra\_15, Leviticus\_13, Unstoppable\_13, Legacy\_13, Phettuccine\_13, Aaronocolus\_13
- Track 2 : Yasdnil\_13, Chucky\_13, TuanPN\_13, Maneekul\_13, Ejemplo\_13
- Track 3 : Celeste\_13, Dattran\_14, Brataylor\_14, Zemlya\_14
- Track 4 : Lannister\_14
- Track 5 : Nanodon\_15
- Track 6 : Werner\_13, Whatever\_13, OzzyJ\_14, Hippo\_13, Snorlax\_13, SarahRose\_13, BarryBee\_15, Emaanora\_15, TagePghter\_14, Asten\_13, Dwayne\_13, Triste\_13
- Track 7 : Goby\_13, Godpower\_14, Sujidade\_14, Lika\_13, Toma\_13
- Track 8 : BryanRecycles\_14, Oliynyk\_14, Rusticus\_14, Eddasa\_14, Ozzie\_13, Jash\_14, EnochSoames\_14, BeardedLady\_14
- Track 9 : Nabi\_13, Lorelei\_13, Rana\_13
- Track 10 : Caliburn\_13
- Track 11 : Katalie\_14, RedBear\_15, South40\_14
- Track 12 : Danzina\_14
- Track 13 : Izzy\_14
- Track 14 : TrvxScott\_12, Thestral\_14
- Track 15 : Hank144\_14
- Track 16 : Janus\_14
- Track 17 : Triumph\_15, Axiom\_14
- Track 18 : GirlDinner\_13, SqueakyClean\_14
- Track 19 : Puginator\_15
- Track 20 : Paolo\_15
- Track 21 : Marav\_16
- Track 22 : Omar\_14
- Track 23 : Daudau\_13
- Track 24 : Animus\_14
- Track 25 : Caelum\_14
- Track 26 : ELB20\_12, R4\_13
- Track 27 : Alvy\_15, BartholomewSD\_15
- Track 28 : Pablito\_13

- Track 29 : Zainub\_15
- Track 30 : Paedore\_13
- Track 31 : Amethyst\_13
- Track 32 : Haizum\_13
- Track 33 : Jevington\_15
- Track 34 : Issmi\_14
- Track 35 : Tefunt\_13
- Track 36 : Bowden\_14
- Track 37 : Nishikigoi\_13
- Track 38 : Diane\_13
- Track 39 : Andris\_13
- Track 40 : Superstar\_16
- Track 41 : TinaBelcher\_13
- Track 42 : Loofah\_14
- Track 43 : Pavo\_14, Conan\_14, Provolone\_14
- Track 44 : Celery\_16
- Track 45 : Vanseggelen\_17
- Track 46 : Verse\_13
- Track 47 : Speedwell\_18
- Track 48 : Yosif\_14
- Track 49 : Kaine\_13, Alsaber\_14, Dexers\_12
- Track 50 : ElGato\_14
- Track 51 : Verabelle\_14
- Track 52 : phiCAM\_14
- Track 53 : Saftant\_13
- Track 54 : Amela\_13
- Track 55 : GreenWeasel\_15, phiHau3\_15
- Track 56 : BroPlease\_14
- Track 57 : VieEnRose\_13
- Track 58 : Itza\_13, Celia\_13, Urza\_13

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

The start number called the most often in the published annotations is 31, it was called in 58 of the 106 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Aaronocolus\_13, Asten\_13, BarryBee\_15, BeardedLady\_14, Bovely\_13, Brataylor\_14, BryanRecycles\_14, Caliburn\_13, Celeste\_13, Celia\_13, Chucky\_13, Danzina\_14, Dattran\_14, Dwayne\_13, Eddasa\_14, Ejemplo\_13, Emaanora\_15, EnochSoames\_14, Esperer\_13, Goby\_13, Godpower\_14, Hippo\_13, Hydra\_15, Indigo\_13, Itza\_13, Jash\_14, Katalie\_14, Lannister\_14, Legacy\_13, Leviticus\_13, Lika\_13, Lorelei\_13, Maneekul\_13, Nabi\_13, Nanodon\_15, Nerdos\_13, Oliynyk\_14, Ozzie\_13, OzzyJ\_14, Phettuccine\_13, Rana\_13, RedBear\_15, Rusticus\_14, SarahRose\_13, Snorlax\_13, South40\_14, Sujidade\_14, SunsetPointe\_13, TagePhighter\_14, Toma\_13, Triste\_13, TuanPN\_13, Unstoppable\_13, Urza\_13, VieEnRose\_13, Werner\_13, Whatever\_13, Yasdnil\_13, Zemlya\_14,

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

- Izzy\_14,

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

- Alsaber\_14, Alvy\_15, Amela\_13, Amethyst\_13, Andris\_13, Animus\_14, Axiom\_14, BartholomewSD\_15, Bowden\_14, BroPlease\_14, Caelum\_14, Celery\_16, Conan\_14, Daudau\_13, Dexers\_12, Diane\_13, ELB20\_12, ElGato\_14, GirlDinner\_13, GreenWeasel\_15, Haizum\_13, Hank144\_14, Issmi\_14, Janus\_14, Jevington\_15, Kaine\_13, Loofah\_14, Marav\_16, Nishikigoi\_13, Omar\_14, Pablito\_13, Paedore\_13, Paolo\_15, Pavo\_14, Provolone\_14, Puginator\_15, R4\_13, Saftant\_13, Speedwell\_18, SqueakyClean\_14, Superstar\_16, Tefunt\_13, Thestral\_14, TinaBelcher\_13, Triumph\_15, TrvxScott\_12, Vanseggelen\_17, Verabelle\_14, Verse\_13, Yosif\_14, Zainub\_15, phiCAM\_14, phiHau3\_15,

### Summary by start number:

Start 30:

- Found in 15 of 113 ( 13.3% ) of genes in pham
- Manual Annotations of this start: 5 of 106
- Called 40.0% of time when present
- Phage (with cluster) where this start called: Amela\_13 (BD3), BroPlease\_14 (BD4), GreenWeasel\_15 (BD4), Paolo\_15 (BD2), phiCAM\_14 (BD3), phiHau3\_15 (BD4),

Start 31:

- Found in 60 of 113 ( 53.1% ) of genes in pham
- Manual Annotations of this start: 58 of 106
- Called 98.3% of time when present
- Phage (with cluster) where this start called: Aaronocolus\_13 (BD1), Asten\_13 (BD1), BarryBee\_15 (BD1), BeardedLady\_14 (BD1), Bovely\_13 (BD1), Brataylor\_14 (BD1), BryanRecycles\_14 (BD1), Caliburn\_13 (BD1), Celeste\_13 (BD1), Celia\_13 (BD6), Chucky\_13 (BD1), Danzina\_14 (BD1), Dattran\_14 (BD1), Dwayne\_13 (BD1), Eddasa\_14 (BD1), Ejemplo\_13 (BD1), Emaanora\_15 (BD1), EnochSoames\_14 (BD1), Esperer\_13 (BD1), Goby\_13 (BD1), Godpower\_14 (BD1), Hippo\_13 (BD1), Hydra\_15 (BD1), Indigo\_13 (BD1), Itza\_13 (BD6), Jash\_14 (BD1), Katalie\_14 (BD1), Lannister\_14 (BD1), Legacy\_13 (BD1), Leviticus\_13 (BD1), Lika\_13 (BD1), Lorelei\_13 (BD1), Maneekul\_13 (BD1), Nabi\_13 (BD1), Nanodon\_15 (BD1), Nerdos\_13 (BD1), Oliynyk\_14 (BD1), Ozzie\_13 (BD1), OzzyJ\_14 (BD1), Phettuccine\_13 (BD1), Rana\_13 (BD1), RedBear\_15 (BD1), Rusticus\_14 (BD1), SarahRose\_13 (BD1), Snorlax\_13 (BD1), South40\_14 (BD1), Sujidade\_14 (BD1), SunsetPointe\_13 (BD1), TagePhighter\_14 (BD1), Toma\_13 (BD1), Triste\_13 (BD1), TuanPN\_13 (BD1), Unstoppable\_13 (BD1), Urza\_13 (BD6), VieEnRose\_13 (BD6), Werner\_13 (BD1), Whatever\_13 (BD1), Yasdnil\_13 (BD1), Zemlya\_14 (BD1),

Start 32:

- Found in 50 of 113 ( 44.2% ) of genes in pham
- Manual Annotations of this start: 41 of 106
- Called 92.0% of time when present
- Phage (with cluster) where this start called: Alsaber\_14 (BD3), Alvy\_15 (BD2), Amethyst\_13 (BD2), Andris\_13 (BD2), Animus\_14 (BD2), Axiom\_14 (BD2), BartholomewSD\_15 (BD2), Bowden\_14 (BD2), Caelum\_14 (BD2), Celery\_16 (BD3), Conan\_14 (BD3), Daudau\_13 (BD2), Dexers\_12 (BD3), Diane\_13 (BD2), ELB20\_12 (BD2), ElGato\_14 (BD3), GirlDinner\_13 (BD2), Haizum\_13 (BD2), Hank144\_14 (BD2), Issmi\_14 (BD2), Janus\_14 (BD2), Jevington\_15 (BD2), Kaine\_13 (BD3), Loofah\_14 (BD2), Marav\_16 (BD2), Nishikigoi\_13 (BD2), Omar\_14 (BD2), Pablito\_13 (BD2), Pavo\_14 (BD3), Provolone\_14 (BD3), Puginator\_15 (BD2), R4\_13 (BD2),

Saftant\_13 (BD3), Speedwell\_18 (BD3), SqueakyClean\_14 (BD2), Superstar\_16 (BD2), Tefunt\_13 (BD2), Thestral\_14 (BD2), TinaBelcher\_13 (BD2), Triumph\_15 (BD2), TrvxScott\_12 (BD2), Vanseggelen\_17 (BD3), Verabelle\_14 (BD3), Verse\_13 (BD3), Yosif\_14 (BD3), Zainub\_15 (BD2),

Start 40:

- Found in 52 of 113 ( 46.0% ) of genes in pham
- Manual Annotations of this start: 2 of 106
- Called 3.8% of time when present
- Phage (with cluster) where this start called: Izzy\_14 (BD1), Paedore\_13 (BD2),

### **Summary by clusters:**

There are 5 clusters represented in this pham: BD4, BD6, BD1, BD3, BD2,

Info for manual annotations of cluster BD1:

- Start number 31 was manually annotated 54 times for cluster BD1.
- Start number 40 was manually annotated 1 time for cluster BD1.

Info for manual annotations of cluster BD2:

- Start number 30 was manually annotated 1 time for cluster BD2.
- Start number 32 was manually annotated 30 times for cluster BD2.
- Start number 40 was manually annotated 1 time for cluster BD2.

Info for manual annotations of cluster BD3:

- Start number 30 was manually annotated 1 time for cluster BD3.
- Start number 32 was manually annotated 11 times for cluster BD3.

Info for manual annotations of cluster BD4:

- Start number 30 was manually annotated 3 times for cluster BD4.

Info for manual annotations of cluster BD6:

- Start number 31 was manually annotated 4 times for cluster BD6.

### **Gene Information:**

Gene: Aaronocolus\_13 Start: 9179, Stop: 9577, Start Num: 31

Candidate Starts for Aaronocolus\_13:

(4, 8600), (6, 8636), (27, 9065), (28, 9080), (29, 9095), (Start: 31 @9179 has 58 MA's), (45, 9284), (49, 9356), (51, 9383), (52, 9386), (60, 9503), (62, 9563),

Gene: Alsaber\_14 Start: 9250, Stop: 9636, Start Num: 32

Candidate Starts for Alsaber\_14:

(29, 9163), (Start: 30 @9244 has 5 MA's), (Start: 32 @9250 has 41 MA's), (45, 9355), (60, 9562), (62, 9622),

Gene: Alvy\_15 Start: 9132, Stop: 9584, Start Num: 32

Candidate Starts for Alvy\_15:

(19, 8775), (Start: 32 @9132 has 41 MA's), (35, 9168), (Start: 40 @9198 has 2 MA's), (49, 9294), (51, 9321), (59, 9453),

Gene: Amela\_13 Start: 9353, Stop: 9742, Start Num: 30

Candidate Starts for Amela\_13:

(15, 8981), (22, 9014), (29, 9272), (Start: 30 @9353 has 5 MA's), (Start: 32 @9359 has 41 MA's), (41, 9428), (57, 9644), (62, 9728),

Gene: Amethyst\_13 Start: 8945, Stop: 9406, Start Num: 32

Candidate Starts for Amethyst\_13:

(14, 8552), (25, 8723), (27, 8828), (29, 8858), (Start: 32 @8945 has 41 MA's), (35, 8981), (Start: 40 @9011 has 2 MA's), (45, 9050), (55, 9227), (57, 9251), (60, 9275),

Gene: Andris\_13 Start: 9002, Stop: 9391, Start Num: 32

Candidate Starts for Andris\_13:

(20, 8651), (25, 8780), (27, 8885), (29, 8915), (Start: 32 @9002 has 41 MA's), (44, 9110), (50, 9176), (51, 9200), (52, 9203), (60, 9317), (62, 9377),

Gene: Animus\_14 Start: 9373, Stop: 9744, Start Num: 32

Candidate Starts for Animus\_14:

(9, 8911), (11, 8947), (20, 9022), (21, 9025), (29, 9286), (Start: 32 @9373 has 41 MA's), (34, 9388), (51, 9547), (52, 9550), (57, 9646), (60, 9670), (62, 9730),

Gene: Asten\_13 Start: 9138, Stop: 9533, Start Num: 31

Candidate Starts for Asten\_13:

(4, 8559), (5, 8583), (7, 8646), (27, 9024), (29, 9054), (Start: 31 @9138 has 58 MA's), (Start: 40 @9204 has 2 MA's), (49, 9312), (52, 9342), (60, 9462), (62, 9519),

Gene: Axiom\_14 Start: 9034, Stop: 9429, Start Num: 32

Candidate Starts for Axiom\_14:

(20, 8683), (29, 8947), (Start: 32 @9034 has 41 MA's), (Start: 40 @9109 has 2 MA's), (42, 9121), (48, 9181), (50, 9208), (51, 9232), (52, 9235), (60, 9355), (62, 9415),

Gene: BarryBee\_15 Start: 9145, Stop: 9540, Start Num: 31

Candidate Starts for BarryBee\_15:

(4, 8566), (5, 8590), (7, 8653), (27, 9031), (29, 9061), (Start: 31 @9145 has 58 MA's), (Start: 40 @9211 has 2 MA's), (49, 9319), (52, 9349), (60, 9469), (62, 9526),

Gene: BartholomewSD\_15 Start: 9132, Stop: 9584, Start Num: 32

Candidate Starts for BartholomewSD\_15:

(19, 8775), (Start: 32 @9132 has 41 MA's), (35, 9168), (Start: 40 @9198 has 2 MA's), (49, 9294), (51, 9321), (59, 9453),

Gene: BeardedLady\_14 Start: 9426, Stop: 9824, Start Num: 31

Candidate Starts for BeardedLady\_14:

(4, 8847), (6, 8883), (27, 9312), (28, 9327), (29, 9342), (Start: 31 @9426 has 58 MA's), (Start: 40 @9492 has 2 MA's), (45, 9531), (49, 9603), (51, 9630), (52, 9633), (60, 9750), (62, 9810),

Gene: Bovely\_13 Start: 9185, Stop: 9583, Start Num: 31

Candidate Starts for Bovely\_13:

(4, 8606), (6, 8642), (27, 9071), (28, 9086), (29, 9101), (Start: 31 @9185 has 58 MA's), (45, 9290), (49, 9362), (51, 9389), (52, 9392), (60, 9509), (62, 9569),

Gene: Bowden\_14 Start: 9046, Stop: 9501, Start Num: 32

Candidate Starts for Bowden\_14:

(3, 8470), (19, 8689), (27, 8929), (Start: 32 @9046 has 41 MA's), (Start: 40 @9115 has 2 MA's), (49, 9211), (51, 9238), (59, 9370),

Gene: Brataylor\_14 Start: 9148, Stop: 9546, Start Num: 31

Candidate Starts for Brataylor\_14:

(4, 8569), (5, 8593), (8, 8686), (27, 9034), (28, 9049), (29, 9064), (Start: 31 @9148 has 58 MA's), (49, 9322), (52, 9352), (60, 9472), (62, 9532),

Gene: BroPlease\_14 Start: 9249, Stop: 9743, Start Num: 30

Candidate Starts for BroPlease\_14:

(1, 8541), (2, 8565), (19, 8898), (25, 9033), (27, 9138), (29, 9168), (Start: 30 @9249 has 5 MA's), (43, 9357), (54, 9552), (64, 9684), (65, 9696),

Gene: BryanRecycles\_14 Start: 9342, Stop: 9740, Start Num: 31

Candidate Starts for BryanRecycles\_14:

(4, 8763), (6, 8799), (27, 9228), (28, 9243), (29, 9258), (Start: 31 @9342 has 58 MA's), (Start: 40 @9408 has 2 MA's), (45, 9447), (49, 9519), (51, 9546), (52, 9549), (60, 9666), (62, 9726),

Gene: Caelum\_14 Start: 8901, Stop: 9377, Start Num: 32

Candidate Starts for Caelum\_14:

(Start: 32 @8901 has 41 MA's), (35, 8937), (45, 9006), (56, 9186), (60, 9231),

Gene: Caliburn\_13 Start: 9159, Stop: 9557, Start Num: 31

Candidate Starts for Caliburn\_13:

(Start: 31 @9159 has 58 MA's), (45, 9264), (49, 9336), (51, 9363), (52, 9366), (60, 9483), (62, 9543),

Gene: Celery\_16 Start: 9208, Stop: 9591, Start Num: 32

Candidate Starts for Celery\_16:

(Start: 32 @9208 has 41 MA's), (45, 9313), (57, 9493), (58, 9502), (62, 9577),

Gene: Celeste\_13 Start: 9146, Stop: 9544, Start Num: 31

Candidate Starts for Celeste\_13:

(4, 8567), (5, 8591), (8, 8684), (27, 9032), (28, 9047), (29, 9062), (Start: 31 @9146 has 58 MA's), (49, 9320), (52, 9350), (60, 9470), (62, 9530),

Gene: Celia\_13 Start: 9481, Stop: 9861, Start Num: 31

Candidate Starts for Celia\_13:

(Start: 31 @9481 has 58 MA's), (37, 9535), (Start: 40 @9547 has 2 MA's), (60, 9790), (62, 9850),

Gene: Chucky\_13 Start: 9146, Stop: 9541, Start Num: 31

Candidate Starts for Chucky\_13:

(4, 8567), (5, 8591), (27, 9032), (29, 9062), (Start: 31 @9146 has 58 MA's), (Start: 40 @9212 has 2 MA's), (49, 9320), (52, 9350), (60, 9470), (62, 9527),

Gene: Conan\_14 Start: 8960, Stop: 9343, Start Num: 32

Candidate Starts for Conan\_14:

(29, 8873), (Start: 30 @8954 has 5 MA's), (Start: 32 @8960 has 41 MA's), (45, 9065), (51, 9149), (57, 9245), (58, 9254), (62, 9329),

Gene: Danzina\_14 Start: 9350, Stop: 9748, Start Num: 31

Candidate Starts for Danzina\_14:

(4, 8771), (5, 8795), (27, 9236), (28, 9251), (29, 9266), (Start: 31 @9350 has 58 MA's), (39, 9413), (49, 9524), (52, 9554), (60, 9674), (62, 9734),



Gene: Dattran\_14 Start: 9145, Stop: 9543, Start Num: 31

Candidate Starts for Dattran\_14:

(4, 8566), (5, 8590), (8, 8683), (27, 9031), (28, 9046), (29, 9061), (Start: 31 @9145 has 58 MA's), (49, 9319), (52, 9349), (60, 9469), (62, 9529),

Gene: Daudau\_13 Start: 9036, Stop: 9488, Start Num: 32

Candidate Starts for Daudau\_13:

(19, 8679), (25, 8814), (27, 8919), (Start: 32 @9036 has 41 MA's), (35, 9072), (Start: 40 @9102 has 2 MA's), (49, 9198), (51, 9225), (52, 9228), (54, 9312), (60, 9366),

Gene: Dexers\_12 Start: 8953, Stop: 9339, Start Num: 32

Candidate Starts for Dexers\_12:

(29, 8866), (Start: 30 @8947 has 5 MA's), (Start: 32 @8953 has 41 MA's), (45, 9058), (60, 9265), (62, 9325),

Gene: Diane\_13 Start: 8944, Stop: 9405, Start Num: 32

Candidate Starts for Diane\_13:

(27, 8827), (29, 8857), (Start: 32 @8944 has 41 MA's), (35, 8980), (Start: 40 @9010 has 2 MA's), (55, 9226), (57, 9250), (60, 9274),

Gene: Dwayne\_13 Start: 9145, Stop: 9540, Start Num: 31

Candidate Starts for Dwayne\_13:

(4, 8566), (5, 8590), (7, 8653), (27, 9031), (29, 9061), (Start: 31 @9145 has 58 MA's), (Start: 40 @9211 has 2 MA's), (49, 9319), (52, 9349), (60, 9469), (62, 9526),

Gene: ELB20\_12 Start: 9049, Stop: 9516, Start Num: 32

Candidate Starts for ELB20\_12:

(10, 8629), (18, 8689), (29, 8962), (Start: 32 @9049 has 41 MA's), (35, 9085), (49, 9211), (51, 9238), (60, 9394), (63, 9451),

Gene: Eddasa\_14 Start: 9342, Stop: 9740, Start Num: 31

Candidate Starts for Eddasa\_14:

(4, 8763), (6, 8799), (27, 9228), (28, 9243), (29, 9258), (Start: 31 @9342 has 58 MA's), (Start: 40 @9408 has 2 MA's), (45, 9447), (49, 9519), (51, 9546), (52, 9549), (60, 9666), (62, 9726),

Gene: Ejemplo\_13 Start: 9148, Stop: 9543, Start Num: 31

Candidate Starts for Ejemplo\_13:

(4, 8569), (5, 8593), (27, 9034), (29, 9064), (Start: 31 @9148 has 58 MA's), (Start: 40 @9214 has 2 MA's), (49, 9322), (52, 9352), (60, 9472), (62, 9529),

Gene: ElGato\_14 Start: 8963, Stop: 9346, Start Num: 32

Candidate Starts for ElGato\_14:

(29, 8876), (Start: 30 @8957 has 5 MA's), (Start: 32 @8963 has 41 MA's), (45, 9068), (51, 9152), (57, 9248), (58, 9257), (62, 9332),

Gene: Emaanora\_15 Start: 9145, Stop: 9540, Start Num: 31

Candidate Starts for Emaanora\_15:

(4, 8566), (5, 8590), (7, 8653), (27, 9031), (29, 9061), (Start: 31 @9145 has 58 MA's), (Start: 40 @9211 has 2 MA's), (49, 9319), (52, 9349), (60, 9469), (62, 9526),

Gene: EnochSoames\_14 Start: 9338, Stop: 9736, Start Num: 31

Candidate Starts for EnochSoames\_14:

(4, 8759), (6, 8795), (27, 9224), (28, 9239), (29, 9254), (Start: 31 @9338 has 58 MA's), (Start: 40 @9404 has 2 MA's), (45, 9443), (49, 9515), (51, 9542), (52, 9545), (60, 9662), (62, 9722),

Gene: Esperer\_13 Start: 9179, Stop: 9577, Start Num: 31

Candidate Starts for Esperer\_13:

(4, 8600), (6, 8636), (27, 9065), (28, 9080), (29, 9095), (Start: 31 @9179 has 58 MA's), (45, 9284), (49, 9356), (51, 9383), (52, 9386), (60, 9503), (62, 9563),

Gene: GirlDinner\_13 Start: 9035, Stop: 9406, Start Num: 32

Candidate Starts for GirlDinner\_13:

(9, 8573), (11, 8609), (20, 8684), (21, 8687), (25, 8813), (29, 8948), (Start: 32 @9035 has 41 MA's), (34, 9050), (51, 9209), (52, 9212), (55, 9284), (57, 9308), (60, 9332), (62, 9392),

Gene: Goby\_13 Start: 9148, Stop: 9546, Start Num: 31

Candidate Starts for Goby\_13:

(4, 8569), (5, 8593), (16, 8776), (27, 9034), (28, 9049), (29, 9064), (Start: 31 @9148 has 58 MA's), (39, 9211), (49, 9322), (52, 9352), (60, 9472), (62, 9532),

Gene: Godpower\_14 Start: 9163, Stop: 9561, Start Num: 31

Candidate Starts for Godpower\_14:

(4, 8584), (5, 8608), (16, 8791), (27, 9049), (28, 9064), (29, 9079), (Start: 31 @9163 has 58 MA's), (39, 9226), (49, 9337), (52, 9367), (60, 9487), (62, 9547),

Gene: GreenWeasel\_15 Start: 9258, Stop: 9752, Start Num: 30

Candidate Starts for GreenWeasel\_15:

(1, 8550), (19, 8907), (25, 9042), (27, 9147), (29, 9177), (Start: 30 @9258 has 5 MA's), (43, 9366), (54, 9561), (64, 9693), (65, 9705),

Gene: Haizum\_13 Start: 8974, Stop: 9435, Start Num: 32

Candidate Starts for Haizum\_13:

(25, 8752), (27, 8857), (29, 8887), (Start: 32 @8974 has 41 MA's), (35, 9010), (Start: 40 @9040 has 2 MA's), (55, 9256), (57, 9280), (60, 9304),

Gene: Hank144\_14 Start: 9304, Stop: 9675, Start Num: 32

Candidate Starts for Hank144\_14:

(13, 8893), (20, 8953), (23, 9004), (29, 9217), (Start: 32 @9304 has 41 MA's), (36, 9337), (Start: 40 @9355 has 2 MA's), (51, 9478), (55, 9553), (57, 9577), (60, 9601), (62, 9661),

Gene: Hippo\_13 Start: 9145, Stop: 9540, Start Num: 31

Candidate Starts for Hippo\_13:

(4, 8566), (5, 8590), (7, 8653), (27, 9031), (29, 9061), (Start: 31 @9145 has 58 MA's), (Start: 40 @9211 has 2 MA's), (49, 9319), (52, 9349), (60, 9469), (62, 9526),

Gene: Hydra\_15 Start: 9707, Stop: 10105, Start Num: 31

Candidate Starts for Hydra\_15:

(4, 9128), (6, 9164), (27, 9593), (28, 9608), (29, 9623), (Start: 31 @9707 has 58 MA's), (45, 9812), (49, 9884), (51, 9911), (52, 9914), (60, 10031), (62, 10091),

Gene: Indigo\_13 Start: 9179, Stop: 9577, Start Num: 31

Candidate Starts for Indigo\_13:

(4, 8600), (6, 8636), (27, 9065), (28, 9080), (29, 9095), (Start: 31 @9179 has 58 MA's), (45, 9284), (49, 9356), (51, 9383), (52, 9386), (60, 9503), (62, 9563),

Gene: Issmi\_14 Start: 9254, Stop: 9706, Start Num: 32

Candidate Starts for Issmi\_14:

(25, 9032), (27, 9137), (29, 9167), (Start: 32 @9254 has 41 MA's), (35, 9290), (45, 9359), (47, 9380), (51, 9443), (53, 9497), (60, 9584),

Gene: Itza\_13 Start: 9404, Stop: 9784, Start Num: 31

Candidate Starts for Itza\_13:

(Start: 31 @9404 has 58 MA's), (37, 9458), (Start: 40 @9470 has 2 MA's), (60, 9713), (62, 9773),

Gene: Izzy\_14 Start: 9455, Stop: 9787, Start Num: 40

Candidate Starts for Izzy\_14:

(4, 8810), (6, 8846), (27, 9275), (28, 9290), (29, 9305), (Start: 31 @9389 has 58 MA's), (Start: 40 @9455 has 2 MA's), (45, 9494), (49, 9566), (51, 9593), (52, 9596), (60, 9713), (62, 9773),

Gene: Janus\_14 Start: 9373, Stop: 9744, Start Num: 32

Candidate Starts for Janus\_14:

(9, 8911), (11, 8947), (20, 9022), (21, 9025), (29, 9286), (Start: 32 @9373 has 41 MA's), (34, 9388), (51, 9547), (52, 9550), (55, 9622), (57, 9646), (60, 9670), (62, 9730),

Gene: Jash\_14 Start: 9342, Stop: 9740, Start Num: 31

Candidate Starts for Jash\_14:

(4, 8763), (6, 8799), (27, 9228), (28, 9243), (29, 9258), (Start: 31 @9342 has 58 MA's), (Start: 40 @9408 has 2 MA's), (45, 9447), (49, 9519), (51, 9546), (52, 9549), (60, 9666), (62, 9726),

Gene: Jevington\_15 Start: 9556, Stop: 10032, Start Num: 32

Candidate Starts for Jevington\_15:

(17, 9193), (25, 9334), (Start: 32 @9556 has 41 MA's), (47, 9703), (49, 9739), (51, 9766), (60, 9916), (63, 9973),

Gene: Kaine\_13 Start: 8953, Stop: 9339, Start Num: 32

Candidate Starts for Kaine\_13:

(29, 8866), (Start: 30 @8947 has 5 MA's), (Start: 32 @8953 has 41 MA's), (45, 9058), (60, 9265), (62, 9325),

Gene: Katalie\_14 Start: 9418, Stop: 9816, Start Num: 31

Candidate Starts for Katalie\_14:

(4, 8839), (5, 8863), (7, 8926), (27, 9304), (29, 9334), (Start: 31 @9418 has 58 MA's), (49, 9592), (52, 9622), (60, 9742), (62, 9802),

Gene: Lannister\_14 Start: 9166, Stop: 9564, Start Num: 31

Candidate Starts for Lannister\_14:

(27, 9052), (28, 9067), (29, 9082), (Start: 31 @9166 has 58 MA's), (Start: 40 @9232 has 2 MA's), (49, 9340), (52, 9370), (60, 9490), (62, 9550),

Gene: Legacy\_13 Start: 9150, Stop: 9548, Start Num: 31

Candidate Starts for Legacy\_13:

(4, 8571), (6, 8607), (27, 9036), (28, 9051), (29, 9066), (Start: 31 @9150 has 58 MA's), (45, 9255), (49, 9327), (51, 9354), (52, 9357), (60, 9474), (62, 9534),

Gene: Leviticus\_13 Start: 9179, Stop: 9577, Start Num: 31

Candidate Starts for Leviticus\_13:

(4, 8600), (6, 8636), (27, 9065), (28, 9080), (29, 9095), (Start: 31 @9179 has 58 MA's), (45, 9284), (49, 9356), (51, 9383), (52, 9386), (60, 9503), (62, 9563),

Gene: Lika\_13 Start: 9164, Stop: 9562, Start Num: 31

Candidate Starts for Lika\_13:

(4, 8585), (5, 8609), (16, 8792), (27, 9050), (28, 9065), (29, 9080), (Start: 31 @9164 has 58 MA's), (39, 9227), (49, 9338), (52, 9368), (60, 9488), (62, 9548),

Gene: Loofah\_14 Start: 9086, Stop: 9547, Start Num: 32

Candidate Starts for Loofah\_14:

(25, 8864), (Start: 32 @9086 has 41 MA's), (35, 9122), (Start: 40 @9152 has 2 MA's), (49, 9248), (51, 9275), (60, 9425), (63, 9482),

Gene: Lorelei\_13 Start: 9136, Stop: 9534, Start Num: 31

Candidate Starts for Lorelei\_13:

(4, 8557), (5, 8581), (27, 9022), (28, 9037), (29, 9052), (Start: 31 @9136 has 58 MA's), (39, 9199), (Start: 40 @9202 has 2 MA's), (49, 9310), (60, 9460), (62, 9520),

Gene: Maneekul\_13 Start: 9147, Stop: 9542, Start Num: 31

Candidate Starts for Maneekul\_13:

(4, 8568), (5, 8592), (27, 9033), (29, 9063), (Start: 31 @9147 has 58 MA's), (Start: 40 @9213 has 2 MA's), (49, 9321), (52, 9351), (60, 9471), (62, 9528),

Gene: Marav\_16 Start: 9906, Stop: 10382, Start Num: 32

Candidate Starts for Marav\_16:

(25, 9684), (Start: 32 @9906 has 41 MA's), (47, 10053), (49, 10089), (51, 10116), (60, 10266), (63, 10323),

Gene: Nabi\_13 Start: 9136, Stop: 9534, Start Num: 31

Candidate Starts for Nabi\_13:

(4, 8557), (5, 8581), (27, 9022), (28, 9037), (29, 9052), (Start: 31 @9136 has 58 MA's), (39, 9199), (Start: 40 @9202 has 2 MA's), (49, 9310), (60, 9460), (62, 9520),

Gene: Nanodon\_15 Start: 9338, Stop: 9736, Start Num: 31

Candidate Starts for Nanodon\_15:

(27, 9224), (28, 9239), (29, 9254), (Start: 31 @9338 has 58 MA's), (Start: 40 @9404 has 2 MA's), (41, 9407), (49, 9512), (60, 9662), (62, 9722),

Gene: Nerdos\_13 Start: 9179, Stop: 9577, Start Num: 31

Candidate Starts for Nerdos\_13:

(4, 8600), (6, 8636), (27, 9065), (28, 9080), (29, 9095), (Start: 31 @9179 has 58 MA's), (45, 9284), (49, 9356), (51, 9383), (52, 9386), (60, 9503), (62, 9563),

Gene: Nishikigoi\_13 Start: 8974, Stop: 9435, Start Num: 32

Candidate Starts for Nishikigoi\_13:

(25, 8752), (27, 8857), (Start: 32 @8974 has 41 MA's), (35, 9010), (Start: 40 @9040 has 2 MA's), (55, 9256), (57, 9280), (60, 9304),

Gene: Oliynyk\_14 Start: 9342, Stop: 9740, Start Num: 31

Candidate Starts for Oliynyk\_14:

(4, 8763), (6, 8799), (27, 9228), (28, 9243), (29, 9258), (Start: 31 @9342 has 58 MA's), (Start: 40 @9408 has 2 MA's), (45, 9447), (49, 9519), (51, 9546), (52, 9549), (60, 9666), (62, 9726),

Gene: Omar\_14 Start: 9208, Stop: 9669, Start Num: 32

Candidate Starts for Omar\_14:

(11, 8782), (12, 8785), (20, 8857), (25, 8986), (27, 9091), (29, 9121), (Start: 32 @9208 has 41 MA's), (38, 9265), (Start: 40 @9274 has 2 MA's), (45, 9313), (51, 9397), (55, 9490), (60, 9538),

Gene: Ozzie\_13 Start: 9159, Stop: 9557, Start Num: 31

Candidate Starts for Ozzie\_13:

(4, 8580), (6, 8616), (27, 9045), (28, 9060), (29, 9075), (Start: 31 @9159 has 58 MA's), (Start: 40 @9225 has 2 MA's), (45, 9264), (49, 9336), (51, 9363), (52, 9366), (60, 9483), (62, 9543),

Gene: OzzyJ\_14 Start: 9139, Stop: 9534, Start Num: 31

Candidate Starts for OzzyJ\_14:

(4, 8560), (5, 8584), (7, 8647), (27, 9025), (29, 9055), (Start: 31 @9139 has 58 MA's), (Start: 40 @9205 has 2 MA's), (49, 9313), (52, 9343), (60, 9463), (62, 9520),

Gene: Pablito\_13 Start: 9034, Stop: 9405, Start Num: 32

Candidate Starts for Pablito\_13:

(29, 8947), (Start: 32 @9034 has 41 MA's), (33, 9043), (44, 9118), (51, 9208), (60, 9331), (62, 9391),

Gene: Paedore\_13 Start: 9152, Stop: 9547, Start Num: 40

Candidate Starts for Paedore\_13:

(Start: 32 @9086 has 41 MA's), (35, 9122), (Start: 40 @9152 has 2 MA's), (49, 9248), (51, 9275), (60, 9425), (63, 9482),

Gene: Paolo\_15 Start: 9577, Stop: 10047, Start Num: 30

Candidate Starts for Paolo\_15:

(19, 9226), (25, 9361), (Start: 30 @9577 has 5 MA's), (Start: 32 @9580 has 41 MA's), (35, 9637), (42, 9679), (47, 9727), (49, 9763), (51, 9790), (60, 9931), (63, 9988),

Gene: Pavo\_14 Start: 9233, Stop: 9616, Start Num: 32

Candidate Starts for Pavo\_14:

(29, 9146), (Start: 30 @9227 has 5 MA's), (Start: 32 @9233 has 41 MA's), (45, 9338), (51, 9422), (57, 9518), (58, 9527), (62, 9602),

Gene: Phettuccine\_13 Start: 9179, Stop: 9577, Start Num: 31

Candidate Starts for Phettuccine\_13:

(4, 8600), (6, 8636), (27, 9065), (28, 9080), (29, 9095), (Start: 31 @9179 has 58 MA's), (45, 9284), (49, 9356), (51, 9383), (52, 9386), (60, 9503), (62, 9563),

Gene: Provolone\_14 Start: 8963, Stop: 9346, Start Num: 32

Candidate Starts for Provolone\_14:

(29, 8876), (Start: 30 @8957 has 5 MA's), (Start: 32 @8963 has 41 MA's), (45, 9068), (51, 9152), (57, 9248), (58, 9257), (62, 9332),

Gene: Puginator\_15 Start: 9529, Stop: 10005, Start Num: 32

Candidate Starts for Puginator\_15:

(Start: 32 @9529 has 41 MA's), (35, 9586), (42, 9628), (47, 9676), (49, 9712), (51, 9739), (57, 9865), (60, 9889), (63, 9946),

Gene: R4\_13 Start: 9060, Stop: 9527, Start Num: 32

Candidate Starts for R4\_13:

(10, 8640), (18, 8700), (29, 8973), (Start: 32 @9060 has 41 MA's), (35, 9096), (49, 9222), (51, 9249), (60, 9405), (63, 9462),

Gene: Rana\_13 Start: 9136, Stop: 9534, Start Num: 31

Candidate Starts for Rana\_13:

(4, 8557), (5, 8581), (27, 9022), (28, 9037), (29, 9052), (Start: 31 @9136 has 58 MA's), (39, 9199), (Start: 40 @9202 has 2 MA's), (49, 9310), (60, 9460), (62, 9520),

Gene: RedBear\_15 Start: 9418, Stop: 9816, Start Num: 31

Candidate Starts for RedBear\_15:

(4, 8839), (5, 8863), (7, 8926), (27, 9304), (29, 9334), (Start: 31 @9418 has 58 MA's), (49, 9592), (52, 9622), (60, 9742), (62, 9802),

Gene: Rusticus\_14 Start: 9342, Stop: 9740, Start Num: 31

Candidate Starts for Rusticus\_14:

(4, 8763), (6, 8799), (27, 9228), (28, 9243), (29, 9258), (Start: 31 @9342 has 58 MA's), (Start: 40 @9408 has 2 MA's), (45, 9447), (49, 9519), (51, 9546), (52, 9549), (60, 9666), (62, 9726),

Gene: Saftant\_13 Start: 9237, Stop: 9638, Start Num: 32

Candidate Starts for Saftant\_13:

(Start: 32 @9237 has 41 MA's), (37, 9291), (53, 9483), (60, 9567), (62, 9627),

Gene: SarahRose\_13 Start: 9145, Stop: 9540, Start Num: 31

Candidate Starts for SarahRose\_13:

(4, 8566), (5, 8590), (7, 8653), (27, 9031), (29, 9061), (Start: 31 @9145 has 58 MA's), (Start: 40 @9211 has 2 MA's), (49, 9319), (52, 9349), (60, 9469), (62, 9526),

Gene: Snorlax\_13 Start: 9145, Stop: 9540, Start Num: 31

Candidate Starts for Snorlax\_13:

(4, 8566), (5, 8590), (7, 8653), (27, 9031), (29, 9061), (Start: 31 @9145 has 58 MA's), (Start: 40 @9211 has 2 MA's), (49, 9319), (52, 9349), (60, 9469), (62, 9526),

Gene: South40\_14 Start: 9418, Stop: 9816, Start Num: 31

Candidate Starts for South40\_14:

(4, 8839), (5, 8863), (7, 8926), (27, 9304), (29, 9334), (Start: 31 @9418 has 58 MA's), (49, 9592), (52, 9622), (60, 9742), (62, 9802),

Gene: Speedwell\_18 Start: 10967, Stop: 11362, Start Num: 32

Candidate Starts for Speedwell\_18:

(Start: 32 @10967 has 41 MA's), (38, 11024), (51, 11171), (52, 11174), (53, 11207), (62, 11351),

Gene: SqueakyClean\_14 Start: 9299, Stop: 9670, Start Num: 32

Candidate Starts for SqueakyClean\_14:

(9, 8837), (11, 8873), (20, 8948), (21, 8951), (25, 9077), (29, 9212), (Start: 32 @9299 has 41 MA's), (34, 9314), (51, 9473), (52, 9476), (55, 9548), (57, 9572), (60, 9596), (62, 9656),

Gene: Sujidade\_14 Start: 9440, Stop: 9838, Start Num: 31

Candidate Starts for Sujidade\_14:

(4, 8861), (5, 8885), (16, 9068), (27, 9326), (28, 9341), (29, 9356), (Start: 31 @9440 has 58 MA's), (39, 9503), (49, 9614), (52, 9644), (60, 9764), (62, 9824),

Gene: SunsetPointe\_13 Start: 9169, Stop: 9567, Start Num: 31

Candidate Starts for SunsetPointe\_13:

(4, 8590), (6, 8626), (27, 9055), (28, 9070), (29, 9085), (Start: 31 @9169 has 58 MA's), (45, 9274), (49, 9346), (51, 9373), (52, 9376), (60, 9493), (62, 9553),

Gene: Superstar\_16 Start: 10105, Stop: 10563, Start Num: 32

Candidate Starts for Superstar\_16:

(Start: 32 @10105 has 41 MA's), (35, 10141), (Start: 40 @10171 has 2 MA's), (56, 10390), (60, 10435),

Gene: TagePhighter\_14 Start: 9145, Stop: 9540, Start Num: 31

Candidate Starts for TagePhighter\_14:

(4, 8566), (5, 8590), (7, 8653), (27, 9031), (29, 9061), (Start: 31 @9145 has 58 MA's), (Start: 40 @9211 has 2 MA's), (49, 9319), (52, 9349), (60, 9469), (62, 9526),

Gene: Tefunt\_13 Start: 8974, Stop: 9435, Start Num: 32

Candidate Starts for Tefunt\_13:

(27, 8857), (Start: 32 @8974 has 41 MA's), (35, 9010), (Start: 40 @9040 has 2 MA's), (55, 9256), (57, 9280), (60, 9304),

Gene: Thestral\_14 Start: 9049, Stop: 9504, Start Num: 32

Candidate Starts for Thestral\_14:

(19, 8692), (27, 8932), (Start: 32 @9049 has 41 MA's), (49, 9214), (51, 9241), (59, 9373),

Gene: TinaBelcher\_13 Start: 8997, Stop: 9452, Start Num: 32

Candidate Starts for TinaBelcher\_13:

(19, 8640), (27, 8880), (Start: 32 @8997 has 41 MA's), (Start: 40 @9066 has 2 MA's), (49, 9162), (51, 9189), (59, 9321),

Gene: Toma\_13 Start: 9148, Stop: 9546, Start Num: 31

Candidate Starts for Toma\_13:

(4, 8569), (5, 8593), (16, 8776), (27, 9034), (28, 9049), (29, 9064), (Start: 31 @9148 has 58 MA's), (39, 9211), (49, 9322), (52, 9352), (60, 9472), (62, 9532),

Gene: Triste\_13 Start: 9139, Stop: 9534, Start Num: 31

Candidate Starts for Triste\_13:

(4, 8560), (5, 8584), (7, 8647), (27, 9025), (29, 9055), (Start: 31 @9139 has 58 MA's), (Start: 40 @9205 has 2 MA's), (49, 9313), (52, 9343), (60, 9463), (62, 9520),

Gene: Triumph\_15 Start: 9064, Stop: 9459, Start Num: 32

Candidate Starts for Triumph\_15:

(20, 8713), (29, 8977), (Start: 32 @9064 has 41 MA's), (Start: 40 @9139 has 2 MA's), (42, 9151), (48, 9211), (50, 9238), (51, 9262), (52, 9265), (60, 9385), (62, 9445),

Gene: TrvxScott\_12 Start: 8998, Stop: 9453, Start Num: 32

Candidate Starts for TrvxScott\_12:

(19, 8641), (27, 8881), (Start: 32 @8998 has 41 MA's), (49, 9163), (51, 9190), (59, 9322),

Gene: TuanPN\_13 Start: 9148, Stop: 9543, Start Num: 31

Candidate Starts for TuanPN\_13:

(4, 8569), (5, 8593), (27, 9034), (29, 9064), (Start: 31 @9148 has 58 MA's), (Start: 40 @9214 has 2 MA's), (49, 9322), (52, 9352), (60, 9472), (62, 9529),

Gene: Unstoppable\_13 Start: 9170, Stop: 9568, Start Num: 31

Candidate Starts for Unstoppable\_13:

(4, 8591), (6, 8627), (27, 9056), (28, 9071), (29, 9086), (Start: 31 @9170 has 58 MA's), (45, 9275), (49, 9347), (51, 9374), (52, 9377), (60, 9494), (62, 9554),

Gene: Urza\_13 Start: 9416, Stop: 9796, Start Num: 31

Candidate Starts for Urza\_13:

(Start: 31 @9416 has 58 MA's), (37, 9470), (Start: 40 @9482 has 2 MA's), (60, 9725), (62, 9785),

Gene: Vanseggelen\_17 Start: 8887, Stop: 9273, Start Num: 32

Candidate Starts for Vanseggelen\_17:

(Start: 32 @8887 has 41 MA's), (51, 9076), (57, 9175), (60, 9199), (62, 9259),

Gene: Verabelle\_14 Start: 9237, Stop: 9620, Start Num: 32

Candidate Starts for Verabelle\_14:

(24, 8991), (26, 9090), (Start: 32 @9237 has 41 MA's), (53, 9462), (57, 9525), (60, 9549), (62, 9609),

Gene: Verse\_13 Start: 9353, Stop: 9736, Start Num: 32

Candidate Starts for Verse\_13:

(15, 8975), (22, 9008), (29, 9266), (Start: 30 @9347 has 5 MA's), (Start: 32 @9353 has 41 MA's), (41, 9422), (57, 9638), (62, 9722),

Gene: VieEnRose\_13 Start: 9486, Stop: 9866, Start Num: 31

Candidate Starts for VieEnRose\_13:

(29, 9402), (Start: 31 @9486 has 58 MA's), (37, 9540), (Start: 40 @9552 has 2 MA's), (46, 9609), (60, 9795), (62, 9855),

Gene: Werner\_13 Start: 9146, Stop: 9541, Start Num: 31

Candidate Starts for Werner\_13:

(4, 8567), (5, 8591), (7, 8654), (27, 9032), (29, 9062), (Start: 31 @9146 has 58 MA's), (Start: 40 @9212 has 2 MA's), (49, 9320), (52, 9350), (60, 9470), (62, 9527),

Gene: Whatever\_13 Start: 9146, Stop: 9541, Start Num: 31

Candidate Starts for Whatever\_13:

(4, 8567), (5, 8591), (7, 8654), (27, 9032), (29, 9062), (Start: 31 @9146 has 58 MA's), (Start: 40 @9212 has 2 MA's), (49, 9320), (52, 9350), (60, 9470), (62, 9527),

Gene: Yasdni1\_13 Start: 9144, Stop: 9539, Start Num: 31

Candidate Starts for Yasdni1\_13:

(4, 8565), (5, 8589), (27, 9030), (29, 9060), (Start: 31 @9144 has 58 MA's), (Start: 40 @9210 has 2 MA's), (49, 9318), (52, 9348), (60, 9468), (62, 9525),

Gene: Yosif\_14 Start: 9614, Stop: 10000, Start Num: 32

Candidate Starts for Yosif\_14:

(29, 9527), (Start: 32 @9614 has 41 MA's), (33, 9623), (45, 9719), (51, 9803), (53, 9839), (60, 9926), (62, 9986),

Gene: Zainub\_15 Start: 9538, Stop: 10005, Start Num: 32

Candidate Starts for Zainub\_15:

(19, 9184), (25, 9319), (Start: 30 @9535 has 5 MA's), (Start: 32 @9538 has 41 MA's), (35, 9595), (47, 9685), (49, 9721), (51, 9748), (60, 9889), (63, 9946),

Gene: Zemlya\_14 Start: 9156, Stop: 9554, Start Num: 31

Candidate Starts for Zemlya\_14:

(4, 8577), (5, 8601), (8, 8694), (27, 9042), (28, 9057), (29, 9072), (Start: 31 @9156 has 58 MA's), (49, 9330), (52, 9360), (60, 9480), (62, 9540),

Gene: phiCAM\_14 Start: 11010, Stop: 11402, Start Num: 30

Candidate Starts for phiCAM\_14:



(29, 10929), (Start: 30 @11010 has 5 MA's), (Start: 32 @11016 has 41 MA's), (41, 11085), (45, 11121), (60, 11328), (61, 11364), (62, 11388),

Gene: phiHau3\_15 Start: 9226, Stop: 9720, Start Num: 30

Candidate Starts for phiHau3\_15:

(1, 8518), (19, 8875), (25, 9010), (27, 9115), (29, 9145), (Start: 30 @9226 has 5 MA's), (43, 9334), (54, 9529), (64, 9661), (65, 9673),