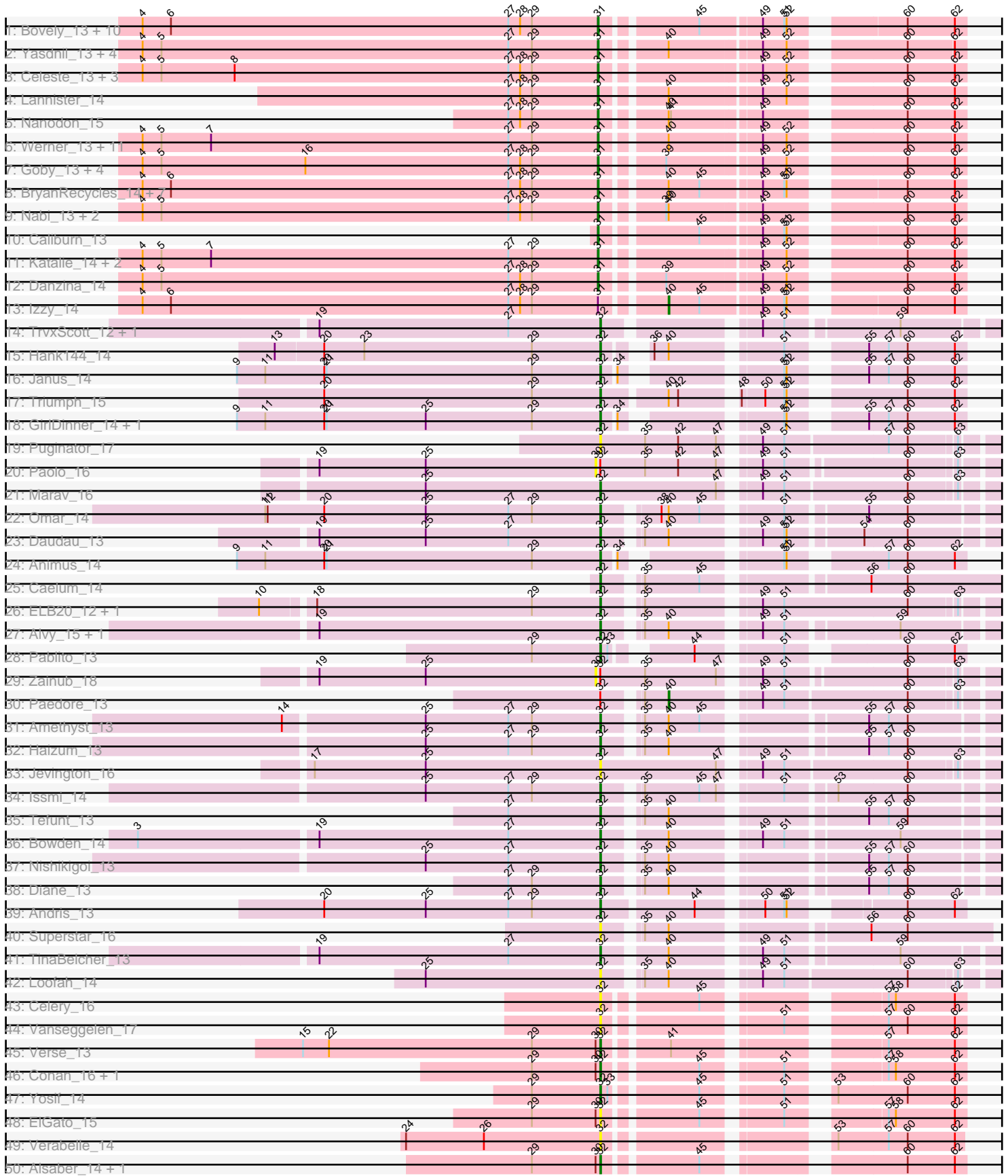


Pham 161737



Pham 161737



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 161737 Report

This analysis was run 04/28/24 on database version 559.

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 161737 has 109 members, 15 are drafts.

Phages represented in each track:

- Track 1 : Bovely_13, Esperer_13, SunsetPointe_13, Indigo_13, Nerdos_13, Hydra_15, Aaronocolus_13, Leviticus_13, Unstoppable_13, Legacy_13, Phettuccine_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_14, TagePhighter_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, BeardedLady_14, EnochSoames_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
- Track 18 : GirlDinner_14, SqueakyClean_14
- Track 19 : Puginator_17
- Track 20 : Paolo_16
- 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_18
- Track 30 : Paedore_13
- Track 31 : Amethyst_13
- Track 32 : Haizum_13
- Track 33 : Jevington_16
- 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 : Celery_16
- Track 44 : Vanseggelen_17
- Track 45 : Verse_13
- Track 46 : Conan_16, Provolone_14
- Track 47 : Yosif_14
- Track 48 : ElGato_15
- Track 49 : Verabelle_14
- Track 50 : Alsaber_14, Dexers_12
- Track 51 : phiCAM_14
- Track 52 : Saftant_13
- Track 53 : Amela_13
- Track 54 : GreenWeasel_15, phiHau3_15
- Track 55 : BroPlease_14
- Track 56 : VieEnRose_13
- Track 57 : 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 57 of the 94 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_14, 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, BartholomewSD_15, Bowden_14, BroPlease_14, Caelum_14, Celery_16, Conan_16, Daudau_13, Dexers_12, Diane_13, ELB20_12, ElGato_15, GirlDinner_14, GreenWeasel_15, Haizum_13, Hank144_14, Issmi_14, Janus_14, Jevington_16, Loofah_14, Marav_16, Nishikigoi_13, Omar_14, Pablito_13, Paedore_13, Paolo_16, Provolone_14, Puginator_17, R4_13, Saftant_13, SqueakyClean_14, Superstar_16, Tefunt_13, Thestral_14, TinaBelcher_13, Triumph_15, TrvxScott_12, Vanseggelen_17, Verabelle_14, Verse_13, Yosif_14, Zainub_18, phiCAM_14, phiHau3_15,

Summary by start number:

Start 30:

- Found in 13 of 109 (11.9%) of genes in pham
- Manual Annotations of this start: 4 of 94
- Called 53.8% of time when present
- Phage (with cluster) where this start called: Amela_13 (BD3), BroPlease_14 (BD4), GreenWeasel_15 (BD4), Paolo_16 (BD2), Zainub_18 (BD2), phiCAM_14 (BD3), phiHau3_15 (BD4),

Start 31:

- Found in 60 of 109 (55.0%) of genes in pham
- Manual Annotations of this start: 57 of 94
- 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_14 (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 46 of 109 (42.2%) of genes in pham
- Manual Annotations of this start: 31 of 94
- Called 89.1% 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), BartholomewSD_15 (BD2), Bowden_14 (BD2), Caelum_14 (BD2), Celery_16 (BD3), Conan_16 (BD3), Daudau_13 (BD2), Dexers_12 (BD3), Diane_13 (BD2), ELB20_12 (BD2), ElGato_15 (BD3), GirlDinner_14 (BD2), Haizum_13 (BD2), Hank144_14 (BD2), Issmi_14 (BD2), Janus_14 (BD2), Jevington_16 (BD2), Loofah_14 (BD2), Marav_16 (BD2), Nishikigoi_13 (BD2), Omar_14 (BD2), Pablito_13 (BD2), Provolone_14 (BD3), Puginator_17 (BD2), R4_13 (BD2), Saftant_13 (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),

Start 40:

- Found in 51 of 109 (46.8%) of genes in pham
- Manual Annotations of this start: 2 of 94
- Called 3.9% 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 53 times for cluster BD1.
- Start number 40 was manually annotated 1 time for cluster BD1.

Info for manual annotations of cluster BD2:

- Start number 32 was manually annotated 25 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 6 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 57 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 4 MA's), (Start: 32 @9250 has 31 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 31 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 4 MA's), (Start: 32 @9359 has 31 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 31 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 31 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 31 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 57 MA's), (Start: 40 @9204 has 2 MA's), (49, 9312), (52, 9342), (60, 9462), (62, 9519),

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 57 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 31 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 57 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 57 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 31 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 57 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 4 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 57 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 31 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 57 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 31 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 57 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 57 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 57 MA's), (Start: 40 @9212 has 2 MA's), (49, 9320), (52, 9350), (60, 9470), (62, 9527),

Gene: Conan_16 Start: 8960, Stop: 9343, Start Num: 32

Candidate Starts for Conan_16:

(29, 8873), (Start: 30 @8954 has 4 MA's), (Start: 32 @8960 has 31 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 57 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 57 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 31 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 4 MA's), (Start: 32 @8953 has 31 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 31 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 57 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 31 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 57 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 57 MA's), (Start: 40 @9214 has 2 MA's), (49, 9322), (52, 9352), (60, 9472), (62, 9529),

Gene: ElGato_15 Start: 8963, Stop: 9346, Start Num: 32

Candidate Starts for ElGato_15:

(29, 8876), (Start: 30 @8957 has 4 MA's), (Start: 32 @8963 has 31 MA's), (45, 9068), (51, 9152), (57, 9248), (58, 9257), (62, 9332),

Gene: Emaanora_14 Start: 9145, Stop: 9540, Start Num: 31

Candidate Starts for Emaanora_14:

(4, 8566), (5, 8590), (7, 8653), (27, 9031), (29, 9061), (Start: 31 @9145 has 57 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 57 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 57 MA's), (45, 9284), (49, 9356), (51, 9383), (52, 9386), (60, 9503), (62, 9563),

Gene: GirlDinner_14 Start: 9035, Stop: 9406, Start Num: 32

Candidate Starts for GirlDinner_14:

(9, 8573), (11, 8609), (20, 8684), (21, 8687), (25, 8813), (29, 8948), (Start: 32 @9035 has 31 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 57 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 57 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 4 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 31 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 31 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 57 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 57 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 57 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 31 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 57 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 57 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 31 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 57 MA's), (Start: 40 @9408 has 2 MA's), (45, 9447), (49, 9519), (51, 9546), (52, 9549), (60, 9666), (62, 9726),

Gene: Jevington_16 Start: 9556, Stop: 10032, Start Num: 32

Candidate Starts for Jevington_16:

(17, 9193), (25, 9334), (Start: 32 @9556 has 31 MA's), (47, 9703), (49, 9739), (51, 9766), (60, 9916), (63, 9973),

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 57 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 57 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 57 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 57 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 57 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 31 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 57 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 57 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 31 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 57 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 57 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 57 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 31 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 57 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 31 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 57 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 57 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 31 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 31 MA's), (35, 9122), (Start: 40 @9152 has 2 MA's), (49, 9248), (51, 9275), (60, 9425), (63, 9482),

Gene: Paolo_16 Start: 9577, Stop: 10047, Start Num: 30
Candidate Starts for Paolo_16:
(19, 9226), (25, 9361), (Start: 30 @9577 has 4 MA's), (Start: 32 @9580 has 31 MA's), (35, 9637), (42, 9679), (47, 9727), (49, 9763), (51, 9790), (60, 9931), (63, 9988),

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 57 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 4 MA's), (Start: 32 @8963 has 31 MA's), (45, 9068), (51, 9152), (57, 9248), (58, 9257), (62, 9332),

Gene: Puginator_17 Start: 9529, Stop: 10005, Start Num: 32
Candidate Starts for Puginator_17:
(Start: 32 @9529 has 31 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 31 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 57 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 57 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 57 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 31 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 57 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 57 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 57 MA's), (49, 9592), (52, 9622), (60, 9742), (62, 9802),

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 31 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 57 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 57 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 31 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 57 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 31 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 31 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 31 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 57 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 57 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 31 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 31 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 57 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 57 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 57 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 31 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 31 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 4 MA's), (Start: 32 @9353 has 31 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 57 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 57 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 57 MA's), (Start: 40 @9212 has 2 MA's), (49, 9320), (52, 9350), (60, 9470), (62, 9527),

Gene: Yasdnil_13 Start: 9144, Stop: 9539, Start Num: 31

Candidate Starts for Yasdnil_13:

(4, 8565), (5, 8589), (27, 9030), (29, 9060), (Start: 31 @9144 has 57 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 31 MA's), (33, 9623), (45, 9719), (51, 9803), (53, 9839), (60, 9926), (62, 9986),

Gene: Zainub_18 Start: 9535, Stop: 10005, Start Num: 30

Candidate Starts for Zainub_18:

(19, 9184), (25, 9319), (Start: 30 @9535 has 4 MA's), (Start: 32 @9538 has 31 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 57 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 4 MA's), (Start: 32 @11016 has 31 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 4 MA's), (43, 9334), (54, 9529), (64, 9661), (65, 9673),