



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 196413 Report

This analysis was run 12/09/24 on database version 580.

Pham number 196413 has 107 members, 6 are drafts.

Phages represented in each track:

- Track 1 : Ruotula_56
- Track 2 : Kykar_53
- Track 3 : Greg_55, Hermia_54, Ciao_53, Buttons_52, Fajezeel_55, Marge_53, Ohno789_55, Pippin_55
- Track 4 : Licorice_56, StewieG_52, Homines_46, Sanya_51, HanShotFirst_54
- Track 5 : NEHalo_51
- Track 6 : Bxb1_49
- Track 7 : SkiPole_58
- Track 8 : Sagefire_56, MetalQZJ_52, ILeeKay_57, MaryBeth_53, Rajelicia_54
- Track 9 : Turj99_52
- Track 10 : Fascinus_49, Gyzlar_49
- Track 11 : Seabiscuit_56, DreamCatcher_57, Briton15_57
- Track 12 : Kugel_54
- Track 13 : Corvo_54, Forsytheast_53, SwissCheese_55, PascalRango_54, KSSJEB_53, McGuire_55, Moose_53, Papez_56, Killigrew_54
- Track 14 : Gandalf20_56
- Track 15 : Swole_54, JuliaChild_54, Museum_54
- Track 16 : SarFire_51, Thor_51
- Track 17 : GrecoEtereo_54, Magnito_52
- Track 18 : RidgeCB_53
- Track 19 : Norz_54, Atkinbua_56
- Track 20 : BK1_49, A6_49
- Track 21 : Tote_49
- Track 22 : Solon_52, Target_54, U2_53
- Track 23 : Marcell_51
- Track 24 : Oogway_52
- Track 25 : Bethlehem_54
- Track 26 : Traft412_56
- Track 27 : Sandaddy_52, Ringer_54, Sorpresa_52
- Track 28 : BPBiebs31_54
- Track 29 : JackSparrow_55
- Track 30 : Pari_55
- Track 31 : PinkPlastic_54
- Track 32 : Alsfro_57
- Track 33 : Maroc7_51
- Track 34 : Sumter_50
- Track 35 : Snazzy_52, ShortQueendom_47

- Track 36 : Pinto_53
- Track 37 : Burton_53
- Track 38 : Switzer_55, Squee_54, Fenn_56, Naira_56
- Track 39 : Gwendoluna_57
- Track 40 : Parliament_53
- Track 41 : GMonster_50
- Track 42 : Molly_54, Arcanine_54, Slagathor_55
- Track 43 : BeesKnees_56, Dynamix_55
- Track 44 : Watermelon_54
- Track 45 : Altman_56, Kanely_55
- Track 46 : Bigfoot_49
- Track 47 : Petp2012_54
- Track 48 : Rubeus_53, Ichabod_56
- Track 49 : Wilkins_53, Topgun_53
- Track 50 : LilBib_53
- Track 51 : Lockley_52, DD5_53
- Track 52 : Conceptll_55
- Track 53 : Sunshine924_55
- Track 54 : Lamina13_54, Tasp14_55
- Track 55 : STLscum_56
- Track 56 : HarryOW_52
- Track 57 : Dulcie_54
- Track 58 : Smeagol_55
- Track 59 : Mryolo_51

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

The start number called the most often in the published annotations is 20, it was called in 81 of the 101 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- A6_49, Alsfro_57, BK1_49, BPBiebs31_54, BeesKnees_56, Bethlehem_54, Bigfoot_49, Briton15_57, Burton_53, Buttons_52, Bxb1_49, Ciao_53, Corvo_54, DD5_53, DreamCatcher_57, Dulcie_54, Dynamix_55, Fajezeel_55, Fenn_56, Forsytheast_53, GMonster_50, Gandalf20_56, GrecoEtereo_54, Greg_55, Gwendoluna_57, HanShotFirst_54, Hermia_54, Homines_46, ILeeKay_57, Ichabod_56, JuliaChild_54, KSSJEB_53, Killigrew_54, Kugel_54, Kykar_53, Lamina13_54, Licorice_56, Lockley_52, Magnito_52, Marcell_51, Marge_53, MaryBeth_53, McGuire_55, MetalQZJ_52, Moose_53, Mryolo_51, Museum_54, NEHalo_51, Naira_56, Ohno789_55, Papez_56, Parliament_53, PascalRango_54, PinkPlastic_54, Pinto_53, Pippin_55, Rajelicia_54, RidgeCB_53, Ringer_54, Rubeus_53, Ruotula_56, STLscum_56, Sagefire_56, Sandaddy_52, Sanya_51, SarFire_51, Seabiscuit_56, SkiPole_58, Solon_52, Sorpresa_52, Squee_54, StewieG_52, Sumter_50, Sunshine924_55, SwissCheese_55, Switzer_55, Swole_54, Target_54, Tasp14_55, Thor_51, Topgun_53, Trafft412_56, Turj99_52, U2_53, Watermelon_54, Wilkins_53,

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

- Pari_55, Smeagol_55, Tote_49,

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

- Altman_56, Arcanine_54, Atkinbua_56, ConceptII_55, Fascinus_49, Gyzlar_49, HarryOW_52, JackSparrow_55, Kanely_55, LilBib_53, Maroc7_51, Molly_54, Norz_54, Oogway_52, Petp2012_54, ShortQueendom_47, Slagathor_55, Snazzy_52,

Summary by start number:

Start 12:

- Found in 5 of 107 (4.7%) of genes in pham
- Manual Annotations of this start: 1 of 101
- Called 20.0% of time when present
- Phage (with cluster) where this start called: Maroc7_51 (A1),

Start 17:

- Found in 12 of 107 (11.2%) of genes in pham
- Manual Annotations of this start: 3 of 101
- Called 25.0% of time when present
- Phage (with cluster) where this start called: Pari_55 (A1), Smeagol_55 (A1), Tote_49 (A1),

Start 19:

- Found in 14 of 107 (13.1%) of genes in pham
- Manual Annotations of this start: 12 of 101
- Called 92.9% of time when present
- Phage (with cluster) where this start called: Altman_56 (A1), Atkinbua_56 (A1), ConceptII_55 (A1), Fascinus_49 (A1), Gyzlar_49 (A1), HarryOW_52 (A1), JackSparrow_55 (A1), Kanely_55 (A1), LilBib_53 (A1), Norz_54 (A1), Oogway_52 (A1), ShortQueendom_47 (A1), Snazzy_52 (A1),

Start 20:

- Found in 89 of 107 (83.2%) of genes in pham
- Manual Annotations of this start: 81 of 101
- Called 96.6% of time when present
- Phage (with cluster) where this start called: A6_49 (A1), Alsfro_57 (A1), BK1_49 (A1), BPBiebs31_54 (A1), BeesKnees_56 (A1), Bethlehem_54 (A1), Bigfoot_49 (A1), Briton15_57 (A1), Burton_53 (A1), Buttons_52 (A1), Bxb1_49 (A1), Ciao_53 (A1), Corvo_54 (A1), DD5_53 (A1), DreamCatcher_57 (A1), Dulcie_54 (A1), Dynamix_55 (A1), Fajezeel_55 (A1), Fenn_56 (A1), Forsytheast_53 (A1), GMonster_50 (A1), Gandalf20_56 (A1), GrecoEtereo_54 (A1), Greg_55 (A1), Gwendoluna_57 (A1), HanShotFirst_54 (A1), Hermia_54 (A1), Homines_46 (A1), ILeeKay_57 (A1), Ichabod_56 (A1), JuliaChild_54 (A1), KSSJEB_53 (A1), Killigrew_54 (A1), Kugel_54 (A1), Kykar_53 (A1), Lamina13_54 (A1), Licorice_56 (A1), Lockley_52 (A1), Magnito_52 (A1), Marcell_51 (A1), Marge_53 (A1), MaryBeth_53 (A1), McGuire_55 (A1), MetalQZJ_52 (A1), Moose_53 (A1), Mryolo_51 (A1), Museum_54 (A1), NEHalo_51 (A1), Naira_56 (A1), Ohno789_55 (A1), Papez_56 (A1), Parliament_53 (A1), PascalRango_54 (A1), PinkPlastic_54 (A1), Pinto_53 (A1), Pippin_55 (A1), Rajelicia_54 (A1), RidgeCB_53 (A1), Ringer_54 (A1), Rubeus_53 (A1), Ruotula_56 (A1), STLscum_56 (A1), Sagefire_56 (A1), Sandaddy_52 (A1), Sanya_51 (A1), SarFire_51 (A1), Seabiscuit_56 (A1), SkiPole_58 (A1), Solon_52 (A1), Sorpresa_52 (A1), Squee_54 (A1), StewieG_52 (A1), Sumter_50 (A1), Sunshine924_55 (A1), SwissCheese_55 (A1), Switzer_55 (A1), Swole_54 (A1), Target_54 (A1), Tasp14_55 (A1), Thor_51 (A1), Topgun_53 (A1), Trافت412_56 (A1), Turj99_52 (A1), U2_53 (A1),

Watermelon_54 (A1), Wilkins_53 (A1),

Start 21:

- Found in 4 of 107 (3.7%) of genes in pham
- Manual Annotations of this start: 4 of 101
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Arcanine_54 (A1), Molly_54 (A1), Petp2012_54 (A1), Slagathor_55 (A1),

Summary by clusters:

There is one cluster represented in this pham: A1

Info for manual annotations of cluster A1:

- Start number 12 was manually annotated 1 time for cluster A1.
- Start number 17 was manually annotated 3 times for cluster A1.
- Start number 19 was manually annotated 12 times for cluster A1.
- Start number 20 was manually annotated 81 times for cluster A1.
- Start number 21 was manually annotated 4 times for cluster A1.

Gene Information:

Gene: A6_49 Start: 36945, Stop: 36379, Start Num: 20

Candidate Starts for A6_49:

(Start: 20 @36945 has 81 MA's), (23, 36846), (24, 36792), (26, 36768), (31, 36633), (32, 36597), (34, 36543), (35, 36522), (36, 36501), (46, 36417),

Gene: Alsfro_57 Start: 38448, Stop: 37891, Start Num: 20

Candidate Starts for Alsfro_57:

(16, 38475), (Start: 20 @38448 has 81 MA's), (22, 38415), (23, 38349), (24, 38295), (25, 38280), (26, 38271), (31, 38136), (32, 38100), (34, 38046), (35, 38025), (39, 37986),

Gene: Altman_56 Start: 39112, Stop: 38498, Start Num: 19

Candidate Starts for Altman_56:

(Start: 12 @39163 has 1 MA's), (Start: 19 @39112 has 12 MA's), (23, 39010), (24, 38956), (25, 38941), (26, 38932), (31, 38797), (32, 38761), (34, 38710), (35, 38689), (36, 38668), (38, 38653), (41, 38620),

Gene: Arcanine_54 Start: 38877, Stop: 38323, Start Num: 21

Candidate Starts for Arcanine_54:

(15, 38919), (18, 38889), (Start: 21 @38877 has 4 MA's), (23, 38778), (24, 38724), (25, 38709), (26, 38700), (31, 38565), (32, 38529), (34, 38478), (35, 38457), (39, 38418),

Gene: Atkinbua_56 Start: 38718, Stop: 38152, Start Num: 19

Candidate Starts for Atkinbua_56:

(4, 38829), (11, 38772), (Start: 19 @38718 has 12 MA's), (23, 38616), (24, 38562), (25, 38547), (26, 38538), (31, 38403), (32, 38367), (34, 38316), (35, 38295), (36, 38274), (46, 38190),

Gene: BK1_49 Start: 36945, Stop: 36379, Start Num: 20

Candidate Starts for BK1_49:

(Start: 20 @36945 has 81 MA's), (23, 36846), (24, 36792), (26, 36768), (31, 36633), (32, 36597), (34, 36543), (35, 36522), (36, 36501), (46, 36417),

Gene: BPBiebs31_54 Start: 39309, Stop: 38695, Start Num: 20

Candidate Starts for BPBiebs31_54:

(14, 39351), (Start: 17 @39321 has 3 MA's), (Start: 20 @39309 has 81 MA's), (23, 39210), (24, 39156), (25, 39141), (26, 39132), (31, 38997), (32, 38961), (34, 38907), (35, 38886), (39, 38847),

Gene: BeesKnees_56 Start: 38614, Stop: 38048, Start Num: 20

Candidate Starts for BeesKnees_56:

(Start: 20 @38614 has 81 MA's), (23, 38515), (24, 38461), (25, 38446), (26, 38437), (31, 38302), (32, 38266), (34, 38212), (35, 38191), (36, 38170), (44, 38113), (46, 38086),

Gene: Bethlehem_54 Start: 40112, Stop: 39468, Start Num: 20

Candidate Starts for Bethlehem_54:

(Start: 20 @40112 has 81 MA's), (23, 40013), (24, 39959), (25, 39944), (26, 39935), (27, 39815), (31, 39719), (32, 39683), (34, 39632), (35, 39611), (36, 39590), (44, 39533), (46, 39506),

Gene: Bigfoot_49 Start: 37265, Stop: 36663, Start Num: 20

Candidate Starts for Bigfoot_49:

(Start: 20 @37265 has 81 MA's), (23, 37166), (24, 37112), (25, 37097), (26, 37088), (31, 36953), (32, 36917), (34, 36863), (35, 36842), (37, 36809), (40, 36785), (49, 36701),

Gene: Briton15_57 Start: 38936, Stop: 38289, Start Num: 20

Candidate Starts for Briton15_57:

(Start: 20 @38936 has 81 MA's), (23, 38837), (24, 38783), (25, 38768), (26, 38759), (27, 38639), (31, 38543), (32, 38507), (34, 38453), (35, 38432), (36, 38411), (44, 38354), (46, 38327),

Gene: Burton_53 Start: 38704, Stop: 38138, Start Num: 20

Candidate Starts for Burton_53:

(5, 38788), (Start: 17 @38716 has 3 MA's), (Start: 20 @38704 has 81 MA's), (23, 38605), (24, 38551), (25, 38536), (26, 38527), (31, 38392), (32, 38356), (34, 38302), (35, 38281), (36, 38260), (44, 38203), (46, 38176),

Gene: Buttons_52 Start: 36766, Stop: 36149, Start Num: 20

Candidate Starts for Buttons_52:

(Start: 20 @36766 has 81 MA's), (23, 36667), (24, 36613), (25, 36598), (26, 36589), (31, 36454), (32, 36418), (34, 36364), (35, 36343),

Gene: Bxb1_49 Start: 37514, Stop: 36960, Start Num: 20

Candidate Starts for Bxb1_49:

(Start: 20 @37514 has 81 MA's), (23, 37415), (24, 37361), (25, 37346), (26, 37337), (31, 37202), (32, 37166), (34, 37115), (35, 37094), (39, 37055),

Gene: Ciao_53 Start: 38224, Stop: 37607, Start Num: 20

Candidate Starts for Ciao_53:

(Start: 20 @38224 has 81 MA's), (23, 38125), (24, 38071), (25, 38056), (26, 38047), (31, 37912), (32, 37876), (34, 37822), (35, 37801),

Gene: ConceptII_55 Start: 39890, Stop: 39276, Start Num: 19

Candidate Starts for ConceptII_55:

(3, 40001), (11, 39944), (Start: 19 @39890 has 12 MA's), (23, 39788), (24, 39734), (25, 39719), (26, 39710), (31, 39575), (32, 39539), (34, 39488), (35, 39467), (36, 39446), (38, 39431), (41, 39398),

Gene: Corvo_54 Start: 39669, Stop: 39103, Start Num: 20

Candidate Starts for Corvo_54:

(Start: 20 @39669 has 81 MA's), (23, 39570), (24, 39516), (25, 39501), (26, 39492), (31, 39357), (32, 39321), (34, 39267), (35, 39246), (36, 39225), (44, 39168), (46, 39141),

Gene: DD5_53 Start: 39005, Stop: 38370, Start Num: 20

Candidate Starts for DD5_53:

(Start: 20 @39005 has 81 MA's), (23, 38906), (24, 38852), (25, 38837), (26, 38828), (27, 38708), (31, 38612), (32, 38576), (35, 38513), (36, 38492), (46, 38408),

Gene: DreamCatcher_57 Start: 39673, Stop: 39026, Start Num: 20

Candidate Starts for DreamCatcher_57:

(Start: 20 @39673 has 81 MA's), (23, 39574), (24, 39520), (25, 39505), (26, 39496), (27, 39376), (31, 39280), (32, 39244), (34, 39190), (35, 39169), (36, 39148), (44, 39091), (46, 39064),

Gene: Dulcie_54 Start: 38438, Stop: 37827, Start Num: 20

Candidate Starts for Dulcie_54:

(Start: 20 @38438 has 81 MA's), (23, 38339), (24, 38285), (25, 38270), (26, 38261), (31, 38126), (32, 38096), (34, 38042), (35, 38021),

Gene: Dynamix_55 Start: 38412, Stop: 37846, Start Num: 20

Candidate Starts for Dynamix_55:

(Start: 20 @38412 has 81 MA's), (23, 38313), (24, 38259), (25, 38244), (26, 38235), (31, 38100), (32, 38064), (34, 38010), (35, 37989), (36, 37968), (44, 37911), (46, 37884),

Gene: Fajezeel_55 Start: 38573, Stop: 37956, Start Num: 20

Candidate Starts for Fajezeel_55:

(Start: 20 @38573 has 81 MA's), (23, 38474), (24, 38420), (25, 38405), (26, 38396), (31, 38261), (32, 38225), (34, 38171), (35, 38150),

Gene: Fascinus_49 Start: 37456, Stop: 36887, Start Num: 19

Candidate Starts for Fascinus_49:

(Start: 12 @37507 has 1 MA's), (Start: 19 @37456 has 12 MA's), (23, 37354), (24, 37300), (25, 37285), (26, 37276), (31, 37141), (32, 37105), (34, 37054), (35, 37033), (36, 37012), (46, 36925),

Gene: Fenn_56 Start: 40358, Stop: 39792, Start Num: 20

Candidate Starts for Fenn_56:

(Start: 20 @40358 has 81 MA's), (23, 40259), (24, 40205), (25, 40190), (26, 40181), (31, 40046), (32, 40010), (34, 39956), (35, 39935), (36, 39914), (44, 39857), (46, 39830),

Gene: Forsytheast_53 Start: 37985, Stop: 37419, Start Num: 20

Candidate Starts for Forsytheast_53:

(Start: 20 @37985 has 81 MA's), (23, 37886), (24, 37832), (25, 37817), (26, 37808), (31, 37673), (32, 37637), (34, 37583), (35, 37562), (36, 37541), (44, 37484), (46, 37457),

Gene: GMonster_50 Start: 36829, Stop: 36272, Start Num: 20

Candidate Starts for GMonster_50:

(2, 37015), (9, 36895), (Start: 20 @36829 has 81 MA's), (22, 36796), (23, 36730), (24, 36676), (25, 36661), (26, 36652), (31, 36517), (32, 36481), (34, 36427), (35, 36406), (39, 36367),

Gene: Gandalf20_56 Start: 40348, Stop: 39758, Start Num: 20

Candidate Starts for Gandalf20_56:

(Start: 20 @40348 has 81 MA's), (23, 40249), (24, 40195), (25, 40180), (26, 40171), (31, 40036), (32, 40000), (34, 39946), (35, 39925), (39, 39886), (43, 39853),

Gene: GrecoEtereo_54 Start: 38332, Stop: 37766, Start Num: 20

Candidate Starts for GrecoEtereo_54:

(Start: 20 @38332 has 81 MA's), (23, 38233), (24, 38179), (25, 38164), (26, 38155), (31, 38020), (32, 37984), (34, 37930), (35, 37909), (46, 37804),

Gene: Greg_55 Start: 38573, Stop: 37956, Start Num: 20

Candidate Starts for Greg_55:

(Start: 20 @38573 has 81 MA's), (23, 38474), (24, 38420), (25, 38405), (26, 38396), (31, 38261), (32, 38225), (34, 38171), (35, 38150),

Gene: Gwendoluna_57 Start: 40576, Stop: 39968, Start Num: 20

Candidate Starts for Gwendoluna_57:

(Start: 20 @40576 has 81 MA's), (23, 40477), (24, 40423), (25, 40408), (26, 40399), (31, 40264), (32, 40228), (34, 40177), (35, 40156),

Gene: Gyzlar_49 Start: 36249, Stop: 35680, Start Num: 19

Candidate Starts for Gyzlar_49:

(Start: 12 @36300 has 1 MA's), (Start: 19 @36249 has 12 MA's), (23, 36147), (24, 36093), (25, 36078), (26, 36069), (31, 35934), (32, 35898), (34, 35844), (35, 35823), (36, 35802), (46, 35718),

Gene: HanShotFirst_54 Start: 38872, Stop: 38306, Start Num: 20

Candidate Starts for HanShotFirst_54:

(Start: 20 @38872 has 81 MA's), (23, 38773), (24, 38719), (25, 38704), (26, 38695), (31, 38560), (32, 38524), (34, 38470), (35, 38449), (36, 38428), (46, 38344),

Gene: HarryOW_52 Start: 37507, Stop: 36938, Start Num: 19

Candidate Starts for HarryOW_52:

(4, 37618), (11, 37561), (Start: 19 @37507 has 12 MA's), (23, 37405), (24, 37351), (25, 37336), (26, 37327), (31, 37192), (32, 37156), (34, 37102), (35, 37081), (46, 36976),

Gene: Hermia_54 Start: 39005, Stop: 38388, Start Num: 20

Candidate Starts for Hermia_54:

(Start: 20 @39005 has 81 MA's), (23, 38906), (24, 38852), (25, 38837), (26, 38828), (31, 38693), (32, 38657), (34, 38603), (35, 38582),

Gene: Homines_46 Start: 34514, Stop: 33951, Start Num: 20

Candidate Starts for Homines_46:

(Start: 20 @34514 has 81 MA's), (23, 34415), (24, 34361), (25, 34346), (26, 34337), (31, 34202), (32, 34166), (34, 34115), (35, 34094), (36, 34073), (46, 33989),

Gene: ILeeKay_57 Start: 39101, Stop: 38547, Start Num: 20

Candidate Starts for ILeeKay_57:

(Start: 20 @39101 has 81 MA's), (23, 39002), (24, 38948), (25, 38933), (26, 38924), (31, 38789), (32, 38753), (34, 38702), (35, 38681), (39, 38642),

Gene: Ichabod_56 Start: 39693, Stop: 39127, Start Num: 20

Candidate Starts for Ichabod_56:

(13, 39735), (Start: 17 @39705 has 3 MA's), (Start: 20 @39693 has 81 MA's), (23, 39594), (24, 39540), (25, 39525), (26, 39516), (31, 39381), (32, 39345), (34, 39291), (35, 39270), (36, 39249), (46, 39165),

Gene: JackSparrow_55 Start: 38752, Stop: 38186, Start Num: 19

Candidate Starts for JackSparrow_55:

(10, 38803), (Start: 19 @38752 has 12 MA's), (22, 38719), (23, 38653), (24, 38599), (25, 38584), (26, 38575), (31, 38440), (32, 38404), (34, 38350), (35, 38329), (36, 38308), (46, 38224),

Gene: JuliaChild_54 Start: 38193, Stop: 37627, Start Num: 20

Candidate Starts for JuliaChild_54:

(13, 38235), (Start: 17 @38205 has 3 MA's), (Start: 20 @38193 has 81 MA's), (23, 38094), (24, 38040), (25, 38025), (26, 38016), (31, 37881), (32, 37845), (34, 37791), (35, 37770), (36, 37749), (44, 37692), (46, 37665),

Gene: KSSJEB_53 Start: 38192, Stop: 37626, Start Num: 20

Candidate Starts for KSSJEB_53:

(Start: 20 @38192 has 81 MA's), (23, 38093), (24, 38039), (25, 38024), (26, 38015), (31, 37880), (32, 37844), (34, 37790), (35, 37769), (36, 37748), (44, 37691), (46, 37664),

Gene: Kanely_55 Start: 38889, Stop: 38275, Start Num: 19

Candidate Starts for Kanely_55:

(Start: 12 @38940 has 1 MA's), (Start: 19 @38889 has 12 MA's), (23, 38787), (24, 38733), (25, 38718), (26, 38709), (31, 38574), (32, 38538), (34, 38487), (35, 38466), (36, 38445), (38, 38430), (41, 38397),

Gene: Killigrew_54 Start: 39392, Stop: 38826, Start Num: 20

Candidate Starts for Killigrew_54:

(Start: 20 @39392 has 81 MA's), (23, 39293), (24, 39239), (25, 39224), (26, 39215), (31, 39080), (32, 39044), (34, 38990), (35, 38969), (36, 38948), (44, 38891), (46, 38864),

Gene: Kugel_54 Start: 39457, Stop: 38903, Start Num: 20

Candidate Starts for Kugel_54:

(Start: 20 @39457 has 81 MA's), (23, 39358), (24, 39304), (25, 39289), (26, 39280), (31, 39145), (32, 39109), (34, 39058), (35, 39037), (39, 38998),

Gene: Kykar_53 Start: 38219, Stop: 37605, Start Num: 20

Candidate Starts for Kykar_53:

(Start: 20 @38219 has 81 MA's), (23, 38120), (24, 38066), (25, 38051), (26, 38042), (31, 37907), (34, 37817), (35, 37796), (36, 37775), (38, 37760), (41, 37727),

Gene: Lamina13_54 Start: 38247, Stop: 37576, Start Num: 20

Candidate Starts for Lamina13_54:

(Start: 20 @38247 has 81 MA's), (23, 38148), (24, 38094), (25, 38079), (26, 38070), (27, 37950), (31, 37854), (32, 37818), (34, 37764), (35, 37743), (39, 37704), (43, 37671),

Gene: Licorice_56 Start: 40561, Stop: 39995, Start Num: 20

Candidate Starts for Licorice_56:

(Start: 20 @40561 has 81 MA's), (23, 40462), (24, 40408), (25, 40393), (26, 40384), (31, 40249), (32, 40213), (34, 40159), (35, 40138), (36, 40117), (46, 40033),

Gene: LilBib_53 Start: 39658, Stop: 39053, Start Num: 19

Candidate Starts for LilBib_53:

(4, 39769), (8, 39721), (Start: 19 @39658 has 12 MA's), (23, 39556), (24, 39502), (25, 39487), (26, 39478), (31, 39343), (32, 39307), (33, 39247), (42, 39124), (48, 39064),

Gene: Lockley_52 Start: 38167, Stop: 37532, Start Num: 20

Candidate Starts for Lockley_52:

(Start: 20 @38167 has 81 MA's), (23, 38068), (24, 38014), (25, 37999), (26, 37990), (27, 37870), (31, 37774), (32, 37738), (35, 37675), (36, 37654), (46, 37570),

Gene: Magnito_52 Start: 38460, Stop: 37900, Start Num: 20

Candidate Starts for Magnito_52:

(Start: 20 @38460 has 81 MA's), (23, 38361), (24, 38307), (25, 38292), (26, 38283), (31, 38148), (32, 38112), (34, 38058), (35, 38037), (46, 37938),

Gene: Marcell_51 Start: 37819, Stop: 37265, Start Num: 20

Candidate Starts for Marcell_51:

(Start: 20 @37819 has 81 MA's), (23, 37720), (24, 37666), (25, 37651), (26, 37642), (31, 37507), (32, 37471), (34, 37420), (35, 37399), (39, 37360),

Gene: Marge_53 Start: 38708, Stop: 38079, Start Num: 20

Candidate Starts for Marge_53:

(Start: 20 @38708 has 81 MA's), (23, 38609), (24, 38555), (25, 38540), (26, 38531), (31, 38396), (32, 38360), (34, 38306), (35, 38285),

Gene: Maroc7_51 Start: 37816, Stop: 37196, Start Num: 12

Candidate Starts for Maroc7_51:

(Start: 12 @37816 has 1 MA's), (Start: 19 @37765 has 12 MA's), (23, 37663), (24, 37609), (25, 37594), (26, 37585), (31, 37450), (32, 37414), (34, 37363), (35, 37342), (36, 37321), (46, 37234),

Gene: MaryBeth_53 Start: 39046, Stop: 38489, Start Num: 20

Candidate Starts for MaryBeth_53:

(Start: 20 @39046 has 81 MA's), (23, 38947), (24, 38893), (25, 38878), (26, 38869), (31, 38734), (32, 38698), (34, 38644), (35, 38623), (39, 38584),

Gene: McGuire_55 Start: 38290, Stop: 37724, Start Num: 20

Candidate Starts for McGuire_55:

(Start: 20 @38290 has 81 MA's), (23, 38191), (24, 38137), (25, 38122), (26, 38113), (31, 37978), (32, 37942), (34, 37888), (35, 37867), (36, 37846), (44, 37789), (46, 37762),

Gene: MetalQZJ_52 Start: 39046, Stop: 38489, Start Num: 20

Candidate Starts for MetalQZJ_52:

(Start: 20 @39046 has 81 MA's), (23, 38947), (24, 38893), (25, 38878), (26, 38869), (31, 38734), (32, 38698), (34, 38644), (35, 38623), (39, 38584),

Gene: Molly_54 Start: 37493, Stop: 36939, Start Num: 21

Candidate Starts for Molly_54:

(15, 37535), (18, 37505), (Start: 21 @37493 has 4 MA's), (23, 37394), (24, 37340), (25, 37325), (26, 37316), (31, 37181), (32, 37145), (34, 37094), (35, 37073), (39, 37034),

Gene: Moose_53 Start: 37985, Stop: 37419, Start Num: 20

Candidate Starts for Moose_53:

(Start: 20 @37985 has 81 MA's), (23, 37886), (24, 37832), (25, 37817), (26, 37808), (31, 37673), (32, 37637), (34, 37583), (35, 37562), (36, 37541), (44, 37484), (46, 37457),

Gene: Mryolo_51 Start: 38512, Stop: 37898, Start Num: 20

Candidate Starts for Mryolo_51:

(Start: 20 @38512 has 81 MA's), (23, 38413), (24, 38359), (25, 38344), (26, 38335), (31, 38200), (32, 38164), (34, 38110), (35, 38089), (36, 38068), (38, 38053), (41, 38020),

Gene: Museum_54 Start: 38643, Stop: 38077, Start Num: 20

Candidate Starts for Museum_54:

(13, 38685), (Start: 17 @38655 has 3 MA's), (Start: 20 @38643 has 81 MA's), (23, 38544), (24, 38490), (25, 38475), (26, 38466), (31, 38331), (32, 38295), (34, 38241), (35, 38220), (36, 38199), (44, 38142), (46, 38115),

Gene: NEHalo_51 Start: 38428, Stop: 37814, Start Num: 20

Candidate Starts for NEHalo_51:

(13, 38470), (Start: 17 @38440 has 3 MA's), (Start: 20 @38428 has 81 MA's), (23, 38329), (24, 38275), (25, 38260), (26, 38251), (31, 38116), (32, 38080), (34, 38026), (35, 38005), (36, 37984), (38, 37969), (41, 37936),

Gene: Naira_56 Start: 40405, Stop: 39839, Start Num: 20

Candidate Starts for Naira_56:

(Start: 20 @40405 has 81 MA's), (23, 40306), (24, 40252), (25, 40237), (26, 40228), (31, 40093), (32, 40057), (34, 40003), (35, 39982), (36, 39961), (44, 39904), (46, 39877),

Gene: Norz_54 Start: 39632, Stop: 39066, Start Num: 19

Candidate Starts for Norz_54:

(4, 39743), (11, 39686), (Start: 19 @39632 has 12 MA's), (23, 39530), (24, 39476), (25, 39461), (26, 39452), (31, 39317), (32, 39281), (34, 39230), (35, 39209), (36, 39188), (46, 39104),

Gene: Ohno789_55 Start: 39227, Stop: 38613, Start Num: 20

Candidate Starts for Ohno789_55:

(Start: 20 @39227 has 81 MA's), (23, 39128), (24, 39074), (25, 39059), (26, 39050), (31, 38915), (32, 38879), (34, 38828), (35, 38807),

Gene: Oogway_52 Start: 38320, Stop: 37736, Start Num: 19

Candidate Starts for Oogway_52:

(4, 38431), (Start: 19 @38320 has 12 MA's), (23, 38218), (24, 38164), (25, 38149), (26, 38140), (29, 38020), (32, 37957), (34, 37903), (35, 37882), (36, 37861), (46, 37774),

Gene: Papez_56 Start: 40588, Stop: 40022, Start Num: 20

Candidate Starts for Papez_56:

(Start: 20 @40588 has 81 MA's), (23, 40489), (24, 40435), (25, 40420), (26, 40411), (31, 40276), (32, 40240), (34, 40186), (35, 40165), (36, 40144), (44, 40087), (46, 40060),

Gene: Pari_55 Start: 38216, Stop: 37557, Start Num: 17

Candidate Starts for Pari_55:

(Start: 17 @38216 has 3 MA's), (Start: 20 @38204 has 81 MA's), (23, 38105), (24, 38051), (25, 38036), (26, 38027), (27, 37907), (31, 37811), (32, 37775), (34, 37721), (35, 37700), (36, 37679), (44, 37622), (46, 37595),

Gene: Parliament_53 Start: 38723, Stop: 38079, Start Num: 20

Candidate Starts for Parliament_53:

(Start: 20 @38723 has 81 MA's), (23, 38624), (24, 38570), (25, 38555), (26, 38546), (27, 38426), (31, 38330), (32, 38294), (34, 38243), (35, 38222), (36, 38201), (46, 38117),

Gene: PascalRango_54 Start: 38941, Stop: 38375, Start Num: 20

Candidate Starts for PascalRango_54:

(Start: 20 @38941 has 81 MA's), (23, 38842), (24, 38788), (25, 38773), (26, 38764), (31, 38629), (32, 38593), (34, 38539), (35, 38518), (36, 38497), (44, 38440), (46, 38413),

Gene: Petp2012_54 Start: 38452, Stop: 37898, Start Num: 21

Candidate Starts for Petp2012_54:

(6, 38536), (15, 38494), (18, 38464), (Start: 21 @38452 has 4 MA's), (23, 38353), (24, 38299), (25, 38284), (26, 38275), (31, 38140), (32, 38104), (34, 38053), (35, 38032), (39, 37993),

Gene: PinkPlastic_54 Start: 38325, Stop: 37675, Start Num: 20

Candidate Starts for PinkPlastic_54:

(Start: 20 @38325 has 81 MA's), (23, 38226), (24, 38172), (25, 38157), (26, 38148), (27, 38028), (31, 37932), (32, 37896), (34, 37842), (35, 37821), (36, 37800), (46, 37713),

Gene: Pinto_53 Start: 38711, Stop: 38067, Start Num: 20

Candidate Starts for Pinto_53:

(13, 38753), (Start: 17 @38723 has 3 MA's), (Start: 20 @38711 has 81 MA's), (23, 38612), (24, 38558), (25, 38543), (26, 38534), (27, 38414), (31, 38318), (32, 38282), (34, 38231), (35, 38210), (36, 38189), (46, 38105),

Gene: Pippin_55 Start: 38617, Stop: 38000, Start Num: 20

Candidate Starts for Pippin_55:

(Start: 20 @38617 has 81 MA's), (23, 38518), (24, 38464), (25, 38449), (26, 38440), (31, 38305), (32, 38269), (34, 38215), (35, 38194),

Gene: Rajelicia_54 Start: 39566, Stop: 39009, Start Num: 20

Candidate Starts for Rajelicia_54:

(Start: 20 @39566 has 81 MA's), (23, 39467), (24, 39413), (25, 39398), (26, 39389), (31, 39254), (32, 39218), (34, 39164), (35, 39143), (39, 39104),

Gene: RidgeCB_53 Start: 38830, Stop: 38195, Start Num: 20

Candidate Starts for RidgeCB_53:

(Start: 20 @38830 has 81 MA's), (23, 38731), (24, 38677), (25, 38662), (26, 38653), (27, 38533), (31, 38437), (32, 38401), (34, 38350), (35, 38329), (39, 38290),

Gene: Ringer_54 Start: 39883, Stop: 39317, Start Num: 20

Candidate Starts for Ringer_54:

(Start: 20 @39883 has 81 MA's), (23, 39784), (24, 39730), (25, 39715), (26, 39706), (31, 39571), (32, 39535), (34, 39481), (35, 39460), (36, 39439), (46, 39355),

Gene: Rubeus_53 Start: 36498, Stop: 35935, Start Num: 20

Candidate Starts for Rubeus_53:

(13, 36540), (Start: 17 @36510 has 3 MA's), (Start: 20 @36498 has 81 MA's), (23, 36399), (24, 36345), (25, 36330), (26, 36321), (31, 36186), (32, 36150), (34, 36099), (35, 36078), (36, 36057), (46, 35973),

Gene: Ruotula_56 Start: 39803, Stop: 39174, Start Num: 20

Candidate Starts for Ruotula_56:

(Start: 20 @39803 has 81 MA's), (23, 39704), (24, 39650), (25, 39635), (26, 39626), (31, 39491), (32, 39455), (34, 39401), (35, 39380),

Gene: STLscum_56 Start: 39588, Stop: 38947, Start Num: 20

Candidate Starts for STLscum_56:

(Start: 20 @39588 has 81 MA's), (23, 39489), (24, 39435), (25, 39420), (26, 39411), (28, 39282), (30, 39237), (31, 39225), (32, 39189), (34, 39135), (35, 39114), (39, 39075), (43, 39042),

Gene: Sagefire_56 Start: 39529, Stop: 38915, Start Num: 20

Candidate Starts for Sagefire_56:

(Start: 20 @39529 has 81 MA's), (23, 39430), (24, 39376), (25, 39361), (26, 39352), (31, 39217), (32, 39181), (34, 39127), (35, 39106), (39, 39067),

Gene: Sandaddy_52 Start: 38282, Stop: 37716, Start Num: 20

Candidate Starts for Sandaddy_52:

(Start: 20 @38282 has 81 MA's), (23, 38183), (24, 38129), (25, 38114), (26, 38105), (31, 37970), (32, 37934), (34, 37880), (35, 37859), (36, 37838), (46, 37754),

Gene: Sanya_51 Start: 38572, Stop: 38009, Start Num: 20

Candidate Starts for Sanya_51:

(Start: 20 @38572 has 81 MA's), (23, 38473), (24, 38419), (25, 38404), (26, 38395), (31, 38260), (32, 38224), (34, 38173), (35, 38152), (36, 38131), (46, 38047),

Gene: SarFire_51 Start: 37844, Stop: 37278, Start Num: 20

Candidate Starts for SarFire_51:

(Start: 20 @37844 has 81 MA's), (23, 37745), (24, 37691), (25, 37676), (26, 37667), (31, 37532), (34, 37442), (35, 37421), (36, 37400), (46, 37316),

Gene: Seabiscuit_56 Start: 38458, Stop: 37811, Start Num: 20

Candidate Starts for Seabiscuit_56:

(Start: 20 @38458 has 81 MA's), (23, 38359), (24, 38305), (25, 38290), (26, 38281), (27, 38161), (31, 38065), (32, 38029), (34, 37975), (35, 37954), (36, 37933), (44, 37876), (46, 37849),

Gene: ShortQueendom_47 Start: 35302, Stop: 34736, Start Num: 19

Candidate Starts for ShortQueendom_47:

(1, 35488), (7, 35368), (Start: 19 @35302 has 12 MA's), (22, 35269), (23, 35203), (24, 35149), (25, 35134), (26, 35125), (31, 34990), (32, 34954), (34, 34900), (35, 34879), (36, 34858), (46, 34774),

Gene: SkiPole_58 Start: 39258, Stop: 38668, Start Num: 20

Candidate Starts for SkiPole_58:

(Start: 20 @39258 has 81 MA's), (23, 39159), (24, 39105), (25, 39090), (26, 39081), (31, 38946), (32, 38910), (34, 38856), (35, 38835), (39, 38796), (43, 38763),

Gene: Slagathor_55 Start: 39464, Stop: 38910, Start Num: 21

Candidate Starts for Slagathor_55:

(15, 39506), (18, 39476), (Start: 21 @39464 has 4 MA's), (23, 39365), (24, 39311), (25, 39296), (26, 39287), (31, 39152), (32, 39116), (34, 39065), (35, 39044), (39, 39005),

Gene: Smeagol_55 Start: 39706, Stop: 39155, Start Num: 17

Candidate Starts for Smeagol_55:

(Start: 17 @39706 has 3 MA's), (Start: 20 @39694 has 81 MA's), (23, 39595), (24, 39541), (25, 39526), (26, 39517), (31, 39382), (32, 39346), (34, 39322), (35, 39301), (36, 39280), (46, 39193),

Gene: Snazzy_52 Start: 37911, Stop: 37345, Start Num: 19

Candidate Starts for Snazzy_52:

(1, 38097), (7, 37977), (Start: 19 @37911 has 12 MA's), (22, 37878), (23, 37812), (24, 37758), (25, 37743), (26, 37734), (31, 37599), (32, 37563), (34, 37509), (35, 37488), (36, 37467), (46, 37383),

Gene: Solon_52 Start: 38166, Stop: 37603, Start Num: 20

Candidate Starts for Solon_52:

(Start: 20 @38166 has 81 MA's), (23, 38067), (24, 38013), (25, 37998), (26, 37989), (31, 37854), (32, 37818), (34, 37767), (35, 37746), (36, 37725), (46, 37641),

Gene: Sorpresa_52 Start: 38284, Stop: 37718, Start Num: 20

Candidate Starts for Sorpresa_52:

(Start: 20 @38284 has 81 MA's), (23, 38185), (24, 38131), (25, 38116), (26, 38107), (31, 37972), (32, 37936), (34, 37882), (35, 37861), (36, 37840), (46, 37756),

Gene: Squee_54 Start: 38872, Stop: 38306, Start Num: 20

Candidate Starts for Squee_54:

(Start: 20 @38872 has 81 MA's), (23, 38773), (24, 38719), (25, 38704), (26, 38695), (31, 38560), (32, 38524), (34, 38470), (35, 38449), (36, 38428), (44, 38371), (46, 38344),

Gene: StewieG_52 Start: 35689, Stop: 35123, Start Num: 20

Candidate Starts for StewieG_52:

(Start: 20 @35689 has 81 MA's), (23, 35590), (24, 35536), (25, 35521), (26, 35512), (31, 35377), (32, 35341), (34, 35290), (35, 35269), (36, 35248), (46, 35161),

Gene: Sumter_50 Start: 38825, Stop: 38259, Start Num: 20

Candidate Starts for Sumter_50:

(Start: 20 @38825 has 81 MA's), (23, 38726), (24, 38672), (25, 38657), (26, 38648), (31, 38513), (32, 38477), (34, 38423), (35, 38402), (36, 38381), (44, 38324), (46, 38297),

Gene: Sunshine924_55 Start: 37963, Stop: 37409, Start Num: 20

Candidate Starts for Sunshine924_55:

(Start: 20 @37963 has 81 MA's), (23, 37864), (24, 37810), (25, 37795), (26, 37786), (31, 37651), (32, 37615), (34, 37564), (35, 37543), (39, 37504), (47, 37426),

Gene: SwissCheese_55 Start: 38485, Stop: 37919, Start Num: 20

Candidate Starts for SwissCheese_55:

(Start: 20 @38485 has 81 MA's), (23, 38386), (24, 38332), (25, 38317), (26, 38308), (31, 38173), (32, 38137), (34, 38083), (35, 38062), (36, 38041), (44, 37984), (46, 37957),

Gene: Switzer_55 Start: 39397, Stop: 38831, Start Num: 20

Candidate Starts for Switzer_55:

(Start: 20 @39397 has 81 MA's), (23, 39298), (24, 39244), (25, 39229), (26, 39220), (31, 39085), (32, 39049), (34, 38995), (35, 38974), (36, 38953), (44, 38896), (46, 38869),

Gene: Swole_54 Start: 37668, Stop: 37102, Start Num: 20

Candidate Starts for Swole_54:

(13, 37710), (Start: 17 @37680 has 3 MA's), (Start: 20 @37668 has 81 MA's), (23, 37569), (24, 37515), (25, 37500), (26, 37491), (31, 37356), (32, 37320), (34, 37266), (35, 37245), (36, 37224), (44, 37167), (46, 37140),

Gene: Target_54 Start: 37073, Stop: 36507, Start Num: 20

Candidate Starts for Target_54:

(Start: 20 @37073 has 81 MA's), (23, 36974), (24, 36920), (25, 36905), (26, 36896), (31, 36761), (32, 36725), (34, 36671), (35, 36650), (36, 36629), (46, 36545),

Gene: Tasp14_55 Start: 38871, Stop: 38200, Start Num: 20

Candidate Starts for Tasp14_55:

(Start: 20 @38871 has 81 MA's), (23, 38772), (24, 38718), (25, 38703), (26, 38694), (27, 38574), (31, 38478), (32, 38442), (34, 38388), (35, 38367), (39, 38328), (43, 38295),

Gene: Thor_51 Start: 37202, Stop: 36636, Start Num: 20

Candidate Starts for Thor_51:

(Start: 20 @37202 has 81 MA's), (23, 37103), (24, 37049), (25, 37034), (26, 37025), (31, 36890), (34, 36800), (35, 36779), (36, 36758), (46, 36674),

Gene: Topgun_53 Start: 38055, Stop: 37489, Start Num: 20

Candidate Starts for Topgun_53:

(Start: 20 @38055 has 81 MA's), (23, 37956), (24, 37902), (25, 37887), (26, 37878), (31, 37743), (32, 37707), (34, 37656), (35, 37635), (36, 37614), (46, 37527),

Gene: Tote_49 Start: 34947, Stop: 34369, Start Num: 17

Candidate Starts for Tote_49:

(13, 34977), (Start: 17 @34947 has 3 MA's), (Start: 20 @34935 has 81 MA's), (23, 34836), (24, 34782), (25, 34767), (26, 34758), (31, 34623), (32, 34587), (34, 34533), (35, 34512), (36, 34491), (44, 34434), (46, 34407),

Gene: Traft412_56 Start: 39446, Stop: 38832, Start Num: 20

Candidate Starts for Traft412_56:

(Start: 20 @39446 has 81 MA's), (23, 39347), (24, 39293), (25, 39278), (26, 39269), (31, 39134), (32, 39098), (34, 39044), (35, 39023), (36, 39002), (38, 38987), (41, 38954),

Gene: Turj99_52 Start: 38730, Stop: 38170, Start Num: 20

Candidate Starts for Turj99_52:

(Start: 20 @38730 has 81 MA's), (23, 38631), (24, 38577), (25, 38562), (26, 38553), (31, 38418), (32, 38382), (34, 38328), (35, 38307), (46, 38208),

Gene: U2_53 Start: 39377, Stop: 38811, Start Num: 20

Candidate Starts for U2_53:

(Start: 20 @39377 has 81 MA's), (23, 39278), (24, 39224), (25, 39209), (26, 39200), (31, 39065), (32, 39029), (34, 38975), (35, 38954), (36, 38933), (46, 38849),

Gene: Watermelon_54 Start: 38595, Stop: 38029, Start Num: 20

Candidate Starts for Watermelon_54:

(Start: 20 @38595 has 81 MA's), (23, 38496), (24, 38442), (25, 38427), (26, 38418), (31, 38283), (32, 38247), (34, 38193), (35, 38172), (36, 38151), (45, 38085), (46, 38067),

Gene: Wilkins_53 Start: 37985, Stop: 37419, Start Num: 20

Candidate Starts for Wilkins_53:

(Start: 20 @37985 has 81 MA's), (23, 37886), (24, 37832), (25, 37817), (26, 37808), (31, 37673), (32, 37637), (34, 37586), (35, 37565), (36, 37544), (46, 37457),