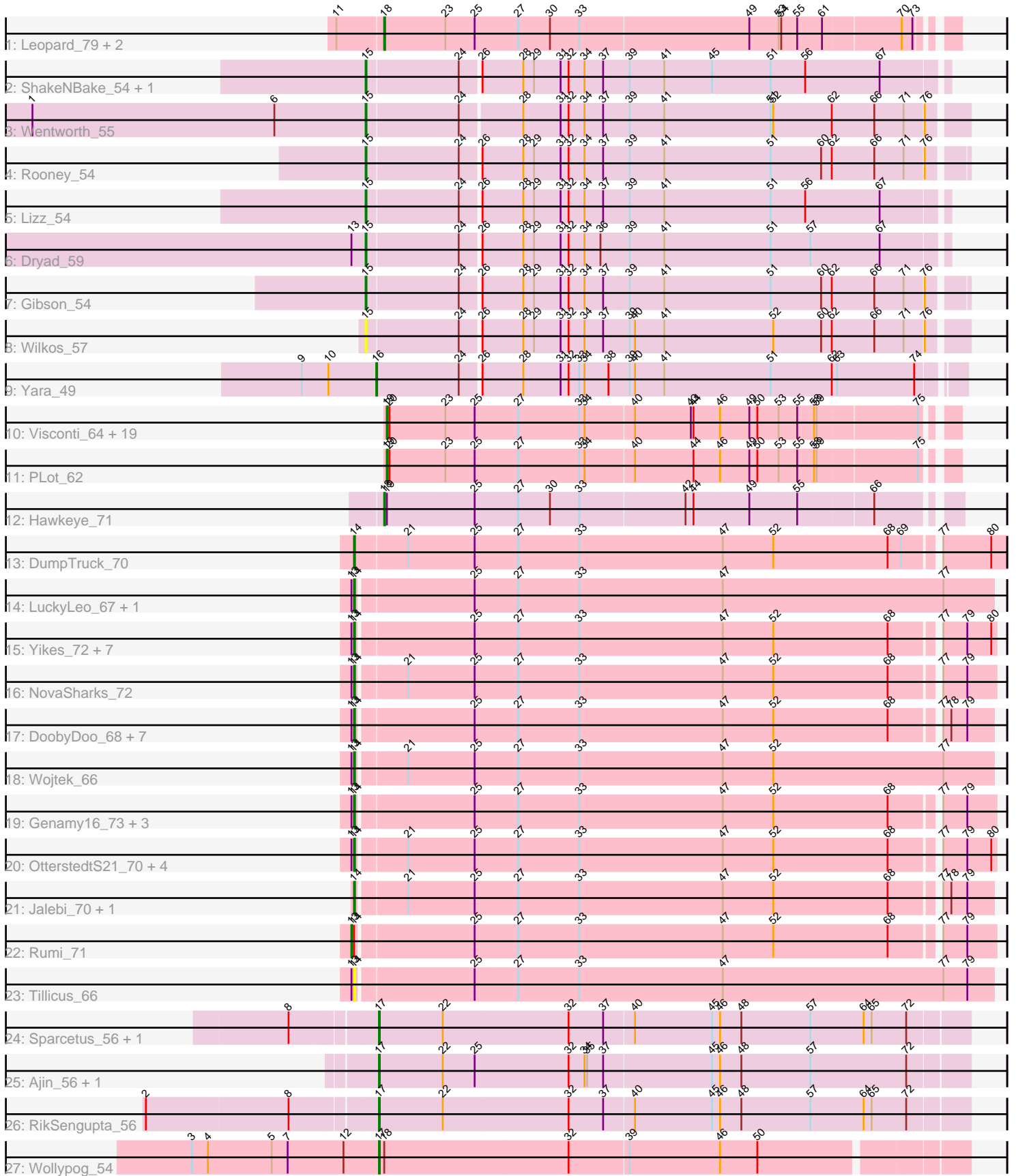


Pham 1661



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 1661 Report

This analysis was run 07/09/24 on database version 566.

Pham number 1661 has 74 members, 13 are drafts.

Phages represented in each track:

- Track 1 : Leopard_79, Onyinye_80, Aikoy_80
- Track 2 : ShakeNBake_54, PHTown_54
- Track 3 : Wentworth_55
- Track 4 : Rooney_54
- Track 5 : Lizz_54
- Track 6 : Dryad_59
- Track 7 : Gibson_54
- Track 8 : Wilkos_57
- Track 9 : Yara_49
- Track 10 : Visconti_64, WaldoWhy_65, Gumball_62, Prager_63, Penelope2018_63, Troll4_62, Butterscotch_61, Helpful_66, PBI1_59, Erk16_62, Chill_65, KandZ_61, Mopey_64, Adjutor_61, BigMama_61, Thoth_63, SirHarley_65, Giuseppe_64, Nova_62, Delton_63
- Track 11 : PLOT_62
- Track 12 : Hawkeye_71
- Track 13 : DumpTruck_70
- Track 14 : LuckyLeo_67, Apeppi_64
- Track 15 : Yikes_72, MoiGyank_76, DaviePasture_71, ParvusTarda_69, Zany_68, Sadboi_71, GretelLyn_70, Lila22_74
- Track 16 : NovaSharks_72
- Track 17 : DoobyDoo_68, NorManre_74, Fulcrum_70, Patos_74, Gibbin_72, GOATification_70, Mima20_71, Lambo_68
- Track 18 : Wojtek_66
- Track 19 : Genamy16_73, Alyssamiracle_73, Jamemuya19_70, Avian_69
- Track 20 : OtterstedtS21_70, BirthdayBoy_72, Ranch_70, Erutan_70, Alephilan_71
- Track 21 : Jalebi_70, Sampudon_71
- Track 22 : Rumi_71
- Track 23 : Tillicus_66
- Track 24 : Sparcetus_56, Kors_57
- Track 25 : Ajin_56, TinyMiny_56
- Track 26 : RikSengupta_56
- Track 27 : Wollypog_54

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

The start number called the most often in the published annotations is 14, it was called in 23 of the 61 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Alephilan_71, Alyssamiracle_73, Apeppi_64, Avian_69, BirthdayBoy_72, DaviePasture_71, DoobyDoo_68, DumpTruck_70, Erutan_70, Fulcrum_70, GOATification_70, Genamy16_73, Gibbin_72, GretelLyn_70, Jalebi_70, Jamemuya19_70, Lambo_68, Lila22_74, LuckyLeo_67, Mima20_71, MoiGyank_76, NorManre_74, NovaSharks_72, OtterstedtS21_70, ParvusTarda_69, Patos_74, Ranch_70, Sadboi_71, Sampudon_71, Tillicus_66, Wojtek_66, Yikes_72, Zany_68,

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

- Rumi_71,

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

- Adjutor_61, Aikoy_80, Ajin_56, BigMama_61, Butterscotch_61, Chill_65, Delton_63, Dryad_59, Erk16_62, Gibson_54, Giuseppe_64, Gumball_62, Hawkeye_71, Helpful_66, KandZ_61, Kors_57, Leopard_79, Lizz_54, Mopey_64, Nova_62, Onyinye_80, PBI1_59, PHTowN_54, PLOT_62, Penelope2018_63, Prager_63, RikSengupta_56, Rooney_54, ShakeNBake_54, SirHarley_65, Sparcetus_56, Thoth_63, TinyMiny_56, Troll4_62, Visconti_64, WaldoWhy_65, Wentworth_55, Wilkos_57, Wollypog_54, Yara_49,

Summary by start number:

Start 13:

- Found in 32 of 74 (43.2%) of genes in pham
- Manual Annotations of this start: 1 of 61
- Called 3.1% of time when present
- Phage (with cluster) where this start called: Rumi_71 (DV),

Start 14:

- Found in 34 of 74 (45.9%) of genes in pham
- Manual Annotations of this start: 23 of 61
- Called 97.1% of time when present
- Phage (with cluster) where this start called: Alephilan_71 (DV), Alyssamiracle_73 (DV), Apeppi_64 (DV), Avian_69 (DV), BirthdayBoy_72 (DV), DaviePasture_71 (DV), DoobyDoo_68 (DV), DumpTruck_70 (DV), Erutan_70 (DV), Fulcrum_70 (DV), GOATification_70 (DV), Genamy16_73 (DV), Gibbin_72 (DV), GretelLyn_70 (DV), Jalebi_70 (DV), Jamemuya19_70 (DV), Lambo_68 (DV), Lila22_74 (DV), LuckyLeo_67 (DV), Mima20_71 (DV), MoiGyank_76 (DV), NorManre_74 (DV), NovaSharks_72 (DV), OtterstedtS21_70 (DV), ParvusTarda_69 (DV), Patos_74 (DV), Ranch_70 (DV), Sadboi_71 (DV), Sampudon_71 (DV), Tillicus_66 (DV), Wojtek_66 (DV), Yikes_72 (DV), Zany_68 (DV),

Start 15:

- Found in 8 of 74 (10.8%) of genes in pham
- Manual Annotations of this start: 7 of 61
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Dryad_59 (BN), Gibson_54 (BN), Lizz_54 (BN), PHTowN_54 (BN), Rooney_54 (BN), ShakeNBake_54 (BN), Wentworth_55 (BN), Wilkos_57 (BN),

Start 16:

- Found in 1 of 74 (1.4%) of genes in pham
- Manual Annotations of this start: 1 of 61
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Yara_49 (BN),

Start 17:

- Found in 6 of 74 (8.1%) of genes in pham
- Manual Annotations of this start: 5 of 61
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Ajin_56 (EF), Kors_57 (EF), RikSengupta_56 (EF), Sparcetus_56 (EF), TinyMiny_56 (EF), Wollypog_54 (singleton),

Start 18:

- Found in 5 of 74 (6.8%) of genes in pham
- Manual Annotations of this start: 4 of 61
- Called 80.0% of time when present
- Phage (with cluster) where this start called: Aikoy_80 (AE), Hawkeye_71 (D2), Leopard_79 (AE), Onyinye_80 (AE),

Start 19:

- Found in 22 of 74 (29.7%) of genes in pham
- Manual Annotations of this start: 20 of 61
- Called 95.5% of time when present
- Phage (with cluster) where this start called: Adjutor_61 (D1), BigMama_61 (D1), Butterscotch_61 (D1), Chill_65 (D1), Delton_63 (D1), Erk16_62 (D1), Giuseppe_64 (D1), Gumball_62 (D1), Helpful_66 (D1), KandZ_61 (D1), Mopey_64 (D1), Nova_62 (D1), PBI1_59 (D1), PLOT_62 (D1), Penelope2018_63 (D1), Prager_63 (D1), SirHarley_65 (D1), Thoth_63 (D1), Troll4_62 (D1), Visconti_64 (D1), WaldoWhy_65 (D1),

Summary by clusters:

There are 7 clusters represented in this pham: singleton, AE, BN, EF, DV, D2, D1,

Info for manual annotations of cluster AE:

- Start number 18 was manually annotated 3 times for cluster AE.

Info for manual annotations of cluster BN:

- Start number 15 was manually annotated 7 times for cluster BN.
- Start number 16 was manually annotated 1 time for cluster BN.

Info for manual annotations of cluster D1:

- Start number 19 was manually annotated 20 times for cluster D1.

Info for manual annotations of cluster D2:

- Start number 18 was manually annotated 1 time for cluster D2.

Info for manual annotations of cluster DV:

- Start number 13 was manually annotated 1 time for cluster DV.
- Start number 14 was manually annotated 23 times for cluster DV.

Info for manual annotations of cluster EF:

•Start number 17 was manually annotated 4 times for cluster EF.

Gene Information:

Gene: Adjutor_61 Start: 47250, Stop: 47867, Start Num: 19

Candidate Starts for Adjutor_61:

(Start: 19 @47250 has 20 MA's), (20, 47253), (23, 47316), (25, 47349), (27, 47397), (33, 47466), (34, 47472), (40, 47526), (43, 47589), (44, 47592), (46, 47622), (49, 47655), (50, 47664), (53, 47688), (55, 47709), (58, 47727), (59, 47730), (75, 47838),

Gene: Aikoy_80 Start: 54899, Stop: 55516, Start Num: 18

Candidate Starts for Aikoy_80:

(11, 54848), (Start: 18 @54899 has 4 MA's), (23, 54968), (25, 55001), (27, 55049), (30, 55085), (33, 55118), (49, 55307), (53, 55340), (54, 55343), (55, 55361), (61, 55388), (70, 55472), (73, 55484),

Gene: Ajin_56 Start: 38629, Stop: 39285, Start Num: 17

Candidate Starts for Ajin_56:

(Start: 17 @38629 has 5 MA's), (22, 38701), (25, 38737), (32, 38842), (34, 38860), (35, 38863), (37, 38881), (45, 39001), (46, 39010), (48, 39034), (57, 39112), (72, 39220),

Gene: Alephilan_71 Start: 48365, Stop: 49063, Start Num: 14

Candidate Starts for Alephilan_71:

(Start: 13 @48362 has 1 MA's), (Start: 14 @48365 has 23 MA's), (21, 48416), (25, 48491), (27, 48539), (33, 48608), (47, 48770), (52, 48827), (68, 48956), (77, 49004), (79, 49031), (80, 49058),

Gene: Alyssamiracle_73 Start: 47362, Stop: 48060, Start Num: 14

Candidate Starts for Alyssamiracle_73:

(Start: 13 @47359 has 1 MA's), (Start: 14 @47362 has 23 MA's), (25, 47488), (27, 47536), (33, 47605), (47, 47767), (52, 47824), (68, 47953), (77, 48001), (79, 48028),

Gene: Apeppi_64 Start: 47510, Stop: 48220, Start Num: 14

Candidate Starts for Apeppi_64:

(Start: 13 @47507 has 1 MA's), (Start: 14 @47510 has 23 MA's), (25, 47636), (27, 47684), (33, 47753), (47, 47915), (77, 48164),

Gene: Avian_69 Start: 47090, Stop: 47788, Start Num: 14

Candidate Starts for Avian_69:

(Start: 13 @47087 has 1 MA's), (Start: 14 @47090 has 23 MA's), (25, 47216), (27, 47264), (33, 47333), (47, 47495), (52, 47552), (68, 47681), (77, 47729), (79, 47756),

Gene: BigMama_61 Start: 47323, Stop: 47940, Start Num: 19

Candidate Starts for BigMama_61:

(Start: 19 @47323 has 20 MA's), (20, 47326), (23, 47389), (25, 47422), (27, 47470), (33, 47539), (34, 47545), (40, 47599), (43, 47662), (44, 47665), (46, 47695), (49, 47728), (50, 47737), (53, 47761), (55, 47782), (58, 47800), (59, 47803), (75, 47911),

Gene: BirthdayBoy_72 Start: 48687, Stop: 49385, Start Num: 14

Candidate Starts for BirthdayBoy_72:

(Start: 13 @48684 has 1 MA's), (Start: 14 @48687 has 23 MA's), (21, 48738), (25, 48813), (27, 48861), (33, 48930), (47, 49092), (52, 49149), (68, 49278), (77, 49326), (79, 49353), (80, 49380),

Gene: Butterscotch_61 Start: 47301, Stop: 47918, Start Num: 19

Candidate Starts for Butterscotch_61:

(Start: 19 @47301 has 20 MA's), (20, 47304), (23, 47367), (25, 47400), (27, 47448), (33, 47517), (34, 47523), (40, 47577), (43, 47640), (44, 47643), (46, 47673), (49, 47706), (50, 47715), (53, 47739), (55, 47760), (58, 47778), (59, 47781), (75, 47889),

Gene: Chill_65 Start: 47334, Stop: 47951, Start Num: 19

Candidate Starts for Chill_65:

(Start: 19 @47334 has 20 MA's), (20, 47337), (23, 47400), (25, 47433), (27, 47481), (33, 47550), (34, 47556), (40, 47610), (43, 47673), (44, 47676), (46, 47706), (49, 47739), (50, 47748), (53, 47772), (55, 47793), (58, 47811), (59, 47814), (75, 47922),

Gene: DaviePasture_71 Start: 48274, Stop: 48972, Start Num: 14

Candidate Starts for DaviePasture_71:

(Start: 13 @48271 has 1 MA's), (Start: 14 @48274 has 23 MA's), (25, 48400), (27, 48448), (33, 48517), (47, 48679), (52, 48736), (68, 48865), (77, 48913), (79, 48940), (80, 48967),

Gene: Delton_63 Start: 47699, Stop: 48316, Start Num: 19

Candidate Starts for Delton_63:

(Start: 19 @47699 has 20 MA's), (20, 47702), (23, 47765), (25, 47798), (27, 47846), (33, 47915), (34, 47921), (40, 47975), (43, 48038), (44, 48041), (46, 48071), (49, 48104), (50, 48113), (53, 48137), (55, 48158), (58, 48176), (59, 48179), (75, 48287),

Gene: DoobyDoo_68 Start: 47148, Stop: 47843, Start Num: 14

Candidate Starts for DoobyDoo_68:

(Start: 13 @47145 has 1 MA's), (Start: 14 @47148 has 23 MA's), (25, 47274), (27, 47322), (33, 47391), (47, 47553), (52, 47610), (68, 47739), (77, 47787), (78, 47796), (79, 47814),

Gene: Dryad_59 Start: 42007, Stop: 41372, Start Num: 15

Candidate Starts for Dryad_59:

(Start: 13 @42022 has 1 MA's), (Start: 15 @42007 has 7 MA's), (24, 41905), (26, 41884), (28, 41839), (29, 41827), (31, 41797), (32, 41788), (34, 41770), (36, 41752), (39, 41722), (41, 41683), (51, 41563), (57, 41518), (67, 41440),

Gene: DumpTruck_70 Start: 47315, Stop: 48031, Start Num: 14

Candidate Starts for DumpTruck_70:

(Start: 14 @47315 has 23 MA's), (21, 47372), (25, 47447), (27, 47495), (33, 47564), (47, 47726), (52, 47783), (68, 47912), (69, 47927), (77, 47960), (80, 48014),

Gene: Erk16_62 Start: 47365, Stop: 47982, Start Num: 19

Candidate Starts for Erk16_62:

(Start: 19 @47365 has 20 MA's), (20, 47368), (23, 47431), (25, 47464), (27, 47512), (33, 47581), (34, 47587), (40, 47641), (43, 47704), (44, 47707), (46, 47737), (49, 47770), (50, 47779), (53, 47803), (55, 47824), (58, 47842), (59, 47845), (75, 47953),

Gene: Erutan_70 Start: 47787, Stop: 48485, Start Num: 14

Candidate Starts for Erutan_70:

(Start: 13 @47784 has 1 MA's), (Start: 14 @47787 has 23 MA's), (21, 47838), (25, 47913), (27, 47961), (33, 48030), (47, 48192), (52, 48249), (68, 48378), (77, 48426), (79, 48453), (80, 48480),

Gene: Fulcrum_70 Start: 47995, Stop: 48690, Start Num: 14

Candidate Starts for Fulcrum_70:

(Start: 13 @47992 has 1 MA's), (Start: 14 @47995 has 23 MA's), (25, 48121), (27, 48169), (33, 48238), (47, 48400), (52, 48457), (68, 48586), (77, 48634), (78, 48643), (79, 48661),

Gene: GOATification_70 Start: 47995, Stop: 48690, Start Num: 14

Candidate Starts for GOATification_70:

(Start: 13 @47992 has 1 MA's), (Start: 14 @47995 has 23 MA's), (25, 48121), (27, 48169), (33, 48238), (47, 48400), (52, 48457), (68, 48586), (77, 48634), (78, 48643), (79, 48661),

Gene: Genamy16_73 Start: 47348, Stop: 48046, Start Num: 14

Candidate Starts for Genamy16_73:

(Start: 13 @47345 has 1 MA's), (Start: 14 @47348 has 23 MA's), (25, 47474), (27, 47522), (33, 47591), (47, 47753), (52, 47810), (68, 47939), (77, 47987), (79, 48014),

Gene: Gibbin_72 Start: 48800, Stop: 49495, Start Num: 14

Candidate Starts for Gibbin_72:

(Start: 13 @48797 has 1 MA's), (Start: 14 @48800 has 23 MA's), (25, 48926), (27, 48974), (33, 49043), (47, 49205), (52, 49262), (68, 49391), (77, 49439), (78, 49448), (79, 49466),

Gene: Gibson_54 Start: 41040, Stop: 40387, Start Num: 15

Candidate Starts for Gibson_54:

(Start: 15 @41040 has 7 MA's), (24, 40938), (26, 40917), (28, 40872), (29, 40860), (31, 40830), (32, 40821), (34, 40803), (37, 40782), (39, 40755), (41, 40716), (51, 40596), (60, 40539), (62, 40527), (66, 40479), (71, 40446), (76, 40425),

Gene: Giuseppe_64 Start: 47249, Stop: 47866, Start Num: 19

Candidate Starts for Giuseppe_64:

(Start: 19 @47249 has 20 MA's), (20, 47252), (23, 47315), (25, 47348), (27, 47396), (33, 47465), (34, 47471), (40, 47525), (43, 47588), (44, 47591), (46, 47621), (49, 47654), (50, 47663), (53, 47687), (55, 47708), (58, 47726), (59, 47729), (75, 47837),

Gene: Gretellyn_70 Start: 48662, Stop: 49360, Start Num: 14

Candidate Starts for Gretellyn_70:

(Start: 13 @48659 has 1 MA's), (Start: 14 @48662 has 23 MA's), (25, 48788), (27, 48836), (33, 48905), (47, 49067), (52, 49124), (68, 49253), (77, 49301), (79, 49328), (80, 49355),

Gene: Gumball_62 Start: 47770, Stop: 48387, Start Num: 19

Candidate Starts for Gumball_62:

(Start: 19 @47770 has 20 MA's), (20, 47773), (23, 47836), (25, 47869), (27, 47917), (33, 47986), (34, 47992), (40, 48046), (43, 48109), (44, 48112), (46, 48142), (49, 48175), (50, 48184), (53, 48208), (55, 48229), (58, 48247), (59, 48250), (75, 48358),

Gene: Hawkeye_71 Start: 48356, Stop: 48979, Start Num: 18

Candidate Starts for Hawkeye_71:

(Start: 18 @48356 has 4 MA's), (Start: 19 @48359 has 20 MA's), (25, 48458), (27, 48506), (30, 48542), (33, 48575), (42, 48692), (44, 48701), (49, 48764), (55, 48818), (66, 48899),

Gene: Helpful_66 Start: 47610, Stop: 48227, Start Num: 19

Candidate Starts for Helpful_66:

(Start: 19 @47610 has 20 MA's), (20, 47613), (23, 47676), (25, 47709), (27, 47757), (33, 47826), (34, 47832), (40, 47886), (43, 47949), (44, 47952), (46, 47982), (49, 48015), (50, 48024), (53, 48048), (55, 48069), (58, 48087), (59, 48090), (75, 48198),

Gene: Jalebi_70 Start: 49389, Stop: 50084, Start Num: 14

Candidate Starts for Jalebi_70:

(Start: 14 @49389 has 23 MA's), (21, 49440), (25, 49515), (27, 49563), (33, 49632), (47, 49794), (52, 49851), (68, 49980), (77, 50028), (78, 50037), (79, 50055),

Gene: Jamemuya19_70 Start: 46953, Stop: 47651, Start Num: 14

Candidate Starts for Jamemuya19_70:

(Start: 13 @46950 has 1 MA's), (Start: 14 @46953 has 23 MA's), (25, 47079), (27, 47127), (33, 47196), (47, 47358), (52, 47415), (68, 47544), (77, 47592), (79, 47619),

Gene: KandZ_61 Start: 47394, Stop: 48011, Start Num: 19

Candidate Starts for KandZ_61:

(Start: 19 @47394 has 20 MA's), (20, 47397), (23, 47460), (25, 47493), (27, 47541), (33, 47610), (34, 47616), (40, 47670), (43, 47733), (44, 47736), (46, 47766), (49, 47799), (50, 47808), (53, 47832), (55, 47853), (58, 47871), (59, 47874), (75, 47982),

Gene: Kors_57 Start: 38715, Stop: 39371, Start Num: 17

Candidate Starts for Kors_57:

(8, 38625), (Start: 17 @38715 has 5 MA's), (22, 38787), (32, 38928), (37, 38967), (40, 39000), (45, 39087), (46, 39096), (48, 39120), (57, 39198), (64, 39258), (65, 39267), (72, 39306),

Gene: Lambo_68 Start: 47792, Stop: 48487, Start Num: 14

Candidate Starts for Lambo_68:

(Start: 13 @47789 has 1 MA's), (Start: 14 @47792 has 23 MA's), (25, 47918), (27, 47966), (33, 48035), (47, 48197), (52, 48254), (68, 48383), (77, 48431), (78, 48440), (79, 48458),

Gene: Leopard_79 Start: 55205, Stop: 55822, Start Num: 18

Candidate Starts for Leopard_79:

(11, 55154), (Start: 18 @55205 has 4 MA's), (23, 55274), (25, 55307), (27, 55355), (30, 55391), (33, 55424), (49, 55613), (53, 55646), (54, 55649), (55, 55667), (61, 55694), (70, 55778), (73, 55790),

Gene: Lila22_74 Start: 48745, Stop: 49443, Start Num: 14

Candidate Starts for Lila22_74:

(Start: 13 @48742 has 1 MA's), (Start: 14 @48745 has 23 MA's), (25, 48871), (27, 48919), (33, 48988), (47, 49150), (52, 49207), (68, 49336), (77, 49384), (79, 49411), (80, 49438),

Gene: Lizz_54 Start: 40880, Stop: 40245, Start Num: 15

Candidate Starts for Lizz_54:

(Start: 15 @40880 has 7 MA's), (24, 40778), (26, 40757), (28, 40712), (29, 40700), (31, 40670), (32, 40661), (34, 40643), (37, 40622), (39, 40595), (41, 40556), (51, 40436), (56, 40397), (67, 40313),

Gene: LuckyLeo_67 Start: 47510, Stop: 48220, Start Num: 14

Candidate Starts for LuckyLeo_67:

(Start: 13 @47507 has 1 MA's), (Start: 14 @47510 has 23 MA's), (25, 47636), (27, 47684), (33, 47753), (47, 47915), (77, 48164),

Gene: Mima20_71 Start: 48178, Stop: 48873, Start Num: 14

Candidate Starts for Mima20_71:

(Start: 13 @48175 has 1 MA's), (Start: 14 @48178 has 23 MA's), (25, 48304), (27, 48352), (33, 48421), (47, 48583), (52, 48640), (68, 48769), (77, 48817), (78, 48826), (79, 48844),

Gene: MoiGyank_76 Start: 48943, Stop: 49641, Start Num: 14

Candidate Starts for MoiGyank_76:

(Start: 13 @48940 has 1 MA's), (Start: 14 @48943 has 23 MA's), (25, 49069), (27, 49117), (33, 49186), (47, 49348), (52, 49405), (68, 49534), (77, 49582), (79, 49609), (80, 49636),

Gene: Mopey_64 Start: 47254, Stop: 47871, Start Num: 19

Candidate Starts for Mopey_64:

(Start: 19 @47254 has 20 MA's), (20, 47257), (23, 47320), (25, 47353), (27, 47401), (33, 47470), (34, 47476), (40, 47530), (43, 47593), (44, 47596), (46, 47626), (49, 47659), (50, 47668), (53, 47692), (55, 47713), (58, 47731), (59, 47734), (75, 47842),

Gene: NorManre_74 Start: 49192, Stop: 49887, Start Num: 14

Candidate Starts for NorManre_74:

(Start: 13 @49189 has 1 MA's), (Start: 14 @49192 has 23 MA's), (25, 49318), (27, 49366), (33, 49435), (47, 49597), (52, 49654), (68, 49783), (77, 49831), (78, 49840), (79, 49858),

Gene: Nova_62 Start: 47742, Stop: 48359, Start Num: 19

Candidate Starts for Nova_62:

(Start: 19 @47742 has 20 MA's), (20, 47745), (23, 47808), (25, 47841), (27, 47889), (33, 47958), (34, 47964), (40, 48018), (43, 48081), (44, 48084), (46, 48114), (49, 48147), (50, 48156), (53, 48180), (55, 48201), (58, 48219), (59, 48222), (75, 48330),

Gene: NovaSharks_72 Start: 46939, Stop: 47637, Start Num: 14

Candidate Starts for NovaSharks_72:

(Start: 13 @46936 has 1 MA's), (Start: 14 @46939 has 23 MA's), (21, 46990), (25, 47065), (27, 47113), (33, 47182), (47, 47344), (52, 47401), (68, 47530), (77, 47578), (79, 47605),

Gene: Onyinye_80 Start: 55075, Stop: 55692, Start Num: 18

Candidate Starts for Onyinye_80:

(11, 55024), (Start: 18 @55075 has 4 MA's), (23, 55144), (25, 55177), (27, 55225), (30, 55261), (33, 55294), (49, 55483), (53, 55516), (54, 55519), (55, 55537), (61, 55564), (70, 55648), (73, 55660),

Gene: OtterstedtS21_70 Start: 48126, Stop: 48824, Start Num: 14

Candidate Starts for OtterstedtS21_70:

(Start: 13 @48123 has 1 MA's), (Start: 14 @48126 has 23 MA's), (21, 48177), (25, 48252), (27, 48300), (33, 48369), (47, 48531), (52, 48588), (68, 48717), (77, 48765), (79, 48792), (80, 48819),

Gene: PBI1_59 Start: 47232, Stop: 47849, Start Num: 19

Candidate Starts for PBI1_59:

(Start: 19 @47232 has 20 MA's), (20, 47235), (23, 47298), (25, 47331), (27, 47379), (33, 47448), (34, 47454), (40, 47508), (43, 47571), (44, 47574), (46, 47604), (49, 47637), (50, 47646), (53, 47670), (55, 47691), (58, 47709), (59, 47712), (75, 47820),

Gene: PHTowN_54 Start: 40878, Stop: 40243, Start Num: 15

Candidate Starts for PHTowN_54:

(Start: 15 @40878 has 7 MA's), (24, 40776), (26, 40755), (28, 40710), (29, 40698), (31, 40668), (32, 40659), (34, 40641), (37, 40620), (39, 40593), (41, 40554), (45, 40500), (51, 40434), (56, 40395), (67, 40311),

Gene: PLOT_62 Start: 47260, Stop: 47877, Start Num: 19

Candidate Starts for PLOT_62:

(Start: 19 @47260 has 20 MA's), (20, 47263), (23, 47326), (25, 47359), (27, 47407), (33, 47476), (34, 47482), (40, 47536), (44, 47602), (46, 47632), (49, 47665), (50, 47674), (53, 47698), (55, 47719), (58, 47737), (59, 47740), (75, 47848),

Gene: ParvusTarda_69 Start: 47498, Stop: 48196, Start Num: 14
Candidate Starts for ParvusTarda_69:
(Start: 13 @47495 has 1 MA's), (Start: 14 @47498 has 23 MA's), (25, 47624), (27, 47672), (33, 47741), (47, 47903), (52, 47960), (68, 48089), (77, 48137), (79, 48164), (80, 48191),

Gene: Patos_74 Start: 49191, Stop: 49886, Start Num: 14
Candidate Starts for Patos_74:
(Start: 13 @49188 has 1 MA's), (Start: 14 @49191 has 23 MA's), (25, 49317), (27, 49365), (33, 49434), (47, 49596), (52, 49653), (68, 49782), (77, 49830), (78, 49839), (79, 49857),

Gene: Penelope2018_63 Start: 47288, Stop: 47905, Start Num: 19
Candidate Starts for Penelope2018_63:
(Start: 19 @47288 has 20 MA's), (20, 47291), (23, 47354), (25, 47387), (27, 47435), (33, 47504), (34, 47510), (40, 47564), (43, 47627), (44, 47630), (46, 47660), (49, 47693), (50, 47702), (53, 47726), (55, 47747), (58, 47765), (59, 47768), (75, 47876),

Gene: Prager_63 Start: 47348, Stop: 47965, Start Num: 19
Candidate Starts for Prager_63:
(Start: 19 @47348 has 20 MA's), (20, 47351), (23, 47414), (25, 47447), (27, 47495), (33, 47564), (34, 47570), (40, 47624), (43, 47687), (44, 47690), (46, 47720), (49, 47753), (50, 47762), (53, 47786), (55, 47807), (58, 47825), (59, 47828), (75, 47936),

Gene: Ranch_70 Start: 46970, Stop: 47668, Start Num: 14
Candidate Starts for Ranch_70:
(Start: 13 @46967 has 1 MA's), (Start: 14 @46970 has 23 MA's), (21, 47021), (25, 47096), (27, 47144), (33, 47213), (47, 47375), (52, 47432), (68, 47561), (77, 47609), (79, 47636), (80, 47663),

Gene: RikSengupta_56 Start: 38740, Stop: 39396, Start Num: 17
Candidate Starts for RikSengupta_56:
(2, 38491), (8, 38650), (Start: 17 @38740 has 5 MA's), (22, 38812), (32, 38953), (37, 38992), (40, 39025), (45, 39112), (46, 39121), (48, 39145), (57, 39223), (64, 39283), (65, 39292), (72, 39331),

Gene: Rooney_54 Start: 41037, Stop: 40384, Start Num: 15
Candidate Starts for Rooney_54:
(Start: 15 @41037 has 7 MA's), (24, 40935), (26, 40914), (28, 40869), (29, 40857), (31, 40827), (32, 40818), (34, 40800), (37, 40779), (39, 40752), (41, 40713), (51, 40593), (60, 40536), (62, 40524), (66, 40476), (71, 40443), (76, 40422),

Gene: Rumi_71 Start: 46633, Stop: 47334, Start Num: 13
Candidate Starts for Rumi_71:
(Start: 13 @46633 has 1 MA's), (Start: 14 @46636 has 23 MA's), (25, 46762), (27, 46810), (33, 46879), (47, 47041), (52, 47098), (68, 47227), (77, 47275), (79, 47302),

Gene: Sadboi_71 Start: 48663, Stop: 49361, Start Num: 14
Candidate Starts for Sadboi_71:
(Start: 13 @48660 has 1 MA's), (Start: 14 @48663 has 23 MA's), (25, 48789), (27, 48837), (33, 48906), (47, 49068), (52, 49125), (68, 49254), (77, 49302), (79, 49329), (80, 49356),

Gene: Sampudon_71 Start: 49389, Stop: 50084, Start Num: 14
Candidate Starts for Sampudon_71:
(Start: 14 @49389 has 23 MA's), (21, 49440), (25, 49515), (27, 49563), (33, 49632), (47, 49794), (52, 49851), (68, 49980), (77, 50028), (78, 50037), (79, 50055),

Gene: ShakeNBake_54 Start: 40896, Stop: 40261, Start Num: 15

Candidate Starts for ShakeNBake_54:

(Start: 15 @40896 has 7 MA's), (24, 40794), (26, 40773), (28, 40728), (29, 40716), (31, 40686), (32, 40677), (34, 40659), (37, 40638), (39, 40611), (41, 40572), (45, 40518), (51, 40452), (56, 40413), (67, 40329),

Gene: SirHarley_65 Start: 47753, Stop: 48370, Start Num: 19

Candidate Starts for SirHarley_65:

(Start: 19 @47753 has 20 MA's), (20, 47756), (23, 47819), (25, 47852), (27, 47900), (33, 47969), (34, 47975), (40, 48029), (43, 48092), (44, 48095), (46, 48125), (49, 48158), (50, 48167), (53, 48191), (55, 48212), (58, 48230), (59, 48233), (75, 48341),

Gene: Sparcetus_56 Start: 38617, Stop: 39273, Start Num: 17

Candidate Starts for Sparcetus_56:

(8, 38527), (Start: 17 @38617 has 5 MA's), (22, 38689), (32, 38830), (37, 38869), (40, 38902), (45, 38989), (46, 38998), (48, 39022), (57, 39100), (64, 39160), (65, 39169), (72, 39208),

Gene: Thoth_63 Start: 47342, Stop: 47959, Start Num: 19

Candidate Starts for Thoth_63:

(Start: 19 @47342 has 20 MA's), (20, 47345), (23, 47408), (25, 47441), (27, 47489), (33, 47558), (34, 47564), (40, 47618), (43, 47681), (44, 47684), (46, 47714), (49, 47747), (50, 47756), (53, 47780), (55, 47801), (58, 47819), (59, 47822), (75, 47930),

Gene: Tillicus_66 Start: 47452, Stop: 48162, Start Num: 14

Candidate Starts for Tillicus_66:

(Start: 13 @47449 has 1 MA's), (Start: 14 @47452 has 23 MA's), (25, 47578), (27, 47626), (33, 47695), (47, 47857), (77, 48106), (79, 48133),

Gene: TinyMiny_56 Start: 38641, Stop: 39297, Start Num: 17

Candidate Starts for TinyMiny_56:

(Start: 17 @38641 has 5 MA's), (22, 38713), (25, 38749), (32, 38854), (34, 38872), (35, 38875), (37, 38893), (45, 39013), (46, 39022), (48, 39046), (57, 39124), (72, 39232),

Gene: Troll4_62 Start: 47410, Stop: 48027, Start Num: 19

Candidate Starts for Troll4_62:

(Start: 19 @47410 has 20 MA's), (20, 47413), (23, 47476), (25, 47509), (27, 47557), (33, 47626), (34, 47632), (40, 47686), (43, 47749), (44, 47752), (46, 47782), (49, 47815), (50, 47824), (53, 47848), (55, 47869), (58, 47887), (59, 47890), (75, 47998),

Gene: Visconti_64 Start: 47318, Stop: 47935, Start Num: 19

Candidate Starts for Visconti_64:

(Start: 19 @47318 has 20 MA's), (20, 47321), (23, 47384), (25, 47417), (27, 47465), (33, 47534), (34, 47540), (40, 47594), (43, 47657), (44, 47660), (46, 47690), (49, 47723), (50, 47732), (53, 47756), (55, 47777), (58, 47795), (59, 47798), (75, 47906),

Gene: WaldoWhy_65 Start: 47334, Stop: 47951, Start Num: 19

Candidate Starts for WaldoWhy_65:

(Start: 19 @47334 has 20 MA's), (20, 47337), (23, 47400), (25, 47433), (27, 47481), (33, 47550), (34, 47556), (40, 47610), (43, 47673), (44, 47676), (46, 47706), (49, 47739), (50, 47748), (53, 47772), (55, 47793), (58, 47811), (59, 47814), (75, 47922),

Gene: Wentworth_55 Start: 41269, Stop: 40613, Start Num: 15

Candidate Starts for Wentworth_55:

(1, 41644), (6, 41371), (Start: 15 @41269 has 7 MA's), (24, 41167), (28, 41101), (31, 41059), (32, 41050), (34, 41032), (37, 41011), (39, 40984), (41, 40945), (51, 40825), (52, 40822), (62, 40756), (66, 40708), (71, 40675), (76, 40654),

Gene: Wilkos_57 Start: 41210, Stop: 40554, Start Num: 15

Candidate Starts for Wilkos_57:

(Start: 15 @41210 has 7 MA's), (24, 41108), (26, 41087), (28, 41042), (29, 41030), (31, 41000), (32, 40991), (34, 40973), (37, 40952), (39, 40925), (40, 40919), (41, 40886), (52, 40763), (60, 40709), (62, 40697), (66, 40649), (71, 40616), (76, 40595),

Gene: Wojtek_66 Start: 47217, Stop: 47927, Start Num: 14

Candidate Starts for Wojtek_66:

(Start: 13 @47214 has 1 MA's), (Start: 14 @47217 has 23 MA's), (21, 47268), (25, 47343), (27, 47391), (33, 47460), (47, 47622), (52, 47679), (77, 47871),

Gene: Wollypog_54 Start: 41322, Stop: 41963, Start Num: 17

Candidate Starts for Wollypog_54:

(3, 41112), (4, 41130), (5, 41202), (7, 41220), (12, 41283), (Start: 17 @41322 has 5 MA's), (Start: 18 @41328 has 4 MA's), (32, 41535), (39, 41601), (46, 41703), (50, 41745),

Gene: Yara_49 Start: 39548, Stop: 38907, Start Num: 16

Candidate Starts for Yara_49:

(9, 39632), (10, 39602), (Start: 16 @39548 has 1 MA's), (24, 39455), (26, 39434), (28, 39389), (31, 39347), (32, 39338), (33, 39326), (34, 39320), (38, 39293), (39, 39272), (40, 39266), (41, 39233), (51, 39113), (62, 39044), (63, 39038), (74, 38951),

Gene: Yikes_72 Start: 49109, Stop: 49807, Start Num: 14

Candidate Starts for Yikes_72:

(Start: 13 @49106 has 1 MA's), (Start: 14 @49109 has 23 MA's), (25, 49235), (27, 49283), (33, 49352), (47, 49514), (52, 49571), (68, 49700), (77, 49748), (79, 49775), (80, 49802),

Gene: Zany_68 Start: 48703, Stop: 49401, Start Num: 14

Candidate Starts for Zany_68:

(Start: 13 @48700 has 1 MA's), (Start: 14 @48703 has 23 MA's), (25, 48829), (27, 48877), (33, 48946), (47, 49108), (52, 49165), (68, 49294), (77, 49342), (79, 49369), (80, 49396),