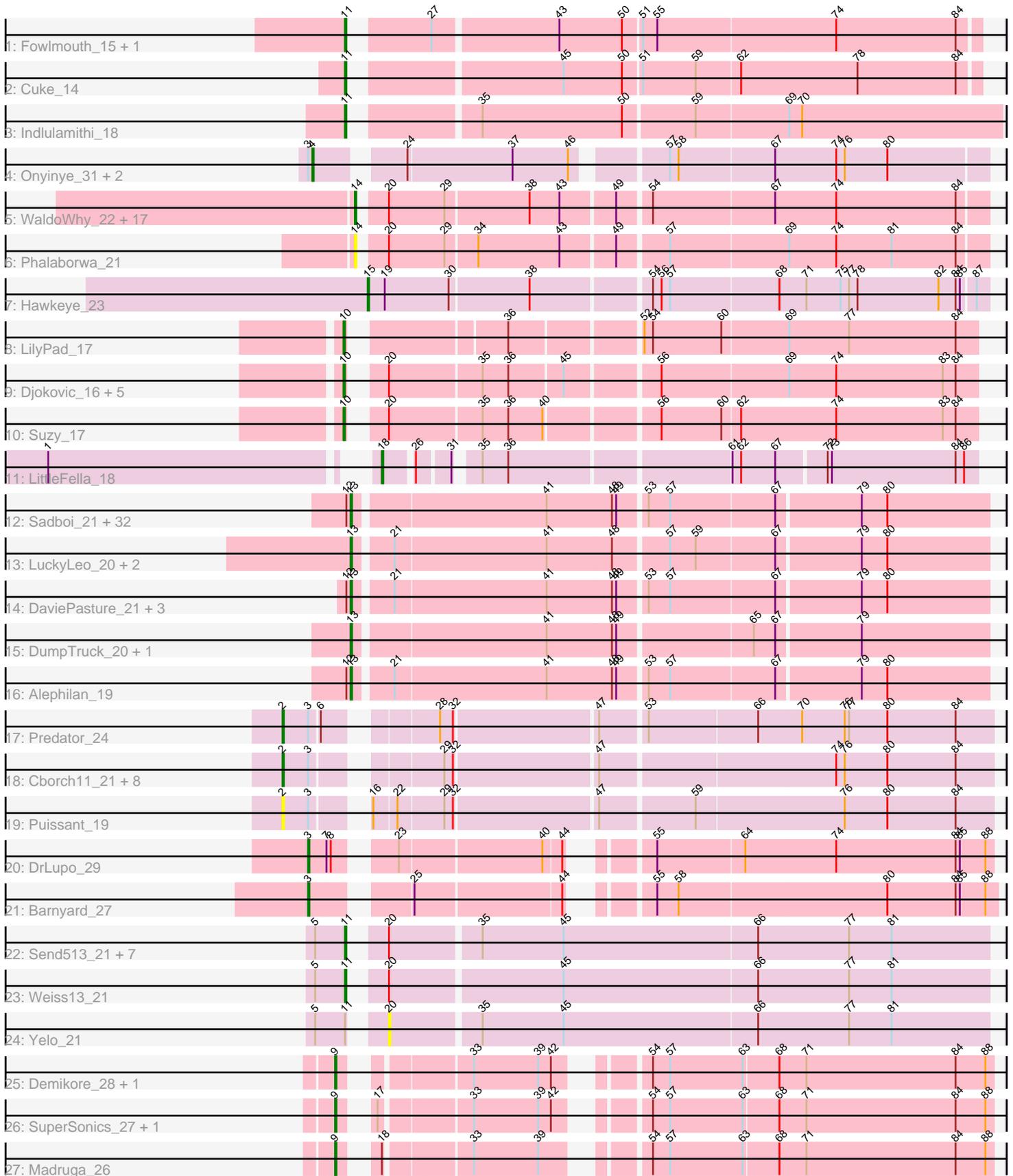# Pham 291007

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 291007 Report

This analysis was run 03/28/26 on database version 641.

Pham number 291007 has 107 members, 12 are drafts.

Phages represented in each track:
• Track 1 : Fowlmouth_15, MrMiyagi_15
• Track 2 : Cuke_14
• Track 3 : Indlulamithi_18
• Track 4 : Onyinye_31, Leopard_30, Aikoy_30
• Track 5 : WaldoWhy_22, Nova_21, Butterscotch_21, SirHarley_20, Penelope2018_21, Thoth_21, Chill_22, Giuseppe_21, Mopey_21, Prager_21, PLot_22, Troll4_21, Adjutor_22, Visconti_21, Gumball_20, Helpful_22, Delton_21, PBI1_22
• Track 6 : Phalaborwa_21
• Track 7 : Hawkeye_23
• Track 8 : LilyPad_17
• Track 9 : Djokovic_16, Madi_16, Terapin_16, BiteSize_16, Sienna_16, Beyoncage_16
• Track 10 : Suzy_17
• Track 11 : LittleFella_18
• Track 12 : Sadboi_21, Sampudon_21, Charminar_19, Yikes_22, Gibbin_22, Stormer_19, ParvusTarda_21, RazorC_19, Lambo_21, OtterstedtS21_21, Fulcrum_22, Alyssamiracle_20, Lila22_21, Genamy16_20, Riduram_19, Rumi_20, MoiGyank_23, Avian_19, GretelLyn_21, BirthdayBoy_22, Ranch_21, Patos_22, GOATification_22, Erutan_21, Rukungu_21, Jamemuya19_19, Wojtek_20, Astralis_19, NovaSharks_20, NorManre_22, Jalebi_21, Rota_20, DoobyDoo_20
• Track 13 : LuckyLeo_20, Apeppi_19, Tillicus_21
• Track 14 : DaviePasture_21, Mima20_20, LavAbarElk_19, Zany_20
• Track 15 : DumpTruck_20, Xenia2_21
• Track 16 : Alephilan_19
• Track 17 : Predator_24
• Track 18 : Cborch11_21, Phreeze_20, Beckerton_20, Oaker_20, Megatron06_22, Konstantine_25, BobtimousPrime_19, Thumb_20, Damien_20
• Track 19 : Puissant_19
• Track 20 : DrLupo_29
• Track 21 : Barnyard_27
• Track 22 : Send513_21, MontyDev_21, Candle_21, Nilo_22, Papyrus_21, Riparian_21, Zenon_22, Rope_21
• Track 23 : Weiss13_21
• Track 24 : Yelo_21
• Track 25 : Demikore_28, Patience_28
• Track 26 : SuperSonics_27, Labelle_27

• Track 27 : Madruga_26

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

The start number called the most often in the published annotations is 13, it was called in 37 of the 95 non-draft genes in the pham.

Genes that call this "Most Annotated" start:
• Alephilan_19, Alyssamiracle_20, Apeppi_19, Astralis_19, Avian_19, BirthdayBoy_22, Charminar_19, DaviePasture_21, DoobyDoo_20, DumpTruck_20, Erutan_21, Fulcrum_22, GOATification_22, Genamy16_20, Gibbin_22, GretelLyn_21, Jalebi_21, Jamemuya19_19, Lambo_21, LavAbarElk_19, Lila22_21, LuckyLeo_20, Mima20_20, MoiGyank_23, NorManre_22, NovaSharks_20, OtterstedtS21_21, ParvusTarda_21, Patos_22, Ranch_21, RazorC_19, Riduram_19, Rota_20, Rukungu_21, Rumi_20, Sadboi_21, Sampudon_21, Stormer_19, Tillicus_21, Wojtek_20, Xenia2_21, Yikes_22, Zany_20,

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

Genes that do not have the "Most Annotated" start:
• Adjutor_22, Aikoy_30, Barnyard_27, Beckerton_20, Beyoncage_16, BiteSize_16, BobtimousPrime_19, Butterscotch_21, Candle_21, Cborch11_21, Chill_22, Cuke_14, Damien_20, Delton_21, Demikore_28, Djokovic_16, DrLupo_29, Fowlmouth_15, Giuseppe_21, Gumball_20, Hawkeye_23, Helpful_22, Indlulamithi_18, Konstantine_25, Labelle_27, Leopard_30, LilyPad_17, LittleFella_18, Madi_16, Madruga_26, Megatron06_22, MontyDev_21, Mopey_21, MrMiyagi_15, Nilo_22, Nova_21, Oaker_20, Onyinye_31, PBI1_22, PLot_22, Papyrus_21, Patience_28, Penelope2018_21, Phalaborwa_21, Phreeze_20, Prager_21, Predator_24, Puissant_19, Riparian_21, Rope_21, Send513_21, Sienna_16, SirHarley_20, SuperSonics_27, Suzy_17, Terapin_16, Thoth_21, Thumb_20, Troll4_21, Visconti_21, WaldoWhy_22, Weiss13_21, Yelo_21, Zenon_22,

Summary by start number:

Start 2:
• Found in 11 of 107 (10.3%) of genes in pham
• Manual Annotations of this start: 9 of 95
• Called 100.0% of time when present
• Phage (with cluster) where this start called: Beckerton_20 (H1), BobtimousPrime_19 (H1), Cborch11_21 (H1), Damien_20 (H1), Konstantine_25 (H1), Megatron06_22 (H1), Oaker_20 (H1), Phreeze_20 (H1), Predator_24 (H1), Puissant_19 (H1), Thumb_20 (H1),

Start 3:
• Found in 16 of 107 (15.0%) of genes in pham
• Manual Annotations of this start: 2 of 95
• Called 12.5% of time when present
• Phage (with cluster) where this start called: Barnyard_27 (H2), DrLupo_29 (H2),

Start 4:
• Found in 3 of 107 (2.8%) of genes in pham
• Manual Annotations of this start: 3 of 95
• Called 100.0% of time when present
• Phage (with cluster) where this start called: Aikoy_30 (AE), Leopard_30 (AE), Onyinye_31 (AE),

Start 9:
• Found in 5 of 107 (4.7%) of genes in pham
• Manual Annotations of this start: 3 of 95
• Called 100.0% of time when present
• Phage (with cluster) where this start called: Demikore_28 (U), Labelle_27 (U), Madruga_26 (U), Patience_28 (U), SuperSonics_27 (U),

Start 10:
• Found in 8 of 107 (7.5%) of genes in pham
• Manual Annotations of this start: 8 of 95
• Called 100.0% of time when present
• Phage (with cluster) where this start called: Beyoncage_16 (DG1), BiteSize_16 (DG1), Djokovic_16 (DG1), LilyPad_17 (DG1), Madi_16 (DG1), Sienna_16 (DG1), Suzy_17 (DG1), Terapin_16 (DG1),

Start 11:
• Found in 14 of 107 (13.1%) of genes in pham
• Manual Annotations of this start: 13 of 95
• Called 92.9% of time when present
• Phage (with cluster) where this start called: Candle_21 (R), Cuke_14 (AC), Fowlmouth_15 (AC), Indlulamithi_18 (AC), MontyDev_21 (R), MrMiyagi_15 (AC), Nilo_22 (R), Papyrus_21 (R), Riparian_21 (R), Rope_21 (R), Send513_21 (R), Weiss13_21 (R), Zenon_22 (R),

Start 13:
• Found in 43 of 107 (40.2%) of genes in pham
• Manual Annotations of this start: 37 of 95
• Called 100.0% of time when present
• Phage (with cluster) where this start called: Alephilan_19 (DV), Alyssamiracle_20 (DV), Apeppi_19 (DV), Astralis_19 (DV), Avian_19 (DV), BirthdayBoy_22 (DV), Charminar_19 (DV), DaviePasture_21 (DV), DoobyDoo_20 (DV), DumpTruck_20 (DV), Erutan_21 (DV), Fulcrum_22 (DV), GOATification_22 (DV), Genamy16_20 (DV), Gibbin_22 (DV), GretelLyn_21 (DV), Jalebi_21 (DV), Jamemuya19_19 (DV), Lambo_21 (DV), LavAbarElk_19 (DV), Lila22_21 (DV), LuckyLeo_20 (DV), Mima20_20 (DV), MoiGyank_23 (DV), NorManre_22 (DV), NovaSharks_20 (DV), OtterstedtS21_21 (DV), ParvusTarda_21 (DV), Patos_22 (DV), Ranch_21 (DV), RazorC_19 (DV), Riduram_19 (DV), Rota_20 (DV), Rukungu_21 (DV), Rumi_20 (DV), Sadboi_21 (DV), Sampudon_21 (DV), Stormer_19 (DV), Tillicus_21 (DV), Wojtek_20 (DV), Xenia2_21 (DV), Yikes_22 (DV), Zany_20 (DV),

Start 14:
• Found in 19 of 107 (17.8%) of genes in pham
• Manual Annotations of this start: 18 of 95
• Called 100.0% of time when present
• Phage (with cluster) where this start called: Adjutor_22 (D1), Butterscotch_21 (D1), Chill_22 (D1), Delton_21 (D1), Giuseppe_21 (D1), Gumball_20 (D1), Helpful_22 (D1),

Mopey_21 (D1), Nova_21 (D1), PBI1_22 (D1), PLot_22 (D1), Penelope2018_21 (D1), Phalaborwa_21 (D1), Prager_21 (D1), SirHarley_20 (D1), Thoth_21 (D1), Troll4_21 (D1), Visconti_21 (D1), WaldoWhy_22 (D1),

Start 15:
• Found in 1 of 107 (0.9%) of genes in pham
• Manual Annotations of this start: 1 of 95
• Called 100.0% of time when present
• Phage (with cluster) where this start called: Hawkeye_23 (D2),

Start 18:
• Found in 2 of 107 (1.9%) of genes in pham
• Manual Annotations of this start: 1 of 95
• Called 50.0% of time when present
• Phage (with cluster) where this start called: LittleFella_18 (DG2),

Start 20:
• Found in 36 of 107 (33.6%) of genes in pham
• No Manual Annotations of this start.
• Called 2.8% of time when present
• Phage (with cluster) where this start called: Yelo_21 (R),

Summary by clusters:

There are 11 clusters represented in this pham: AC, AE, H2, H1, DG2, DG1, U, DV, R, D2, D1,

Info for manual annotations of cluster AC:
•Start number 11 was manually annotated 4 times for cluster AC.

Info for manual annotations of cluster AE:
•Start number 4 was manually annotated 3 times for cluster AE.

Info for manual annotations of cluster D1:
•Start number 14 was manually annotated 18 times for cluster D1.

Info for manual annotations of cluster D2:
•Start number 15 was manually annotated 1 time for cluster D2.

Info for manual annotations of cluster DG1:
•Start number 10 was manually annotated 8 times for cluster DG1.

Info for manual annotations of cluster DG2:
•Start number 18 was manually annotated 1 time for cluster DG2.

Info for manual annotations of cluster DV:
•Start number 13 was manually annotated 37 times for cluster DV.

Info for manual annotations of cluster H1:
•Start number 2 was manually annotated 9 times for cluster H1.

Info for manual annotations of cluster H2:
•Start number 3 was manually annotated 2 times for cluster H2.

Info for manual annotations of cluster R:
•Start number 11 was manually annotated 9 times for cluster R.

Info for manual annotations of cluster U:
•Start number 9 was manually annotated 3 times for cluster U.

Gene Information:
Gene: Adjutor_22 Start: 13488, Stop: 13907, Start Num: 14
Candidate Starts for Adjutor_22:
(Start: 14 @13488 has 18 MA's), (20, 13503), (29, 13542), (38, 13599), (43, 13620), (49, 13656), (54, 13677), (67, 13761), (74, 13803), (84, 13887),

Gene: Aikoy_30 Start: 19005, Stop: 19439, Start Num: 4
Candidate Starts for Aikoy_30:
(Start: 3 @19002 has 2 MA's), (Start: 4 @19005 has 3 MA's), (24, 19056), (37, 19128), (46, 19167), (57, 19221), (58, 19227), (67, 19293), (74, 19335), (76, 19341), (80, 19371),

Gene: Alephilan_19 Start: 13971, Stop: 14399, Start Num: 13
Candidate Starts for Alephilan_19:
(12, 13968), (Start: 13 @13971 has 37 MA's), (21, 13995), (41, 14100), (48, 14145), (49, 14148), (53, 14166), (57, 14181), (67, 14253), (79, 14310), (80, 14328),

Gene: Alyssamiracle_20 Start: 12378, Stop: 12806, Start Num: 13
Candidate Starts for Alyssamiracle_20:
(12, 12375), (Start: 13 @12378 has 37 MA's), (41, 12507), (48, 12552), (49, 12555), (53, 12573), (57, 12588), (67, 12660), (79, 12717), (80, 12735),

Gene: Apeppi_19 Start: 14093, Stop: 14521, Start Num: 13
Candidate Starts for Apeppi_19:
(Start: 13 @14093 has 37 MA's), (21, 14117), (41, 14222), (48, 14267), (57, 14303), (59, 14321), (67, 14375), (79, 14432), (80, 14450),

Gene: Astralis_19 Start: 12378, Stop: 12806, Start Num: 13
Candidate Starts for Astralis_19:
(12, 12375), (Start: 13 @12378 has 37 MA's), (41, 12507), (48, 12552), (49, 12555), (53, 12573), (57, 12588), (67, 12660), (79, 12717), (80, 12735),

Gene: Avian_19 Start: 12378, Stop: 12806, Start Num: 13
Candidate Starts for Avian_19:
(12, 12375), (Start: 13 @12378 has 37 MA's), (41, 12507), (48, 12552), (49, 12555), (53, 12573), (57, 12588), (67, 12660), (79, 12717), (80, 12735),

Gene: Barnyard_27 Start: 15178, Stop: 15603, Start Num: 3
Candidate Starts for Barnyard_27:
(Start: 3 @15178 has 2 MA's), (25, 15232), (44, 15331), (55, 15367), (58, 15382), (80, 15526), (84, 15574), (85, 15577), (88, 15595),

Gene: Beckerton_20 Start: 13898, Stop: 14365, Start Num: 2
Candidate Starts for Beckerton_20:

(Start: 2 @13898 has 9 MA's), (Start: 3 @13916 has 2 MA's), (29, 13985), (32, 13991), (47, 14087), (74, 14246), (76, 14252), (80, 14282), (84, 14330),

Gene: Beyoncage_16 Start: 9866, Stop: 10276, Start Num: 10
Candidate Starts for Beyoncage_16:
(Start: 10 @9866 has 8 MA's), (20, 9881), (35, 9944), (36, 9962), (45, 9998), (56, 10058), (69, 10145), (74, 10178), (83, 10253), (84, 10262),

Gene: BirthdayBoy_22 Start: 14824, Stop: 15252, Start Num: 13
Candidate Starts for BirthdayBoy_22:
(12, 14821), (Start: 13 @14824 has 37 MA's), (41, 14953), (48, 14998), (49, 15001), (53, 15019), (57, 15034), (67, 15106), (79, 15163), (80, 15181),

Gene: BiteSize_16 Start: 9866, Stop: 10276, Start Num: 10
Candidate Starts for BiteSize_16:
(Start: 10 @9866 has 8 MA's), (20, 9881), (35, 9944), (36, 9962), (45, 9998), (56, 10058), (69, 10145), (74, 10178), (83, 10253), (84, 10262),

Gene: BobtimousPrime_19 Start: 13818, Stop: 14276, Start Num: 2
Candidate Starts for BobtimousPrime_19:
(Start: 2 @13818 has 9 MA's), (Start: 3 @13836 has 2 MA's), (29, 13905), (32, 13911), (47, 14007), (74, 14166), (76, 14172), (80, 14202), (84, 14250),

Gene: Butterscotch_21 Start: 13548, Stop: 13967, Start Num: 14
Candidate Starts for Butterscotch_21:
(Start: 14 @13548 has 18 MA's), (20, 13563), (29, 13602), (38, 13659), (43, 13680), (49, 13716), (54, 13737), (67, 13821), (74, 13863), (84, 13947),

Gene: Candle_21 Start: 13912, Stop: 14340, Start Num: 11
Candidate Starts for Candle_21:
(5, 13891), (Start: 11 @13912 has 13 MA's), (20, 13927), (35, 13987), (45, 14044), (66, 14179), (77, 14242), (81, 14272),

Gene: Cborch11_21 Start: 13361, Stop: 13819, Start Num: 2
Candidate Starts for Cborch11_21:
(Start: 2 @13361 has 9 MA's), (Start: 3 @13379 has 2 MA's), (29, 13448), (32, 13454), (47, 13550), (74, 13709), (76, 13715), (80, 13745), (84, 13793),

Gene: Charminar_19 Start: 12378, Stop: 12806, Start Num: 13
Candidate Starts for Charminar_19:
(12, 12375), (Start: 13 @12378 has 37 MA's), (41, 12507), (48, 12552), (49, 12555), (53, 12573), (57, 12588), (67, 12660), (79, 12717), (80, 12735),

Gene: Chill_22 Start: 13554, Stop: 13973, Start Num: 14
Candidate Starts for Chill_22:
(Start: 14 @13554 has 18 MA's), (20, 13569), (29, 13608), (38, 13665), (43, 13686), (49, 13722), (54, 13743), (67, 13827), (74, 13869), (84, 13953),

Gene: Cuke_14 Start: 9111, Stop: 9524, Start Num: 11
Candidate Starts for Cuke_14:
(Start: 11 @9111 has 13 MA's), (45, 9243), (50, 9282), (51, 9294), (59, 9330), (62, 9360), (78, 9441), (84, 9510),

Gene: Damien_20 Start: 13360, Stop: 13827, Start Num: 2
Candidate Starts for Damien_20:
(Start: 2 @13360 has 9 MA's), (Start: 3 @13378 has 2 MA's), (29, 13447), (32, 13453), (47, 13549), (74, 13708), (76, 13714), (80, 13744), (84, 13792),

Gene: DaviePasture_21 Start: 14581, Stop: 15009, Start Num: 13
Candidate Starts for DaviePasture_21:
(12, 14578), (Start: 13 @14581 has 37 MA's), (21, 14605), (41, 14710), (48, 14755), (49, 14758), (53, 14776), (57, 14791), (67, 14863), (79, 14920), (80, 14938),

Gene: Delton_21 Start: 13560, Stop: 13979, Start Num: 14
Candidate Starts for Delton_21:
(Start: 14 @13560 has 18 MA's), (20, 13575), (29, 13614), (38, 13671), (43, 13692), (49, 13728), (54, 13749), (67, 13833), (74, 13875), (84, 13959),

Gene: Demikore_28 Start: 16743, Stop: 17144, Start Num: 9
Candidate Starts for Demikore_28:
(Start: 9 @16743 has 3 MA's), (33, 16812), (39, 16857), (42, 16866), (54, 16908), (57, 16920), (63, 16971), (68, 16995), (71, 17013), (84, 17118), (88, 17139),

Gene: Djokovic_16 Start: 9866, Stop: 10276, Start Num: 10
Candidate Starts for Djokovic_16:
(Start: 10 @9866 has 8 MA's), (20, 9881), (35, 9944), (36, 9962), (45, 9998), (56, 10058), (69, 10145), (74, 10178), (83, 10253), (84, 10262),

Gene: DoobyDoo_20 Start: 13758, Stop: 14186, Start Num: 13
Candidate Starts for DoobyDoo_20:
(12, 13755), (Start: 13 @13758 has 37 MA's), (41, 13887), (48, 13932), (49, 13935), (53, 13953), (57, 13968), (67, 14040), (79, 14097), (80, 14115),

Gene: DrLupo_29 Start: 15577, Stop: 15999, Start Num: 3
Candidate Starts for DrLupo_29:
(Start: 3 @15577 has 2 MA's), (7, 15589), (8, 15592), (23, 15622), (40, 15718), (44, 15730), (55, 15766), (64, 15826), (74, 15889), (84, 15973), (85, 15976), (88, 15994),

Gene: DumpTruck_20 Start: 14012, Stop: 14440, Start Num: 13
Candidate Starts for DumpTruck_20:
(Start: 13 @14012 has 37 MA's), (41, 14141), (48, 14186), (49, 14189), (65, 14279), (67, 14294), (79, 14351),

Gene: Erutan_21 Start: 14271, Stop: 14699, Start Num: 13
Candidate Starts for Erutan_21:
(12, 14268), (Start: 13 @14271 has 37 MA's), (41, 14400), (48, 14445), (49, 14448), (53, 14466), (57, 14481), (67, 14553), (79, 14610), (80, 14628),

Gene: Fowlmouth_15 Start: 9282, Stop: 9695, Start Num: 11
Candidate Starts for Fowlmouth_15:
(Start: 11 @9282 has 13 MA's), (27, 9327), (43, 9411), (50, 9453), (51, 9465), (55, 9474), (74, 9597), (84, 9681),

Gene: Fulcrum_22 Start: 14804, Stop: 15232, Start Num: 13
Candidate Starts for Fulcrum_22:

(12, 14801), (Start: 13 @14804 has 37 MA's), (41, 14933), (48, 14978), (49, 14981), (53, 14999), (57, 15014), (67, 15086), (79, 15143), (80, 15161),

Gene: GOATification_22 Start: 14804, Stop: 15232, Start Num: 13
Candidate Starts for GOATification_22:
(12, 14801), (Start: 13 @14804 has 37 MA's), (41, 14933), (48, 14978), (49, 14981), (53, 14999), (57, 15014), (67, 15086), (79, 15143), (80, 15161),

Gene: Genamy16_20 Start: 12378, Stop: 12806, Start Num: 13
Candidate Starts for Genamy16_20:
(12, 12375), (Start: 13 @12378 has 37 MA's), (41, 12507), (48, 12552), (49, 12555), (53, 12573), (57, 12588), (67, 12660), (79, 12717), (80, 12735),

Gene: Gibbin_22 Start: 14864, Stop: 15292, Start Num: 13
Candidate Starts for Gibbin_22:
(12, 14861), (Start: 13 @14864 has 37 MA's), (41, 14993), (48, 15038), (49, 15041), (53, 15059), (57, 15074), (67, 15146), (79, 15203), (80, 15221),

Gene: Giuseppe_21 Start: 13540, Stop: 13959, Start Num: 14
Candidate Starts for Giuseppe_21:
(Start: 14 @13540 has 18 MA's), (20, 13555), (29, 13594), (38, 13651), (43, 13672), (49, 13708), (54, 13729), (67, 13813), (74, 13855), (84, 13939),

Gene: GretelLyn_21 Start: 15138, Stop: 15566, Start Num: 13
Candidate Starts for GretelLyn_21:
(12, 15135), (Start: 13 @15138 has 37 MA's), (41, 15267), (48, 15312), (49, 15315), (53, 15333), (57, 15348), (67, 15420), (79, 15477), (80, 15495),

Gene: Gumball_20 Start: 13498, Stop: 13917, Start Num: 14
Candidate Starts for Gumball_20:
(Start: 14 @13498 has 18 MA's), (20, 13513), (29, 13552), (38, 13609), (43, 13630), (49, 13666), (54, 13687), (67, 13771), (74, 13813), (84, 13897),

Gene: Hawkeye_23 Start: 13446, Stop: 13865, Start Num: 15
Candidate Starts for Hawkeye_23:
(Start: 15 @13446 has 1 MA's), (19, 13458), (30, 13503), (38, 13557), (54, 13635), (56, 13641), (57, 13647), (68, 13722), (71, 13740), (75, 13764), (77, 13770), (78, 13776), (82, 13833), (84, 13845), (85, 13848), (87, 13857),

Gene: Helpful_22 Start: 13548, Stop: 13967, Start Num: 14
Candidate Starts for Helpful_22:
(Start: 14 @13548 has 18 MA's), (20, 13563), (29, 13602), (38, 13659), (43, 13680), (49, 13716), (54, 13737), (67, 13821), (74, 13863), (84, 13947),

Gene: Indlulamithi_18 Start: 11372, Stop: 11803, Start Num: 11
Candidate Starts for Indlulamithi_18:
(Start: 11 @11372 has 13 MA's), (35, 11447), (50, 11543), (59, 11591), (69, 11654), (70, 11663),

Gene: Jalebi_21 Start: 15314, Stop: 15742, Start Num: 13
Candidate Starts for Jalebi_21:
(12, 15311), (Start: 13 @15314 has 37 MA's), (41, 15443), (48, 15488), (49, 15491), (53, 15509), (57, 15524), (67, 15596), (79, 15653), (80, 15671),

Gene: Jamemuya19_19 Start: 12378, Stop: 12806, Start Num: 13
Candidate Starts for Jamemuya19_19:
(12, 12375), (Start: 13 @12378 has 37 MA's), (41, 12507), (48, 12552), (49, 12555), (53, 12573), (57, 12588), (67, 12660), (79, 12717), (80, 12735),

Gene: Konstantine_25 Start: 14562, Stop: 15029, Start Num: 2
Candidate Starts for Konstantine_25:
(Start: 2 @14562 has 9 MA's), (Start: 3 @14580 has 2 MA's), (29, 14649), (32, 14655), (47, 14751), (74, 14910), (76, 14916), (80, 14946), (84, 14994),

Gene: Labelle_27 Start: 16745, Stop: 17146, Start Num: 9
Candidate Starts for Labelle_27:
(Start: 9 @16745 has 3 MA's), (17, 16757), (33, 16814), (39, 16859), (42, 16868), (54, 16910), (57, 16922), (63, 16973), (68, 16997), (71, 17015), (84, 17120), (88, 17141),

Gene: Lambo_21 Start: 14808, Stop: 15236, Start Num: 13
Candidate Starts for Lambo_21:
(12, 14805), (Start: 13 @14808 has 37 MA's), (41, 14937), (48, 14982), (49, 14985), (53, 15003), (57, 15018), (67, 15090), (79, 15147), (80, 15165),

Gene: LavAbarElk_19 Start: 13241, Stop: 13669, Start Num: 13
Candidate Starts for LavAbarElk_19:
(12, 13238), (Start: 13 @13241 has 37 MA's), (21, 13265), (41, 13370), (48, 13415), (49, 13418), (53, 13436), (57, 13451), (67, 13523), (79, 13580), (80, 13598),

Gene: Leopard_30 Start: 19290, Stop: 19724, Start Num: 4
Candidate Starts for Leopard_30:
(Start: 3 @19287 has 2 MA's), (Start: 4 @19290 has 3 MA's), (24, 19341), (37, 19413), (46, 19452), (57, 19506), (58, 19512), (67, 19578), (74, 19620), (76, 19626), (80, 19656),

Gene: Lila22_21 Start: 14762, Stop: 15190, Start Num: 13
Candidate Starts for Lila22_21:
(12, 14759), (Start: 13 @14762 has 37 MA's), (41, 14891), (48, 14936), (49, 14939), (53, 14957), (57, 14972), (67, 15044), (79, 15101), (80, 15119),

Gene: LilyPad_17 Start: 10585, Stop: 10992, Start Num: 10
Candidate Starts for LilyPad_17:
(Start: 10 @10585 has 8 MA's), (36, 10678), (52, 10762), (54, 10768), (60, 10816), (69, 10861), (77, 10903), (84, 10978),

Gene: LittleFella_18 Start: 12477, Stop: 12860, Start Num: 18
Candidate Starts for LittleFella_18:
(1, 12273), (Start: 18 @12477 has 1 MA's), (26, 12495), (31, 12516), (35, 12528), (36, 12546), (61, 12693), (62, 12699), (67, 12723), (72, 12756), (73, 12759), (84, 12846), (86, 12852),

Gene: LuckyLeo_20 Start: 14093, Stop: 14521, Start Num: 13
Candidate Starts for LuckyLeo_20:
(Start: 13 @14093 has 37 MA's), (21, 14117), (41, 14222), (48, 14267), (57, 14303), (59, 14321), (67, 14375), (79, 14432), (80, 14450),

Gene: Madi_16 Start: 9866, Stop: 10276, Start Num: 10
Candidate Starts for Madi_16:

(Start: 10 @9866 has 8 MA's), (20, 9881), (35, 9944), (36, 9962), (45, 9998), (56, 10058), (69, 10145), (74, 10178), (83, 10253), (84, 10262),

Gene: Madruga_26 Start: 16414, Stop: 16815, Start Num: 9
Candidate Starts for Madruga_26:
(Start: 9 @16414 has 3 MA's), (Start: 18 @16429 has 1 MA's), (33, 16483), (39, 16528), (54, 16579), (57, 16591), (63, 16642), (68, 16666), (71, 16684), (84, 16789), (88, 16810),

Gene: Megatron06_22 Start: 13895, Stop: 14353, Start Num: 2
Candidate Starts for Megatron06_22:
(Start: 2 @13895 has 9 MA's), (Start: 3 @13913 has 2 MA's), (29, 13982), (32, 13988), (47, 14084), (74, 14243), (76, 14249), (80, 14279), (84, 14327),

Gene: Mima20_20 Start: 14491, Stop: 14919, Start Num: 13
Candidate Starts for Mima20_20:
(12, 14488), (Start: 13 @14491 has 37 MA's), (21, 14515), (41, 14620), (48, 14665), (49, 14668), (53, 14686), (57, 14701), (67, 14773), (79, 14830), (80, 14848),

Gene: MoiGyank_23 Start: 15175, Stop: 15603, Start Num: 13
Candidate Starts for MoiGyank_23:
(12, 15172), (Start: 13 @15175 has 37 MA's), (41, 15304), (48, 15349), (49, 15352), (53, 15370), (57, 15385), (67, 15457), (79, 15514), (80, 15532),

Gene: MontyDev_21 Start: 13570, Stop: 13998, Start Num: 11
Candidate Starts for MontyDev_21:
(5, 13549), (Start: 11 @13570 has 13 MA's), (20, 13585), (35, 13645), (45, 13702), (66, 13837), (77, 13900), (81, 13930),

Gene: Mopey_21 Start: 13548, Stop: 13967, Start Num: 14
Candidate Starts for Mopey_21:
(Start: 14 @13548 has 18 MA's), (20, 13563), (29, 13602), (38, 13659), (43, 13680), (49, 13716), (54, 13737), (67, 13821), (74, 13863), (84, 13947),

Gene: MrMiyagi_15 Start: 9282, Stop: 9695, Start Num: 11
Candidate Starts for MrMiyagi_15:
(Start: 11 @9282 has 13 MA's), (27, 9327), (43, 9411), (50, 9453), (51, 9465), (55, 9474), (74, 9597), (84, 9681),

Gene: Nilo_22 Start: 13909, Stop: 14337, Start Num: 11
Candidate Starts for Nilo_22:
(5, 13888), (Start: 11 @13909 has 13 MA's), (20, 13924), (35, 13984), (45, 14041), (66, 14176), (77, 14239), (81, 14269),

Gene: NorManre_22 Start: 14370, Stop: 14798, Start Num: 13
Candidate Starts for NorManre_22:
(12, 14367), (Start: 13 @14370 has 37 MA's), (41, 14499), (48, 14544), (49, 14547), (53, 14565), (57, 14580), (67, 14652), (79, 14709), (80, 14727),

Gene: Nova_21 Start: 13975, Stop: 14394, Start Num: 14
Candidate Starts for Nova_21:
(Start: 14 @13975 has 18 MA's), (20, 13990), (29, 14029), (38, 14086), (43, 14107), (49, 14143), (54, 14164), (67, 14248), (74, 14290), (84, 14374),

Gene: NovaSharks_20 Start: 12378, Stop: 12806, Start Num: 13
Candidate Starts for NovaSharks_20:
(12, 12375), (Start: 13 @12378 has 37 MA's), (41, 12507), (48, 12552), (49, 12555), (53, 12573), (57, 12588), (67, 12660), (79, 12717), (80, 12735),

Gene: Oaker_20 Start: 13619, Stop: 14077, Start Num: 2
Candidate Starts for Oaker_20:
(Start: 2 @13619 has 9 MA's), (Start: 3 @13637 has 2 MA's), (29, 13706), (32, 13712), (47, 13808), (74, 13967), (76, 13973), (80, 14003), (84, 14051),

Gene: Onyinye_31 Start: 19171, Stop: 19605, Start Num: 4
Candidate Starts for Onyinye_31:
(Start: 3 @19168 has 2 MA's), (Start: 4 @19171 has 3 MA's), (24, 19222), (37, 19294), (46, 19333), (57, 19387), (58, 19393), (67, 19459), (74, 19501), (76, 19507), (80, 19537),

Gene: OtterstedtS21_21 Start: 14460, Stop: 14888, Start Num: 13
Candidate Starts for OtterstedtS21_21:
(12, 14457), (Start: 13 @14460 has 37 MA's), (41, 14589), (48, 14634), (49, 14637), (53, 14655), (57, 14670), (67, 14742), (79, 14799), (80, 14817),

Gene: PBI1_22 Start: 13479, Stop: 13898, Start Num: 14
Candidate Starts for PBI1_22:
(Start: 14 @13479 has 18 MA's), (20, 13494), (29, 13533), (38, 13590), (43, 13611), (49, 13647), (54, 13668), (67, 13752), (74, 13794), (84, 13878),

Gene: PLot_22 Start: 13551, Stop: 13970, Start Num: 14
Candidate Starts for PLot_22:
(Start: 14 @13551 has 18 MA's), (20, 13566), (29, 13605), (38, 13662), (43, 13683), (49, 13719), (54, 13740), (67, 13824), (74, 13866), (84, 13950),

Gene: Papyrus_21 Start: 13571, Stop: 13999, Start Num: 11
Candidate Starts for Papyrus_21:
(5, 13550), (Start: 11 @13571 has 13 MA's), (20, 13586), (35, 13646), (45, 13703), (66, 13838), (77, 13901), (81, 13931),

Gene: ParvusTarda_21 Start: 13942, Stop: 14370, Start Num: 13
Candidate Starts for ParvusTarda_21:
(12, 13939), (Start: 13 @13942 has 37 MA's), (41, 14071), (48, 14116), (49, 14119), (53, 14137), (57, 14152), (67, 14224), (79, 14281), (80, 14299),

Gene: Patience_28 Start: 17304, Stop: 17705, Start Num: 9
Candidate Starts for Patience_28:
(Start: 9 @17304 has 3 MA's), (33, 17373), (39, 17418), (42, 17427), (54, 17469), (57, 17481), (63, 17532), (68, 17556), (71, 17574), (84, 17679), (88, 17700),

Gene: Patos_22 Start: 14370, Stop: 14798, Start Num: 13
Candidate Starts for Patos_22:
(12, 14367), (Start: 13 @14370 has 37 MA's), (41, 14499), (48, 14544), (49, 14547), (53, 14565), (57, 14580), (67, 14652), (79, 14709), (80, 14727),

Gene: Penelope2018_21 Start: 13548, Stop: 13967, Start Num: 14
Candidate Starts for Penelope2018_21:

(Start: 14 @13548 has 18 MA's), (20, 13563), (29, 13602), (38, 13659), (43, 13680), (49, 13716), (54, 13737), (67, 13821), (74, 13863), (84, 13947),

Gene: Phalaborwa_21 Start: 13581, Stop: 14000, Start Num: 14
Candidate Starts for Phalaborwa_21:
(Start: 14 @13581 has 18 MA's), (20, 13596), (29, 13635), (34, 13656), (43, 13713), (49, 13749), (57, 13782), (69, 13863), (74, 13896), (81, 13935), (84, 13980),

Gene: Phreeze_20 Start: 13360, Stop: 13818, Start Num: 2
Candidate Starts for Phreeze_20:
(Start: 2 @13360 has 9 MA's), (Start: 3 @13378 has 2 MA's), (29, 13447), (32, 13453), (47, 13549), (74, 13708), (76, 13714), (80, 13744), (84, 13792),

Gene: Prager_21 Start: 13560, Stop: 13979, Start Num: 14
Candidate Starts for Prager_21:
(Start: 14 @13560 has 18 MA's), (20, 13575), (29, 13614), (38, 13671), (43, 13692), (49, 13728), (54, 13749), (67, 13833), (74, 13875), (84, 13959),

Gene: Predator_24 Start: 14885, Stop: 15343, Start Num: 2
Candidate Starts for Predator_24:
(Start: 2 @14885 has 9 MA's), (Start: 3 @14903 has 2 MA's), (6, 14909), (28, 14969), (32, 14978), (47, 15074), (53, 15104), (66, 15179), (70, 15209), (76, 15239), (77, 15242), (80, 15269), (84, 15317),

Gene: Puissant_19 Start: 13816, Stop: 14274, Start Num: 2
Candidate Starts for Puissant_19:
(Start: 2 @13816 has 9 MA's), (Start: 3 @13834 has 2 MA's), (16, 13858), (22, 13873), (29, 13903), (32, 13909), (47, 14005), (59, 14068), (76, 14170), (80, 14200), (84, 14248),

Gene: Ranch_21 Start: 13308, Stop: 13736, Start Num: 13
Candidate Starts for Ranch_21:
(12, 13305), (Start: 13 @13308 has 37 MA's), (41, 13437), (48, 13482), (49, 13485), (53, 13503), (57, 13518), (67, 13590), (79, 13647), (80, 13665),

Gene: RazorC_19 Start: 12378, Stop: 12806, Start Num: 13
Candidate Starts for RazorC_19:
(12, 12375), (Start: 13 @12378 has 37 MA's), (41, 12507), (48, 12552), (49, 12555), (53, 12573), (57, 12588), (67, 12660), (79, 12717), (80, 12735),

Gene: Riduram_19 Start: 12348, Stop: 12776, Start Num: 13
Candidate Starts for Riduram_19:
(12, 12345), (Start: 13 @12348 has 37 MA's), (41, 12477), (48, 12522), (49, 12525), (53, 12543), (57, 12558), (67, 12630), (79, 12687), (80, 12705),

Gene: Riparian_21 Start: 13370, Stop: 13798, Start Num: 11
Candidate Starts for Riparian_21:
(5, 13349), (Start: 11 @13370 has 13 MA's), (20, 13385), (35, 13445), (45, 13502), (66, 13637), (77, 13700), (81, 13730),

Gene: Rope_21 Start: 13562, Stop: 13990, Start Num: 11
Candidate Starts for Rope_21:
(5, 13541), (Start: 11 @13562 has 13 MA's), (20, 13577), (35, 13637), (45, 13694), (66, 13829), (77, 13892), (81, 13922),

Gene: Rota_20 Start: 14266, Stop: 14694, Start Num: 13
Candidate Starts for Rota_20:
(12, 14263), (Start: 13 @14266 has 37 MA's), (41, 14395), (48, 14440), (49, 14443), (53, 14461), (57, 14476), (67, 14548), (79, 14605), (80, 14623),

Gene: Rukungu_21 Start: 15007, Stop: 15435, Start Num: 13
Candidate Starts for Rukungu_21:
(12, 15004), (Start: 13 @15007 has 37 MA's), (41, 15136), (48, 15181), (49, 15184), (53, 15202), (57, 15217), (67, 15289), (79, 15346), (80, 15364),

Gene: Rumi_20 Start: 12378, Stop: 12806, Start Num: 13
Candidate Starts for Rumi_20:
(12, 12375), (Start: 13 @12378 has 37 MA's), (41, 12507), (48, 12552), (49, 12555), (53, 12573), (57, 12588), (67, 12660), (79, 12717), (80, 12735),

Gene: Sadboi_21 Start: 15138, Stop: 15566, Start Num: 13
Candidate Starts for Sadboi_21:
(12, 15135), (Start: 13 @15138 has 37 MA's), (41, 15267), (48, 15312), (49, 15315), (53, 15333), (57, 15348), (67, 15420), (79, 15477), (80, 15495),

Gene: Sampudon_21 Start: 15314, Stop: 15742, Start Num: 13
Candidate Starts for Sampudon_21:
(12, 15311), (Start: 13 @15314 has 37 MA's), (41, 15443), (48, 15488), (49, 15491), (53, 15509), (57, 15524), (67, 15596), (79, 15653), (80, 15671),

Gene: Send513_21 Start: 13912, Stop: 14340, Start Num: 11
Candidate Starts for Send513_21:
(5, 13891), (Start: 11 @13912 has 13 MA's), (20, 13927), (35, 13987), (45, 14044), (66, 14179), (77, 14242), (81, 14272),

Gene: Sienna_16 Start: 9866, Stop: 10276, Start Num: 10
Candidate Starts for Sienna_16:
(Start: 10 @9866 has 8 MA's), (20, 9881), (35, 9944), (36, 9962), (45, 9998), (56, 10058), (69, 10145), (74, 10178), (83, 10253), (84, 10262),

Gene: SirHarley_20 Start: 13480, Stop: 13899, Start Num: 14
Candidate Starts for SirHarley_20:
(Start: 14 @13480 has 18 MA's), (20, 13495), (29, 13534), (38, 13591), (43, 13612), (49, 13648), (54, 13669), (67, 13753), (74, 13795), (84, 13879),

Gene: Stormer_19 Start: 12378, Stop: 12806, Start Num: 13
Candidate Starts for Stormer_19:
(12, 12375), (Start: 13 @12378 has 37 MA's), (41, 12507), (48, 12552), (49, 12555), (53, 12573), (57, 12588), (67, 12660), (79, 12717), (80, 12735),

Gene: SuperSonics_27 Start: 16471, Stop: 16872, Start Num: 9
Candidate Starts for SuperSonics_27:
(Start: 9 @16471 has 3 MA's), (17, 16483), (33, 16540), (39, 16585), (42, 16594), (54, 16636), (57, 16648), (63, 16699), (68, 16723), (71, 16741), (84, 16846), (88, 16867),

Gene: Suzy_17 Start: 11094, Stop: 11504, Start Num: 10
Candidate Starts for Suzy_17:

(Start: 10 @11094 has 8 MA's), (20, 11109), (35, 11172), (36, 11190), (40, 11214), (56, 11286), (60, 11328), (62, 11340), (74, 11406), (83, 11481), (84, 11490),

Gene: Terapin_16 Start: 9866, Stop: 10276, Start Num: 10
Candidate Starts for Terapin_16:
(Start: 10 @9866 has 8 MA's), (20, 9881), (35, 9944), (36, 9962), (45, 9998), (56, 10058), (69, 10145), (74, 10178), (83, 10253), (84, 10262),

Gene: Thoth_21 Start: 13545, Stop: 13964, Start Num: 14
Candidate Starts for Thoth_21:
(Start: 14 @13545 has 18 MA's), (20, 13560), (29, 13599), (38, 13656), (43, 13677), (49, 13713), (54, 13734), (67, 13818), (74, 13860), (84, 13944),

Gene: Thumb_20 Start: 13361, Stop: 13819, Start Num: 2
Candidate Starts for Thumb_20:
(Start: 2 @13361 has 9 MA's), (Start: 3 @13379 has 2 MA's), (29, 13448), (32, 13454), (47, 13550), (74, 13709), (76, 13715), (80, 13745), (84, 13793),

Gene: Tillicus_21 Start: 13687, Stop: 14115, Start Num: 13
Candidate Starts for Tillicus_21:
(Start: 13 @13687 has 37 MA's), (21, 13711), (41, 13816), (48, 13861), (57, 13897), (59, 13915), (67, 13969), (79, 14026), (80, 14044),

Gene: Troll4_21 Start: 13549, Stop: 13968, Start Num: 14
Candidate Starts for Troll4_21:
(Start: 14 @13549 has 18 MA's), (20, 13564), (29, 13603), (38, 13660), (43, 13681), (49, 13717), (54, 13738), (67, 13822), (74, 13864), (84, 13948),

Gene: Visconti_21 Start: 13558, Stop: 13977, Start Num: 14
Candidate Starts for Visconti_21:
(Start: 14 @13558 has 18 MA's), (20, 13573), (29, 13612), (38, 13669), (43, 13690), (49, 13726), (54, 13747), (67, 13831), (74, 13873), (84, 13957),

Gene: WaldoWhy_22 Start: 13554, Stop: 13973, Start Num: 14
Candidate Starts for WaldoWhy_22:
(Start: 14 @13554 has 18 MA's), (20, 13569), (29, 13608), (38, 13665), (43, 13686), (49, 13722), (54, 13743), (67, 13827), (74, 13869), (84, 13953),

Gene: Weiss13_21 Start: 13602, Stop: 14030, Start Num: 11
Candidate Starts for Weiss13_21:
(5, 13581), (Start: 11 @13602 has 13 MA's), (20, 13617), (45, 13734), (66, 13869), (77, 13932), (81, 13962),

Gene: Wojtek_20 Start: 14015, Stop: 14443, Start Num: 13
Candidate Starts for Wojtek_20:
(12, 14012), (Start: 13 @14015 has 37 MA's), (41, 14144), (48, 14189), (49, 14192), (53, 14210), (57, 14225), (67, 14297), (79, 14354), (80, 14372),

Gene: Xenia2_21 Start: 14054, Stop: 14482, Start Num: 13
Candidate Starts for Xenia2_21:
(Start: 13 @14054 has 37 MA's), (41, 14183), (48, 14228), (49, 14231), (65, 14321), (67, 14336), (79, 14393),

Gene: Yelo_21 Start: 13927, Stop: 14340, Start Num: 20
Candidate Starts for Yelo_21:
(5, 13891), (Start: 11 @13912 has 13 MA's), (20, 13927), (35, 13987), (45, 14044), (66, 14179), (77, 14242), (81, 14272),

Gene: Yikes_22 Start: 15399, Stop: 15827, Start Num: 13
Candidate Starts for Yikes_22:
(12, 15396), (Start: 13 @15399 has 37 MA's), (41, 15528), (48, 15573), (49, 15576), (53, 15594), (57, 15609), (67, 15681), (79, 15738), (80, 15756),

Gene: Zany_20 Start: 14528, Stop: 14956, Start Num: 13
Candidate Starts for Zany_20:
(12, 14525), (Start: 13 @14528 has 37 MA's), (21, 14552), (41, 14657), (48, 14702), (49, 14705), (53, 14723), (57, 14738), (67, 14810), (79, 14867), (80, 14885),

Gene: Zenon_22 Start: 13914, Stop: 14342, Start Num: 11
Candidate Starts for Zenon_22:
(5, 13893), (Start: 11 @13914 has 13 MA's), (20, 13929), (35, 13989), (45, 14046), (66, 14181), (77, 14244), (81, 14274),