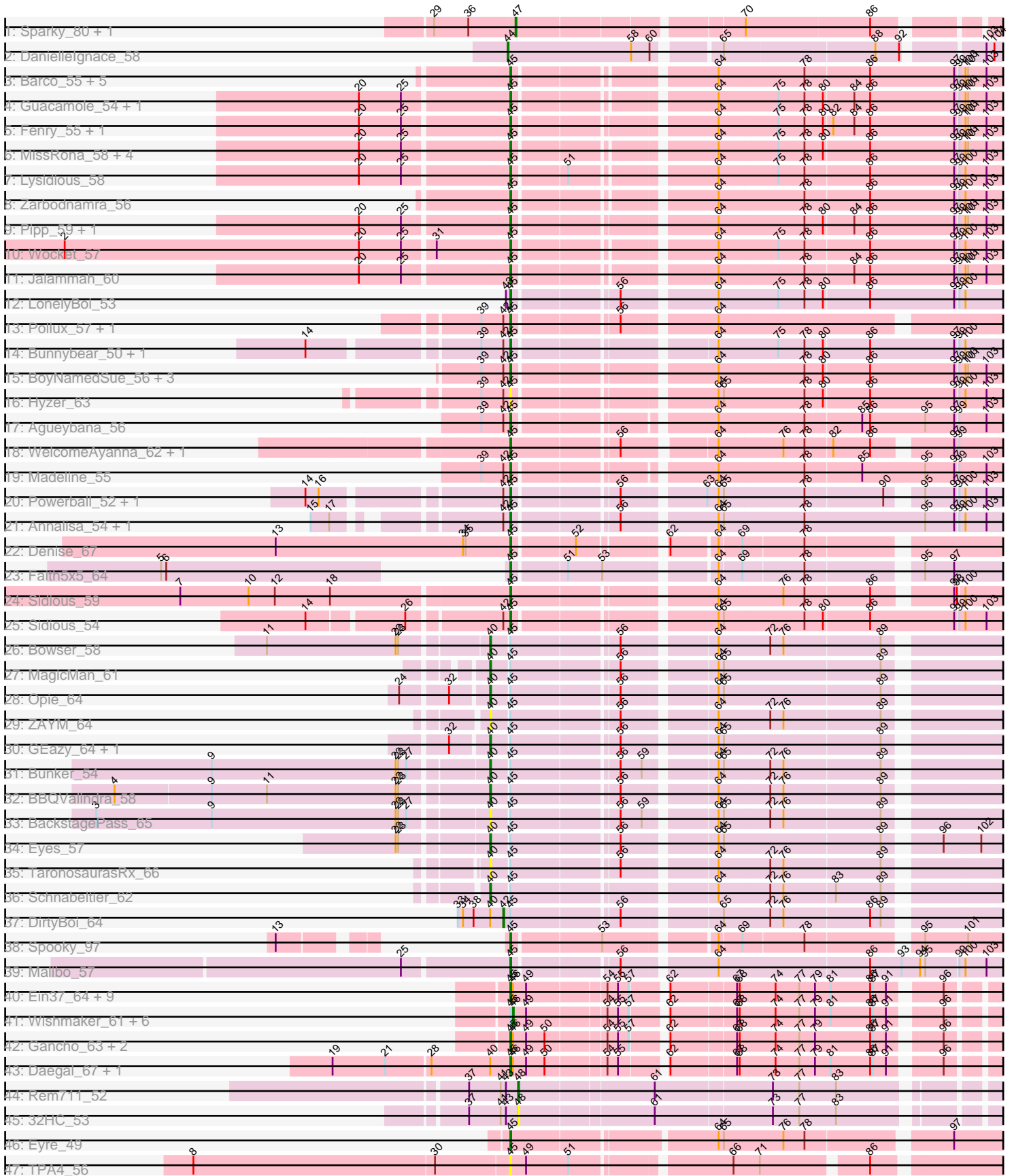


# Zoomed Pham 193923



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 193923 Report

This analysis was run 11/02/24 on database version 579.

Pham number 193923 has 87 members, 8 are drafts.

Phages represented in each track:

- Track 1 : Sparky\_80, Farewell\_81
- Track 2 : DanielleIgnace\_58
- Track 3 : Barco\_55, Hitter\_57, Delian\_60, CaptainKirk2\_57, MintFen\_57, Samba\_56
- Track 4 : Guacamole\_54, JasperJr\_54
- Track 5 : Fenry\_55, Petra\_53
- Track 6 : MissRona\_58, Gambino\_60, Mellie\_55, Azula\_58, Blueberry\_57
- Track 7 : Lysidious\_58
- Track 8 : Zarbodnamra\_56
- Track 9 : Pipp\_59, Walrus\_55
- Track 10 : Wocket\_57
- Track 11 : Jalammah\_60
- Track 12 : LonelyBoi\_53
- Track 13 : Pollux\_57, Floral\_55
- Track 14 : Bunnybear\_50, Maridalia\_58
- Track 15 : BoyNamedSue\_56, Marteena\_53, AlumE\_56, EMSquaredA\_54
- Track 16 : Hyzer\_63
- Track 17 : Agueybana\_56
- Track 18 : WelcomeAyanna\_62, ThankyouJordi\_62
- Track 19 : Madeline\_55
- Track 20 : Powerball\_52, PhriskyACE\_51
- Track 21 : Annalisa\_54, Oregano\_55
- Track 22 : Denise\_67
- Track 23 : Faith5x5\_64
- Track 24 : Sidious\_59
- Track 25 : Sidious\_54
- Track 26 : Bowser\_58
- Track 27 : MagicMan\_61
- Track 28 : Opie\_64
- Track 29 : ZAYM\_64
- Track 30 : GEazy\_64, HannahD\_61
- Track 31 : Bunker\_54
- Track 32 : BBQValindra\_58
- Track 33 : BackstagePass\_65
- Track 34 : Eyes\_57
- Track 35 : TaronosaurusRx\_66
- Track 36 : Schnabeltier\_62
- Track 37 : DirtyBoi\_64

- Track 38 : Spooky\_97
- Track 39 : Malibo\_57
- Track 40 : Ein37\_64, HH92\_63, Kinbote\_63, DeepSoil15\_64, Webster2\_64, LilHazelNut\_64, Giles\_61, Dewey\_61, Hadrien\_63, Evanesce\_63
- Track 41 : Wishmaker\_61, Ubuntu\_64, Luna22\_61, Luke\_63, Hail\_61, Amymech\_64, Forge\_61
- Track 42 : Gancho\_63, OBUpride\_64, Gravaillia\_62
- Track 43 : Daegal\_67, Amochick\_65
- Track 44 : Rem711\_52
- Track 45 : 32HC\_53
- Track 46 : Eyre\_49
- Track 47 : TPA4\_56

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

The start number called the most often in the published annotations is 45, it was called in 58 of the 79 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Agueybana\_56, AlumE\_56, Amochick\_65, Annalisa\_54, Azula\_58, Barco\_55, Blueberry\_57, BoyNamedSue\_56, Bunnybear\_50, CaptainKirk2\_57, Daegal\_67, DeepSoil15\_64, Delian\_60, Denise\_67, Dewey\_61, EMSquaredA\_54, Ein37\_64, Evanesce\_63, Eyre\_49, Faith5x5\_64, Fenry\_55, Floral\_55, Gambino\_60, Gancho\_63, Giles\_61, Gravaillia\_62, Guacamole\_54, HH92\_63, Hadrien\_63, Hitter\_57, Hyzer\_63, Jalammah\_60, JasperJr\_54, Kinbote\_63, LilHazelNut\_64, LonelyBoi\_53, Lysidious\_58, Madeline\_55, Malibo\_57, Maridalia\_58, Marteena\_53, Mellie\_55, MintFen\_57, MissRona\_58, OBUpride\_64, Oregano\_55, Petra\_53, PhriskyACE\_51, Pipp\_59, Pollux\_57, Powerball\_52, Samba\_56, Sidious\_54, Sidious\_59, Spooky\_97, TPA4\_56, ThankyouJordi\_62, Walrus\_55, Webster2\_64, WelcomeAyanna\_62, Wocket\_57, Zarbodnamra\_56,

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

- Amymech\_64, BBQValindra\_58, BackstagePass\_65, Bowser\_58, Bunker\_54, DirtyBoi\_64, Eyes\_57, Forge\_61, GEazy\_64, Hail\_61, HannahD\_61, Luke\_63, Luna22\_61, MagicMan\_61, Opie\_64, Schnabeltier\_62, TaronosaurusRx\_66, Ubuntu\_64, Wishmaker\_61, ZAYM\_64,

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

- 32HC\_53, DanielleIgnace\_58, Farewell\_81, Rem711\_52, Sparky\_80,

### **Summary by start number:**

Start 40:

- Found in 15 of 87 ( 17.2% ) of genes in pham
- Manual Annotations of this start: 9 of 79
- Called 80.0% of time when present
- Phage (with cluster) where this start called: BBQValindra\_58 (DB), BackstagePass\_65 (DB), Bowser\_58 (DB), Bunker\_54 (DB), Eyes\_57 (DB), GEazy\_64 (DB), HannahD\_61 (DB), MagicMan\_61 (DB), Opie\_64 (DB), Schnabeltier\_62 (DB), TaronosaurusRx\_66 (DB), ZAYM\_64 (DB),

Start 42:

- Found in 17 of 87 ( 19.5% ) of genes in pham
- Manual Annotations of this start: 1 of 79
- Called 5.9% of time when present
- Phage (with cluster) where this start called: DirtyBoi\_64 (DB),

Start 44:

- Found in 1 of 87 ( 1.1% ) of genes in pham
- Manual Annotations of this start: 1 of 79
- Called 100.0% of time when present
- Phage (with cluster) where this start called: DanielleIgnace\_58 (AT),

Start 45:

- Found in 82 of 87 ( 94.3% ) of genes in pham
- Manual Annotations of this start: 58 of 79
- Called 75.6% of time when present
- Phage (with cluster) where this start called: Agueybana\_56 (CZ1), AlumE\_56 (CZ1), Amochick\_65 (Q), Annalisa\_54 (CZ4), Azula\_58 (CV), Barco\_55 (CV), Blueberry\_57 (CV), BoyNamedSue\_56 (CZ1), Bunnybear\_50 (CZ), CaptainKirk2\_57 (CV), Daegal\_67 (Q), DeepSoil15\_64 (Q), Delian\_60 (CV), Denise\_67 (CZ5), Dewey\_61 (Q), EMSquaredA\_54 (CY1), Ein37\_64 (Q), Evanesce\_63 (Q), Eyre\_49 (singleton), Faith5x5\_64 (CZ6), Fenry\_55 (CV), Floral\_55 (CY1), Gambino\_60 (CV), Gancho\_63 (Q), Giles\_61 (Q), Gravaillia\_62 (Q), Guacamole\_54 (CV), HH92\_63 (Q), Hadrien\_63 (Q), Hitter\_57 (CV), Hyzer\_63 (CZ1), Jalammah\_60 (CV), JasperJr\_54 (CV), Kinbote\_63 (Q), LilHazelNut\_64 (Q), LonelyBoi\_53 (CY), Lysidious\_58 (CV), Madeline\_55 (CZ1), Malibo\_57 (DW), Maridalia\_58 (CZ1), Marteenaa\_53 (CY1), Mellie\_55 (CV), MintFen\_57 (CV), MissRona\_58 (CV), OBUpride\_64 (Q), Oregano\_55 (CZ4), Petra\_53 (CV), PhriskyACE\_51 (CZ4), Pipp\_59 (CV), Pollux\_57 (CY1), Powerball\_52 (CZ4), Samba\_56 (CV), Sidious\_54 (CZ7), Sidious\_59 (CZ7), Spooky\_97 (DN2), TPA4\_56 (singleton), ThankyouJordi\_62 (CZ1), Walrus\_55 (CV), Webster2\_64 (Q), WelcomeAyanna\_62 (CZ1), Wocket\_57 (CV), Zarbodnamra\_56 (CV),

Start 46:

- Found in 22 of 87 ( 25.3% ) of genes in pham
- Manual Annotations of this start: 7 of 79
- Called 31.8% of time when present
- Phage (with cluster) where this start called: Amymech\_64 (Q), Forge\_61 (Q), Hail\_61 (Q), Luke\_63 (Q), Luna22\_61 (Q), Ubuntu\_64 (Q), Wishmaker\_61 (Q),

Start 47:

- Found in 2 of 87 ( 2.3% ) of genes in pham
- Manual Annotations of this start: 2 of 79
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Farewell\_81 (AF), Sparky\_80 (AF),

Start 48:

- Found in 2 of 87 ( 2.3% ) of genes in pham
- Manual Annotations of this start: 1 of 79
- Called 100.0% of time when present
- Phage (with cluster) where this start called: 32HC\_53 (Z), Rem711\_52 (Z),

## Summary by clusters:

There are 17 clusters represented in this pham: CZ7, CY1, AF, CZ6, CZ1, DB, singleton, CZ4, CZ5, Q, CZ, CY, AT, DN2, DW, Z, CV,

Info for manual annotations of cluster AF:

- Start number 47 was manually annotated 2 times for cluster AF.

Info for manual annotations of cluster AT:

- Start number 44 was manually annotated 1 time for cluster AT.

Info for manual annotations of cluster CV:

- Start number 45 was manually annotated 21 times for cluster CV.

Info for manual annotations of cluster CY:

- Start number 45 was manually annotated 1 time for cluster CY.

Info for manual annotations of cluster CY1:

- Start number 45 was manually annotated 4 times for cluster CY1.

Info for manual annotations of cluster CZ:

- Start number 45 was manually annotated 1 time for cluster CZ.

Info for manual annotations of cluster CZ1:

- Start number 45 was manually annotated 7 times for cluster CZ1.

Info for manual annotations of cluster CZ4:

- Start number 45 was manually annotated 2 times for cluster CZ4.

Info for manual annotations of cluster CZ5:

- Start number 45 was manually annotated 1 time for cluster CZ5.

Info for manual annotations of cluster CZ6:

- Start number 45 was manually annotated 1 time for cluster CZ6.

Info for manual annotations of cluster CZ7:

- Start number 45 was manually annotated 2 times for cluster CZ7.

Info for manual annotations of cluster DB:

- Start number 40 was manually annotated 9 times for cluster DB.
- Start number 42 was manually annotated 1 time for cluster DB.

Info for manual annotations of cluster DN2:

- Start number 45 was manually annotated 1 time for cluster DN2.

Info for manual annotations of cluster DW:

- Start number 45 was manually annotated 1 time for cluster DW.

Info for manual annotations of cluster Q:

- Start number 45 was manually annotated 15 times for cluster Q.
- Start number 46 was manually annotated 7 times for cluster Q.

Info for manual annotations of cluster Z:

- Start number 48 was manually annotated 1 time for cluster Z.

**Gene Information:**

Gene: 32HC\_53 Start: 36136, Stop: 36690, Start Num: 48

Candidate Starts for 32HC\_53:

(37, 36082), (41, 36118), (43, 36124), (Start: 48 @36136 has 1 MA's), (61, 36283), (73, 36409), (77, 36439), (83, 36478), (105, 36631), (106, 36640),

Gene: Agueybana\_56 Start: 39653, Stop: 40237, Start Num: 45

Candidate Starts for Agueybana\_56:

(39, 39623), (Start: 42 @39647 has 1 MA's), (Start: 45 @39653 has 58 MA's), (64, 39854), (78, 39950), (85, 40013), (86, 40022), (95, 40085), (97, 40118), (99, 40121), (103, 40151),

Gene: AlumE\_56 Start: 39435, Stop: 40025, Start Num: 45

Candidate Starts for AlumE\_56:

(39, 39405), (Start: 42 @39429 has 1 MA's), (Start: 45 @39435 has 58 MA's), (64, 39639), (78, 39735), (80, 39756), (86, 39807), (97, 39903), (99, 39906), (100, 39912), (101, 39915), (103, 39936), (113, 40005),

Gene: Amochick\_65 Start: 44443, Stop: 44997, Start Num: 45

Candidate Starts for Amochick\_65:

(19, 44248), (21, 44308), (28, 44356), (Start: 40 @44422 has 9 MA's), (Start: 45 @44443 has 58 MA's), (Start: 46 @44446 has 7 MA's), (49, 44461), (50, 44482), (54, 44545), (55, 44557), (62, 44602), (67, 44671), (68, 44674), (74, 44713), (77, 44740), (79, 44758), (81, 44776), (86, 44821), (87, 44824), (91, 44839), (96, 44884), (106, 44944), (110, 44962),

Gene: Amymech\_64 Start: 43962, Stop: 44513, Start Num: 46

Candidate Starts for Amymech\_64:

(Start: 45 @43959 has 58 MA's), (Start: 46 @43962 has 7 MA's), (49, 43977), (54, 44061), (55, 44073), (57, 44085), (62, 44118), (67, 44187), (68, 44190), (74, 44229), (77, 44256), (79, 44274), (81, 44292), (86, 44337), (87, 44340), (91, 44355), (96, 44400), (106, 44460), (110, 44478),

Gene: Annalisa\_54 Start: 35792, Stop: 36379, Start Num: 45

Candidate Starts for Annalisa\_54:

(15, 35615), (17, 35636), (Start: 42 @35786 has 1 MA's), (Start: 45 @35792 has 58 MA's), (56, 35900), (64, 35996), (65, 36002), (78, 36092), (95, 36230), (97, 36263), (99, 36266), (100, 36272), (103, 36296),

Gene: Azula\_58 Start: 39149, Stop: 39736, Start Num: 45

Candidate Starts for Azula\_58:

(20, 38987), (25, 39035), (Start: 45 @39149 has 58 MA's), (64, 39350), (75, 39416), (78, 39446), (80, 39467), (86, 39518), (97, 39614), (99, 39617), (100, 39623), (101, 39626), (103, 39647),

Gene: BBQValindra\_58 Start: 41020, Stop: 41751, Start Num: 40

Candidate Starts for BBQValindra\_58:

(4, 40606), (9, 40714), (11, 40777), (22, 40924), (23, 40927), (Start: 40 @41020 has 9 MA's), (Start: 45 @41038 has 58 MA's), (56, 41152), (64, 41245), (72, 41302), (76, 41317), (89, 41425), (105, 41545), (107, 41557),

Gene: BackstagePass\_65 Start: 40434, Stop: 41168, Start Num: 40

Candidate Starts for BackstagePass\_65:

(3, 39999), (9, 40131), (22, 40341), (23, 40344), (27, 40353), (Start: 40 @40434 has 9 MA's), (Start: 45 @40452 has 58 MA's), (56, 40566), (59, 40590), (64, 40659), (65, 40665), (72, 40716), (76, 40731), (89, 40839), (105, 40959), (117, 41157),

Gene: Barco\_55 Start: 36423, Stop: 37010, Start Num: 45

Candidate Starts for Barco\_55:

(Start: 45 @36423 has 58 MA's), (64, 36624), (78, 36720), (86, 36792), (97, 36888), (99, 36891), (100, 36897), (101, 36900), (103, 36921),

Gene: Blueberry\_57 Start: 39149, Stop: 39736, Start Num: 45

Candidate Starts for Blueberry\_57:

(20, 38987), (25, 39035), (Start: 45 @39149 has 58 MA's), (64, 39350), (75, 39416), (78, 39446), (80, 39467), (86, 39518), (97, 39614), (99, 39617), (100, 39623), (101, 39626), (103, 39647),

Gene: Bowser\_58 Start: 40743, Stop: 41495, Start Num: 40

Candidate Starts for Bowser\_58:

(11, 40503), (22, 40650), (23, 40653), (Start: 40 @40743 has 9 MA's), (Start: 45 @40761 has 58 MA's), (56, 40875), (64, 40968), (72, 41025), (76, 41040), (89, 41148), (105, 41268), (106, 41277), (107, 41280), (114, 41370), (115, 41442), (116, 41463),

Gene: BoyNamedSue\_56 Start: 39435, Stop: 40025, Start Num: 45

Candidate Starts for BoyNamedSue\_56:

(39, 39405), (Start: 42 @39429 has 1 MA's), (Start: 45 @39435 has 58 MA's), (64, 39639), (78, 39735), (80, 39756), (86, 39807), (97, 39903), (99, 39906), (100, 39912), (101, 39915), (103, 39936), (113, 40005),

Gene: Bunker\_54 Start: 39327, Stop: 40058, Start Num: 40

Candidate Starts for Bunker\_54:

(9, 39024), (22, 39234), (23, 39237), (27, 39246), (Start: 40 @39327 has 9 MA's), (Start: 45 @39345 has 58 MA's), (56, 39459), (59, 39483), (64, 39552), (65, 39558), (72, 39609), (76, 39624), (89, 39732), (105, 39852), (107, 39864),

Gene: Bunnybear\_50 Start: 37443, Stop: 38027, Start Num: 45

Candidate Starts for Bunnybear\_50:

(14, 37239), (39, 37413), (Start: 42 @37437 has 1 MA's), (Start: 45 @37443 has 58 MA's), (64, 37644), (75, 37710), (78, 37740), (80, 37761), (86, 37812), (97, 37908), (99, 37911), (100, 37917), (112, 38007),

Gene: CaptainKirk2\_57 Start: 36662, Stop: 37249, Start Num: 45

Candidate Starts for CaptainKirk2\_57:

(Start: 45 @36662 has 58 MA's), (64, 36863), (78, 36959), (86, 37031), (97, 37127), (99, 37130), (100, 37136), (101, 37139), (103, 37160),

Gene: Daegal\_67 Start: 45005, Stop: 45559, Start Num: 45

Candidate Starts for Daegal\_67:

(19, 44810), (21, 44870), (28, 44918), (Start: 40 @44984 has 9 MA's), (Start: 45 @45005 has 58 MA's), (Start: 46 @45008 has 7 MA's), (49, 45023), (50, 45044), (54, 45107), (55, 45119), (62, 45164), (67, 45233), (68, 45236), (74, 45275), (77, 45302), (79, 45320), (81, 45338), (86, 45383), (87, 45386), (91, 45401), (96, 45446), (106, 45506), (110, 45524),

Gene: DanielleIgnace\_58 Start: 38690, Stop: 39253, Start Num: 44

Candidate Starts for DanielleIgnace\_58:

(Start: 44 @38690 has 1 MA's), (58, 38831), (60, 38852), (65, 38915), (88, 39083), (92, 39110), (103, 39188), (104, 39197), (106, 39218),

Gene: DeepSoil15\_64 Start: 43959, Stop: 44513, Start Num: 45

Candidate Starts for DeepSoil15\_64:

(Start: 45 @43959 has 58 MA's), (Start: 46 @43962 has 7 MA's), (49, 43977), (54, 44061), (55, 44073), (57, 44085), (62, 44118), (67, 44187), (68, 44190), (74, 44229), (77, 44256), (79, 44274), (81, 44292), (86, 44337), (87, 44340), (91, 44355), (96, 44400), (106, 44460), (110, 44478),

Gene: Delian\_60 Start: 36660, Stop: 37247, Start Num: 45

Candidate Starts for Delian\_60:

(Start: 45 @36660 has 58 MA's), (64, 36861), (78, 36957), (86, 37029), (97, 37125), (99, 37128), (100, 37134), (101, 37137), (103, 37158),

Gene: Denise\_67 Start: 40135, Stop: 40689, Start Num: 45

Candidate Starts for Denise\_67:

(13, 39871), (34, 40084), (35, 40087), (Start: 45 @40135 has 58 MA's), (52, 40201), (62, 40285), (64, 40333), (69, 40357), (78, 40423), (105, 40627),

Gene: Dewey\_61 Start: 43959, Stop: 44513, Start Num: 45

Candidate Starts for Dewey\_61:

(Start: 45 @43959 has 58 MA's), (Start: 46 @43962 has 7 MA's), (49, 43977), (54, 44061), (55, 44073), (57, 44085), (62, 44118), (67, 44187), (68, 44190), (74, 44229), (77, 44256), (79, 44274), (81, 44292), (86, 44337), (87, 44340), (91, 44355), (96, 44400), (106, 44460), (110, 44478),

Gene: DirtyBoi\_64 Start: 41042, Stop: 41764, Start Num: 42

Candidate Starts for DirtyBoi\_64:

(33, 40991), (34, 40997), (38, 41009), (Start: 40 @41027 has 9 MA's), (Start: 42 @41042 has 1 MA's), (Start: 45 @41048 has 58 MA's), (56, 41162), (65, 41261), (72, 41312), (76, 41327), (86, 41423), (89, 41435), (105, 41555), (106, 41564),

Gene: EMSquaredA\_54 Start: 38610, Stop: 39200, Start Num: 45

Candidate Starts for EMSquaredA\_54:

(39, 38580), (Start: 42 @38604 has 1 MA's), (Start: 45 @38610 has 58 MA's), (64, 38814), (78, 38910), (80, 38931), (86, 38982), (97, 39078), (99, 39081), (100, 39087), (101, 39090), (103, 39111), (113, 39180),

Gene: Ein37\_64 Start: 43959, Stop: 44513, Start Num: 45

Candidate Starts for Ein37\_64:

(Start: 45 @43959 has 58 MA's), (Start: 46 @43962 has 7 MA's), (49, 43977), (54, 44061), (55, 44073), (57, 44085), (62, 44118), (67, 44187), (68, 44190), (74, 44229), (77, 44256), (79, 44274), (81, 44292), (86, 44337), (87, 44340), (91, 44355), (96, 44400), (106, 44460), (110, 44478),

Gene: Evanesce\_63 Start: 43959, Stop: 44513, Start Num: 45

Candidate Starts for Evanesce\_63:

(Start: 45 @43959 has 58 MA's), (Start: 46 @43962 has 7 MA's), (49, 43977), (54, 44061), (55, 44073), (57, 44085), (62, 44118), (67, 44187), (68, 44190), (74, 44229), (77, 44256), (79, 44274), (81, 44292), (86, 44337), (87, 44340), (91, 44355), (96, 44400), (106, 44460), (110, 44478),

Gene: Eyes\_57 Start: 40795, Stop: 41526, Start Num: 40

Candidate Starts for Eyes\_57:

(22, 40702), (23, 40705), (Start: 40 @40795 has 9 MA's), (Start: 45 @40813 has 58 MA's), (56, 40927), (64, 41020), (65, 41026), (89, 41200), (96, 41251), (102, 41293), (105, 41320), (106, 41329),



(107, 41332),

Gene: Eyre\_49 Start: 34637, Stop: 35221, Start Num: 45

Candidate Starts for Eyre\_49:

(Start: 45 @34637 has 58 MA's), (64, 34853), (65, 34859), (76, 34925), (78, 34949), (97, 35096), (105, 35153), (106, 35162), (111, 35192),

Gene: Faith5x5\_64 Start: 38441, Stop: 39004, Start Num: 45

Candidate Starts for Faith5x5\_64:

(5, 38189), (6, 38195), (Start: 45 @38441 has 58 MA's), (51, 38498), (53, 38537), (64, 38648), (69, 38672), (78, 38738), (95, 38852), (97, 38885), (105, 38942), (106, 38951),

Gene: Farewell\_81 Start: 52822, Stop: 53370, Start Num: 47

Candidate Starts for Farewell\_81:

(29, 52732), (36, 52771), (Start: 47 @52822 has 2 MA's), (70, 53056), (86, 53191), (105, 53308), (106, 53317), (109, 53329),

Gene: Fenry\_55 Start: 38167, Stop: 38757, Start Num: 45

Candidate Starts for Fenry\_55:

(20, 38005), (25, 38053), (Start: 45 @38167 has 58 MA's), (64, 38371), (75, 38437), (78, 38467), (80, 38488), (82, 38497), (84, 38521), (86, 38539), (97, 38635), (99, 38638), (100, 38644), (101, 38647), (103, 38668),

Gene: Floral\_55 Start: 40516, Stop: 41088, Start Num: 45

Candidate Starts for Floral\_55:

(39, 40486), (Start: 42 @40510 has 1 MA's), (Start: 45 @40516 has 58 MA's), (56, 40624), (64, 40720),

Gene: Forge\_61 Start: 43962, Stop: 44513, Start Num: 46

Candidate Starts for Forge\_61:

(Start: 45 @43959 has 58 MA's), (Start: 46 @43962 has 7 MA's), (49, 43977), (54, 44061), (55, 44073), (57, 44085), (62, 44118), (67, 44187), (68, 44190), (74, 44229), (77, 44256), (79, 44274), (81, 44292), (86, 44337), (87, 44340), (91, 44355), (96, 44400), (106, 44460), (110, 44478),

Gene: GEazy\_64 Start: 40986, Stop: 41714, Start Num: 40

Candidate Starts for GEazy\_64:

(32, 40947), (Start: 40 @40986 has 9 MA's), (Start: 45 @41004 has 58 MA's), (56, 41118), (64, 41211), (65, 41217), (89, 41391), (105, 41511), (106, 41520), (107, 41523),

Gene: Gambino\_60 Start: 39149, Stop: 39736, Start Num: 45

Candidate Starts for Gambino\_60:

(20, 38987), (25, 39035), (Start: 45 @39149 has 58 MA's), (64, 39350), (75, 39416), (78, 39446), (80, 39467), (86, 39518), (97, 39614), (99, 39617), (100, 39623), (101, 39626), (103, 39647),

Gene: Gancho\_63 Start: 43686, Stop: 44240, Start Num: 45

Candidate Starts for Gancho\_63:

(Start: 45 @43686 has 58 MA's), (Start: 46 @43689 has 7 MA's), (49, 43704), (50, 43725), (54, 43788), (55, 43800), (57, 43812), (62, 43845), (67, 43914), (68, 43917), (74, 43956), (77, 43983), (79, 44001), (86, 44064), (87, 44067), (91, 44082), (96, 44127), (106, 44187), (109, 44199), (110, 44205),

Gene: Giles\_61 Start: 43959, Stop: 44513, Start Num: 45

Candidate Starts for Giles\_61:

(Start: 45 @43959 has 58 MA's), (Start: 46 @43962 has 7 MA's), (49, 43977), (54, 44061), (55, 44073), (57, 44085), (62, 44118), (67, 44187), (68, 44190), (74, 44229), (77, 44256), (79, 44274), (81, 44292), (86, 44337), (87, 44340), (91, 44355), (96, 44400), (106, 44460), (110, 44478),

Gene: Gravaillia\_62 Start: 43967, Stop: 44521, Start Num: 45

Candidate Starts for Gravaillia\_62:

(Start: 45 @43967 has 58 MA's), (Start: 46 @43970 has 7 MA's), (49, 43985), (50, 44006), (54, 44069), (55, 44081), (57, 44093), (62, 44126), (67, 44195), (68, 44198), (74, 44237), (77, 44264), (79, 44282), (86, 44345), (87, 44348), (91, 44363), (96, 44408), (106, 44468), (109, 44480), (110, 44486),

Gene: Guacamole\_54 Start: 36889, Stop: 37476, Start Num: 45

Candidate Starts for Guacamole\_54:

(20, 36727), (25, 36775), (Start: 45 @36889 has 58 MA's), (64, 37090), (75, 37156), (78, 37186), (80, 37207), (84, 37240), (86, 37258), (97, 37354), (99, 37357), (100, 37363), (101, 37366), (103, 37387), (113, 37456),

Gene: HH92\_63 Start: 43959, Stop: 44513, Start Num: 45

Candidate Starts for HH92\_63:

(Start: 45 @43959 has 58 MA's), (Start: 46 @43962 has 7 MA's), (49, 43977), (54, 44061), (55, 44073), (57, 44085), (62, 44118), (67, 44187), (68, 44190), (74, 44229), (77, 44256), (79, 44274), (81, 44292), (86, 44337), (87, 44340), (91, 44355), (96, 44400), (106, 44460), (110, 44478),

Gene: Hadrien\_63 Start: 43959, Stop: 44513, Start Num: 45

Candidate Starts for Hadrien\_63:

(Start: 45 @43959 has 58 MA's), (Start: 46 @43962 has 7 MA's), (49, 43977), (54, 44061), (55, 44073), (57, 44085), (62, 44118), (67, 44187), (68, 44190), (74, 44229), (77, 44256), (79, 44274), (81, 44292), (86, 44337), (87, 44340), (91, 44355), (96, 44400), (106, 44460), (110, 44478),

Gene: Hail\_61 Start: 43962, Stop: 44513, Start Num: 46

Candidate Starts for Hail\_61:

(Start: 45 @43959 has 58 MA's), (Start: 46 @43962 has 7 MA's), (49, 43977), (54, 44061), (55, 44073), (57, 44085), (62, 44118), (67, 44187), (68, 44190), (74, 44229), (77, 44256), (79, 44274), (81, 44292), (86, 44337), (87, 44340), (91, 44355), (96, 44400), (106, 44460), (110, 44478),

Gene: HannahD\_61 Start: 40353, Stop: 41081, Start Num: 40

Candidate Starts for HannahD\_61:

(32, 40314), (Start: 40 @40353 has 9 MA's), (Start: 45 @40371 has 58 MA's), (56, 40485), (64, 40578), (65, 40584), (89, 40758), (105, 40878), (106, 40887), (107, 40890),

Gene: Hitter\_57 Start: 36465, Stop: 37052, Start Num: 45

Candidate Starts for Hitter\_57:

(Start: 45 @36465 has 58 MA's), (64, 36666), (78, 36762), (86, 36834), (97, 36930), (99, 36933), (100, 36939), (101, 36942), (103, 36963),

Gene: Hyzer\_63 Start: 42350, Stop: 42940, Start Num: 45

Candidate Starts for Hyzer\_63:

(39, 42320), (Start: 42 @42344 has 1 MA's), (Start: 45 @42350 has 58 MA's), (64, 42554), (65, 42560), (78, 42650), (80, 42671), (86, 42722), (97, 42818), (99, 42821), (100, 42827), (103, 42851),

Gene: Jalammah\_60 Start: 39468, Stop: 40055, Start Num: 45

Candidate Starts for Jalammah\_60:

(20, 39306), (25, 39354), (Start: 45 @39468 has 58 MA's), (64, 39669), (78, 39765), (84, 39819), (86, 39837), (97, 39933), (99, 39936), (100, 39942), (101, 39945), (103, 39966), (113, 40035),

Gene: JasperJr\_54 Start: 36889, Stop: 37476, Start Num: 45

Candidate Starts for JasperJr\_54:

(20, 36727), (25, 36775), (Start: 45 @36889 has 58 MA's), (64, 37090), (75, 37156), (78, 37186), (80, 37207), (84, 37240), (86, 37258), (97, 37354), (99, 37357), (100, 37363), (101, 37366), (103, 37387), (113, 37456),

Gene: Kinbote\_63 Start: 43959, Stop: 44513, Start Num: 45

Candidate Starts for Kinbote\_63:

(Start: 45 @43959 has 58 MA's), (Start: 46 @43962 has 7 MA's), (49, 43977), (54, 44061), (55, 44073), (57, 44085), (62, 44118), (67, 44187), (68, 44190), (74, 44229), (77, 44256), (79, 44274), (81, 44292), (86, 44337), (87, 44340), (91, 44355), (96, 44400), (106, 44460), (110, 44478),

Gene: LilHazelnut\_64 Start: 43959, Stop: 44513, Start Num: 45

Candidate Starts for LilHazelnut\_64:

(Start: 45 @43959 has 58 MA's), (Start: 46 @43962 has 7 MA's), (49, 43977), (54, 44061), (55, 44073), (57, 44085), (62, 44118), (67, 44187), (68, 44190), (74, 44229), (77, 44256), (79, 44274), (81, 44292), (86, 44337), (87, 44340), (91, 44355), (96, 44400), (106, 44460), (110, 44478),

Gene: LonelyBoi\_53 Start: 40470, Stop: 41057, Start Num: 45

Candidate Starts for LonelyBoi\_53:

(43, 40467), (Start: 45 @40470 has 58 MA's), (56, 40578), (64, 40674), (75, 40740), (78, 40770), (80, 40791), (86, 40842), (97, 40938), (99, 40941), (100, 40947), (112, 41037),

Gene: Luke\_63 Start: 43917, Stop: 44468, Start Num: 46

Candidate Starts for Luke\_63:

(Start: 45 @43914 has 58 MA's), (Start: 46 @43917 has 7 MA's), (49, 43932), (54, 44016), (55, 44028), (57, 44040), (62, 44073), (67, 44142), (68, 44145), (74, 44184), (77, 44211), (79, 44229), (81, 44247), (86, 44292), (87, 44295), (91, 44310), (96, 44355), (106, 44415), (110, 44433),

Gene: Luna22\_61 Start: 43946, Stop: 44497, Start Num: 46

Candidate Starts for Luna22\_61:

(Start: 45 @43943 has 58 MA's), (Start: 46 @43946 has 7 MA's), (49, 43961), (54, 44045), (55, 44057), (57, 44069), (62, 44102), (67, 44171), (68, 44174), (74, 44213), (77, 44240), (79, 44258), (81, 44276), (86, 44321), (87, 44324), (91, 44339), (96, 44384), (106, 44444), (110, 44462),

Gene: Lysidious\_58 Start: 38835, Stop: 39422, Start Num: 45

Candidate Starts for Lysidious\_58:

(20, 38673), (25, 38721), (Start: 45 @38835 has 58 MA's), (51, 38892), (64, 39036), (75, 39102), (78, 39132), (86, 39204), (97, 39300), (99, 39303), (100, 39309), (103, 39333), (113, 39402),

Gene: Madeline\_55 Start: 39843, Stop: 40427, Start Num: 45

Candidate Starts for Madeline\_55:

(39, 39813), (Start: 42 @39837 has 1 MA's), (Start: 45 @39843 has 58 MA's), (64, 40044), (78, 40140), (85, 40203), (95, 40275), (97, 40308), (99, 40311), (103, 40341),

Gene: MagicMan\_61 Start: 41953, Stop: 42714, Start Num: 40

Candidate Starts for MagicMan\_61:

(Start: 40 @41953 has 9 MA's), (Start: 45 @41971 has 58 MA's), (56, 42085), (64, 42178), (65, 42184), (89, 42358), (105, 42478), (106, 42487), (107, 42490),

Gene: Malibo\_57 Start: 39555, Stop: 40142, Start Num: 45

Candidate Starts for Malibo\_57:

(25, 39441), (Start: 45 @39555 has 58 MA's), (56, 39663), (64, 39759), (86, 39927), (93, 39963), (94, 39984), (95, 39990), (99, 40026), (100, 40032), (103, 40056),

Gene: Maridalia\_58 Start: 39189, Stop: 39773, Start Num: 45

Candidate Starts for Maridalia\_58:

(14, 38985), (39, 39159), (Start: 42 @39183 has 1 MA's), (Start: 45 @39189 has 58 MA's), (64, 39390), (75, 39456), (78, 39486), (80, 39507), (86, 39558), (97, 39654), (99, 39657), (100, 39663), (112, 39753),

Gene: Marteena\_53 Start: 38610, Stop: 39200, Start Num: 45

Candidate Starts for Marteena\_53:

(39, 38580), (Start: 42 @38604 has 1 MA's), (Start: 45 @38610 has 58 MA's), (64, 38814), (78, 38910), (80, 38931), (86, 38982), (97, 39078), (99, 39081), (100, 39087), (101, 39090), (103, 39111), (113, 39180),

Gene: Mellie\_55 Start: 36842, Stop: 37432, Start Num: 45

Candidate Starts for Mellie\_55:

(20, 36680), (25, 36728), (Start: 45 @36842 has 58 MA's), (64, 37046), (75, 37112), (78, 37142), (80, 37163), (86, 37214), (97, 37310), (99, 37313), (100, 37319), (101, 37322), (103, 37343),

Gene: MintFen\_57 Start: 37276, Stop: 37863, Start Num: 45

Candidate Starts for MintFen\_57:

(Start: 45 @37276 has 58 MA's), (64, 37477), (78, 37573), (86, 37645), (97, 37741), (99, 37744), (100, 37750), (101, 37753), (103, 37774),

Gene: MissRona\_58 Start: 39150, Stop: 39737, Start Num: 45

Candidate Starts for MissRona\_58:

(20, 38988), (25, 39036), (Start: 45 @39150 has 58 MA's), (64, 39351), (75, 39417), (78, 39447), (80, 39468), (86, 39519), (97, 39615), (99, 39618), (100, 39624), (101, 39627), (103, 39648),

Gene: OBUpride\_64 Start: 43955, Stop: 44509, Start Num: 45

Candidate Starts for OBUpride\_64:

(Start: 45 @43955 has 58 MA's), (Start: 46 @43958 has 7 MA's), (49, 43973), (50, 43994), (54, 44057), (55, 44069), (57, 44081), (62, 44114), (67, 44183), (68, 44186), (74, 44225), (77, 44252), (79, 44270), (86, 44333), (87, 44336), (91, 44351), (96, 44396), (106, 44456), (109, 44468), (110, 44474),

Gene: Opie\_64 Start: 42071, Stop: 42832, Start Num: 40

Candidate Starts for Opie\_64:

(24, 41987), (32, 42032), (Start: 40 @42071 has 9 MA's), (Start: 45 @42089 has 58 MA's), (56, 42203), (64, 42296), (65, 42302), (89, 42476), (105, 42596), (106, 42605), (107, 42608),

Gene: Oregano\_55 Start: 36424, Stop: 37011, Start Num: 45

Candidate Starts for Oregano\_55:

(15, 36247), (17, 36268), (Start: 42 @36418 has 1 MA's), (Start: 45 @36424 has 58 MA's), (56, 36532), (64, 36628), (65, 36634), (78, 36724), (95, 36862), (97, 36895), (99, 36898), (100, 36904), (103, 36928),

Gene: Petra\_53 Start: 35617, Stop: 36207, Start Num: 45

Candidate Starts for Petra\_53:

(20, 35455), (25, 35503), (Start: 45 @35617 has 58 MA's), (64, 35821), (75, 35887), (78, 35917), (80, 35938), (82, 35947), (84, 35971), (86, 35989), (97, 36085), (99, 36088), (100, 36094), (101, 36097), (103, 36118),

Gene: PhriskyACE\_51 Start: 36416, Stop: 36979, Start Num: 45

Candidate Starts for PhriskyACE\_51:

(14, 36212), (16, 36227), (Start: 42 @36410 has 1 MA's), (Start: 45 @36416 has 58 MA's), (56, 36524), (63, 36608), (64, 36620), (65, 36626), (78, 36716), (90, 36803), (95, 36830), (97, 36863), (99, 36866), (100, 36872), (103, 36896),

Gene: Pipp\_59 Start: 37969, Stop: 38559, Start Num: 45

Candidate Starts for Pipp\_59:

(20, 37807), (25, 37855), (Start: 45 @37969 has 58 MA's), (64, 38173), (78, 38269), (80, 38290), (84, 38323), (86, 38341), (97, 38437), (99, 38440), (100, 38446), (101, 38449), (103, 38470),

Gene: Pollux\_57 Start: 40516, Stop: 41088, Start Num: 45

Candidate Starts for Pollux\_57:

(39, 40486), (Start: 42 @40510 has 1 MA's), (Start: 45 @40516 has 58 MA's), (56, 40624), (64, 40720),

Gene: Powerball\_52 Start: 36542, Stop: 37105, Start Num: 45

Candidate Starts for Powerball\_52:

(14, 36338), (16, 36353), (Start: 42 @36536 has 1 MA's), (Start: 45 @36542 has 58 MA's), (56, 36650), (63, 36734), (64, 36746), (65, 36752), (78, 36842), (90, 36929), (95, 36956), (97, 36989), (99, 36992), (100, 36998), (103, 37022),

Gene: Rem711\_52 Start: 36120, Stop: 36674, Start Num: 48

Candidate Starts for Rem711\_52:

(37, 36066), (41, 36102), (43, 36108), (Start: 48 @36120 has 1 MA's), (61, 36267), (73, 36393), (77, 36423), (83, 36462), (105, 36615), (106, 36624),

Gene: Samba\_56 Start: 39498, Stop: 40085, Start Num: 45

Candidate Starts for Samba\_56:

(Start: 45 @39498 has 58 MA's), (64, 39699), (78, 39795), (86, 39867), (97, 39963), (99, 39966), (100, 39972), (101, 39975), (103, 39996),

Gene: Schnabeltier\_62 Start: 41372, Stop: 42097, Start Num: 40

Candidate Starts for Schnabeltier\_62:

(Start: 40 @41372 has 9 MA's), (Start: 45 @41390 has 58 MA's), (64, 41597), (72, 41654), (76, 41669), (83, 41726), (89, 41777), (105, 41897), (106, 41906), (107, 41909),

Gene: Sidious\_59 Start: 42258, Stop: 42845, Start Num: 45

Candidate Starts for Sidious\_59:

(7, 41895), (10, 41973), (12, 42003), (18, 42066), (Start: 45 @42258 has 58 MA's), (64, 42468), (76, 42540), (78, 42564), (86, 42636), (97, 42711), (98, 42714), (100, 42720), (105, 42765), (106, 42774),

Gene: Sidious\_54 Start: 38723, Stop: 39313, Start Num: 45

Candidate Starts for Sidious\_54:

(14, 38519), (26, 38621), (Start: 42 @38717 has 1 MA's), (Start: 45 @38723 has 58 MA's), (64, 38927), (65, 38933), (78, 39023), (80, 39044), (86, 39095), (97, 39191), (99, 39194), (100, 39200), (103, 39224),

Gene: Sparky\_80 Start: 54416, Stop: 54964, Start Num: 47

Candidate Starts for Sparky\_80:

(29, 54326), (36, 54365), (Start: 47 @54416 has 2 MA's), (70, 54650), (86, 54785), (105, 54902), (106, 54911), (109, 54923),

Gene: Spooky\_97 Start: 52512, Stop: 53075, Start Num: 45

Candidate Starts for Spooky\_97:

(13, 52416), (Start: 45 @52512 has 58 MA's), (53, 52608), (64, 52719), (69, 52743), (78, 52809), (95, 52923), (101, 52971), (105, 53013),

Gene: TPA4\_56 Start: 40632, Stop: 41162, Start Num: 45

Candidate Starts for TPA4\_56:

(8, 40278), (30, 40551), (Start: 45 @40632 has 58 MA's), (49, 40650), (51, 40698), (66, 40863), (71, 40893), (86, 41004), (108, 41151),

Gene: TaronosaurusRx\_66 Start: 41369, Stop: 42100, Start Num: 40

Candidate Starts for TaronosaurusRx\_66:

(Start: 40 @41369 has 9 MA's), (Start: 45 @41387 has 58 MA's), (56, 41501), (64, 41594), (72, 41651), (76, 41666), (89, 41774), (105, 41894), (106, 41903), (107, 41906), (114, 41996),

Gene: ThankyouJordi\_62 Start: 43975, Stop: 44550, Start Num: 45

Candidate Starts for ThankyouJordi\_62:

(Start: 45 @43975 has 58 MA's), (56, 44089), (64, 44182), (76, 44254), (78, 44278), (82, 44308), (86, 44350), (97, 44425), (99, 44431), (105, 44482),

Gene: Ubuntu\_64 Start: 43962, Stop: 44513, Start Num: 46

Candidate Starts for Ubuntu\_64:

(Start: 45 @43959 has 58 MA's), (Start: 46 @43962 has 7 MA's), (49, 43977), (54, 44061), (55, 44073), (57, 44085), (62, 44118), (67, 44187), (68, 44190), (74, 44229), (77, 44256), (79, 44274), (81, 44292), (86, 44337), (87, 44340), (91, 44355), (96, 44400), (106, 44460), (110, 44478),

Gene: Walrus\_55 Start: 36777, Stop: 37367, Start Num: 45

Candidate Starts for Walrus\_55:

(20, 36615), (25, 36663), (Start: 45 @36777 has 58 MA's), (64, 36981), (78, 37077), (80, 37098), (84, 37131), (86, 37149), (97, 37245), (99, 37248), (100, 37254), (101, 37257), (103, 37278),

Gene: Webster2\_64 Start: 43959, Stop: 44513, Start Num: 45

Candidate Starts for Webster2\_64:

(Start: 45 @43959 has 58 MA's), (Start: 46 @43962 has 7 MA's), (49, 43977), (54, 44061), (55, 44073), (57, 44085), (62, 44118), (67, 44187), (68, 44190), (74, 44229), (77, 44256), (79, 44274), (81, 44292), (86, 44337), (87, 44340), (91, 44355), (96, 44400), (106, 44460), (110, 44478),

Gene: WelcomeAyanna\_62 Start: 44122, Stop: 44697, Start Num: 45

Candidate Starts for WelcomeAyanna\_62:

(Start: 45 @44122 has 58 MA's), (56, 44236), (64, 44329), (76, 44401), (78, 44425), (82, 44455), (86, 44497), (97, 44572), (99, 44578), (105, 44629),

Gene: Wishmaker\_61 Start: 43962, Stop: 44513, Start Num: 46

Candidate Starts for Wishmaker\_61:

(Start: 45 @43959 has 58 MA's), (Start: 46 @43962 has 7 MA's), (49, 43977), (54, 44061), (55, 44073), (57, 44085), (62, 44118), (67, 44187), (68, 44190), (74, 44229), (77, 44256), (79, 44274), (81, 44292), (86, 44337), (87, 44340), (91, 44355), (96, 44400), (106, 44460), (110, 44478),

Gene: Wocket\_57 Start: 37262, Stop: 37849, Start Num: 45

Candidate Starts for Wocket\_57:

(1, 36689), (2, 36764), (20, 37100), (25, 37148), (31, 37181), (Start: 45 @37262 has 58 MA's), (64, 37463), (75, 37529), (78, 37559), (86, 37631), (97, 37727), (99, 37730), (100, 37736), (103, 37760),

Gene: ZAYM\_64 Start: 41414, Stop: 42145, Start Num: 40

Candidate Starts for ZAYM\_64:

(Start: 40 @41414 has 9 MA's), (Start: 45 @41432 has 58 MA's), (56, 41546), (64, 41639), (72, 41696), (76, 41711), (89, 41819), (105, 41939), (106, 41948), (107, 41951),

Gene: Zarbodnamra\_56 Start: 36684, Stop: 37271, Start Num: 45

Candidate Starts for Zarbodnamra\_56:

(Start: 45 @36684 has 58 MA's), (64, 36885), (78, 36981), (86, 37053), (97, 37149), (99, 37152), (100, 37158), (103, 37182),