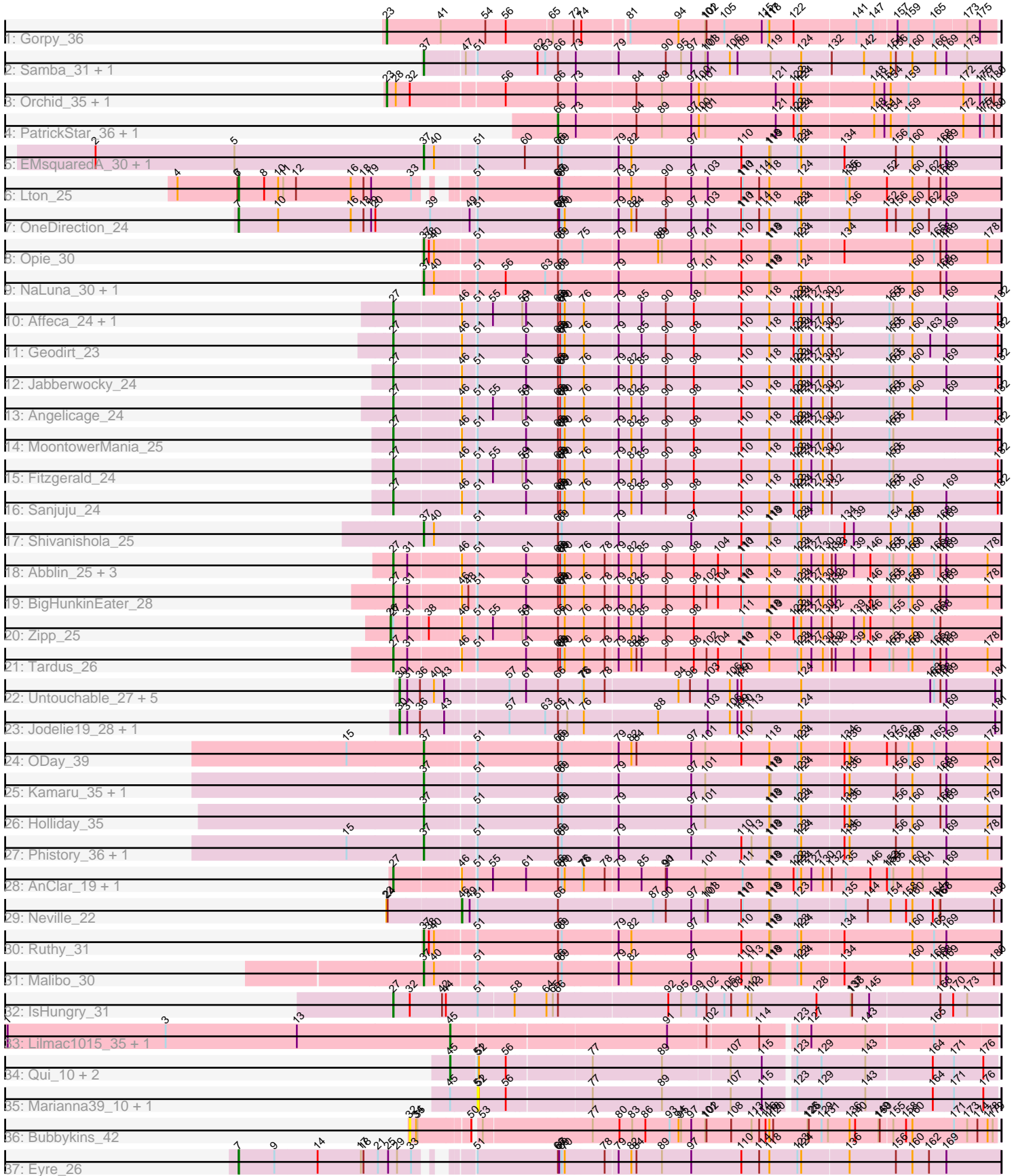


Pham 308655



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 308655 Report

This analysis was run 06/27/26 on database version 652.

Pham number 308655 has 59 members, 9 are drafts.

Phages represented in each track:

- Track 1 : Gorpy\_36
- Track 2 : Samba\_31, ZiggyZoo\_31
- Track 3 : Orchid\_35, RobinSparkles\_38
- Track 4 : PatrickStar\_36, Kampe\_36
- Track 5 : EMSquaredA\_30, Marteena\_30
- Track 6 : Lton\_25
- Track 7 : OneDirection\_24
- Track 8 : Opie\_30
- Track 9 : NaLuna\_30, HannahD\_30
- Track 10 : Affeca\_24, Brawn1\_22
- Track 11 : Geodirt\_23
- Track 12 : Jabberwocky\_24
- Track 13 : Angelicage\_24
- Track 14 : MoontowerMania\_25
- Track 15 : Fitzgerald\_24
- Track 16 : Sanjuju\_24
- Track 17 : Shivanishola\_25
- Track 18 : Abblin\_25, Scioto\_25, Sampson\_25, Natkenzie\_25
- Track 19 : BigHunkinEater\_28
- Track 20 : Zipp\_25
- Track 21 : Tardus\_26
- Track 22 : Untouchable\_27, Crocheter\_27, Kenosha\_27, Nadmeg\_28, ArtetaBall\_28, Dialga\_28
- Track 23 : Jodelie19\_28, TenaciousP\_28
- Track 24 : ODay\_39
- Track 25 : Kamaru\_35, LitninMcQueen\_34
- Track 26 : Holliday\_35
- Track 27 : Phistory\_36, ShawBrad\_35
- Track 28 : AnClar\_19, LittleMunchkin\_20
- Track 29 : Neville\_22
- Track 30 : Ruthy\_31
- Track 31 : Malibo\_30
- Track 32 : IsHungry\_31
- Track 33 : Lilmac1015\_35, CalWood4100\_35
- Track 34 : Qui\_10, Paella\_10, Elver\_10
- Track 35 : Marianna39\_10, Gandionco\_9
- Track 36 : Bubbykins\_42

- Track 37 : Eyre\_26

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

The start number called the most often in the published annotations is 27, it was called in 16 of the 50 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Abblin\_25, Affeca\_24, AnClar\_19, Angelicage\_24, BigHunkinEater\_28, Brawn1\_22, Fitzgerald\_24, Geodirt\_23, IsHungry\_31, Jabberwocky\_24, LittleMunchkin\_20, MoontowerMania\_25, Natkenzie\_25, Sampson\_25, Sanjuju\_24, Scioto\_25, Tardus\_26,

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

- Zipp\_25,

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

- ArtetaBall\_28, Bubbykins\_42, CalWood4100\_35, Crocheter\_27, Dialga\_28, EMSquaredA\_30, Elver\_10, Eyre\_26, Gandionco\_9, Gorpy\_36, HannahD\_30, Holliday\_35, Jodelie19\_28, Kamaru\_35, Kampe\_36, Kenosha\_27, Lilmac1015\_35, LitninMcQueen\_34, Lton\_25, Malibo\_30, Marianna39\_10, Marteena\_30, NaLuna\_30, Nadmeg\_28, Neville\_22, ODay\_39, OneDirection\_24, Opie\_30, Orchid\_35, Paella\_10, PatrickStar\_36, Phistory\_36, Qui\_10, RobinSparkles\_38, Ruthy\_31, Samba\_31, ShawBrad\_35, Shivanishola\_25, TenaciousP\_28, Untouchable\_27, ZiggyZoo\_31,

**Summary by start number:**

Start 7:

- Found in 3 of 59 ( 5.1% ) of genes in pham
- Manual Annotations of this start: 3 of 50
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Eyre\_26 (singleton), Lton\_25 (CZ), OneDirection\_24 (CZ6),

Start 23:

- Found in 3 of 59 ( 5.1% ) of genes in pham
- Manual Annotations of this start: 3 of 50
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Gorpy\_36 (AY), Orchid\_35 (CX), RobinSparkles\_38 (CX),

Start 26:

- Found in 1 of 59 ( 1.7% ) of genes in pham
- Manual Annotations of this start: 1 of 50
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Zipp\_25 (DE4),

Start 27:

- Found in 18 of 59 ( 30.5% ) of genes in pham

- Manual Annotations of this start: 16 of 50
- Called 94.4% of time when present
- Phage (with cluster) where this start called: Abblin\_25 (DE4), Affeca\_24 (DE1), AnClar\_19 (DR), Angelicage\_24 (DE1), BigHunkinEater\_28 (DE4), Brawn1\_22 (DE1), Fitzgerald\_24 (DE1), Geodirt\_23 (DE1), IsHungry\_31 (FF), Jabberwocky\_24 (DE1), LittleMunchkin\_20 (DR), MoontowerMania\_25 (DE1), Natkenzie\_25 (DE4), Sampson\_25 (DE4), Sanjuju\_24 (DE1), Scioto\_25 (DE4), Tardus\_26 (DE4),

#### Start 30:

- Found in 8 of 59 ( 13.6% ) of genes in pham
- Manual Annotations of this start: 6 of 50
- Called 100.0% of time when present
- Phage (with cluster) where this start called: ArtetaBall\_28 (DJ), Crocheter\_27 (DJ), Dialga\_28 (DJ), Jodelie19\_28 (DJ), Kenosha\_27 (DJ), Nadmeg\_28 (DJ), TenaciousP\_28 (DJ), Untouchable\_27 (DJ),

#### Start 32:

- Found in 4 of 59 ( 6.8% ) of genes in pham
- No Manual Annotations of this start.
- Called 25.0% of time when present
- Phage (with cluster) where this start called: Bubbykins\_42 (UNK),

#### Start 37:

- Found in 16 of 59 ( 27.1% ) of genes in pham
- Manual Annotations of this start: 14 of 50
- Called 100.0% of time when present
- Phage (with cluster) where this start called: EMSquaredA\_30 (CY1), HannahD\_30 (DB), Holliday\_35 (DN1), Kamaru\_35 (DN1), LitninMcQueen\_34 (DN1), Malibo\_30 (DW), Marteena\_30 (CY1), NaLuna\_30 (DB), ODay\_39 (DN), Opie\_30 (DB), Phistory\_36 (DN1), Ruthy\_31 (DW), Samba\_31 (CV), ShawBrad\_35 (DN1), Shivanishola\_25 (DE1), ZiggyZoo\_31 (CV),

#### Start 45:

- Found in 7 of 59 ( 11.9% ) of genes in pham
- Manual Annotations of this start: 4 of 50
- Called 71.4% of time when present
- Phage (with cluster) where this start called: CalWood4100\_35 (FH), Elver\_10 (FK), Lilmac1015\_35 (FH), Paella\_10 (FK), Qui\_10 (FK),

#### Start 46:

- Found in 18 of 59 ( 30.5% ) of genes in pham
- Manual Annotations of this start: 1 of 50
- Called 5.6% of time when present
- Phage (with cluster) where this start called: Neville\_22 (DU2),

#### Start 51:

- Found in 43 of 59 ( 72.9% ) of genes in pham
- No Manual Annotations of this start.
- Called 4.7% of time when present
- Phage (with cluster) where this start called: Gandionco\_9 (FK), Marianna39\_10 (FK),

#### Start 66:

- Found in 50 of 59 ( 84.7% ) of genes in pham

- Manual Annotations of this start: 2 of 50
- Called 4.0% of time when present
- Phage (with cluster) where this start called: Kampe\_36 (CX), PatrickStar\_36 (CX),

### **Summary by clusters:**

There are 20 clusters represented in this pham: DN, CY1, FK, DJ, DE1, DB, DE4, CZ6, singleton, CZ, AY, CX, DN1, FF, FH, DW, DU2, UNK, DR, CV,

Info for manual annotations of cluster AY:

- Start number 23 was manually annotated 1 time for cluster AY.

Info for manual annotations of cluster CV:

- Start number 37 was manually annotated 2 times for cluster CV.

Info for manual annotations of cluster CX:

- Start number 23 was manually annotated 2 times for cluster CX.
- Start number 66 was manually annotated 2 times for cluster CX.

Info for manual annotations of cluster CY1:

- Start number 37 was manually annotated 2 times for cluster CY1.

Info for manual annotations of cluster CZ:

- Start number 7 was manually annotated 1 time for cluster CZ.

Info for manual annotations of cluster CZ6:

- Start number 7 was manually annotated 1 time for cluster CZ6.

Info for manual annotations of cluster DB:

- Start number 37 was manually annotated 2 times for cluster DB.

Info for manual annotations of cluster DE1:

- Start number 27 was manually annotated 7 times for cluster DE1.
- Start number 37 was manually annotated 1 time for cluster DE1.

Info for manual annotations of cluster DE4:

- Start number 26 was manually annotated 1 time for cluster DE4.
- Start number 27 was manually annotated 6 times for cluster DE4.

Info for manual annotations of cluster DJ:

- Start number 30 was manually annotated 6 times for cluster DJ.

Info for manual annotations of cluster DN:

- Start number 37 was manually annotated 1 time for cluster DN.

Info for manual annotations of cluster DN1:

- Start number 37 was manually annotated 4 times for cluster DN1.

Info for manual annotations of cluster DR:

- Start number 27 was manually annotated 2 times for cluster DR.

Info for manual annotations of cluster DU2:

- Start number 46 was manually annotated 1 time for cluster DU2.

Info for manual annotations of cluster DW:

- Start number 37 was manually annotated 2 times for cluster DW.

Info for manual annotations of cluster FF:

- Start number 27 was manually annotated 1 time for cluster FF.

Info for manual annotations of cluster FH:

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

Info for manual annotations of cluster FK:

- Start number 45 was manually annotated 3 times for cluster FK.

### **Gene Information:**

Gene: Abblin\_25 Start: 19737, Stop: 21101, Start Num: 27

Candidate Starts for Abblin\_25:

(Start: 27 @19737 has 16 MA's), (31, 19770), (Start: 46 @19878 has 1 MA's), (51, 19908), (61, 20022), (Start: 66 @20094 has 2 MA's), (68, 20100), (69, 20103), (70, 20109), (76, 20151), (78, 20199), (79, 20226), (82, 20256), (85, 20280), (90, 20331), (98, 20397), (104, 20451), (110, 20505), (111, 20508), (118, 20571), (123, 20637), (124, 20646), (127, 20670), (130, 20697), (132, 20712), (133, 20721), (139, 20763), (146, 20802), (153, 20847), (155, 20856), (159, 20892), (160, 20901), (165, 20952), (168, 20967), (169, 20979), (178, 21069),

Gene: Affeca\_24 Start: 19645, Stop: 21006, Start Num: 27

Candidate Starts for Affeca\_24:

(Start: 27 @19645 has 16 MA's), (Start: 46 @19786 has 1 MA's), (51, 19816), (55, 19852), (59, 19921), (61, 19930), (Start: 66 @20002 has 2 MA's), (68, 20008), (69, 20011), (70, 20017), (76, 20059), (79, 20134), (85, 20188), (90, 20239), (98, 20305), (110, 20413), (118, 20479), (122, 20536), (123, 20545), (124, 20554), (127, 20578), (130, 20605), (132, 20620), (153, 20755), (155, 20764), (160, 20809), (169, 20887), (182, 21001),

Gene: AnClar\_19 Start: 16411, Stop: 17775, Start Num: 27

Candidate Starts for AnClar\_19:

(Start: 27 @16411 has 16 MA's), (Start: 46 @16552 has 1 MA's), (51, 16582), (55, 16618), (61, 16696), (Start: 66 @16768 has 2 MA's), (69, 16777), (70, 16783), (75, 16822), (76, 16825), (78, 16873), (79, 16900), (85, 16954), (90, 17005), (91, 17008), (101, 17095), (111, 17182), (118, 17245), (119, 17248), (122, 17302), (123, 17311), (124, 17320), (127, 17344), (130, 17371), (132, 17386), (135, 17419), (146, 17476), (152, 17515), (153, 17521), (155, 17530), (160, 17575), (161, 17599), (169, 17653),

Gene: Angelicage\_24 Start: 20068, Stop: 21429, Start Num: 27

Candidate Starts for Angelicage\_24:

(Start: 27 @20068 has 16 MA's), (Start: 46 @20209 has 1 MA's), (51, 20239), (55, 20275), (59, 20344), (61, 20353), (Start: 66 @20425 has 2 MA's), (68, 20431), (69, 20434), (70, 20440), (76, 20482), (79, 20557), (82, 20587), (85, 20611), (90, 20662), (98, 20728), (110, 20836), (118, 20902), (122, 20959), (123, 20968), (124, 20977), (127, 21001), (130, 21028), (132, 21043), (153, 21178), (155, 21187), (160, 21232), (169, 21310), (182, 21424),

Gene: ArtetaBall\_28 Start: 19527, Stop: 20882, Start Num: 30

Candidate Starts for ArtetaBall\_28:

(Start: 30 @19527 has 6 MA's), (31, 19545), (36, 19575), (40, 19608), (43, 19632), (57, 19764), (61, 19803), (Start: 66 @19875 has 2 MA's), (75, 19929), (76, 19932), (78, 19980), (94, 20142), (96, 20169), (103, 20211), (106, 20262), (109, 20280), (110, 20289), (124, 20430), (163, 20727), (165, 20736), (168, 20751), (169, 20763), (181, 20871),

Gene: BigHunkinEater\_28 Start: 18907, Stop: 20271, Start Num: 27

Candidate Starts for BigHunkinEater\_28:

(Start: 27 @18907 has 16 MA's), (31, 18940), (Start: 46 @19048 has 1 MA's), (48, 19063), (51, 19078), (61, 19192), (Start: 66 @19264 has 2 MA's), (68, 19270), (69, 19273), (70, 19279), (76, 19321), (78, 19369), (79, 19396), (82, 19426), (85, 19450), (90, 19501), (98, 19567), (102, 19594), (104, 19621), (110, 19675), (111, 19678), (118, 19741), (123, 19807), (124, 19816), (127, 19840), (130, 19867), (132, 19882), (133, 19891), (146, 19972), (153, 20017), (155, 20026), (159, 20062), (160, 20071), (168, 20137), (169, 20149), (178, 20239),

Gene: Brawn1\_22 Start: 18843, Stop: 20204, Start Num: 27

Candidate Starts for Brawn1\_22:

(Start: 27 @18843 has 16 MA's), (Start: 46 @18984 has 1 MA's), (51, 19014), (55, 19050), (59, 19119), (61, 19128), (Start: 66 @19200 has 2 MA's), (68, 19206), (69, 19209), (70, 19215), (76, 19257), (79, 19332), (85, 19386), (90, 19437), (98, 19503), (110, 19611), (118, 19677), (122, 19734), (123, 19743), (124, 19752), (127, 19776), (130, 19803), (132, 19818), (153, 19953), (155, 19962), (160, 20007), (169, 20085), (182, 20199),

Gene: Bubbykins\_42 Start: 32858, Stop: 34141, Start Num: 32

Candidate Starts for Bubbykins\_42:

(32, 32858), (34, 32873), (35, 32876), (50, 32984), (53, 32996), (77, 33236), (80, 33299), (83, 33326), (86, 33356), (93, 33407), (94, 33428), (95, 33434), (97, 33458), (101, 33488), (102, 33491), (108, 33548), (113, 33596), (114, 33614), (116, 33629), (118, 33638), (120, 33647), (125, 33728), (126, 33731), (129, 33761), (131, 33776), (136, 33821), (140, 33833), (149, 33887), (150, 33890), (155, 33914), (158, 33938), (160, 33953), (171, 34046), (173, 34073), (174, 34097), (178, 34121), (179, 34133),

Gene: CalWood4100\_35 Start: 26452, Stop: 27645, Start Num: 45

Candidate Starts for CalWood4100\_35:

(1, 25411), (3, 25783), (13, 26092), (Start: 45 @26452 has 4 MA's), (91, 26926), (102, 27013), (114, 27130), (123, 27199), (127, 27232), (143, 27358), (165, 27511),

Gene: Crocheter\_27 Start: 19527, Stop: 20882, Start Num: 30

Candidate Starts for Crocheter\_27:

(Start: 30 @19527 has 6 MA's), (31, 19545), (36, 19575), (40, 19608), (43, 19632), (57, 19764), (61, 19803), (Start: 66 @19875 has 2 MA's), (75, 19929), (76, 19932), (78, 19980), (94, 20142), (96, 20169), (103, 20211), (106, 20262), (109, 20280), (110, 20289), (124, 20430), (163, 20727), (165, 20736), (168, 20751), (169, 20763), (181, 20871),

Gene: Dialga\_28 Start: 19549, Stop: 20904, Start Num: 30

Candidate Starts for Dialga\_28:

(Start: 30 @19549 has 6 MA's), (31, 19567), (36, 19597), (40, 19630), (43, 19654), (57, 19786), (61, 19825), (Start: 66 @19897 has 2 MA's), (75, 19951), (76, 19954), (78, 20002), (94, 20164), (96, 20191), (103, 20233), (106, 20284), (109, 20302), (110, 20311), (124, 20452), (163, 20749), (165, 20758), (168, 20773), (169, 20785), (181, 20893),

Gene: EMSquaredA\_30 Start: 25192, Stop: 26484, Start Num: 37

Candidate Starts for EMSquaredA\_30:

(2, 24430), (5, 24757), (Start: 37 @25192 has 14 MA's), (40, 25213), (51, 25294), (60, 25405), (Start: 66 @25480 has 2 MA's), (69, 25489), (79, 25612), (82, 25642), (97, 25777), (110, 25891), (118, 25957), (119, 25960), (123, 26023), (124, 26032), (134, 26128), (156, 26248), (160, 26287), (168, 26353), (169, 26365),

Gene: Elver\_10 Start: 4443, Stop: 5639, Start Num: 45

Candidate Starts for Elver\_10:

(Start: 45 @4443 has 4 MA's), (51, 4497), (52, 4500), (56, 4563), (77, 4749), (89, 4911), (107, 5058), (115, 5130), (123, 5193), (129, 5250), (143, 5352), (164, 5502), (171, 5547), (176, 5607),

Gene: Eyre\_26 Start: 22144, Stop: 23817, Start Num: 7

Candidate Starts for Eyre\_26:

(Start: 7 @22144 has 3 MA's), (9, 22228), (14, 22327), (17, 22429), (18, 22435), (21, 22468), (25, 22492), (29, 22513), (33, 22546), (51, 22624), (Start: 66 @22810 has 2 MA's), (67, 22813), (69, 22819), (70, 22825), (78, 22915), (79, 22942), (82, 22972), (84, 22984), (89, 23041), (97, 23107), (110, 23224), (114, 23266), (118, 23290), (123, 23356), (124, 23365), (136, 23473), (156, 23581), (160, 23620), (162, 23659), (169, 23698),

Gene: Fitzgerald\_24 Start: 20115, Stop: 21476, Start Num: 27

Candidate Starts for Fitzgerald\_24:

(Start: 27 @20115 has 16 MA's), (Start: 46 @20256 has 1 MA's), (51, 20286), (55, 20322), (59, 20391), (61, 20400), (Start: 66 @20472 has 2 MA's), (68, 20478), (69, 20481), (70, 20487), (76, 20529), (79, 20604), (82, 20634), (85, 20658), (90, 20709), (98, 20775), (110, 20883), (118, 20949), (122, 21006), (123, 21015), (124, 21024), (127, 21048), (130, 21075), (132, 21090), (153, 21225), (155, 21234), (182, 21471),

Gene: Gandionco\_9 Start: 4496, Stop: 5638, Start Num: 51

Candidate Starts for Gandionco\_9:

(Start: 45 @4442 has 4 MA's), (51, 4496), (52, 4499), (56, 4562), (77, 4748), (89, 4910), (107, 5057), (115, 5129), (123, 5192), (129, 5249), (143, 5351), (164, 5501), (171, 5546), (176, 5606),

Gene: Geodirt\_23 Start: 19423, Stop: 20784, Start Num: 27

Candidate Starts for Geodirt\_23:

(Start: 27 @19423 has 16 MA's), (Start: 46 @19564 has 1 MA's), (51, 19594), (61, 19708), (Start: 66 @19780 has 2 MA's), (68, 19786), (69, 19789), (70, 19795), (76, 19837), (79, 19912), (85, 19966), (90, 20017), (98, 20083), (110, 20191), (118, 20257), (122, 20314), (123, 20323), (124, 20332), (127, 20356), (130, 20383), (132, 20398), (153, 20533), (155, 20542), (160, 20587), (163, 20629), (169, 20665), (182, 20779),

Gene: Gorpy\_36 Start: 24267, Stop: 25628, Start Num: 23

Candidate Starts for Gorpy\_36:

(Start: 23 @24267 has 3 MA's), (41, 24393), (54, 24495), (56, 24543), (65, 24648), (72, 24696), (74, 24714), (81, 24810), (94, 24915), (101, 24978), (102, 24981), (105, 25023), (115, 25110), (117, 25125), (118, 25128), (122, 25185), (141, 25323), (147, 25362), (157, 25407), (159, 25431), (165, 25491), (173, 25560), (175, 25590),

Gene: HannahD\_30 Start: 24895, Stop: 26187, Start Num: 37

Candidate Starts for HannahD\_30:

(Start: 37 @24895 has 14 MA's), (40, 24916), (51, 24997), (56, 25063), (63, 25156), (Start: 66 @25183 has 2 MA's), (69, 25192), (79, 25315), (97, 25480), (101, 25510), (110, 25594), (118, 25660), (119, 25663), (124, 25735), (160, 25990), (168, 26056), (169, 26068),

Gene: Holliday\_35 Start: 27235, Stop: 28530, Start Num: 37

Candidate Starts for Holliday\_35:

(Start: 37 @27235 has 14 MA's), (51, 27340), (Start: 66 @27526 has 2 MA's), (69, 27535), (79, 27658), (97, 27823), (101, 27853), (118, 28003), (119, 28006), (123, 28069), (124, 28078), (134, 28174), (136, 28186), (156, 28294), (160, 28333), (168, 28399), (169, 28411), (178, 28501),

Gene: IsHungry\_31 Start: 23474, Stop: 24847, Start Num: 27

Candidate Starts for IsHungry\_31:

(Start: 27 @23474 has 16 MA's), (32, 23513), (42, 23588), (44, 23597), (51, 23672), (58, 23753), (64, 23828), (65, 23843), (Start: 66 @23855 has 2 MA's), (92, 24092), (95, 24122), (99, 24158), (102, 24179), (105, 24221), (108, 24236), (112, 24275), (113, 24284), (128, 24437), (137, 24515), (138, 24518), (145, 24557), (168, 24713), (170, 24743), (173, 24776),

Gene: Jabberwocky\_24 Start: 20582, Stop: 21943, Start Num: 27

Candidate Starts for Jabberwocky\_24:

(Start: 27 @20582 has 16 MA's), (Start: 46 @20723 has 1 MA's), (51, 20753), (61, 20867), (Start: 66 @20939 has 2 MA's), (68, 20945), (69, 20948), (76, 20996), (79, 21071), (82, 21101), (85, 21125), (90, 21176), (98, 21242), (110, 21350), (118, 21416), (122, 21473), (123, 21482), (124, 21491), (127, 21515), (130, 21542), (132, 21557), (153, 21692), (155, 21701), (160, 21746), (169, 21824), (182, 21938),

Gene: Jodelie19\_28 Start: 20820, Stop: 22175, Start Num: 30

Candidate Starts for Jodelie19\_28:

(Start: 30 @20820 has 6 MA's), (31, 20838), (36, 20868), (43, 20925), (57, 21057), (63, 21141), (Start: 66 @21168 has 2 MA's), (71, 21189), (76, 21225), (88, 21390), (103, 21504), (106, 21555), (109, 21573), (110, 21582), (113, 21606), (124, 21723), (169, 22056), (181, 22164),

Gene: Kamaru\_35 Start: 27235, Stop: 28530, Start Num: 37

Candidate Starts for Kamaru\_35:

(Start: 37 @27235 has 14 MA's), (51, 27340), (Start: 66 @27526 has 2 MA's), (69, 27535), (79, 27658), (97, 27823), (101, 27853), (118, 28003), (119, 28006), (123, 28069), (124, 28078), (134, 28174), (136, 28186), (156, 28294), (160, 28333), (168, 28399), (169, 28411), (178, 28501),

Gene: Kampe\_36 Start: 37364, Stop: 38371, Start Num: 66

Candidate Starts for Kampe\_36:

(Start: 66 @37364 has 2 MA's), (73, 37403), (84, 37538), (89, 37598), (97, 37664), (100, 37682), (101, 37697), (121, 37862), (122, 37904), (123, 37913), (124, 37922), (148, 38087), (151, 38111), (154, 38126), (159, 38168), (172, 38288), (175, 38327), (177, 38336), (180, 38360),

Gene: Kenosha\_27 Start: 19938, Stop: 21293, Start Num: 30

Candidate Starts for Kenosha\_27:

(Start: 30 @19938 has 6 MA's), (31, 19956), (36, 19986), (40, 20019), (43, 20043), (57, 20175), (61, 20214), (Start: 66 @20286 has 2 MA's), (75, 20340), (76, 20343), (78, 20391), (94, 20553), (96, 20580), (103, 20622), (106, 20673), (109, 20691), (110, 20700), (124, 20841), (163, 21138), (165, 21147), (168, 21162), (169, 21174), (181, 21282),

Gene: Lilmac1015\_35 Start: 26452, Stop: 27645, Start Num: 45

Candidate Starts for Lilmac1015\_35:

(1, 25411), (3, 25783), (13, 26092), (Start: 45 @26452 has 4 MA's), (91, 26926), (102, 27013), (114, 27130), (123, 27199), (127, 27232), (143, 27358), (165, 27511),

Gene: LitninMcQueen\_34 Start: 26978, Stop: 28273, Start Num: 37

Candidate Starts for LitninMcQueen\_34:

(Start: 37 @26978 has 14 MA's), (51, 27083), (Start: 66 @27269 has 2 MA's), (69, 27278), (79, 27401), (97, 27566), (101, 27596), (118, 27746), (119, 27749), (123, 27812), (124, 27821), (134, 27917), (136, 27929), (156, 28037), (160, 28076), (168, 28142), (169, 28154), (178, 28244),

Gene: LittleMunchkin\_20 Start: 17045, Stop: 18409, Start Num: 27

Candidate Starts for LittleMunchkin\_20:

(Start: 27 @17045 has 16 MA's), (Start: 46 @17186 has 1 MA's), (51, 17216), (55, 17252), (61, 17330), (Start: 66 @17402 has 2 MA's), (69, 17411), (70, 17417), (75, 17456), (76, 17459), (78, 17507), (79, 17534), (85, 17588), (90, 17639), (91, 17642), (101, 17729), (111, 17816), (118, 17879), (119, 17882), (122, 17936), (123, 17945), (124, 17954), (127, 17978), (130, 18005), (132, 18020), (135, 18053), (146, 18110), (152, 18149), (153, 18155), (155, 18164), (160, 18209), (161, 18233), (169, 18287),

Gene: Lton\_25 Start: 21029, Stop: 22702, Start Num: 7

Candidate Starts for Lton\_25:

(4, 20885), (6, 21026), (Start: 7 @21029 has 3 MA's), (8, 21089), (10, 21119), (11, 21131), (12, 21161), (16, 21290), (18, 21320), (19, 21338), (33, 21431), (51, 21509), (Start: 66 @21695 has 2 MA's), (67, 21698), (69, 21704), (79, 21827), (82, 21857), (90, 21932), (97, 21992), (103, 22031), (110, 22109), (111, 22112), (114, 22151), (118, 22175), (124, 22250), (135, 22349), (136, 22358), (152, 22445), (160, 22505), (162, 22544), (168, 22571), (169, 22583),

Gene: Malibo\_30 Start: 24379, Stop: 25671, Start Num: 37

Candidate Starts for Malibo\_30:

(Start: 37 @24379 has 14 MA's), (40, 24400), (51, 24481), (Start: 66 @24667 has 2 MA's), (69, 24676), (79, 24799), (82, 24829), (97, 24964), (110, 25078), (113, 25102), (118, 25144), (119, 25147), (123, 25210), (124, 25219), (134, 25315), (160, 25474), (165, 25525), (168, 25540), (169, 25552), (180, 25657),

Gene: Marianna39\_10 Start: 4496, Stop: 5638, Start Num: 51

Candidate Starts for Marianna39\_10:

(Start: 45 @4442 has 4 MA's), (51, 4496), (52, 4499), (56, 4562), (77, 4748), (89, 4910), (107, 5057), (115, 5129), (123, 5192), (129, 5249), (143, 5351), (164, 5501), (171, 5546), (176, 5606),

Gene: Marteena\_30 Start: 25192, Stop: 26484, Start Num: 37

Candidate Starts for Marteena\_30:

(2, 24430), (5, 24757), (Start: 37 @25192 has 14 MA's), (40, 25213), (51, 25294), (60, 25405), (Start: 66 @25480 has 2 MA's), (69, 25489), (79, 25612), (82, 25642), (97, 25777), (110, 25891), (118, 25957), (119, 25960), (123, 26023), (124, 26032), (134, 26128), (156, 26248), (160, 26287), (168, 26353), (169, 26365),

Gene: MoontowerMania\_25 Start: 19790, Stop: 21151, Start Num: 27

Candidate Starts for MoontowerMania\_25:

(Start: 27 @19790 has 16 MA's), (Start: 46 @19931 has 1 MA's), (51, 19961), (61, 20075), (Start: 66 @20147 has 2 MA's), (68, 20153), (69, 20156), (70, 20162), (76, 20204), (79, 20279), (82, 20309), (85, 20333), (90, 20384), (98, 20450), (110, 20558), (118, 20624), (122, 20681), (123, 20690), (124, 20699), (127, 20723), (130, 20750), (132, 20765), (153, 20900), (155, 20909), (182, 21146),

Gene: NaLuna\_30 Start: 24895, Stop: 26187, Start Num: 37

Candidate Starts for NaLuna\_30:

(Start: 37 @24895 has 14 MA's), (40, 24916), (51, 24997), (56, 25063), (63, 25156), (Start: 66 @25183 has 2 MA's), (69, 25192), (79, 25315), (97, 25480), (101, 25510), (110, 25594), (118, 25660), (119, 25663), (124, 25735), (160, 25990), (168, 26056), (169, 26068),

Gene: Nadmeg\_28 Start: 20601, Stop: 21956, Start Num: 30

Candidate Starts for Nadmeg\_28:

(Start: 30 @20601 has 6 MA's), (31, 20619), (36, 20649), (40, 20682), (43, 20706), (57, 20838), (61, 20877), (Start: 66 @20949 has 2 MA's), (75, 21003), (76, 21006), (78, 21054), (94, 21216), (96, 21243), (103, 21285), (106, 21336), (109, 21354), (110, 21363), (124, 21504), (163, 21801), (165, 21810), (168, 21825), (169, 21837), (181, 21945),

Gene: Natkenzie\_25 Start: 19737, Stop: 21101, Start Num: 27

Candidate Starts for Natkenzie\_25:

(Start: 27 @19737 has 16 MA's), (31, 19770), (Start: 46 @19878 has 1 MA's), (51, 19908), (61, 20022), (Start: 66 @20094 has 2 MA's), (68, 20100), (69, 20103), (70, 20109), (76, 20151), (78, 20199), (79, 20226), (82, 20256), (85, 20280), (90, 20331), (98, 20397), (104, 20451), (110, 20505), (111, 20508), (118, 20571), (123, 20637), (124, 20646), (127, 20670), (130, 20697), (132, 20712), (133, 20721), (139, 20763), (146, 20802), (153, 20847), (155, 20856), (159, 20892), (160, 20901), (165, 20952), (168, 20967), (169, 20979), (178, 21069),

Gene: Neville\_22 Start: 13040, Stop: 14260, Start Num: 46

Candidate Starts for Neville\_22:

(22, 12884), (24, 12887), (Start: 46 @13040 has 1 MA's), (49, 13058), (51, 13070), (Start: 66 @13256 has 2 MA's), (87, 13469), (90, 13493), (97, 13553), (101, 13583), (103, 13589), (110, 13667), (111, 13670), (118, 13733), (119, 13736), (123, 13799), (135, 13907), (144, 13958), (154, 14012), (158, 14048), (160, 14063), (164, 14111), (167, 14126), (168, 14129), (180, 14246),

Gene: ODay\_39 Start: 29045, Stop: 30340, Start Num: 37

Candidate Starts for ODay\_39:

(15, 28868), (Start: 37 @29045 has 14 MA's), (51, 29150), (Start: 66 @29336 has 2 MA's), (69, 29345), (79, 29468), (82, 29498), (84, 29510), (97, 29633), (101, 29663), (110, 29747), (118, 29813), (123, 29879), (124, 29888), (134, 29984), (136, 29996), (152, 30083), (156, 30104), (159, 30134), (160, 30143), (165, 30194), (169, 30221), (178, 30311),

Gene: OneDirection\_24 Start: 20984, Stop: 22720, Start Num: 7

Candidate Starts for OneDirection\_24:

(Start: 7 @20984 has 3 MA's), (10, 21074), (16, 21245), (18, 21275), (19, 21293), (20, 21302), (39, 21431), (49, 21515), (51, 21527), (Start: 66 @21713 has 2 MA's), (67, 21716), (69, 21722), (70, 21728), (79, 21845), (82, 21875), (84, 21887), (90, 21950), (97, 22010), (103, 22049), (110, 22127), (111, 22130), (114, 22169), (118, 22193), (123, 22259), (124, 22268), (136, 22376), (152, 22463), (156, 22484), (160, 22523), (162, 22562), (169, 22601),

Gene: Opie\_30 Start: 25229, Stop: 26521, Start Num: 37

Candidate Starts for Opie\_30:

(Start: 37 @25229 has 14 MA's), (38, 25238), (40, 25250), (51, 25331), (Start: 66 @25517 has 2 MA's), (69, 25526), (75, 25571), (79, 25649), (88, 25739), (89, 25748), (97, 25814), (101, 25844), (110, 25928), (118, 25994), (119, 25997), (123, 26060), (124, 26069), (134, 26165), (160, 26324), (165, 26375), (168, 26390), (169, 26402), (178, 26492),

Gene: Orchid\_35 Start: 36987, Stop: 38372, Start Num: 23

Candidate Starts for Orchid\_35:

(Start: 23 @36987 has 3 MA's), (28, 37008), (32, 37041), (56, 37248), (Start: 66 @37365 has 2 MA's), (73, 37404), (84, 37539), (89, 37599), (97, 37665), (100, 37683), (101, 37698), (121, 37863), (122, 37905), (123, 37914), (124, 37923), (148, 38088), (151, 38112), (154, 38127), (159, 38169), (172, 38289), (175, 38328), (177, 38337), (180, 38361),

Gene: Paella\_10 Start: 4442, Stop: 5638, Start Num: 45

Candidate Starts for Paella\_10:

(Start: 45 @4442 has 4 MA's), (51, 4496), (52, 4499), (56, 4562), (77, 4748), (89, 4910), (107, 5057), (115, 5129), (123, 5192), (129, 5249), (143, 5351), (164, 5501), (171, 5546), (176, 5606),

Gene: PatrickStar\_36 Start: 37364, Stop: 38371, Start Num: 66

Candidate Starts for PatrickStar\_36:

(Start: 66 @37364 has 2 MA's), (73, 37403), (84, 37538), (89, 37598), (97, 37664), (100, 37682), (101, 37697), (121, 37862), (122, 37904), (123, 37913), (124, 37922), (148, 38087), (151, 38111), (154, 38126), (159, 38168), (172, 38288), (175, 38327), (177, 38336), (180, 38360),

Gene: Phistory\_36 Start: 27923, Stop: 29218, Start Num: 37

Candidate Starts for Phistory\_36:

(15, 27746), (Start: 37 @27923 has 14 MA's), (51, 28028), (Start: 66 @28214 has 2 MA's), (69, 28223), (79, 28346), (97, 28511), (110, 28625), (113, 28649), (118, 28691), (119, 28694), (123, 28757), (124, 28766), (134, 28862), (136, 28874), (156, 28982), (160, 29021), (169, 29099), (178, 29189),

Gene: Qui\_10 Start: 4442, Stop: 5638, Start Num: 45

Candidate Starts for Qui\_10:

(Start: 45 @4442 has 4 MA's), (51, 4496), (52, 4499), (56, 4562), (77, 4748), (89, 4910), (107, 5057), (115, 5129), (123, 5192), (129, 5249), (143, 5351), (164, 5501), (171, 5546), (176, 5606),

Gene: RobinSparkles\_38 Start: 37904, Stop: 39289, Start Num: 23

Candidate Starts for RobinSparkles\_38:

(Start: 23 @37904 has 3 MA's), (28, 37925), (32, 37958), (56, 38165), (Start: 66 @38282 has 2 MA's), (73, 38321), (84, 38456), (89, 38516), (97, 38582), (100, 38600), (101, 38615), (121, 38780), (122, 38822), (123, 38831), (124, 38840), (148, 39005), (151, 39029), (154, 39044), (159, 39086), (172, 39206), (175, 39245), (177, 39254), (180, 39278),

Gene: Ruthy\_31 Start: 25882, Stop: 27174, Start Num: 37

Candidate Starts for Ruthy\_31:

(Start: 37 @25882 has 14 MA's), (38, 25891), (40, 25903), (51, 25984), (Start: 66 @26170 has 2 MA's), (69, 26179), (79, 26302), (82, 26332), (97, 26467), (110, 26581), (118, 26647), (119, 26650), (123, 26713), (124, 26722), (134, 26818), (160, 26977), (165, 27028), (169, 27055),

Gene: Samba\_31 Start: 26209, Stop: 27507, Start Num: 37

Candidate Starts for Samba\_31:

(Start: 37 @26209 has 14 MA's), (47, 26293), (51, 26314), (62, 26455), (63, 26473), (Start: 66 @26500 has 2 MA's), (73, 26539), (79, 26632), (90, 26737), (95, 26773), (97, 26797), (101, 26830), (103, 26836), (106, 26887), (109, 26905), (119, 26983), (124, 27055), (132, 27121), (142, 27196), (154, 27259), (156, 27271), (160, 27310), (166, 27364), (169, 27388), (173, 27430),

Gene: Sampson\_25 Start: 19682, Stop: 21046, Start Num: 27

Candidate Starts for Sampson\_25:

(Start: 27 @19682 has 16 MA's), (31, 19715), (Start: 46 @19823 has 1 MA's), (51, 19853), (61, 19967), (Start: 66 @20039 has 2 MA's), (68, 20045), (69, 20048), (70, 20054), (76, 20096), (78, 20144), (79, 20171), (82, 20201), (85, 20225), (90, 20276), (98, 20342), (104, 20396), (110, 20450), (111, 20453), (118, 20516), (123, 20582), (124, 20591), (127, 20615), (130, 20642), (132, 20657), (133, 20666), (139, 20708), (146, 20747), (153, 20792), (155, 20801), (159, 20837), (160, 20846), (165, 20897), (168, 20912), (169, 20924), (178, 21014),

Gene: Sanjuju\_24 Start: 20194, Stop: 21555, Start Num: 27

Candidate Starts for Sanjuju\_24:

(Start: 27 @20194 has 16 MA's), (Start: 46 @20335 has 1 MA's), (51, 20365), (61, 20479), (Start: 66 @20551 has 2 MA's), (68, 20557), (69, 20560), (70, 20566), (76, 20608), (79, 20683), (82, 20713), (85,

20737), (90, 20788), (98, 20854), (110, 20962), (118, 21028), (122, 21085), (123, 21094), (124, 21103), (127, 21127), (130, 21154), (132, 21169), (153, 21304), (155, 21313), (160, 21358), (169, 21436), (182, 21550),

Gene: Scioto\_25 Start: 19737, Stop: 21101, Start Num: 27

Candidate Starts for Scioto\_25:

(Start: 27 @19737 has 16 MA's), (31, 19770), (Start: 46 @19878 has 1 MA's), (51, 19908), (61, 20022), (Start: 66 @20094 has 2 MA's), (68, 20100), (69, 20103), (70, 20109), (76, 20151), (78, 20199), (79, 20226), (82, 20256), (85, 20280), (90, 20331), (98, 20397), (104, 20451), (110, 20505), (111, 20508), (118, 20571), (123, 20637), (124, 20646), (127, 20670), (130, 20697), (132, 20712), (133, 20721), (139, 20763), (146, 20802), (153, 20847), (155, 20856), (159, 20892), (160, 20901), (165, 20952), (168, 20967), (169, 20979), (178, 21069),

Gene: ShawBrad\_35 Start: 27145, Stop: 28440, Start Num: 37

Candidate Starts for ShawBrad\_35:

(15, 26968), (Start: 37 @27145 has 14 MA's), (51, 27250), (Start: 66 @27436 has 2 MA's), (69, 27445), (79, 27568), (97, 27733), (110, 27847), (113, 27871), (118, 27913), (119, 27916), (123, 27979), (124, 27988), (134, 28084), (136, 28096), (156, 28204), (160, 28243), (169, 28321), (178, 28411),

Gene: Shivanishola\_25 Start: 19590, Stop: 20882, Start Num: 37

Candidate Starts for Shivanishola\_25:

(Start: 37 @19590 has 14 MA's), (40, 19611), (51, 19692), (Start: 66 @19878 has 2 MA's), (69, 19887), (79, 20010), (97, 20175), (110, 20289), (118, 20355), (119, 20358), (123, 20421), (124, 20430), (134, 20526), (139, 20547), (154, 20634), (159, 20676), (160, 20685), (168, 20751), (169, 20763),

Gene: Tardus\_26 Start: 19018, Stop: 20382, Start Num: 27

Candidate Starts for Tardus\_26:

(Start: 27 @19018 has 16 MA's), (31, 19051), (Start: 46 @19159 has 1 MA's), (51, 19189), (61, 19303), (Start: 66 @19375 has 2 MA's), (68, 19381), (69, 19384), (70, 19390), (76, 19432), (78, 19480), (79, 19507), (82, 19537), (84, 19549), (85, 19561), (90, 19612), (98, 19678), (102, 19705), (104, 19732), (110, 19786), (111, 19789), (118, 19852), (123, 19918), (124, 19927), (127, 19951), (130, 19978), (132, 19993), (133, 20002), (139, 20044), (146, 20083), (153, 20128), (155, 20137), (159, 20173), (160, 20182), (165, 20233), (168, 20248), (169, 20260), (178, 20350),

Gene: TenaciousP\_28 Start: 20820, Stop: 22175, Start Num: 30

Candidate Starts for TenaciousP\_28:

(Start: 30 @20820 has 6 MA's), (31, 20838), (36, 20868), (43, 20925), (57, 21057), (63, 21141), (Start: 66 @21168 has 2 MA's), (71, 21189), (76, 21225), (88, 21390), (103, 21504), (106, 21555), (109, 21573), (110, 21582), (113, 21606), (124, 21723), (169, 22056), (181, 22164),

Gene: Untouchable\_27 Start: 19526, Stop: 20881, Start Num: 30

Candidate Starts for Untouchable\_27:

(Start: 30 @19526 has 6 MA's), (31, 19544), (36, 19574), (40, 19607), (43, 19631), (57, 19763), (61, 19802), (Start: 66 @19874 has 2 MA's), (75, 19928), (76, 19931), (78, 19979), (94, 20141), (96, 20168), (103, 20210), (106, 20261), (109, 20279), (110, 20288), (124, 20429), (163, 20726), (165, 20735), (168, 20750), (169, 20762), (181, 20870),

Gene: ZiggyZoo\_31 Start: 26050, Stop: 27348, Start Num: 37

Candidate Starts for ZiggyZoo\_31:

(Start: 37 @26050 has 14 MA's), (47, 26134), (51, 26155), (62, 26296), (63, 26314), (Start: 66 @26341 has 2 MA's), (73, 26380), (79, 26473), (90, 26578), (95, 26614), (97, 26638), (101, 26671), (103, 26677), (106, 26728), (109, 26746), (119, 26824), (124, 26896), (132, 26962), (142, 27037), (154, 27100), (156, 27112), (160, 27151), (166, 27205), (169, 27229), (173, 27271),

Gene: Zipp\_25 Start: 19842, Stop: 21212, Start Num: 26

Candidate Starts for Zipp\_25:

(Start: 26 @19842 has 1 MA's), (Start: 27 @19848 has 16 MA's), (31, 19881), (38, 19926), (Start: 46 @19989 has 1 MA's), (51, 20019), (55, 20055), (59, 20124), (61, 20133), (Start: 66 @20205 has 2 MA's), (70, 20220), (76, 20262), (78, 20310), (79, 20337), (82, 20367), (85, 20391), (90, 20442), (98, 20508), (111, 20619), (118, 20682), (119, 20685), (122, 20739), (123, 20748), (124, 20757), (127, 20781), (130, 20808), (132, 20823), (139, 20874), (142, 20898), (146, 20913), (155, 20967), (160, 21012), (165, 21063), (168, 21078),