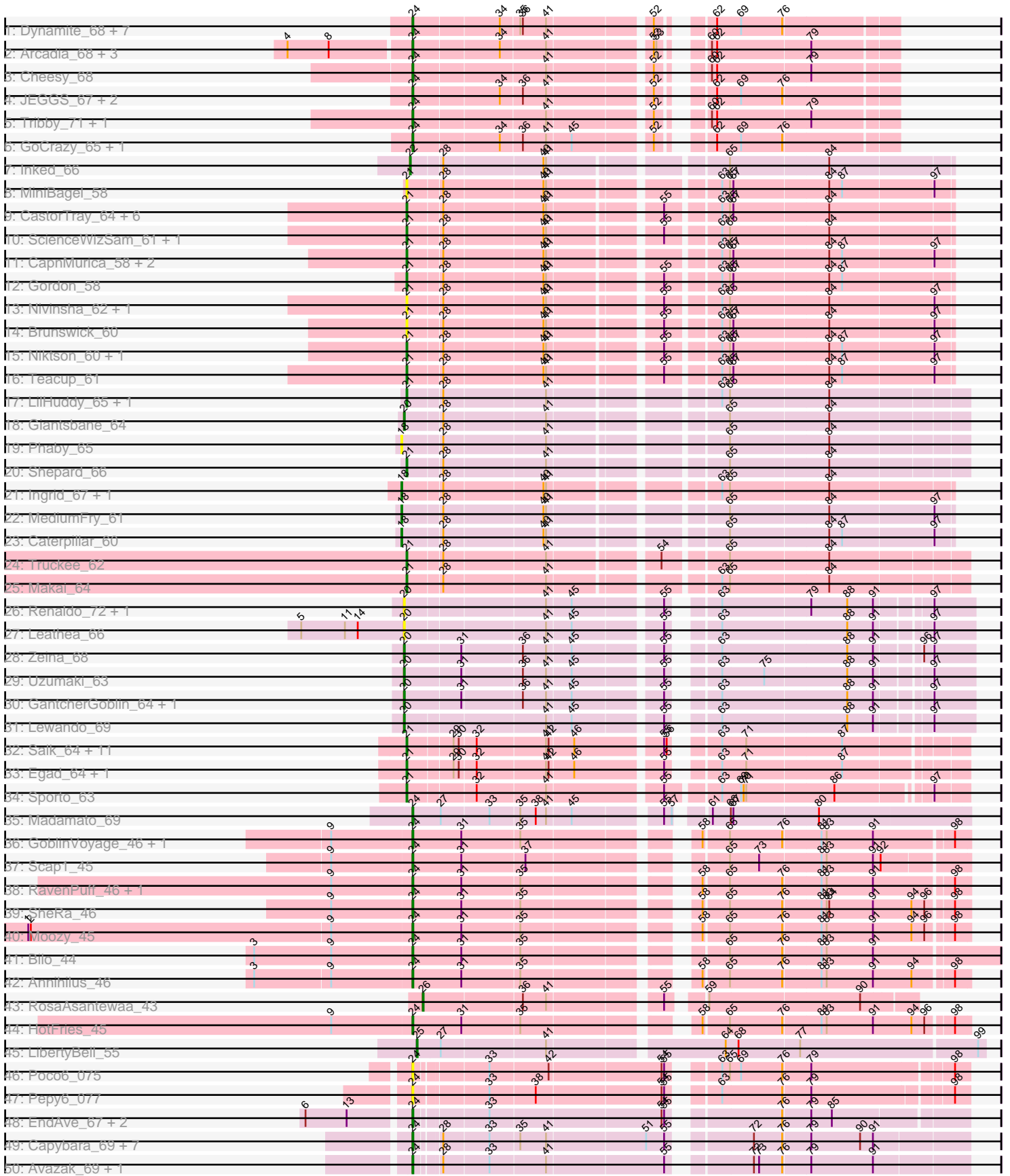
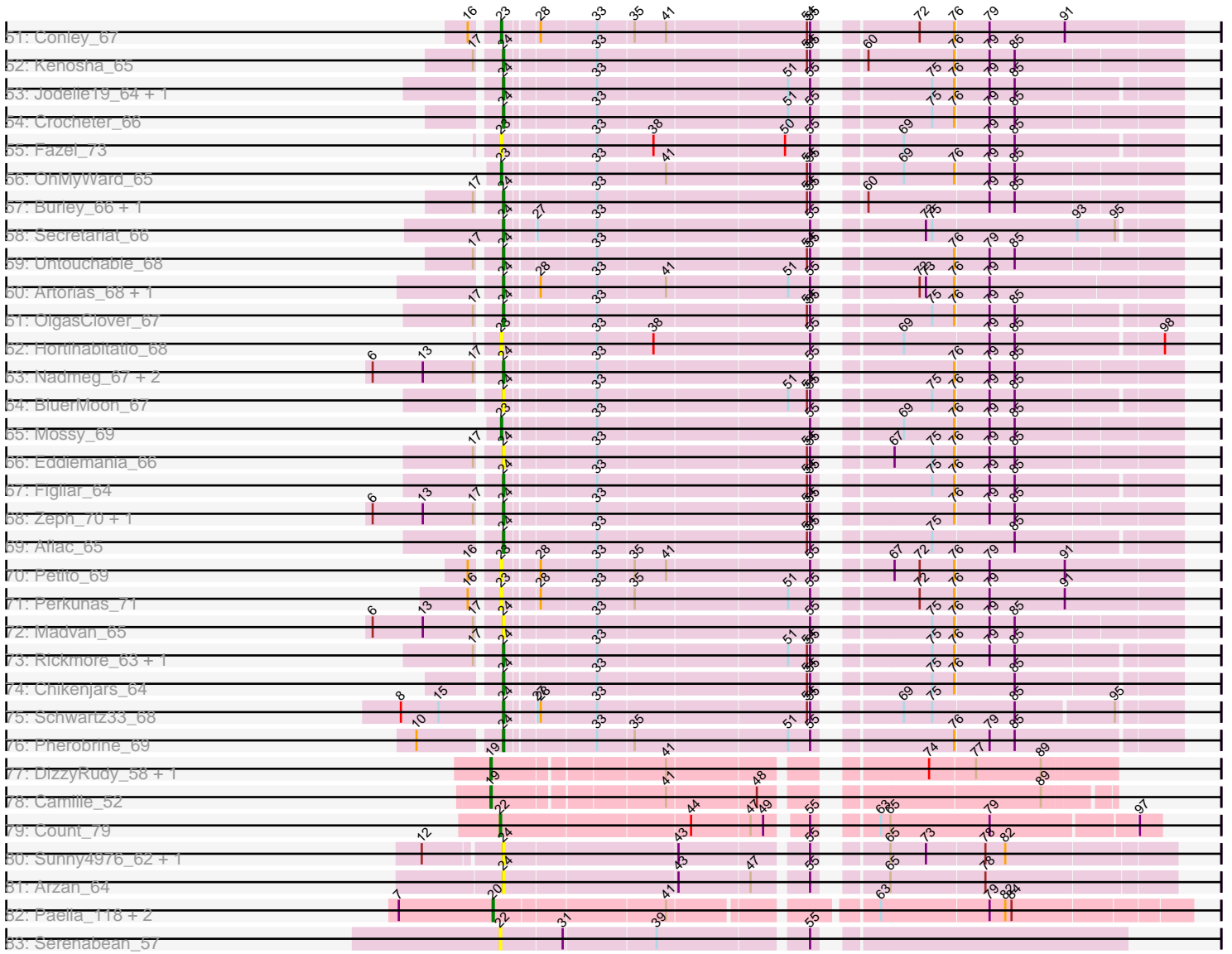


Pham 159034



Pham 159034



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 159034 Report

This analysis was run 04/28/24 on database version 559.

Pham number 159034 has 147 members, 33 are drafts.

Phages represented in each track:

- Track 1 : Dynamite\_68, Kardesai\_68, NapoleonB\_69, Benllo\_68, Mooshroom\_68, Circum\_69, BenitoAntonio\_66, Hankly\_67
- Track 2 : Arcadia\_68, Nason\_68, Elsa\_68, Xenomorph\_64
- Track 3 : Cheesy\_68
- Track 4 : JEGGS\_67, Mudcat\_64, Heisenberger\_67
- Track 5 : Tribby\_71, Correa\_66
- Track 6 : GoCrazy\_65, KeaneyLin\_64
- Track 7 : Inked\_66
- Track 8 : MiniBagel\_58
- Track 9 : CastorTray\_64, Breylor17\_60, Nightmare\_62, DevitoJr\_60, Tatanka\_57, Trustiboi\_60, Darby\_59
- Track 10 : ScienceWizSam\_61, Synopsis\_59
- Track 11 : CapnMurica\_58, Tenno\_61, Issa\_61
- Track 12 : Gordon\_58
- Track 13 : Nivinsha\_62, AreFloNak\_63
- Track 14 : Brunswick\_60
- Track 15 : Niktson\_60, ElephantMan\_60
- Track 16 : Teacup\_61
- Track 17 : LilHuddy\_65, Tokki\_69
- Track 18 : Giantsbane\_64
- Track 19 : Phaby\_65
- Track 20 : Shepard\_66
- Track 21 : Ingrid\_67, Loretta\_64
- Track 22 : MediumFry\_61
- Track 23 : Caterpillar\_60
- Track 24 : Truckee\_62
- Track 25 : Makai\_64
- Track 26 : Renaldo\_72, BarbieDoll\_70
- Track 27 : Leathea\_66
- Track 28 : Zeina\_68
- Track 29 : Uzumaki\_63
- Track 30 : GantcherGoblin\_64, Argan\_63
- Track 31 : Lewando\_69
- Track 32 : Salk\_64, Raunak\_65, BronxBay\_64, Michelle\_64, Shiba\_63, MrAaronian\_64, DoctorPepper\_64, Sloopyjoe\_64, Linda\_64, Djungelskog\_63, Stayer\_64, StarLord\_64
- Track 33 : Egad\_64, ProfFrink\_65

- Track 34 : Sporto\_63
- Track 35 : Madamato\_69
- Track 36 : GoblinVoyage\_46, PherryCruz\_45
- Track 37 : Scap1\_45
- Track 38 : RavenPuff\_46, Doxi13\_47
- Track 39 : SheRa\_46
- Track 40 : Moozy\_45
- Track 41 : Bilo\_44
- Track 42 : Annihilus\_46
- Track 43 : RosaAsantewaa\_43
- Track 44 : HotFries\_45
- Track 45 : LibertyBell\_55
- Track 46 : Poco6\_075
- Track 47 : Pepy6\_077
- Track 48 : EndAve\_67, Nithya\_66, AlainaMarie\_65
- Track 49 : Capybara\_69, Gravy\_67, Tanis\_68, Magel\_69, Kerry\_67, Roney\_68, Odesza\_67, Gill\_68
- Track 50 : Avazak\_69, Captrips\_69
- Track 51 : Conley\_67
- Track 52 : Kenosha\_65
- Track 53 : Jodelie19\_64, TenaciousP\_71
- Track 54 : Crocheter\_66
- Track 55 : Fazel\_73
- Track 56 : OhMyWard\_65
- Track 57 : Burley\_66, Phepper\_67
- Track 58 : Secretariat\_66
- Track 59 : Untouchable\_68
- Track 60 : Artorias\_68, FortCran\_72
- Track 61 : OlgasClover\_67
- Track 62 : Hortihabitatio\_68
- Track 63 : Nadmeg\_67, Vardy\_65, Runhaar\_66
- Track 64 : BluerMoon\_67
- Track 65 : Mossy\_69
- Track 66 : Eddiemania\_66
- Track 67 : Figliar\_64
- Track 68 : Zeph\_70, Hydrus\_68
- Track 69 : Aflac\_65
- Track 70 : Petite\_69
- Track 71 : Perkunas\_71
- Track 72 : Madvan\_65
- Track 73 : Rickmore\_63, Duffington\_64
- Track 74 : Chikenjars\_64
- Track 75 : Schwartz33\_68
- Track 76 : Pherobrine\_69
- Track 77 : DizzyRudy\_58, Damascus\_54
- Track 78 : Camille\_52
- Track 79 : Count\_79
- Track 80 : Sunny4976\_62, Jazzy4900\_63
- Track 81 : Arzan\_64
- Track 82 : Paella\_118, Qui\_118, Elver\_117
- Track 83 : Serenabean\_57

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

The start number called the most often in the published annotations is 24, it was called in 60 of the 114 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Aflac\_65, AlainaMarie\_65, Annihilus\_46, Arcadia\_68, Artorias\_68, Arzan\_64, Avazak\_69, BenitoAntonio\_66, Benllo\_68, Bil0\_44, BluerMoon\_67, Burley\_66, Captrips\_69, Capybara\_69, Cheesy\_68, Chikenjars\_64, Circum\_69, Correa\_66, Crocheter\_66, Doxi13\_47, Duffington\_64, Dynamite\_68, Eddiemania\_66, Elsa\_68, EndAve\_67, Figliar\_64, FortCran\_72, Gill\_68, GoCrazy\_65, GoblinVoyage\_46, Gravy\_67, Hankly\_67, Heisenberger\_67, HotFries\_45, Hydrus\_68, JEGGS\_67, Jazzy4900\_63, Jodelie19\_64, Kardesai\_68, KeaneyLin\_64, Kenosha\_65, Kerry\_67, Madamato\_69, Madvan\_65, Magel\_69, Mooshroom\_68, Moozy\_45, Mudcat\_64, Nadmeg\_67, NapoleonB\_69, Nason\_68, Nithya\_66, Odesza\_67, OlgasClover\_67, Pepy6\_077, Phepper\_67, Pherobrine\_69, PherryCruz\_45, Poco6\_075, RavenPuff\_46, Rickmore\_63, Roney\_68, Runhaar\_66, Scap1\_45, Schwartz33\_68, Secretariat\_66, SheRa\_46, Sunny4976\_62, Tanis\_68, TenaciousP\_71, Tribby\_71, Untouchable\_68, Vardy\_65, Xenomorph\_64, Zeph\_70,

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

- 

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

- AreFloNak\_63, Argan\_63, BarbieDoll\_70, Breylor17\_60, BronxBay\_64, Brunswick\_60, Camille\_52, CapnMurica\_58, CastorTray\_64, Caterpillar\_60, Conley\_67, Count\_79, Damascus\_54, Darby\_59, DevitoJr\_60, DizzyRudy\_58, Djungelskog\_63, DoctorPepper\_64, Egad\_64, ElephantMan\_60, Elver\_117, Fazel\_73, GantcherGoblin\_64, Giantsbane\_64, Gordon\_58, Hortihabitatio\_68, Ingrid\_67, Inked\_66, Issa\_61, Leathea\_66, Lewando\_69, LibertyBell\_55, LilHuddy\_65, Linda\_64, Loretta\_64, Makai\_64, MediumFry\_61, Michelle\_64, MiniBagel\_58, Mossy\_69, MrAaronian\_64, Nightmare\_62, Niktson\_60, Nivinsha\_62, OhMyWard\_65, Paella\_118, Perkunas\_71, Petite\_69, Phaby\_65, ProfFrink\_65, Qui\_118, Raunak\_65, Renaldo\_72, RosaAsantewaa\_43, Salk\_64, ScienceWizSam\_61, Serenabean\_57, Shepard\_66, Shiba\_63, Sloopyjoe\_64, Sporto\_63, StarLord\_64, Stayer\_64, Synopsis\_59, Tatanka\_57, Teacup\_61, Tenno\_61, Tokki\_69, Truckee\_62, Trustiboi\_60, Uzumaki\_63, Zeina\_68,

## **Summary by start number:**

Start 18:

- Found in 5 of 147 ( 3.4% ) of genes in pham
- Manual Annotations of this start: 4 of 114
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Caterpillar\_60 (AU4), Ingrid\_67 (AU3), Loretta\_64 (AU3), MediumFry\_61 (AU4), Phaby\_65 (AU2),

Start 19:

- Found in 3 of 147 ( 2.0% ) of genes in pham
- Manual Annotations of this start: 3 of 114
- Called 100.0% of time when present

- Phage (with cluster) where this start called: Camille\_52 (EL), Damascus\_54 (EL), DizzyRudy\_58 (EL),

#### Start 20:

- Found in 12 of 147 ( 8.2% ) of genes in pham
- Manual Annotations of this start: 8 of 114
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Argan\_63 (AU6), BarbieDoll\_70 (AU6), Elver\_117 (FK), GantcherGoblin\_64 (AU6), Giantsbane\_64 (AU2), Leatheia\_66 (AU6), Lewando\_69 (AU6), Paella\_118 (FK), Qui\_118 (FK), Renaldo\_72 (AU6), Uzumaki\_63 (AU6), Zeina\_68 (AU6),

#### Start 21:

- Found in 40 of 147 ( 27.2% ) of genes in pham
- Manual Annotations of this start: 32 of 114
- Called 100.0% of time when present
- Phage (with cluster) where this start called: AreFloNak\_63 (AU1), Breylor17\_60 (AU1), BronxBay\_64 (AW), Brunswick\_60 (AU1), CapnMurica\_58 (AU1), CastorTray\_64 (AU1), Darby\_59 (AU1), DevitoJr\_60 (AU1), Djungelskog\_63 (AW), DoctorPepper\_64 (AW), Egad\_64 (AW), ElephantMan\_60 (AU1), Gordon\_58 (AU1), Issa\_61 (AU1), LilHuddy\_65 (AU2), Linda\_64 (AW), Makai\_64 (AU5), Michelle\_64 (AW), MiniBagel\_58 (AU1), MrAaronian\_64 (AW), Nightmare\_62 (AU1), Niktson\_60 (AU1), Nivinsha\_62 (AU1), ProfFrink\_65 (AW), Raunak\_65 (AW), Salk\_64 (AW), ScienceWizSam\_61 (AU1), Shepard\_66 (AU2), Shiba\_63 (AW), Sloopyjoe\_64 (AW), Sporto\_63 (AW), StarLord\_64 (AW), Stayer\_64 (AW), Synepsis\_59 (AU1), Tatanka\_57 (AU1), Teacup\_61 (AU1), Tenno\_61 (AU1), Tokki\_69 (AU2), Truckee\_62 (AU5), Trustiboi\_60 (AU1),

#### Start 22:

- Found in 3 of 147 ( 2.0% ) of genes in pham
- Manual Annotations of this start: 2 of 114
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Count\_79 (EL), Inked\_66 (AU), Serenabean\_57 (singleton),

#### Start 23:

- Found in 7 of 147 ( 4.8% ) of genes in pham
- Manual Annotations of this start: 3 of 114
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Conley\_67 (DJ), Fazel\_73 (DJ), Hortihabitatio\_68 (DJ), Mossy\_69 (DJ), OhMyWard\_65 (DJ), Perkunas\_71 (DJ), Petito\_69 (DJ),

#### Start 24:

- Found in 75 of 147 ( 51.0% ) of genes in pham
- Manual Annotations of this start: 60 of 114
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Aflac\_65 (DJ), AlainaMarie\_65 (DJ), Annihilus\_46 (BI2), Arcadia\_68 (AM), Artorias\_68 (DJ), Arzan\_64 (FI), Avazak\_69 (DJ), BenitoAntonio\_66 (AM), Benllo\_68 (AM), Bilo\_44 (BI2), BluerMoon\_67 (DJ), Burley\_66 (DJ), Captrips\_69 (DJ), Copybara\_69 (DJ), Cheesy\_68 (AM), Chikenjars\_64 (DJ), Circum\_69 (AM), Correa\_66 (AM), Crocheter\_66 (DJ), Doxi13\_47 (BI2), Duffington\_64 (DJ), Dynamite\_68 (AM), Eddiemania\_66 (DJ),

Elsa\_68 (AM), EndAve\_67 (DJ), Figliar\_64 (DJ), FortCran\_72 (DJ), Gill\_68 (DJ), GoCrazy\_65 (AM), GoblinVoyage\_46 (BI2), Gravy\_67 (DJ), Hankly\_67 (AM), Heisenberger\_67 (AM), HotFries\_45 (BI2), Hydrus\_68 (DJ), JEGGS\_67 (AM), Jazzy4900\_63 (FI), Jodelie19\_64 (DJ), Kardesai\_68 (AM), KeaneyLin\_64 (AM), Kenosha\_65 (DJ), Kerry\_67 (DJ), Madamato\_69 (BI1), Madvan\_65 (DJ), Magel\_69 (DJ), Mooshroom\_68 (AM), Moozy\_45 (BI2), Mudcat\_64 (AM), Nadmeg\_67 (DJ), NapoleonB\_69 (AM), Nason\_68 (AM), Nithya\_66 (DJ), Odesza\_67 (DJ), OlgasClover\_67 (DJ), Pepy6\_077 (CC), Phepper\_67 (DJ), Pherobrine\_69 (DJ), PherryCruz\_45 (BI2), Poco6\_075 (CC), RavenPuff\_46 (BI2), Rickmore\_63 (DJ), Roney\_68 (DJ), Runhaar\_66 (DJ), Scap1\_45 (BI2), Schwartz33\_68 (DJ), Secretariat\_66 (DJ), SheRa\_46 (BI2), Sunny4976\_62 (FI), Tanis\_68 (DJ), TenaciousP\_71 (DJ), Tribby\_71 (AM), Untouchable\_68 (DJ), Vardy\_65 (DJ), Xenomorph\_64 (AM), Zeph\_70 (DJ),

Start 25:

- Found in 1 of 147 ( 0.7% ) of genes in pham
- Manual Annotations of this start: 1 of 114
- Called 100.0% of time when present
- Phage (with cluster) where this start called: LibertyBell\_55 (BI3),

Start 26:

- Found in 1 of 147 ( 0.7% ) of genes in pham
- Manual Annotations of this start: 1 of 114
- Called 100.0% of time when present
- Phage (with cluster) where this start called: RosaAsantewaa\_43 (BI2),

### Summary by clusters:

There are 18 clusters represented in this pham: EL, singleton, DJ, AU5, CC, AM, AU1, AU3, AU2, AU, AU4, AW, AU6, FI, FK, BI2, BI3, BI1,

Info for manual annotations of cluster AM:

- Start number 24 was manually annotated 18 times for cluster AM.

Info for manual annotations of cluster AU:

- Start number 22 was manually annotated 1 time for cluster AU.

Info for manual annotations of cluster AU1:

- Start number 21 was manually annotated 15 times for cluster AU1.

Info for manual annotations of cluster AU2:

- Start number 20 was manually annotated 1 time for cluster AU2.
- Start number 21 was manually annotated 3 times for cluster AU2.

Info for manual annotations of cluster AU3:

- Start number 18 was manually annotated 2 times for cluster AU3.

Info for manual annotations of cluster AU4:

- Start number 18 was manually annotated 2 times for cluster AU4.

Info for manual annotations of cluster AU5:

- Start number 21 was manually annotated 2 times for cluster AU5.

Info for manual annotations of cluster AU6:

- Start number 20 was manually annotated 5 times for cluster AU6.

Info for manual annotations of cluster AW:

- Start number 21 was manually annotated 12 times for cluster AW.

Info for manual annotations of cluster BI1:

- Start number 24 was manually annotated 1 time for cluster BI1.

Info for manual annotations of cluster BI2:

- Start number 24 was manually annotated 10 times for cluster BI2.
- Start number 26 was manually annotated 1 time for cluster BI2.

Info for manual annotations of cluster BI3:

- Start number 25 was manually annotated 1 time for cluster BI3.

Info for manual annotations of cluster DJ:

- Start number 23 was manually annotated 3 times for cluster DJ.
- Start number 24 was manually annotated 31 times for cluster DJ.

Info for manual annotations of cluster EL:

- Start number 19 was manually annotated 3 times for cluster EL.
- Start number 22 was manually annotated 1 time for cluster EL.

Info for manual annotations of cluster FK:

- Start number 20 was manually annotated 2 times for cluster FK.

### ***Gene Information:***

Gene: Aflac\_65 Start: 46978, Stop: 47559, Start Num: 24

Candidate Starts for Aflac\_65:

(Start: 24 @46978 has 60 MA's), (33, 47053), (54, 47245), (55, 47248), (75, 47335), (85, 47410),

Gene: AlainaMarie\_65 Start: 47020, Stop: 47601, Start Num: 24

Candidate Starts for AlainaMarie\_65:

(6, 46906), (13, 46954), (Start: 24 @47020 has 60 MA's), (33, 47095), (54, 47287), (55, 47290), (76, 47398), (79, 47428), (85, 47452),

Gene: Annihilus\_46 Start: 35097, Stop: 35678, Start Num: 24

Candidate Starts for Annihilus\_46:

(3, 34917), (9, 35004), (Start: 24 @35097 has 60 MA's), (31, 35154), (35, 35220), (58, 35385), (65, 35412), (76, 35472), (81, 35514), (83, 35520), (91, 35574), (94, 35619), (98, 35661),

Gene: Arcadia\_68 Start: 42977, Stop: 43471, Start Num: 24

Candidate Starts for Arcadia\_68:

(4, 42839), (8, 42887), (Start: 24 @42977 has 60 MA's), (34, 43073), (41, 43124), (52, 43232), (53, 43235), (60, 43265), (62, 43271), (79, 43376),

Gene: AreFloNak\_63 Start: 43375, Stop: 43950, Start Num: 21



Candidate Starts for AreFloNak\_63:

(Start: 21 @43375 has 32 MA's), (28, 43411), (40, 43522), (41, 43525), (55, 43639), (63, 43693), (65, 43702), (84, 43813), (97, 43930),

Gene: Argan\_63 Start: 42106, Stop: 42693, Start Num: 20

Candidate Starts for Argan\_63:

(Start: 20 @42106 has 8 MA's), (31, 42169), (36, 42235), (41, 42262), (45, 42289), (55, 42382), (63, 42421), (88, 42562), (91, 42592), (97, 42646),

Gene: Artorias\_68 Start: 47461, Stop: 48048, Start Num: 24

Candidate Starts for Artorias\_68:

(Start: 24 @47461 has 60 MA's), (28, 47485), (33, 47536), (41, 47599), (51, 47710), (55, 47731), (72, 47806), (73, 47812), (76, 47839), (79, 47869),

Gene: Arzan\_64 Start: 42782, Stop: 43357, Start Num: 24

Candidate Starts for Arzan\_64:

(Start: 24 @42782 has 60 MA's), (43, 42938), (47, 43004), (55, 43049), (65, 43097), (78, 43184),

Gene: Avazak\_69 Start: 47788, Stop: 48375, Start Num: 24

Candidate Starts for Avazak\_69:

(Start: 24 @47788 has 60 MA's), (28, 47812), (33, 47863), (41, 47926), (55, 48058), (72, 48133), (73, 48139), (76, 48166), (79, 48196), (91, 48268),

Gene: BarbieDoll\_70 Start: 43789, Stop: 44373, Start Num: 20

Candidate Starts for BarbieDoll\_70:

(Start: 20 @43789 has 8 MA's), (41, 43942), (45, 43969), (55, 44062), (63, 44101), (79, 44200), (88, 44242), (91, 44272), (97, 44326),

Gene: BenitoAntonio\_66 Start: 42012, Stop: 42506, Start Num: 24

Candidate Starts for BenitoAntonio\_66:

(Start: 24 @42012 has 60 MA's), (34, 42108), (35, 42129), (36, 42132), (41, 42159), (52, 42267), (62, 42306), (69, 42333), (76, 42381),

Gene: Benllo\_68 Start: 42690, Stop: 43184, Start Num: 24

Candidate Starts for Benllo\_68:

(Start: 24 @42690 has 60 MA's), (34, 42786), (35, 42807), (36, 42810), (41, 42837), (52, 42945), (62, 42984), (69, 43011), (76, 43059),

Gene: Bilo\_44 Start: 35251, Stop: 35868, Start Num: 24

Candidate Starts for Bilo\_44:

(3, 35068), (9, 35158), (Start: 24 @35251 has 60 MA's), (31, 35308), (35, 35374), (65, 35566), (76, 35626), (81, 35668), (83, 35674), (91, 35728),

Gene: BluerMoon\_67 Start: 47016, Stop: 47597, Start Num: 24

Candidate Starts for BluerMoon\_67:

(Start: 24 @47016 has 60 MA's), (33, 47091), (51, 47265), (54, 47283), (55, 47286), (75, 47373), (76, 47394), (79, 47424), (85, 47448),

Gene: Breylor17\_60 Start: 43951, Stop: 44526, Start Num: 21

Candidate Starts for Breylor17\_60:

(Start: 21 @43951 has 32 MA's), (28, 43987), (40, 44098), (41, 44101), (55, 44215), (63, 44269), (65, 44278), (67, 44281), (84, 44389),

Gene: BronxBay\_64 Start: 41915, Stop: 42493, Start Num: 21

Candidate Starts for BronxBay\_64:

(Start: 21 @41915 has 32 MA's), (29, 41963), (30, 41969), (32, 41987), (41, 42065), (42, 42068), (46, 42095), (55, 42188), (56, 42191), (63, 42227), (71, 42254), (87, 42362),

Gene: Brunswick\_60 Start: 43248, Stop: 43823, Start Num: 21

Candidate Starts for Brunswick\_60:

(Start: 21 @43248 has 32 MA's), (28, 43284), (40, 43395), (41, 43398), (55, 43512), (63, 43566), (65, 43575), (67, 43578), (84, 43686), (97, 43803),

Gene: Burley\_66 Start: 46701, Stop: 47285, Start Num: 24

Candidate Starts for Burley\_66:

(17, 46683), (Start: 24 @46701 has 60 MA's), (33, 46776), (54, 46968), (55, 46971), (60, 46998), (79, 47109), (85, 47133),

Gene: Camille\_52 Start: 38577, Stop: 39089, Start Num: 19

Candidate Starts for Camille\_52:

(Start: 19 @38577 has 3 MA's), (41, 38727), (48, 38805), (89, 39030),

Gene: CapnMurica\_58 Start: 44140, Stop: 44715, Start Num: 21

Candidate Starts for CapnMurica\_58:

(Start: 21 @44140 has 32 MA's), (28, 44176), (40, 44287), (41, 44290), (63, 44458), (65, 44467), (67, 44470), (84, 44578), (87, 44593), (97, 44695),

Gene: Captrips\_69 Start: 46936, Stop: 47523, Start Num: 24

Candidate Starts for Captrips\_69:

(Start: 24 @46936 has 60 MA's), (28, 46960), (33, 47011), (41, 47074), (55, 47206), (72, 47281), (73, 47287), (76, 47314), (79, 47344), (91, 47416),

Gene: Capybara\_69 Start: 47267, Stop: 47854, Start Num: 24

Candidate Starts for Capybara\_69:

(Start: 24 @47267 has 60 MA's), (28, 47291), (33, 47342), (35, 47375), (41, 47405), (51, 47516), (55, 47537), (72, 47612), (76, 47645), (79, 47675), (90, 47732), (91, 47747),

Gene: CastorTray\_64 Start: 44139, Stop: 44714, Start Num: 21

Candidate Starts for CastorTray\_64:

(Start: 21 @44139 has 32 MA's), (28, 44175), (40, 44286), (41, 44289), (55, 44403), (63, 44457), (65, 44466), (67, 44469), (84, 44577),

Gene: Caterpillar\_60 Start: 43063, Stop: 43644, Start Num: 18

Candidate Starts for Caterpillar\_60:

(Start: 18 @43063 has 4 MA's), (28, 43105), (40, 43216), (41, 43219), (65, 43396), (84, 43507), (87, 43522), (97, 43624),

Gene: Cheesy\_68 Start: 42204, Stop: 42698, Start Num: 24

Candidate Starts for Cheesy\_68:

(Start: 24 @42204 has 60 MA's), (41, 42351), (52, 42459), (60, 42492), (62, 42498), (79, 42603),

Gene: Chikenjars\_64 Start: 47040, Stop: 47621, Start Num: 24

Candidate Starts for Chikenjars\_64:

(Start: 24 @47040 has 60 MA's), (33, 47115), (54, 47307), (55, 47310), (75, 47397), (76, 47418), (85, 47472),

Gene: Circum\_69 Start: 42780, Stop: 43274, Start Num: 24

Candidate Starts for Circum\_69:

(Start: 24 @42780 has 60 MA's), (34, 42876), (35, 42897), (36, 42900), (41, 42927), (52, 43035), (62, 43074), (69, 43101), (76, 43149),

Gene: Conley\_67 Start: 48039, Stop: 48629, Start Num: 23

Candidate Starts for Conley\_67:

(16, 48018), (Start: 23 @48039 has 3 MA's), (28, 48063), (33, 48114), (35, 48147), (41, 48177), (54, 48306), (55, 48309), (72, 48384), (76, 48417), (79, 48447), (91, 48519),

Gene: Correa\_66 Start: 41778, Stop: 42272, Start Num: 24

Candidate Starts for Correa\_66:

(Start: 24 @41778 has 60 MA's), (41, 41925), (52, 42033), (60, 42066), (62, 42072), (79, 42177),

Gene: Count\_79 Start: 54971, Stop: 55534, Start Num: 22

Candidate Starts for Count\_79:

(Start: 22 @54971 has 2 MA's), (44, 55145), (47, 55199), (49, 55211), (55, 55241), (63, 55280), (65, 55289), (79, 55382), (97, 55514),

Gene: Crocheter\_66 Start: 47141, Stop: 47725, Start Num: 24

Candidate Starts for Crocheter\_66:

(Start: 24 @47141 has 60 MA's), (33, 47216), (51, 47390), (55, 47411), (75, 47498), (76, 47519), (79, 47549), (85, 47573),

Gene: Damascus\_54 Start: 40213, Stop: 40734, Start Num: 19

Candidate Starts for Damascus\_54:

(Start: 19 @40213 has 3 MA's), (41, 40363), (74, 40564), (77, 40606), (89, 40666),

Gene: Darby\_59 Start: 43186, Stop: 43761, Start Num: 21

Candidate Starts for Darby\_59:

(Start: 21 @43186 has 32 MA's), (28, 43222), (40, 43333), (41, 43336), (55, 43450), (63, 43504), (65, 43513), (67, 43516), (84, 43624),

Gene: DevitoJr\_60 Start: 43572, Stop: 44147, Start Num: 21

Candidate Starts for DevitoJr\_60:

(Start: 21 @43572 has 32 MA's), (28, 43608), (40, 43719), (41, 43722), (55, 43836), (63, 43890), (65, 43899), (67, 43902), (84, 44010),

Gene: DizzyRudy\_58 Start: 40100, Stop: 40621, Start Num: 19

Candidate Starts for DizzyRudy\_58:

(Start: 19 @40100 has 3 MA's), (41, 40250), (74, 40451), (77, 40493), (89, 40553),

Gene: Djungelskog\_63 Start: 41914, Stop: 42492, Start Num: 21

Candidate Starts for Djungelskog\_63:

(Start: 21 @41914 has 32 MA's), (29, 41962), (30, 41968), (32, 41986), (41, 42064), (42, 42067), (46, 42094), (55, 42187), (56, 42190), (63, 42226), (71, 42253), (87, 42361),

Gene: DoctorPepper\_64 Start: 41619, Stop: 42197, Start Num: 21

Candidate Starts for DoctorPepper\_64:

(Start: 21 @41619 has 32 MA's), (29, 41667), (30, 41673), (32, 41691), (41, 41769), (42, 41772), (46, 41799), (55, 41892), (56, 41895), (63, 41931), (71, 41958), (87, 42066),

Gene: Doxi13\_47 Start: 35297, Stop: 35878, Start Num: 24

Candidate Starts for Doxi13\_47:

(9, 35204), (Start: 24 @35297 has 60 MA's), (31, 35354), (35, 35420), (58, 35585), (65, 35612), (76, 35672), (81, 35714), (83, 35720), (91, 35774), (98, 35861),

Gene: Duffington\_64 Start: 46736, Stop: 47317, Start Num: 24

Candidate Starts for Duffington\_64:

(17, 46718), (Start: 24 @46736 has 60 MA's), (33, 46811), (51, 46985), (54, 47003), (55, 47006), (75, 47093), (76, 47114), (79, 47144), (85, 47168),

Gene: Dynamite\_68 Start: 42793, Stop: 43287, Start Num: 24

Candidate Starts for Dynamite\_68:

(Start: 24 @42793 has 60 MA's), (34, 42889), (35, 42910), (36, 42913), (41, 42940), (52, 43048), (62, 43087), (69, 43114), (76, 43162),

Gene: Eddiemania\_66 Start: 47892, Stop: 48476, Start Num: 24

Candidate Starts for Eddiemania\_66:

(17, 47874), (Start: 24 @47892 has 60 MA's), (33, 47967), (54, 48159), (55, 48162), (67, 48213), (75, 48249), (76, 48270), (79, 48300), (85, 48324),

Gene: Egad\_64 Start: 41910, Stop: 42488, Start Num: 21

Candidate Starts for Egad\_64:

(Start: 21 @41910 has 32 MA's), (29, 41958), (30, 41964), (32, 41982), (41, 42060), (42, 42063), (46, 42090), (55, 42183), (63, 42222), (71, 42249), (87, 42357),

Gene: ElephantMan\_60 Start: 43878, Stop: 44453, Start Num: 21

Candidate Starts for ElephantMan\_60:

(Start: 21 @43878 has 32 MA's), (28, 43914), (40, 44025), (41, 44028), (55, 44142), (63, 44196), (65, 44205), (67, 44208), (84, 44316), (87, 44331), (97, 44433),

Gene: Elsa\_68 Start: 42977, Stop: 43471, Start Num: 24

Candidate Starts for Elsa\_68:

(4, 42839), (8, 42887), (Start: 24 @42977 has 60 MA's), (34, 43073), (41, 43124), (52, 43232), (53, 43235), (60, 43265), (62, 43271), (79, 43376),

Gene: Elver\_117 Start: 65179, Stop: 65781, Start Num: 20

Candidate Starts for Elver\_117:

(7, 65089), (Start: 20 @65179 has 8 MA's), (41, 65332), (63, 65500), (79, 65599), (82, 65614), (84, 65620),

Gene: EndAve\_67 Start: 47204, Stop: 47785, Start Num: 24

Candidate Starts for EndAve\_67:

(6, 47090), (13, 47138), (Start: 24 @47204 has 60 MA's), (33, 47279), (54, 47471), (55, 47474), (76, 47582), (79, 47612), (85, 47636),

Gene: Fazel\_73 Start: 47551, Stop: 48135, Start Num: 23

Candidate Starts for Fazel\_73:

(Start: 23 @47551 has 3 MA's), (33, 47626), (38, 47677), (50, 47797), (55, 47821), (69, 47881), (79, 47959), (85, 47983),

Gene: Figliar\_64 Start: 47046, Stop: 47627, Start Num: 24

Candidate Starts for Figliar\_64:

(Start: 24 @47046 has 60 MA's), (33, 47121), (54, 47313), (55, 47316), (75, 47403), (76, 47424), (79, 47454), (85, 47478),

Gene: FortCran\_72 Start: 47461, Stop: 48048, Start Num: 24

Candidate Starts for FortCran\_72:

(Start: 24 @47461 has 60 MA's), (28, 47485), (33, 47536), (41, 47599), (51, 47710), (55, 47731), (72, 47806), (73, 47812), (76, 47839), (79, 47869),

Gene: GantcherGoblin\_64 Start: 42162, Stop: 42749, Start Num: 20

Candidate Starts for GantcherGoblin\_64:

(Start: 20 @42162 has 8 MA's), (31, 42225), (36, 42291), (41, 42318), (45, 42345), (55, 42438), (63, 42477), (88, 42618), (91, 42648), (97, 42702),

Gene: Giantsbane\_64 Start: 42742, Stop: 43335, Start Num: 20

Candidate Starts for Giantsbane\_64:

(Start: 20 @42742 has 8 MA's), (28, 42781), (41, 42895), (65, 43072), (84, 43183),

Gene: Gill\_68 Start: 47279, Stop: 47866, Start Num: 24

Candidate Starts for Gill\_68:

(Start: 24 @47279 has 60 MA's), (28, 47303), (33, 47354), (35, 47387), (41, 47417), (51, 47528), (55, 47549), (72, 47624), (76, 47657), (79, 47687), (90, 47744), (91, 47759),

Gene: GoCrazy\_65 Start: 42237, Stop: 42731, Start Num: 24

Candidate Starts for GoCrazy\_65:

(Start: 24 @42237 has 60 MA's), (34, 42333), (36, 42357), (41, 42384), (45, 42411), (52, 42492), (62, 42531), (69, 42558), (76, 42606),

Gene: GoblinVoyage\_46 Start: 35085, Stop: 35666, Start Num: 24

Candidate Starts for GoblinVoyage\_46:

(9, 34992), (Start: 24 @35085 has 60 MA's), (31, 35142), (35, 35208), (58, 35373), (65, 35400), (76, 35460), (81, 35502), (83, 35508), (91, 35562), (98, 35649),

Gene: Gordon\_58 Start: 44058, Stop: 44633, Start Num: 21

Candidate Starts for Gordon\_58:

(Start: 21 @44058 has 32 MA's), (28, 44094), (40, 44205), (41, 44208), (55, 44322), (63, 44376), (65, 44385), (67, 44388), (84, 44496), (87, 44511),

Gene: Gravy\_67 Start: 46957, Stop: 47544, Start Num: 24

Candidate Starts for Gravy\_67:

(Start: 24 @46957 has 60 MA's), (28, 46981), (33, 47032), (35, 47065), (41, 47095), (51, 47206), (55, 47227), (72, 47302), (76, 47335), (79, 47365), (90, 47422), (91, 47437),

Gene: Hankly\_67 Start: 41861, Stop: 42355, Start Num: 24

Candidate Starts for Hankly\_67:

(Start: 24 @41861 has 60 MA's), (34, 41957), (35, 41978), (36, 41981), (41, 42008), (52, 42116), (62, 42155), (69, 42182), (76, 42230),

Gene: Heisenberger\_67 Start: 42199, Stop: 42693, Start Num: 24

Candidate Starts for Heisenberger\_67:

(Start: 24 @42199 has 60 MA's), (34, 42295), (36, 42319), (41, 42346), (52, 42454), (62, 42493), (69, 42520), (76, 42568),

Gene: Hortihabitatio\_68 Start: 47935, Stop: 48519, Start Num: 23

Candidate Starts for Hortihabitatio\_68:

(Start: 23 @47935 has 3 MA's), (33, 48010), (38, 48061), (55, 48205), (69, 48265), (79, 48343), (85, 48367), (98, 48502),

Gene: HotFries\_45 Start: 35274, Stop: 35855, Start Num: 24

Candidate Starts for HotFries\_45:

(9, 35181), (Start: 24 @35274 has 60 MA's), (31, 35331), (35, 35397), (58, 35562), (65, 35589), (76, 35649), (81, 35691), (83, 35697), (91, 35751), (94, 35796), (96, 35811), (98, 35838),

Gene: Hydrus\_68 Start: 47867, Stop: 48451, Start Num: 24

Candidate Starts for Hydrus\_68:

(6, 47753), (13, 47801), (17, 47849), (Start: 24 @47867 has 60 MA's), (33, 47942), (54, 48134), (55, 48137), (76, 48245), (79, 48275), (85, 48299),

Gene: Ingrid\_67 Start: 43933, Stop: 44514, Start Num: 18

Candidate Starts for Ingrid\_67:

(Start: 18 @43933 has 4 MA's), (28, 43975), (40, 44086), (41, 44089), (63, 44257), (65, 44266), (84, 44377),

Gene: Inked\_66 Start: 44617, Stop: 45189, Start Num: 22

Candidate Starts for Inked\_66:

(Start: 22 @44617 has 2 MA's), (28, 44650), (40, 44761), (41, 44764), (65, 44941), (84, 45052),

Gene: Issa\_61 Start: 43234, Stop: 43809, Start Num: 21

Candidate Starts for Issa\_61:

(Start: 21 @43234 has 32 MA's), (28, 43270), (40, 43381), (41, 43384), (63, 43552), (65, 43561), (67, 43564), (84, 43672), (87, 43687), (97, 43789),

Gene: JEGGS\_67 Start: 42278, Stop: 42772, Start Num: 24

Candidate Starts for JEGGS\_67:

(Start: 24 @42278 has 60 MA's), (34, 42374), (36, 42398), (41, 42425), (52, 42533), (62, 42572), (69, 42599), (76, 42647),

Gene: Jazzy4900\_63 Start: 43553, Stop: 44128, Start Num: 24

Candidate Starts for Jazzy4900\_63:

(12, 43484), (Start: 24 @43553 has 60 MA's), (43, 43709), (55, 43820), (65, 43868), (73, 43901), (78, 43955), (82, 43973),

Gene: Jodelie19\_64 Start: 48450, Stop: 49031, Start Num: 24

Candidate Starts for Jodelie19\_64:

(Start: 24 @48450 has 60 MA's), (33, 48525), (51, 48699), (55, 48720), (75, 48807), (76, 48828), (79, 48858), (85, 48882),

Gene: Kardesai\_68 Start: 42587, Stop: 43081, Start Num: 24

Candidate Starts for Kardesai\_68:

(Start: 24 @42587 has 60 MA's), (34, 42683), (35, 42704), (36, 42707), (41, 42734), (52, 42842), (62, 42881), (69, 42908), (76, 42956),

Gene: KeaneyLin\_64 Start: 42237, Stop: 42731, Start Num: 24

Candidate Starts for KeaneyLin\_64:

(Start: 24 @42237 has 60 MA's), (34, 42333), (36, 42357), (41, 42384), (45, 42411), (52, 42492), (62, 42531), (69, 42558), (76, 42606),

Gene: Kenosha\_65 Start: 47320, Stop: 47904, Start Num: 24

Candidate Starts for Kenosha\_65:

(17, 47302), (Start: 24 @47320 has 60 MA's), (33, 47395), (54, 47587), (55, 47590), (60, 47617), (76, 47698), (79, 47728), (85, 47752),

Gene: Kerry\_67 Start: 46957, Stop: 47544, Start Num: 24

Candidate Starts for Kerry\_67:

(Start: 24 @46957 has 60 MA's), (28, 46981), (33, 47032), (35, 47065), (41, 47095), (51, 47206), (55, 47227), (72, 47302), (76, 47335), (79, 47365), (90, 47422), (91, 47437),

Gene: Leathea\_66 Start: 41902, Stop: 42486, Start Num: 20

Candidate Starts for Leathea\_66:

(5, 41782), (11, 41833), (14, 41848), (Start: 20 @41902 has 8 MA's), (41, 42055), (45, 42082), (55, 42175), (63, 42214), (88, 42355), (91, 42385), (97, 42439),

Gene: Lewando\_69 Start: 43861, Stop: 44445, Start Num: 20

Candidate Starts for Lewando\_69:

(Start: 20 @43861 has 8 MA's), (41, 44014), (45, 44041), (55, 44134), (63, 44173), (88, 44314), (91, 44344), (97, 44398),

Gene: LibertyBell\_55 Start: 39572, Stop: 40195, Start Num: 25

Candidate Starts for LibertyBell\_55:

(Start: 25 @39572 has 1 MA's), (27, 39599), (41, 39716), (64, 39902), (68, 39917), (77, 39986), (99, 40187),

Gene: LilHuddy\_65 Start: 43852, Stop: 44442, Start Num: 21

Candidate Starts for LilHuddy\_65:

(Start: 21 @43852 has 32 MA's), (28, 43888), (41, 44002), (63, 44170), (65, 44179), (84, 44290),

Gene: Linda\_64 Start: 41912, Stop: 42490, Start Num: 21

Candidate Starts for Linda\_64:

(Start: 21 @41912 has 32 MA's), (29, 41960), (30, 41966), (32, 41984), (41, 42062), (42, 42065), (46, 42092), (55, 42185), (56, 42188), (63, 42224), (71, 42251), (87, 42359),

Gene: Loretta\_64 Start: 43933, Stop: 44514, Start Num: 18

Candidate Starts for Loretta\_64:

(Start: 18 @43933 has 4 MA's), (28, 43975), (40, 44086), (41, 44089), (63, 44257), (65, 44266), (84, 44377),

Gene: Madamoto\_69 Start: 44307, Stop: 44897, Start Num: 24

Candidate Starts for Madamoto\_69:

(Start: 24 @44307 has 60 MA's), (27, 44340), (33, 44394), (35, 44427), (38, 44445), (41, 44457), (45, 44484), (55, 44574), (57, 44583), (61, 44607), (66, 44628), (67, 44631), (80, 44727),

Gene: Madvan\_65 Start: 46753, Stop: 47337, Start Num: 24

Candidate Starts for Madvan\_65:

(6, 46639), (13, 46687), (17, 46735), (Start: 24 @46753 has 60 MA's), (33, 46828), (55, 47023), (75, 47110), (76, 47131), (79, 47161), (85, 47185),

Gene: Magel\_69 Start: 47194, Stop: 47781, Start Num: 24

Candidate Starts for Magel\_69:

(Start: 24 @47194 has 60 MA's), (28, 47218), (33, 47269), (35, 47302), (41, 47332), (51, 47443), (55, 47464), (72, 47539), (76, 47572), (79, 47602), (90, 47659), (91, 47674),

Gene: Makai\_64 Start: 43998, Stop: 44588, Start Num: 21

Candidate Starts for Makai\_64:

(Start: 21 @43998 has 32 MA's), (28, 44034), (41, 44148), (63, 44316), (65, 44325), (84, 44436),

Gene: MediumFry\_61 Start: 43358, Stop: 43939, Start Num: 18

Candidate Starts for MediumFry\_61:

(Start: 18 @43358 has 4 MA's), (28, 43400), (40, 43511), (41, 43514), (65, 43691), (84, 43802), (97, 43919),

Gene: Michelle\_64 Start: 41914, Stop: 42492, Start Num: 21

Candidate Starts for Michelle\_64:

(Start: 21 @41914 has 32 MA's), (29, 41962), (30, 41968), (32, 41986), (41, 42064), (42, 42067), (46, 42094), (55, 42187), (56, 42190), (63, 42226), (71, 42253), (87, 42361),

Gene: MiniBagel\_58 Start: 44123, Stop: 44698, Start Num: 21

Candidate Starts for MiniBagel\_58:

(Start: 21 @44123 has 32 MA's), (28, 44159), (40, 44270), (41, 44273), (63, 44441), (65, 44450), (67, 44453), (84, 44561), (87, 44576), (97, 44678),

Gene: Mooshroom\_68 Start: 42587, Stop: 43081, Start Num: 24

Candidate Starts for Mooshroom\_68:

(Start: 24 @42587 has 60 MA's), (34, 42683), (35, 42704), (36, 42707), (41, 42734), (52, 42842), (62, 42881), (69, 42908), (76, 42956),

Gene: Moozy\_45 Start: 35081, Stop: 35662, Start Num: 24

Candidate Starts for Moozy\_45:

(1, 34637), (2, 34640), (9, 34988), (Start: 24 @35081 has 60 MA's), (31, 35138), (35, 35204), (58, 35369), (65, 35396), (76, 35456), (81, 35498), (83, 35504), (91, 35558), (94, 35603), (96, 35618), (98, 35645),

Gene: Mossy\_69 Start: 48724, Stop: 49308, Start Num: 23

Candidate Starts for Mossy\_69:

(Start: 23 @48724 has 3 MA's), (33, 48799), (55, 48994), (69, 49054), (76, 49102), (79, 49132), (85, 49156),

Gene: MrAaronian\_64 Start: 41914, Stop: 42492, Start Num: 21

Candidate Starts for MrAaronian\_64:

(Start: 21 @41914 has 32 MA's), (29, 41962), (30, 41968), (32, 41986), (41, 42064), (42, 42067), (46, 42094), (55, 42187), (56, 42190), (63, 42226), (71, 42253), (87, 42361),

Gene: Mudcat\_64 Start: 43636, Stop: 44130, Start Num: 24

Candidate Starts for Mudcat\_64:

(Start: 24 @43636 has 60 MA's), (34, 43732), (36, 43756), (41, 43783), (52, 43891), (62, 43930), (69, 43957), (76, 44005),

Gene: Nadmeg\_67 Start: 47984, Stop: 48568, Start Num: 24

Candidate Starts for Nadmeg\_67:

(6, 47870), (13, 47918), (17, 47966), (Start: 24 @47984 has 60 MA's), (33, 48059), (55, 48254), (76, 48362), (79, 48392), (85, 48416),

Gene: NapoleonB\_69 Start: 42793, Stop: 43287, Start Num: 24

Candidate Starts for NapoleonB\_69:



(Start: 24 @42793 has 60 MA's), (34, 42889), (35, 42910), (36, 42913), (41, 42940), (52, 43048), (62, 43087), (69, 43114), (76, 43162),

Gene: Nason\_68 Start: 42977, Stop: 43471, Start Num: 24

Candidate Starts for Nason\_68:

(4, 42839), (8, 42887), (Start: 24 @42977 has 60 MA's), (34, 43073), (41, 43124), (52, 43232), (53, 43235), (60, 43265), (62, 43271), (79, 43376),

Gene: Nightmare\_62 Start: 44420, Stop: 44995, Start Num: 21

Candidate Starts for Nightmare\_62:

(Start: 21 @44420 has 32 MA's), (28, 44456), (40, 44567), (41, 44570), (55, 44684), (63, 44738), (65, 44747), (67, 44750), (84, 44858),

Gene: Niktson\_60 Start: 43878, Stop: 44453, Start Num: 21

Candidate Starts for Niktson\_60:

(Start: 21 @43878 has 32 MA's), (28, 43914), (40, 44025), (41, 44028), (55, 44142), (63, 44196), (65, 44205), (67, 44208), (84, 44316), (87, 44331), (97, 44433),

Gene: Nithya\_66 Start: 46904, Stop: 47485, Start Num: 24

Candidate Starts for Nithya\_66:

(6, 46790), (13, 46838), (Start: 24 @46904 has 60 MA's), (33, 46979), (54, 47171), (55, 47174), (76, 47282), (79, 47312), (85, 47336),

Gene: Nivinsha\_62 Start: 43375, Stop: 43950, Start Num: 21

Candidate Starts for Nivinsha\_62:

(Start: 21 @43375 has 32 MA's), (28, 43411), (40, 43522), (41, 43525), (55, 43639), (63, 43693), (65, 43702), (84, 43813), (97, 43930),

Gene: Odesza\_67 Start: 47138, Stop: 47725, Start Num: 24

Candidate Starts for Odesza\_67:

(Start: 24 @47138 has 60 MA's), (28, 47162), (33, 47213), (35, 47246), (41, 47276), (51, 47387), (55, 47408), (72, 47483), (76, 47516), (79, 47546), (90, 47603), (91, 47618),

Gene: OhMyWard\_65 Start: 48483, Stop: 49067, Start Num: 23

Candidate Starts for OhMyWard\_65:

(Start: 23 @48483 has 3 MA's), (33, 48558), (41, 48621), (54, 48750), (55, 48753), (69, 48813), (76, 48861), (79, 48891), (85, 48915),

Gene: OlgasClover\_67 Start: 48040, Stop: 48621, Start Num: 24

Candidate Starts for OlgasClover\_67:

(17, 48022), (Start: 24 @48040 has 60 MA's), (33, 48115), (54, 48307), (55, 48310), (75, 48397), (76, 48418), (79, 48448), (85, 48472),

Gene: Paella\_118 Start: 65767, Stop: 66369, Start Num: 20

Candidate Starts for Paella\_118:

(7, 65677), (Start: 20 @65767 has 8 MA's), (41, 65920), (63, 66088), (79, 66187), (82, 66202), (84, 66208),

Gene: Pepy6\_077 Start: 58658, Stop: 59239, Start Num: 24

Candidate Starts for Pepy6\_077:

(Start: 24 @58658 has 60 MA's), (33, 58736), (38, 58787), (54, 58928), (55, 58931), (63, 58970), (76, 59039), (79, 59069), (98, 59222),

Gene: Perkunas\_71 Start: 47540, Stop: 48130, Start Num: 23

Candidate Starts for Perkunas\_71:

(16, 47519), (Start: 23 @47540 has 3 MA's), (28, 47564), (33, 47615), (35, 47648), (51, 47789), (55, 47810), (72, 47885), (76, 47918), (79, 47948), (91, 48020),

Gene: Petito\_69 Start: 48710, Stop: 49300, Start Num: 23

Candidate Starts for Petito\_69:

(16, 48689), (Start: 23 @48710 has 3 MA's), (28, 48734), (33, 48785), (35, 48818), (41, 48848), (55, 48980), (67, 49031), (72, 49055), (76, 49088), (79, 49118), (91, 49190),

Gene: Phaby\_65 Start: 44410, Stop: 45006, Start Num: 18

Candidate Starts for Phaby\_65:

(Start: 18 @44410 has 4 MA's), (28, 44452), (41, 44566), (65, 44743), (84, 44854),

Gene: Phepper\_67 Start: 46995, Stop: 47579, Start Num: 24

Candidate Starts for Phepper\_67:

(17, 46977), (Start: 24 @46995 has 60 MA's), (33, 47070), (54, 47262), (55, 47265), (60, 47292), (79, 47403), (85, 47427),

Gene: Pherobrine\_69 Start: 48757, Stop: 49341, Start Num: 24

Candidate Starts for Pherobrine\_69:

(10, 48685), (Start: 24 @48757 has 60 MA's), (33, 48832), (35, 48865), (51, 49006), (55, 49027), (76, 49135), (79, 49165), (85, 49189),

Gene: PherryCruz\_45 Start: 35270, Stop: 35851, Start Num: 24

Candidate Starts for PherryCruz\_45:

(9, 35177), (Start: 24 @35270 has 60 MA's), (31, 35327), (35, 35393), (58, 35558), (65, 35585), (76, 35645), (81, 35687), (83, 35693), (91, 35747), (98, 35834),

Gene: Poco6\_075 Start: 59837, Stop: 60418, Start Num: 24

Candidate Starts for Poco6\_075:

(Start: 24 @59837 has 60 MA's), (33, 59912), (42, 59978), (54, 60104), (55, 60107), (63, 60146), (65, 60155), (69, 60167), (76, 60215), (79, 60245), (98, 60401),

Gene: ProfFrink\_65 Start: 41909, Stop: 42487, Start Num: 21

Candidate Starts for ProfFrink\_65:

(Start: 21 @41909 has 32 MA's), (29, 41957), (30, 41963), (32, 41981), (41, 42059), (42, 42062), (46, 42089), (55, 42182), (63, 42221), (71, 42248), (87, 42356),

Gene: Qui\_118 Start: 65767, Stop: 66369, Start Num: 20

Candidate Starts for Qui\_118:

(7, 65677), (Start: 20 @65767 has 8 MA's), (41, 65920), (63, 66088), (79, 66187), (82, 66202), (84, 66208),

Gene: Raunak\_65 Start: 41570, Stop: 42148, Start Num: 21

Candidate Starts for Raunak\_65:

(Start: 21 @41570 has 32 MA's), (29, 41618), (30, 41624), (32, 41642), (41, 41720), (42, 41723), (46, 41750), (55, 41843), (56, 41846), (63, 41882), (71, 41909), (87, 42017),

Gene: RavenPuff\_46 Start: 35293, Stop: 35874, Start Num: 24

Candidate Starts for RavenPuff\_46:

(9, 35200), (Start: 24 @35293 has 60 MA's), (31, 35350), (35, 35416), (58, 35581), (65, 35608), (76, 35668), (81, 35710), (83, 35716), (91, 35770), (98, 35857),

Gene: Renaldo\_72 Start: 44085, Stop: 44669, Start Num: 20

Candidate Starts for Renaldo\_72:

(Start: 20 @44085 has 8 MA's), (41, 44238), (45, 44265), (55, 44358), (63, 44397), (79, 44496), (88, 44538), (91, 44568), (97, 44622),

Gene: Rickmore\_63 Start: 45423, Stop: 46004, Start Num: 24

Candidate Starts for Rickmore\_63:

(17, 45405), (Start: 24 @45423 has 60 MA's), (33, 45498), (51, 45672), (54, 45690), (55, 45693), (75, 45780), (76, 45801), (79, 45831), (85, 45855),

Gene: Roney\_68 Start: 47304, Stop: 47891, Start Num: 24

Candidate Starts for Roney\_68:

(Start: 24 @47304 has 60 MA's), (28, 47328), (33, 47379), (35, 47412), (41, 47442), (51, 47553), (55, 47574), (72, 47649), (76, 47682), (79, 47712), (90, 47769), (91, 47784),

Gene: RosaAsantewaa\_43 Start: 34545, Stop: 35060, Start Num: 26

Candidate Starts for RosaAsantewaa\_43:

(Start: 26 @34545 has 1 MA's), (36, 34656), (41, 34683), (55, 34797), (59, 34827), (90, 34998),

Gene: Runhaar\_66 Start: 46805, Stop: 47389, Start Num: 24

Candidate Starts for Runhaar\_66:

(6, 46691), (13, 46739), (17, 46787), (Start: 24 @46805 has 60 MA's), (33, 46880), (55, 47075), (76, 47183), (79, 47213), (85, 47237),

Gene: Salk\_64 Start: 41912, Stop: 42490, Start Num: 21

Candidate Starts for Salk\_64:

(Start: 21 @41912 has 32 MA's), (29, 41960), (30, 41966), (32, 41984), (41, 42062), (42, 42065), (46, 42092), (55, 42185), (56, 42188), (63, 42224), (71, 42251), (87, 42359),

Gene: Scap1\_45 Start: 34871, Stop: 35452, Start Num: 24

Candidate Starts for Scap1\_45:

(9, 34778), (Start: 24 @34871 has 60 MA's), (31, 34928), (37, 35000), (65, 35186), (73, 35219), (81, 35288), (83, 35294), (91, 35348), (92, 35357),

Gene: Schwartz33\_68 Start: 47476, Stop: 48054, Start Num: 24

Candidate Starts for Schwartz33\_68:

(8, 47380), (15, 47416), (Start: 24 @47476 has 60 MA's), (27, 47497), (28, 47500), (33, 47551), (54, 47743), (55, 47746), (69, 47806), (75, 47833), (85, 47908), (95, 47998),

Gene: ScienceWizSam\_61 Start: 43537, Stop: 44112, Start Num: 21

Candidate Starts for ScienceWizSam\_61:

(Start: 21 @43537 has 32 MA's), (28, 43573), (40, 43684), (41, 43687), (55, 43801), (63, 43855), (65, 43864), (84, 43975),

Gene: Secretariat\_66 Start: 46436, Stop: 47020, Start Num: 24

Candidate Starts for Secretariat\_66:

(Start: 24 @46436 has 60 MA's), (27, 46457), (33, 46511), (55, 46706), (73, 46787), (75, 46793), (93, 46928), (95, 46964),

Gene: Serenabean\_57 Start: 40188, Stop: 40733, Start Num: 22

Candidate Starts for Serenabean\_57:

(Start: 22 @40188 has 2 MA's), (31, 40245), (39, 40329), (55, 40461),

Gene: SheRa\_46 Start: 35151, Stop: 35732, Start Num: 24

Candidate Starts for SheRa\_46:

(9, 35058), (Start: 24 @35151 has 60 MA's), (31, 35208), (35, 35274), (58, 35439), (65, 35466), (76, 35526), (81, 35568), (83, 35574), (84, 35577), (91, 35628), (94, 35673), (96, 35688), (98, 35715),

Gene: Shepard\_66 Start: 43711, Stop: 44301, Start Num: 21

Candidate Starts for Shepard\_66:

(Start: 21 @43711 has 32 MA's), (28, 43747), (41, 43861), (65, 44038), (84, 44149),

Gene: Shiba\_63 Start: 41570, Stop: 42148, Start Num: 21

Candidate Starts for Shiba\_63:

(Start: 21 @41570 has 32 MA's), (29, 41618), (30, 41624), (32, 41642), (41, 41720), (42, 41723), (46, 41750), (55, 41843), (56, 41846), (63, 41882), (71, 41909), (87, 42017),

Gene: Sloopyjoe\_64 Start: 41916, Stop: 42494, Start Num: 21

Candidate Starts for Sloopyjoe\_64:

(Start: 21 @41916 has 32 MA's), (29, 41964), (30, 41970), (32, 41988), (41, 42066), (42, 42069), (46, 42096), (55, 42189), (56, 42192), (63, 42228), (71, 42255), (87, 42363),

Gene: Sporto\_63 Start: 43022, Stop: 43609, Start Num: 21

Candidate Starts for Sporto\_63:

(Start: 21 @43022 has 32 MA's), (32, 43094), (41, 43172), (55, 43295), (63, 43349), (69, 43370), (70, 43373), (71, 43376), (86, 43475), (97, 43571),

Gene: StarLord\_64 Start: 41909, Stop: 42487, Start Num: 21

Candidate Starts for StarLord\_64:

(Start: 21 @41909 has 32 MA's), (29, 41957), (30, 41963), (32, 41981), (41, 42059), (42, 42062), (46, 42089), (55, 42182), (56, 42185), (63, 42221), (71, 42248), (87, 42356),

Gene: Stayer\_64 Start: 41912, Stop: 42490, Start Num: 21

Candidate Starts for Stayer\_64:

(Start: 21 @41912 has 32 MA's), (29, 41960), (30, 41966), (32, 41984), (41, 42062), (42, 42065), (46, 42092), (55, 42185), (56, 42188), (63, 42224), (71, 42251), (87, 42359),

Gene: Sunny4976\_62 Start: 43553, Stop: 44128, Start Num: 24

Candidate Starts for Sunny4976\_62:

(12, 43484), (Start: 24 @43553 has 60 MA's), (43, 43709), (55, 43820), (65, 43868), (73, 43901), (78, 43955), (82, 43973),

Gene: Synopsis\_59 Start: 43542, Stop: 44117, Start Num: 21

Candidate Starts for Synopsis\_59:

(Start: 21 @43542 has 32 MA's), (28, 43578), (40, 43689), (41, 43692), (55, 43806), (63, 43860), (65, 43869), (84, 43980),

Gene: Tanis\_68 Start: 47124, Stop: 47711, Start Num: 24

Candidate Starts for Tanis\_68:

(Start: 24 @47124 has 60 MA's), (28, 47148), (33, 47199), (35, 47232), (41, 47262), (51, 47373), (55, 47394), (72, 47469), (76, 47502), (79, 47532), (90, 47589), (91, 47604),

Gene: Tatanka\_57 Start: 43674, Stop: 44249, Start Num: 21

Candidate Starts for Tatanka\_57:

(Start: 21 @43674 has 32 MA's), (28, 43710), (40, 43821), (41, 43824), (55, 43938), (63, 43992), (65, 44001), (67, 44004), (84, 44112),

Gene: Teacup\_61 Start: 43957, Stop: 44532, Start Num: 21

Candidate Starts for Teacup\_61:

(Start: 21 @43957 has 32 MA's), (28, 43993), (40, 44104), (41, 44107), (55, 44221), (63, 44275), (65, 44284), (67, 44287), (84, 44395), (87, 44410), (97, 44512),

Gene: TenaciousP\_71 Start: 48412, Stop: 48993, Start Num: 24

Candidate Starts for TenaciousP\_71:

(Start: 24 @48412 has 60 MA's), (33, 48487), (51, 48661), (55, 48682), (75, 48769), (76, 48790), (79, 48820), (85, 48844),

Gene: Tenno\_61 Start: 44195, Stop: 44770, Start Num: 21

Candidate Starts for Tenno\_61:

(Start: 21 @44195 has 32 MA's), (28, 44231), (40, 44342), (41, 44345), (63, 44513), (65, 44522), (67, 44525), (84, 44633), (87, 44648), (97, 44750),

Gene: Tokki\_69 Start: 44065, Stop: 44655, Start Num: 21

Candidate Starts for Tokki\_69:

(Start: 21 @44065 has 32 MA's), (28, 44101), (41, 44215), (63, 44383), (65, 44392), (84, 44503),

Gene: Tribby\_71 Start: 43164, Stop: 43658, Start Num: 24

Candidate Starts for Tribby\_71:

(Start: 24 @43164 has 60 MA's), (41, 43311), (52, 43419), (60, 43452), (62, 43458), (79, 43563),

Gene: Truckee\_62 Start: 43782, Stop: 44372, Start Num: 21

Candidate Starts for Truckee\_62:

(Start: 21 @43782 has 32 MA's), (28, 43818), (41, 43932), (54, 44043), (65, 44109), (84, 44220),

Gene: Trustiboi\_60 Start: 43797, Stop: 44372, Start Num: 21

Candidate Starts for Trustiboi\_60:

(Start: 21 @43797 has 32 MA's), (28, 43833), (40, 43944), (41, 43947), (55, 44061), (63, 44115), (65, 44124), (67, 44127), (84, 44235),

Gene: Untouchable\_68 Start: 47995, Stop: 48579, Start Num: 24

Candidate Starts for Untouchable\_68:

(17, 47977), (Start: 24 @47995 has 60 MA's), (33, 48070), (54, 48262), (55, 48265), (76, 48373), (79, 48403), (85, 48427),

Gene: Uzumaki\_63 Start: 42263, Stop: 42850, Start Num: 20

Candidate Starts for Uzumaki\_63:

(Start: 20 @42263 has 8 MA's), (31, 42326), (36, 42392), (41, 42419), (45, 42446), (55, 42539), (63, 42578), (75, 42626), (88, 42719), (91, 42749), (97, 42803),

Gene: Vardy\_65 Start: 46695, Stop: 47279, Start Num: 24

Candidate Starts for Vardy\_65:

(6, 46581), (13, 46629), (17, 46677), (Start: 24 @46695 has 60 MA's), (33, 46770), (55, 46965), (76, 47073), (79, 47103), (85, 47127),

Gene: Xenomorph\_64 Start: 42648, Stop: 43142, Start Num: 24

Candidate Starts for Xenomorph\_64:

(4, 42510), (8, 42558), (Start: 24 @42648 has 60 MA's), (34, 42744), (41, 42795), (52, 42903), (53, 42906), (60, 42936), (62, 42942), (79, 43047),

Gene: Zeina\_68 Start: 42957, Stop: 43544, Start Num: 20

Candidate Starts for Zeina\_68:

(Start: 20 @42957 has 8 MA's), (31, 43020), (36, 43086), (41, 43113), (45, 43140), (55, 43233), (63, 43272), (88, 43413), (91, 43443), (96, 43488), (97, 43497),

Gene: Zeph\_70 Start: 47834, Stop: 48418, Start Num: 24

Candidate Starts for Zeph\_70:

(6, 47720), (13, 47768), (17, 47816), (Start: 24 @47834 has 60 MA's), (33, 47909), (54, 48101), (55, 48104), (76, 48212), (79, 48242), (85, 48266),