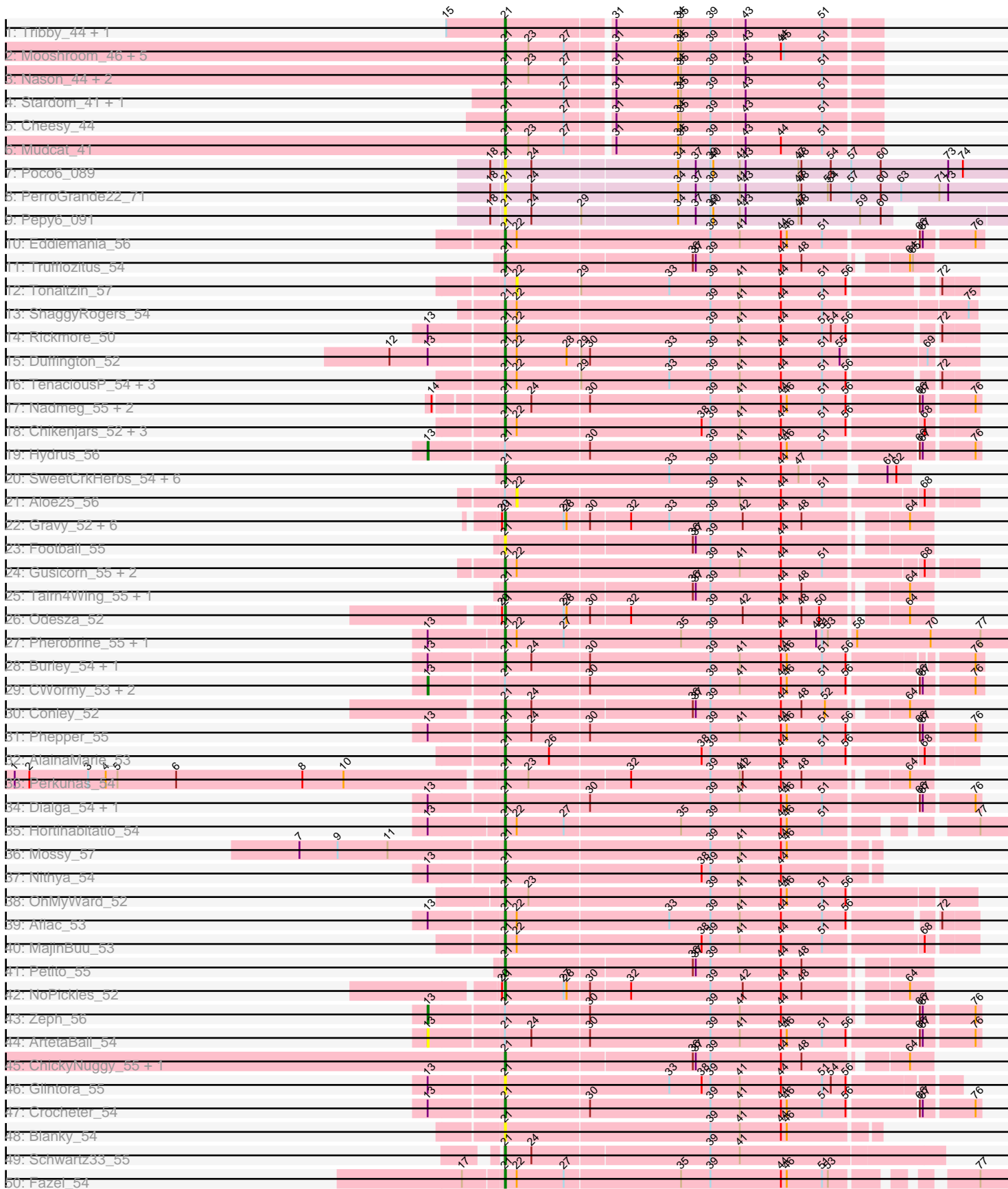


Pham 304905





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 304905 Report

This analysis was run 06/08/26 on database version 649.

Pham number 304905 has 91 members, 19 are drafts.

Phages represented in each track:

- Track 1 : Tribby\_44, Correa\_42
- Track 2 : Mooshroom\_46, JEGGS\_43, Heisenberger\_43, BenitoAntonio\_44, Kardesai\_45, Benllo\_43
- Track 3 : Nason\_44, Elsa\_44, Arcadia\_44
- Track 4 : Stardom\_41, Xenomorph\_40
- Track 5 : Cheesy\_44
- Track 6 : Mudcat\_41
- Track 7 : Poco6\_089
- Track 8 : PerroGrande22\_71
- Track 9 : Pepy6\_091
- Track 10 : Eddiemania\_56
- Track 11 : Trufflozitus\_54
- Track 12 : Tonaltzin\_57
- Track 13 : ShaggyRogers\_54
- Track 14 : Rickmore\_50
- Track 15 : Duffington\_52
- Track 16 : TenaciousP\_54, OlgasClover\_55, Figliar\_52, Jodelie19\_53
- Track 17 : Nadmeg\_55, Kenosha\_53, Runhaar\_54
- Track 18 : Chikenjars\_52, EndAve\_55, Citrus\_53, Luthien\_56
- Track 19 : Hydrus\_56
- Track 20 : SweetCrkHerbs\_54, Captrips\_52, Dancer\_53, FortCran\_53, Bugg\_55, Talon44\_54, Artorias\_53
- Track 21 : Aloe25\_56
- Track 22 : Gravy\_52, Roney\_53, Tanis\_53, Capybara\_53, Gill\_53, Magel\_54, Kerry\_52
- Track 23 : Football\_55
- Track 24 : Gusicorn\_55, BetterYeti\_54, PestoPenguin\_57
- Track 25 : Tairn4Wing\_55, Avazak\_54
- Track 26 : Odesza\_52
- Track 27 : Pherobrine\_55, Mysticmoon\_54
- Track 28 : Burley\_54, Vardy\_53
- Track 29 : CWormy\_53, Arataki\_52, Demure\_51
- Track 30 : Conley\_52
- Track 31 : Phepper\_55
- Track 32 : AlainaMarie\_53
- Track 33 : Perkunas\_54
- Track 34 : Dialga\_54, Untouchable\_55

- Track 35 : Hortihabitatio\_54
- Track 36 : Mossy\_57
- Track 37 : Nithya\_54
- Track 38 : OhMyWard\_52
- Track 39 : Aflac\_53
- Track 40 : MajinBuu\_53
- Track 41 : Petite\_55
- Track 42 : NoPickles\_52
- Track 43 : Zeph\_56
- Track 44 : ArtetaBall\_54
- Track 45 : ChickyNuggy\_55, JulesRay\_53
- Track 46 : Glintora\_55
- Track 47 : Crocheter\_54
- Track 48 : Blanky\_54
- Track 49 : Schwartz33\_55
- Track 50 : Fazel\_54
- Track 51 : BluerMoon\_52
- Track 52 : Madvan\_54
- Track 53 : Secretariat\_53

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

The start number called the most often in the published annotations is 21, it was called in 69 of the 72 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

• Aflac\_53, AlainaMarie\_53, Arcadia\_44, Artorias\_53, Avazak\_54, BenitoAntonio\_44, Benllo\_43, BetterYeti\_54, Blanky\_54, BluerMoon\_52, Bugg\_55, Burley\_54, Captrips\_52, Capybara\_53, Cheesy\_44, ChickyNuggy\_55, Chickenjars\_52, Citrus\_53, Conley\_52, Correa\_42, Crocheter\_54, Dancer\_53, Dialga\_54, Duffington\_52, Eddiemania\_56, Elsa\_44, EndAve\_55, Fazel\_54, Figliar\_52, Football\_55, FortCran\_53, Gill\_53, Glintora\_55, Gravy\_52, Gusicorn\_55, Heisenberger\_43, Hortihabitatio\_54, JEGGS\_43, Jodelie19\_53, JulesRay\_53, Kardesai\_45, Kenosha\_53, Kerry\_52, Luthien\_56, Madvan\_54, Magel\_54, MajinBuu\_53, Mooshroom\_46, Mossy\_57, Mudcat\_41, Mysticmoon\_54, Nadmeg\_55, Nason\_44, Nithya\_54, NoPickles\_52, Odesza\_52, OhMyWard\_52, OlgasClover\_55, Pepy6\_091, Perunas\_54, PerroGrande22\_71, PestoPenguin\_57, Petite\_55, Phepper\_55, Pherobrine\_55, Poco6\_089, Rickmore\_50, Roney\_53, Runhaar\_54, Schwartz33\_55, Secretariat\_53, ShaggyRogers\_54, Stardom\_41, SweetCrkHerbs\_54, Tairn4Wing\_55, Talon44\_54, Tanis\_53, TenaciousP\_54, Tribby\_44, Trufflozitus\_54, Untouchable\_55, Vardy\_53, Xenomorph\_40,

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

• Aloe25\_56, Arataki\_52, ArtetaBall\_54, CWormy\_53, Demure\_51, Hydrus\_56, Tonaltzin\_57, Zeph\_56,

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

•

**Summary by start number:**

Start 13:

- Found in 22 of 91 ( 24.2% ) of genes in pham
- Manual Annotations of this start: 3 of 72
- Called 27.3% of time when present
- Phage (with cluster) where this start called: Arataki\_52 (DJ), ArtetaBall\_54 (DJ), CWormy\_53 (DJ), Demure\_51 (DJ), Hydrus\_56 (DJ), Zeph\_56 (DJ),

Start 21:

- Found in 91 of 91 ( 100.0% ) of genes in pham
- Manual Annotations of this start: 69 of 72
- Called 91.2% of time when present
- Phage (with cluster) where this start called: Aflac\_53 (DJ), AlainaMarie\_53 (DJ), Arcadia\_44 (AM), Artorias\_53 (DJ), Avazak\_54 (DJ), BenitoAntonio\_44 (AM), Benllo\_43 (AM), BetterYeti\_54 (DJ), Blanky\_54 (DJ), BluerMoon\_52 (DJ), Bugg\_55 (DJ), Burley\_54 (DJ), Captrips\_52 (DJ), Copybara\_53 (DJ), Cheesy\_44 (AM), ChickyNuggy\_55 (DJ), Chikenjars\_52 (DJ), Citrus\_53 (DJ), Conley\_52 (DJ), Correa\_42 (AM), Crocheter\_54 (DJ), Dancer\_53 (DJ), Dialga\_54 (DJ), Duffington\_52 (DJ), Eddiemania\_56 (DJ), Elsa\_44 (AM), EndAve\_55 (DJ), Fazel\_54 (DJ), Figliar\_52 (DJ), Football\_55 (DJ), FortCran\_53 (DJ), Gill\_53 (DJ), Glintora\_55 (DJ), Gravy\_52 (DJ), Gusicorn\_55 (DJ), Heisenberger\_43 (AM), Hortihabitatio\_54 (DJ), JEGGS\_43 (AM), Jodelie19\_53 (DJ), JulesRay\_53 (DJ), Kardesai\_45 (AM), Kenosha\_53 (DJ), Kerry\_52 (DJ), Luthien\_56 (DJ), Madvan\_54 (DJ), Magel\_54 (DJ), MajinBuu\_53 (DJ), Mooshroom\_46 (AM), Mossy\_57 (DJ), Mudcat\_41 (AM), Mysticmoon\_54 (DJ), Nadmeg\_55 (DJ), Nason\_44 (AM), Nithya\_54 (DJ), NoPickles\_52 (DJ), Odesza\_52 (DJ), OhMyWard\_52 (DJ), OlgasClover\_55 (DJ), Pepy6\_091 (CC), Perkunas\_54 (DJ), PerroGrande22\_71 (CC), PestoPenguin\_57 (DJ), Petit\_55 (DJ), Phepper\_55 (DJ), Pherobrine\_55 (DJ), Poco6\_089 (CC), Rickmore\_50 (DJ), Roney\_53 (DJ), Runhaar\_54 (DJ), Schwartz33\_55 (DJ), Secretariat\_53 (DJ), ShaggyRogers\_54 (DJ), Stardom\_41 (AM), SweetCrkHerbs\_54 (DJ), Tairn4Wing\_55 (DJ), Talon44\_54 (DJ), Tanis\_53 (DJ), TenaciousP\_54 (DJ), Tribby\_44 (AM), Trufflozitus\_54 (DJ), Untouchable\_55 (DJ), Vardy\_53 (DJ), Xenomorph\_40 (AM),

Start 22:

- Found in 24 of 91 ( 26.4% ) of genes in pham
- No Manual Annotations of this start.
- Called 8.3% of time when present
- Phage (with cluster) where this start called: Aloe25\_56 (DJ), Tonaltzin\_57 (DJ),

**Summary by clusters:**

There are 3 clusters represented in this pham: CC, AM, DJ,

Info for manual annotations of cluster AM:

- Start number 21 was manually annotated 14 times for cluster AM.

Info for manual annotations of cluster DJ:

- Start number 13 was manually annotated 3 times for cluster DJ.
- Start number 21 was manually annotated 55 times for cluster DJ.

### **Gene Information:**

Gene: Aflac\_53 Start: 37122, Stop: 37580, Start Num: 21

Candidate Starts for Aflac\_53:

(Start: 13 @37050 has 3 MA's), (Start: 21 @37122 has 69 MA's), (22, 37134), (33, 37287), (39, 37329), (41, 37359), (44, 37401), (51, 37443), (56, 37467), (72, 37545),

Gene: AlainaMarie\_53 Start: 37102, Stop: 37566, Start Num: 21

Candidate Starts for AlainaMarie\_53:

(Start: 21 @37102 has 69 MA's), (26, 37147), (38, 37300), (39, 37309), (44, 37381), (51, 37423), (56, 37447), (68, 37519),

Gene: Aloe25\_56 Start: 37216, Stop: 37665, Start Num: 22

Candidate Starts for Aloe25\_56:

(Start: 21 @37204 has 69 MA's), (22, 37216), (39, 37411), (41, 37441), (44, 37483), (51, 37525), (68, 37618),

Gene: Arataki\_52 Start: 36159, Stop: 36701, Start Num: 13

Candidate Starts for Arataki\_52:

(Start: 13 @36159 has 3 MA's), (Start: 21 @36231 has 69 MA's), (30, 36315), (39, 36438), (41, 36468), (44, 36510), (46, 36516), (51, 36552), (56, 36576), (66, 36642), (67, 36645), (76, 36693),

Gene: Arcadia\_44 Start: 30490, Stop: 30855, Start Num: 21

Candidate Starts for Arcadia\_44:

(Start: 21 @30490 has 69 MA's), (23, 30514), (27, 30550), (31, 30592), (34, 30655), (35, 30658), (39, 30688), (43, 30721), (51, 30799),

Gene: ArtetaBall\_54 Start: 37348, Stop: 37887, Start Num: 13

Candidate Starts for ArtetaBall\_54:

(Start: 13 @37348 has 3 MA's), (Start: 21 @37420 has 69 MA's), (24, 37447), (30, 37504), (39, 37627), (41, 37657), (44, 37699), (46, 37705), (51, 37741), (56, 37765), (66, 37831), (67, 37834), (76, 37882),

Gene: Artorias\_53 Start: 36489, Stop: 36887, Start Num: 21

Candidate Starts for Artorias\_53:

(Start: 21 @36489 has 69 MA's), (33, 36657), (39, 36699), (44, 36771), (47, 36789), (61, 36864), (62, 36873),

Gene: Avazak\_54 Start: 36834, Stop: 37244, Start Num: 21

Candidate Starts for Avazak\_54:

(Start: 21 @36834 has 69 MA's), (36, 37020), (37, 37023), (39, 37038), (44, 37110), (48, 37131), (64, 37221),

Gene: BenitoAntonio\_44 Start: 30067, Stop: 30432, Start Num: 21

Candidate Starts for BenitoAntonio\_44:

(Start: 21 @30067 has 69 MA's), (23, 30091), (27, 30127), (31, 30169), (34, 30232), (35, 30235), (39, 30265), (43, 30298), (44, 30334), (45, 30337), (51, 30376),

Gene: Benllo\_43 Start: 30751, Stop: 31116, Start Num: 21

Candidate Starts for Benllo\_43:

(Start: 21 @30751 has 69 MA's), (23, 30775), (27, 30811), (31, 30853), (34, 30916), (35, 30919), (39, 30949), (43, 30982), (44, 31018), (45, 31021), (51, 31060),

Gene: BetterYeti\_54 Start: 37203, Stop: 37664, Start Num: 21

Candidate Starts for BetterYeti\_54:

(Start: 21 @37203 has 69 MA's), (22, 37215), (39, 37410), (41, 37440), (44, 37482), (51, 37524), (68, 37617),

Gene: Blanky\_54 Start: 38832, Stop: 39203, Start Num: 21

Candidate Starts for Blanky\_54:

(Start: 21 @38832 has 69 MA's), (39, 39039), (41, 39069), (44, 39111), (46, 39117),

Gene: BluerMoon\_52 Start: 37145, Stop: 37609, Start Num: 21

Candidate Starts for BluerMoon\_52:

(Start: 13 @37073 has 3 MA's), (Start: 21 @37145 has 69 MA's), (22, 37157), (29, 37220), (30, 37229), (39, 37352), (41, 37382), (44, 37424), (51, 37466), (53, 37472), (55, 37484), (69, 37565),

Gene: Bugg\_55 Start: 36534, Stop: 36932, Start Num: 21

Candidate Starts for Bugg\_55:

(Start: 21 @36534 has 69 MA's), (33, 36702), (39, 36744), (44, 36816), (47, 36834), (61, 36909), (62, 36918),

Gene: Burley\_54 Start: 36888, Stop: 37352, Start Num: 21

Candidate Starts for Burley\_54:

(Start: 13 @36816 has 3 MA's), (Start: 21 @36888 has 69 MA's), (24, 36915), (30, 36972), (39, 37095), (41, 37125), (44, 37167), (46, 37173), (51, 37209), (56, 37233), (76, 37344),

Gene: CWormy\_53 Start: 36761, Stop: 37303, Start Num: 13

Candidate Starts for CWormy\_53:

(Start: 13 @36761 has 3 MA's), (Start: 21 @36833 has 69 MA's), (30, 36917), (39, 37040), (41, 37070), (44, 37112), (46, 37118), (51, 37154), (56, 37178), (66, 37244), (67, 37247), (76, 37295),

Gene: Captrips\_52 Start: 35964, Stop: 36362, Start Num: 21

Candidate Starts for Captrips\_52:

(Start: 21 @35964 has 69 MA's), (33, 36132), (39, 36174), (44, 36246), (47, 36264), (61, 36339), (62, 36348),

Gene: Capybara\_53 Start: 36333, Stop: 36743, Start Num: 21

Candidate Starts for Capybara\_53:

(20, 36330), (Start: 21 @36333 has 69 MA's), (27, 36393), (28, 36396), (30, 36417), (32, 36456), (33, 36495), (39, 36537), (42, 36570), (44, 36609), (48, 36630), (64, 36720),

Gene: Cheesy\_44 Start: 30188, Stop: 30553, Start Num: 21

Candidate Starts for Cheesy\_44:

(Start: 21 @30188 has 69 MA's), (27, 30248), (31, 30290), (34, 30353), (35, 30356), (39, 30386), (43, 30419), (51, 30497),

Gene: ChickyNuggy\_55 Start: 36591, Stop: 37001, Start Num: 21

Candidate Starts for ChickyNuggy\_55:

(Start: 21 @36591 has 69 MA's), (36, 36777), (37, 36780), (39, 36795), (44, 36867), (48, 36888), (64, 36978),

Gene: Chikenjars\_52 Start: 37114, Stop: 37578, Start Num: 21

Candidate Starts for Chikenjars\_52:

(Start: 21 @37114 has 69 MA's), (22, 37126), (38, 37312), (39, 37321), (41, 37351), (44, 37393), (51, 37435), (56, 37459), (68, 37531),

Gene: Citrus\_53 Start: 37392, Stop: 37856, Start Num: 21

Candidate Starts for Citrus\_53:

(Start: 21 @37392 has 69 MA's), (22, 37404), (38, 37590), (39, 37599), (41, 37629), (44, 37671), (51, 37713), (56, 37737), (68, 37809),

Gene: Conley\_52 Start: 37120, Stop: 37530, Start Num: 21

Candidate Starts for Conley\_52:

(Start: 21 @37120 has 69 MA's), (24, 37147), (36, 37306), (37, 37309), (39, 37324), (44, 37396), (48, 37417), (52, 37441), (64, 37507),

Gene: Correa\_42 Start: 29373, Stop: 29738, Start Num: 21

Candidate Starts for Correa\_42:

(15, 29313), (Start: 21 @29373 has 69 MA's), (31, 29475), (34, 29538), (35, 29541), (39, 29571), (43, 29604), (51, 29682),

Gene: Crocheter\_54 Start: 37278, Stop: 37745, Start Num: 21

Candidate Starts for Crocheter\_54:

(Start: 13 @37206 has 3 MA's), (Start: 21 @37278 has 69 MA's), (30, 37362), (39, 37485), (41, 37515), (44, 37557), (46, 37563), (51, 37599), (56, 37623), (66, 37689), (67, 37692), (76, 37740),

Gene: Dancer\_53 Start: 36224, Stop: 36622, Start Num: 21

Candidate Starts for Dancer\_53:

(Start: 21 @36224 has 69 MA's), (33, 36392), (39, 36434), (44, 36506), (47, 36524), (61, 36599), (62, 36608),

Gene: Demure\_51 Start: 36159, Stop: 36701, Start Num: 13

Candidate Starts for Demure\_51:

(Start: 13 @36159 has 3 MA's), (Start: 21 @36231 has 69 MA's), (30, 36315), (39, 36438), (41, 36468), (44, 36510), (46, 36516), (51, 36552), (56, 36576), (66, 36642), (67, 36645), (76, 36693),

Gene: Dialga\_54 Start: 37447, Stop: 37914, Start Num: 21

Candidate Starts for Dialga\_54:

(Start: 13 @37375 has 3 MA's), (Start: 21 @37447 has 69 MA's), (30, 37531), (39, 37654), (41, 37684), (44, 37726), (46, 37732), (51, 37768), (66, 37858), (67, 37861), (76, 37909),

Gene: Duffington\_52 Start: 36809, Stop: 37273, Start Num: 21

Candidate Starts for Duffington\_52:

(12, 36698), (Start: 13 @36737 has 3 MA's), (Start: 21 @36809 has 69 MA's), (22, 36821), (28, 36872), (29, 36884), (30, 36893), (33, 36974), (39, 37016), (41, 37046), (44, 37088), (51, 37130), (55, 37148), (69, 37229),

Gene: Eddiemania\_56 Start: 38023, Stop: 38493, Start Num: 21

Candidate Starts for Eddiemania\_56:

(Start: 21 @38023 has 69 MA's), (22, 38035), (39, 38230), (41, 38260), (44, 38302), (46, 38308), (51, 38344), (66, 38434), (67, 38437), (76, 38485),

Gene: Elsa\_44 Start: 30490, Stop: 30855, Start Num: 21

Candidate Starts for Elsa\_44:

(Start: 21 @30490 has 69 MA's), (23, 30514), (27, 30550), (31, 30592), (34, 30655), (35, 30658), (39, 30688), (43, 30721), (51, 30799),

Gene: EndAve\_55 Start: 37282, Stop: 37746, Start Num: 21

Candidate Starts for EndAve\_55:

(Start: 21 @37282 has 69 MA's), (22, 37294), (38, 37480), (39, 37489), (41, 37519), (44, 37561), (51, 37603), (56, 37627), (68, 37699),

Gene: Fazel\_54 Start: 36737, Stop: 37225, Start Num: 21

Candidate Starts for Fazel\_54:

(17, 36698), (Start: 21 @36737 has 69 MA's), (22, 36749), (27, 36797), (35, 36914), (39, 36944), (44, 37016), (46, 37022), (51, 37058), (53, 37064), (77, 37175),

Gene: Figliar\_52 Start: 37190, Stop: 37648, Start Num: 21

Candidate Starts for Figliar\_52:

(Start: 21 @37190 has 69 MA's), (22, 37202), (29, 37265), (33, 37355), (39, 37397), (41, 37427), (44, 37469), (51, 37511), (56, 37535), (72, 37613),

Gene: Football\_55 Start: 36388, Stop: 36798, Start Num: 21

Candidate Starts for Football\_55:

(Start: 21 @36388 has 69 MA's), (36, 36574), (37, 36577), (39, 36592), (44, 36664),

Gene: FortCran\_53 Start: 36489, Stop: 36887, Start Num: 21

Candidate Starts for FortCran\_53:

(Start: 21 @36489 has 69 MA's), (33, 36657), (39, 36699), (44, 36771), (47, 36789), (61, 36864), (62, 36873),

Gene: Gill\_53 Start: 36350, Stop: 36760, Start Num: 21

Candidate Starts for Gill\_53:

(20, 36347), (Start: 21 @36350 has 69 MA's), (27, 36410), (28, 36413), (30, 36434), (32, 36473), (33, 36512), (39, 36554), (42, 36587), (44, 36626), (48, 36647), (64, 36737),

Gene: Glintora\_55 Start: 37742, Stop: 38188, Start Num: 21

Candidate Starts for Glintora\_55:

(Start: 13 @37670 has 3 MA's), (Start: 21 @37742 has 69 MA's), (33, 37907), (38, 37940), (39, 37949), (41, 37979), (44, 38021), (51, 38063), (54, 38072), (56, 38087),

Gene: Gravy\_52 Start: 36023, Stop: 36433, Start Num: 21

Candidate Starts for Gravy\_52:

(20, 36020), (Start: 21 @36023 has 69 MA's), (27, 36083), (28, 36086), (30, 36107), (32, 36146), (33, 36185), (39, 36227), (42, 36260), (44, 36299), (48, 36320), (64, 36410),

Gene: Gusicorn\_55 Start: 37204, Stop: 37665, Start Num: 21

Candidate Starts for Gusicorn\_55:

(Start: 21 @37204 has 69 MA's), (22, 37216), (39, 37411), (41, 37441), (44, 37483), (51, 37525), (68, 37618),

Gene: Heisenberger\_43 Start: 29931, Stop: 30296, Start Num: 21

Candidate Starts for Heisenberger\_43:

(Start: 21 @29931 has 69 MA's), (23, 29955), (27, 29991), (31, 30033), (34, 30096), (35, 30099), (39, 30129), (43, 30162), (44, 30198), (45, 30201), (51, 30240),

Gene: Hortihabitatio\_54 Start: 36942, Stop: 37460, Start Num: 21

Candidate Starts for Hortihabitatio\_54:

(Start: 13 @36870 has 3 MA's), (Start: 21 @36942 has 69 MA's), (22, 36954), (27, 37002), (35, 37119), (39, 37149), (44, 37221), (46, 37227), (51, 37263), (77, 37380),

Gene: Hydrus\_56 Start: 37978, Stop: 38517, Start Num: 13

Candidate Starts for Hydrus\_56:

(Start: 13 @37978 has 3 MA's), (Start: 21 @38050 has 69 MA's), (30, 38134), (39, 38257), (41, 38287), (44, 38329), (46, 38335), (51, 38371), (66, 38461), (67, 38464), (76, 38512),

Gene: JEGGS\_43 Start: 29985, Stop: 30350, Start Num: 21

Candidate Starts for JEGGS\_43:

(Start: 21 @29985 has 69 MA's), (23, 30009), (27, 30045), (31, 30087), (34, 30150), (35, 30153), (39, 30183), (43, 30216), (44, 30252), (45, 30255), (51, 30294),

Gene: Jodelie19\_53 Start: 38594, Stop: 39052, Start Num: 21

Candidate Starts for Jodelie19\_53:

(Start: 21 @38594 has 69 MA's), (22, 38606), (29, 38669), (33, 38759), (39, 38801), (41, 38831), (44, 38873), (51, 38915), (56, 38939), (72, 39017),

Gene: JulesRay\_53 Start: 36516, Stop: 36926, Start Num: 21

Candidate Starts for JulesRay\_53:

(Start: 21 @36516 has 69 MA's), (36, 36702), (37, 36705), (39, 36720), (44, 36792), (48, 36813), (64, 36903),

Gene: Kardesai\_45 Start: 30651, Stop: 31016, Start Num: 21

Candidate Starts for Kardesai\_45:

(Start: 21 @30651 has 69 MA's), (23, 30675), (27, 30711), (31, 30753), (34, 30816), (35, 30819), (39, 30849), (43, 30882), (44, 30918), (45, 30921), (51, 30960),

Gene: Kenosha\_53 Start: 37509, Stop: 37976, Start Num: 21

Candidate Starts for Kenosha\_53:

(14, 37449), (Start: 21 @37509 has 69 MA's), (24, 37536), (30, 37593), (39, 37716), (41, 37746), (44, 37788), (46, 37794), (51, 37830), (56, 37854), (66, 37920), (67, 37923), (76, 37971),

Gene: Kerry\_52 Start: 36023, Stop: 36433, Start Num: 21

Candidate Starts for Kerry\_52:

(20, 36020), (Start: 21 @36023 has 69 MA's), (27, 36083), (28, 36086), (30, 36107), (32, 36146), (33, 36185), (39, 36227), (42, 36260), (44, 36299), (48, 36320), (64, 36410),

Gene: Luthien\_56 Start: 37280, Stop: 37744, Start Num: 21

Candidate Starts for Luthien\_56:

(Start: 21 @37280 has 69 MA's), (22, 37292), (38, 37478), (39, 37487), (41, 37517), (44, 37559), (51, 37601), (56, 37625), (68, 37697),

Gene: Madvan\_54 Start: 36919, Stop: 37386, Start Num: 21

Candidate Starts for Madvan\_54:

(Start: 13 @36847 has 3 MA's), (Start: 21 @36919 has 69 MA's), (24, 36946), (30, 37003), (39, 37126), (41, 37156), (44, 37198), (51, 37240), (56, 37264), (66, 37330), (67, 37333), (76, 37381),

Gene: Magel\_54 Start: 36254, Stop: 36676, Start Num: 21

Candidate Starts for Magel\_54:

(20, 36251), (Start: 21 @36254 has 69 MA's), (27, 36314), (28, 36317), (30, 36338), (32, 36377), (33, 36416), (39, 36458), (42, 36491), (44, 36530), (48, 36551), (64, 36653),

Gene: MajinBuu\_53 Start: 37216, Stop: 37680, Start Num: 21

Candidate Starts for MajinBuu\_53:

(Start: 21 @37216 has 69 MA's), (22, 37228), (38, 37414), (39, 37423), (41, 37453), (44, 37495), (51, 37537), (68, 37633),

Gene: Mooshroom\_46 Start: 30651, Stop: 31016, Start Num: 21

Candidate Starts for Mooshroom\_46:

(Start: 21 @30651 has 69 MA's), (23, 30675), (27, 30711), (31, 30753), (34, 30816), (35, 30819), (39, 30849), (43, 30882), (44, 30918), (45, 30921), (51, 30960),

Gene: Mossy\_57 Start: 39044, Stop: 39415, Start Num: 21

Candidate Starts for Mossy\_57:

(7, 38843), (9, 38882), (11, 38933), (Start: 21 @39044 has 69 MA's), (39, 39251), (41, 39281), (44, 39323), (46, 39329),

Gene: Mudcat\_41 Start: 31344, Stop: 31709, Start Num: 21

Candidate Starts for Mudcat\_41:

(Start: 21 @31344 has 69 MA's), (23, 31368), (27, 31404), (31, 31446), (34, 31509), (35, 31512), (39, 31542), (43, 31575), (44, 31611), (51, 31653),

Gene: Mysticmoon\_54 Start: 37743, Stop: 38270, Start Num: 21

Candidate Starts for Mysticmoon\_54:

(Start: 13 @37671 has 3 MA's), (Start: 21 @37743 has 69 MA's), (22, 37755), (27, 37803), (35, 37920), (39, 37950), (44, 38022), (49, 38058), (51, 38064), (53, 38070), (58, 38094), (70, 38169), (77, 38220),

Gene: Nadmeg\_55 Start: 38165, Stop: 38632, Start Num: 21

Candidate Starts for Nadmeg\_55:

(14, 38105), (Start: 21 @38165 has 69 MA's), (24, 38192), (30, 38249), (39, 38372), (41, 38402), (44, 38444), (46, 38450), (51, 38486), (56, 38510), (66, 38576), (67, 38579), (76, 38627),

Gene: Nason\_44 Start: 30490, Stop: 30855, Start Num: 21

Candidate Starts for Nason\_44:

(Start: 21 @30490 has 69 MA's), (23, 30514), (27, 30550), (31, 30592), (34, 30655), (35, 30658), (39, 30688), (43, 30721), (51, 30799),

Gene: Nithya\_54 Start: 37126, Stop: 37497, Start Num: 21

Candidate Starts for Nithya\_54:

(Start: 13 @37054 has 3 MA's), (Start: 21 @37126 has 69 MA's), (38, 37324), (39, 37333), (41, 37363), (44, 37405),

Gene: NoPickles\_52 Start: 35688, Stop: 36098, Start Num: 21

Candidate Starts for NoPickles\_52:

(20, 35685), (Start: 21 @35688 has 69 MA's), (27, 35748), (28, 35751), (30, 35772), (32, 35811), (39, 35892), (42, 35925), (44, 35964), (48, 35985), (64, 36075),

Gene: Odesza\_52 Start: 36078, Stop: 36488, Start Num: 21

Candidate Starts for Odesza\_52:

(20, 36075), (Start: 21 @36078 has 69 MA's), (27, 36138), (28, 36141), (30, 36162), (32, 36201), (39, 36282), (42, 36315), (44, 36354), (48, 36375), (50, 36393), (64, 36465),

Gene: OhMyWard\_52 Start: 38137, Stop: 38601, Start Num: 21

Candidate Starts for OhMyWard\_52:

(Start: 21 @38137 has 69 MA's), (23, 38161), (39, 38344), (41, 38374), (44, 38416), (46, 38422), (51, 38458), (56, 38482),

Gene: OlgasClover\_55 Start: 38175, Stop: 38633, Start Num: 21

Candidate Starts for OlgasClover\_55:

(Start: 21 @38175 has 69 MA's), (22, 38187), (29, 38250), (33, 38340), (39, 38382), (41, 38412), (44, 38454), (51, 38496), (56, 38520), (72, 38598),

Gene: Pepy6\_091 Start: 46716, Stop: 47210, Start Num: 21

Candidate Starts for Pepy6\_091:

(18, 46704), (Start: 21 @46716 has 69 MA's), (24, 46743), (29, 46791), (34, 46887), (37, 46905), (39, 46920), (40, 46923), (41, 46950), (43, 46956), (47, 47010), (48, 47013), (59, 47073), (60, 47094),

Gene: Perkunas\_54 Start: 36360, Stop: 36770, Start Num: 21

Candidate Starts for Perkunas\_54:

(1, 35874), (2, 35889), (3, 35949), (4, 35967), (5, 35979), (6, 36039), (8, 36168), (10, 36210), (Start: 21 @36360 has 69 MA's), (23, 36384), (32, 36483), (39, 36564), (41, 36594), (42, 36597), (44, 36636), (48, 36657), (64, 36747),

Gene: PerroGrande22\_71 Start: 49107, Stop: 49640, Start Num: 21

Candidate Starts for PerroGrande22\_71:

(18, 49095), (Start: 21 @49107 has 69 MA's), (24, 49134), (34, 49278), (37, 49296), (39, 49311), (41, 49341), (43, 49347), (47, 49401), (48, 49404), (53, 49431), (54, 49434), (57, 49455), (60, 49485), (63, 49506), (71, 49545), (73, 49554),

Gene: PestoPenguin\_57 Start: 37204, Stop: 37665, Start Num: 21

Candidate Starts for PestoPenguin\_57:

(Start: 21 @37204 has 69 MA's), (22, 37216), (39, 37411), (41, 37441), (44, 37483), (51, 37525), (68, 37618),

Gene: Petito\_55 Start: 38180, Stop: 38590, Start Num: 21

Candidate Starts for Petito\_55:

(Start: 21 @38180 has 69 MA's), (36, 38366), (37, 38369), (39, 38384), (44, 38456), (48, 38477),

Gene: Phepper\_55 Start: 37181, Stop: 37648, Start Num: 21

Candidate Starts for Phepper\_55:

(Start: 13 @37109 has 3 MA's), (Start: 21 @37181 has 69 MA's), (24, 37208), (30, 37265), (39, 37388), (41, 37418), (44, 37460), (46, 37466), (51, 37502), (56, 37526), (66, 37592), (67, 37595), (76, 37643),

Gene: Pherobrine\_55 Start: 38033, Stop: 38560, Start Num: 21

Candidate Starts for Pherobrine\_55:

(Start: 13 @37961 has 3 MA's), (Start: 21 @38033 has 69 MA's), (22, 38045), (27, 38093), (35, 38210), (39, 38240), (44, 38312), (49, 38348), (51, 38354), (53, 38360), (58, 38384), (70, 38459), (77, 38510),

Gene: Poco6\_089 Start: 48918, Stop: 49439, Start Num: 21

Candidate Starts for Poco6\_089:

(18, 48906), (Start: 21 @48918 has 69 MA's), (24, 48945), (34, 49089), (37, 49107), (39, 49122), (40, 49125), (41, 49152), (43, 49158), (47, 49212), (48, 49215), (54, 49245), (57, 49266), (60, 49296), (73, 49365), (74, 49380),

Gene: Rickmore\_50 Start: 34982, Stop: 35440, Start Num: 21

Candidate Starts for Rickmore\_50:

(Start: 13 @34910 has 3 MA's), (Start: 21 @34982 has 69 MA's), (22, 34994), (39, 35189), (41, 35219), (44, 35261), (51, 35303), (54, 35312), (56, 35327), (72, 35405),

Gene: Roney\_53 Start: 36376, Stop: 36786, Start Num: 21

Candidate Starts for Roney\_53:

(20, 36373), (Start: 21 @36376 has 69 MA's), (27, 36436), (28, 36439), (30, 36460), (32, 36499), (33, 36538), (39, 36580), (42, 36613), (44, 36652), (48, 36673), (64, 36763),

Gene: Runhaar\_54 Start: 36981, Stop: 37448, Start Num: 21

Candidate Starts for Runhaar\_54:

(14, 36921), (Start: 21 @36981 has 69 MA's), (24, 37008), (30, 37065), (39, 37188), (41, 37218), (44, 37260), (46, 37266), (51, 37302), (56, 37326), (66, 37392), (67, 37395), (76, 37443),

Gene: Schwartz33\_55 Start: 37144, Stop: 37581, Start Num: 21

Candidate Starts for Schwartz33\_55:

(Start: 21 @37144 has 69 MA's), (24, 37171), (39, 37348), (41, 37378),

Gene: Secretariat\_53 Start: 36006, Stop: 36494, Start Num: 21

Candidate Starts for Secretariat\_53:

(16, 35955), (19, 35997), (Start: 21 @36006 has 69 MA's), (24, 36033), (25, 36045), (39, 36210), (40, 36213), (41, 36240), (59, 36360), (78, 36483),

Gene: ShaggyRogers\_54 Start: 36933, Stop: 37400, Start Num: 21

Candidate Starts for ShaggyRogers\_54:

(Start: 21 @36933 has 69 MA's), (22, 36945), (39, 37140), (41, 37170), (44, 37212), (51, 37254), (75, 37392),

Gene: Stardom\_41 Start: 29115, Stop: 29480, Start Num: 21

Candidate Starts for Stardom\_41:

(Start: 21 @29115 has 69 MA's), (27, 29175), (31, 29217), (34, 29280), (35, 29283), (39, 29313), (43, 29346), (51, 29424),

Gene: SweetCrkHerbs\_54 Start: 36034, Stop: 36432, Start Num: 21

Candidate Starts for SweetCrkHerbs\_54:

(Start: 21 @36034 has 69 MA's), (33, 36202), (39, 36244), (44, 36316), (47, 36334), (61, 36409), (62, 36418),

Gene: Tairn4Wing\_55 Start: 36335, Stop: 36745, Start Num: 21

Candidate Starts for Tairn4Wing\_55:

(Start: 21 @36335 has 69 MA's), (36, 36521), (37, 36524), (39, 36539), (44, 36611), (48, 36632), (64, 36722),

Gene: Talon44\_54 Start: 36376, Stop: 36774, Start Num: 21

Candidate Starts for Talon44\_54:

(Start: 21 @36376 has 69 MA's), (33, 36544), (39, 36586), (44, 36658), (47, 36676), (61, 36751), (62, 36760),

Gene: Tanis\_53 Start: 36196, Stop: 36606, Start Num: 21

Candidate Starts for Tanis\_53:

(20, 36193), (Start: 21 @36196 has 69 MA's), (27, 36256), (28, 36259), (30, 36280), (32, 36319), (33, 36358), (39, 36400), (42, 36433), (44, 36472), (48, 36493), (64, 36583),

Gene: TenaciousP\_54 Start: 38556, Stop: 39014, Start Num: 21

Candidate Starts for TenaciousP\_54:

(Start: 21 @38556 has 69 MA's), (22, 38568), (29, 38631), (33, 38721), (39, 38763), (41, 38793), (44, 38835), (51, 38877), (56, 38901), (72, 38979),

Gene: Tonaltzin\_57 Start: 37138, Stop: 37584, Start Num: 22

Candidate Starts for Tonaltzin\_57:

(Start: 21 @37126 has 69 MA's), (22, 37138), (29, 37201), (33, 37291), (39, 37333), (41, 37363), (44, 37405), (51, 37447), (56, 37471), (72, 37549),

Gene: Tribby\_44 Start: 30206, Stop: 30571, Start Num: 21

Candidate Starts for Tribby\_44:

(15, 30146), (Start: 21 @30206 has 69 MA's), (31, 30308), (34, 30371), (35, 30374), (39, 30404), (43, 30437), (51, 30515),

Gene: Trufflozitus\_54 Start: 36858, Stop: 37268, Start Num: 21

Candidate Starts for Trufflozitus\_54:

(Start: 21 @36858 has 69 MA's), (36, 37044), (37, 37047), (39, 37062), (44, 37134), (48, 37155), (64, 37245), (65, 37248),

Gene: Untouchable\_55 Start: 37530, Stop: 37997, Start Num: 21

Candidate Starts for Untouchable\_55:

(Start: 13 @37458 has 3 MA's), (Start: 21 @37530 has 69 MA's), (30, 37614), (39, 37737), (41, 37767), (44, 37809), (46, 37815), (51, 37851), (66, 37941), (67, 37944), (76, 37992),

Gene: Vardy\_53 Start: 36877, Stop: 37338, Start Num: 21

Candidate Starts for Vardy\_53:

(Start: 13 @36805 has 3 MA's), (Start: 21 @36877 has 69 MA's), (24, 36904), (30, 36961), (39, 37084), (41, 37114), (44, 37156), (46, 37162), (51, 37198), (56, 37222), (76, 37333),

Gene: Xenomorph\_40 Start: 29917, Stop: 30282, Start Num: 21

Candidate Starts for Xenomorph\_40:

(Start: 21 @29917 has 69 MA's), (27, 29977), (31, 30019), (34, 30082), (35, 30085), (39, 30115), (43, 30148), (51, 30226),

Gene: Zeph\_56 Start: 37958, Stop: 38485, Start Num: 13

Candidate Starts for Zeph\_56:

(Start: 13 @37958 has 3 MA's), (Start: 21 @38030 has 69 MA's), (30, 38114), (39, 38237), (41, 38267), (44, 38309), (66, 38429), (67, 38432), (76, 38480),