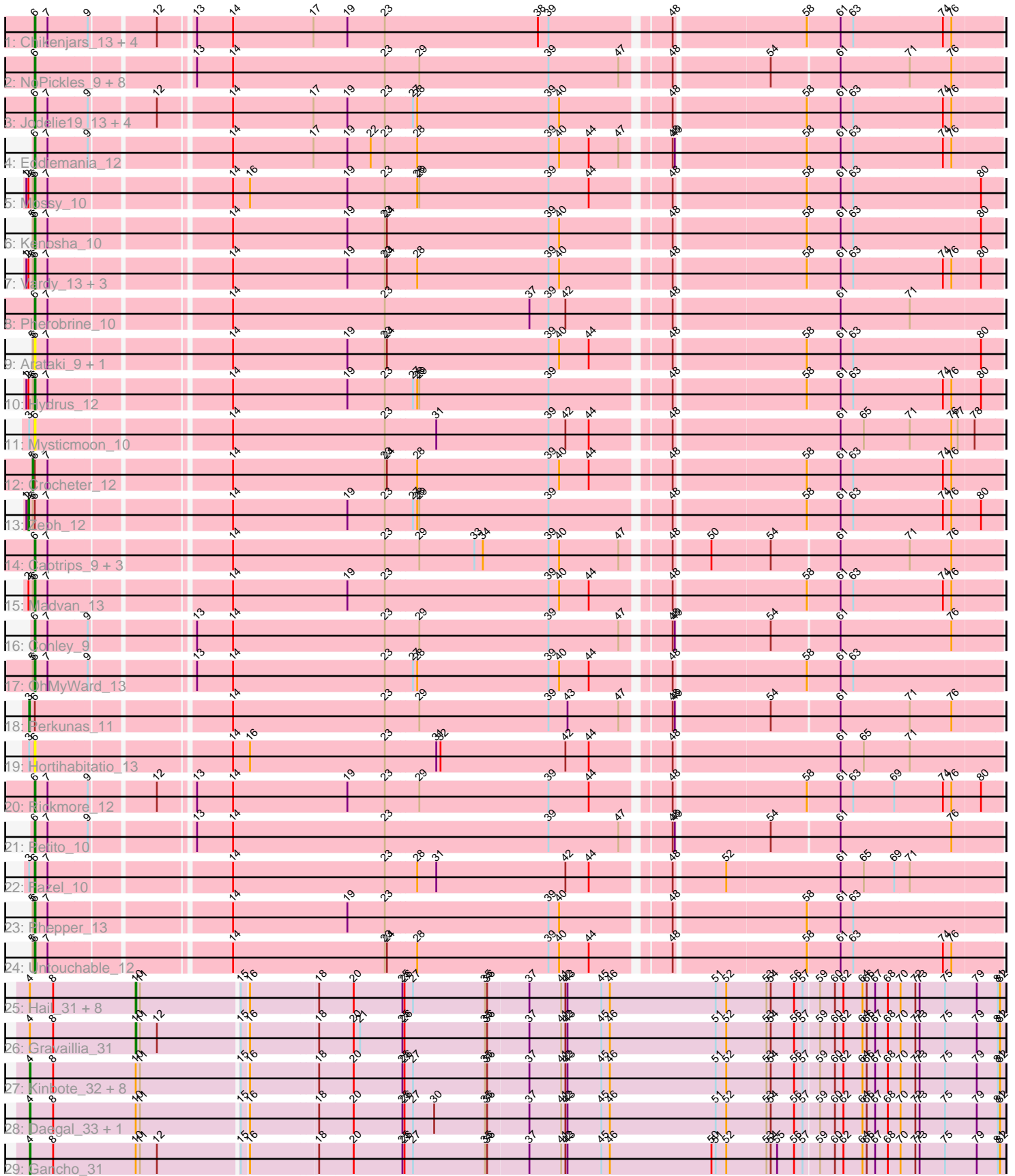


Pham 202916



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 202916 Report

This analysis was run 01/18/25 on database version 583.

Pham number 202916 has 69 members, 5 are drafts.

Phages represented in each track:

- Track 1 : Chikenjars\_13, EndAve\_13, Duffington\_13, Nithya\_13, AlainaMarie\_13
- Track 2 : NoPickles\_9, Gill\_9, Capybara\_9, Odesza\_9, Magel\_9, Roney\_9, Kerry\_9, Gravy\_9, Tanis\_9
- Track 3 : Jodelie19\_13, TenaciousP\_13, Aflac\_13, OlgasClover\_13, Figliar\_13
- Track 4 : Eddiemania\_12
- Track 5 : Mossy\_10
- Track 6 : Kenosha\_10
- Track 7 : Vardy\_13, Burley\_13, Nadmeg\_13, Runhaar\_13
- Track 8 : Pherobrine\_10
- Track 9 : Arataki\_9, Demure\_10
- Track 10 : Hydrus\_12
- Track 11 : Mysticmoon\_10
- Track 12 : Crocheter\_12
- Track 13 : Zeph\_12
- Track 14 : Captrips\_9, FortCran\_9, Artorias\_9, Avazak\_9
- Track 15 : Madvan\_13
- Track 16 : Conley\_9
- Track 17 : OhMyWard\_13
- Track 18 : Perkunas\_11
- Track 19 : Hortihabitatio\_13
- Track 20 : Rickmore\_12
- Track 21 : Petite\_10
- Track 22 : Fazel\_10
- Track 23 : Phepper\_13
- Track 24 : Untouchable\_12
- Track 25 : Hail\_31, Hadrien\_32, Giles\_31, Wishmaker\_31, Dewey\_31, Forge\_31, Luna22\_31, Luke\_32, Ubuntu\_32
- Track 26 : Gravallia\_31
- Track 27 : Kinbote\_32, Evanesce\_31, Amymech\_32, Webster2\_32, DeepSoil15\_32, Ein37\_32, HH92\_31, OBUpride\_32, LilHazelNut\_32
- Track 28 : Daegal\_33, Amochick\_32
- Track 29 : Gancho\_31

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

The start number called the most often in the published annotations is 6, it was called in 39 of the 64 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Aflac\_13, AlainaMarie\_13, Arataki\_9, Artorias\_9, Avazak\_9, Burley\_13, Captrips\_9, Capybara\_9, Chikenjars\_13, Conley\_9, Demure\_10, Duffington\_13, Eddiemania\_12, EndAve\_13, Fazel\_10, Figliar\_13, FortCran\_9, Gill\_9, Gravy\_9, Hortihabitatio\_13, Hydrus\_12, Jodelie19\_13, Kenosha\_10, Kerry\_9, Madvan\_13, Magel\_9, Mossy\_10, Mysticmoon\_10, Nadmeg\_13, Nithya\_13, NoPickles\_9, Odesza\_9, OhMyWard\_13, OlgasClover\_13, Petito\_10, Phepper\_13, Pherobrine\_10, Rickmore\_12, Roney\_9, Runhaar\_13, Tanis\_9, TenaciousP\_13, Untouchable\_12, Vardy\_13,

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

- Crocheter\_12, Perkunas\_11, Zeph\_12,

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

- Amochick\_32, Amymech\_32, Daegal\_33, DeepSoil15\_32, Dewey\_31, Ein37\_32, Evanesce\_31, Forge\_31, Gancho\_31, Giles\_31, Gravaillia\_31, HH92\_31, Hadrien\_32, Hail\_31, Kinbote\_32, LilHazelNut\_32, Luke\_32, Luna22\_31, OBUpride\_32, Ubuntu\_32, Webster2\_32, Wishmaker\_31,

### Summary by start number:

Start 2:

- Found in 8 of 69 ( 11.6% ) of genes in pham
- Manual Annotations of this start: 1 of 64
- Called 12.5% of time when present
- Phage (with cluster) where this start called: Zeph\_12 (DJ),

Start 3:

- Found in 4 of 69 ( 5.8% ) of genes in pham
- Manual Annotations of this start: 1 of 64
- Called 25.0% of time when present
- Phage (with cluster) where this start called: Perkunas\_11 (DJ),

Start 4:

- Found in 22 of 69 ( 31.9% ) of genes in pham
- Manual Annotations of this start: 12 of 64
- Called 54.5% of time when present
- Phage (with cluster) where this start called: Amochick\_32 (Q), Amymech\_32 (Q), Daegal\_33 (Q), DeepSoil15\_32 (Q), Ein37\_32 (Q), Evanesce\_31 (Q), Gancho\_31 (Q), HH92\_31 (Q), Kinbote\_32 (Q), LilHazelNut\_32 (Q), OBUpride\_32 (Q), Webster2\_32 (Q),

Start 5:

- Found in 15 of 69 ( 21.7% ) of genes in pham
- Manual Annotations of this start: 1 of 64
- Called 6.7% of time when present
- Phage (with cluster) where this start called: Crocheter\_12 (DJ),

Start 6:

- Found in 47 of 69 ( 68.1% ) of genes in pham

- Manual Annotations of this start: 39 of 64
- Called 93.6% of time when present
- Phage (with cluster) where this start called: Aflac\_13 (DJ), AlainaMarie\_13 (DJ), Arataki\_9 (DJ), Artorias\_9 (DJ), Avazak\_9 (DJ), Burley\_13 (DJ), Captrips\_9 (DJ), Capybara\_9 (DJ), Chikenjars\_13 (DJ), Conley\_9 (DJ), Demure\_10 (DJ), Duffington\_13 (DJ), Eddiemania\_12 (DJ), EndAve\_13 (DJ), Fazel\_10 (DJ), Figliar\_13 (DJ), FortCran\_9 (DJ), Gill\_9 (DJ), Gravy\_9 (DJ), Hortihabitatio\_13 (DJ), Hydrus\_12 (DJ), Jodelie19\_13 (DJ), Kenosha\_10 (DJ), Kerry\_9 (DJ), Madvan\_13 (DJ), Magel\_9 (DJ), Mossy\_10 (DJ), Mysticmoon\_10 (DJ), Nadmeg\_13 (DJ), Nithya\_13 (DJ), NoPickles\_9 (DJ), Odesza\_9 (DJ), OhMyWard\_13 (DJ), OlgasClover\_13 (DJ), Petite\_10 (DJ), Phepper\_13 (DJ), Pherobrine\_10 (DJ), Rickmore\_12 (DJ), Roney\_9 (DJ), Runhaar\_13 (DJ), Tanis\_9 (DJ), TenaciousP\_13 (DJ), Untouchable\_12 (DJ), Vardy\_13 (DJ),

Start 10:

- Found in 22 of 69 ( 31.9% ) of genes in pham
- Manual Annotations of this start: 10 of 64
- Called 45.5% of time when present
- Phage (with cluster) where this start called: Dewey\_31 (Q), Forge\_31 (Q), Giles\_31 (Q), Gravaiilia\_31 (Q), Hadrien\_32 (Q), Hail\_31 (Q), Luke\_32 (Q), Luna22\_31 (Q), Ubuntu\_32 (Q), Wishmaker\_31 (Q),

### Summary by clusters:

There are 2 clusters represented in this pham: Q, DJ,

Info for manual annotations of cluster DJ:

- Start number 2 was manually annotated 1 time for cluster DJ.
- Start number 3 was manually annotated 1 time for cluster DJ.
- Start number 5 was manually annotated 1 time for cluster DJ.
- Start number 6 was manually annotated 39 times for cluster DJ.

Info for manual annotations of cluster Q:

- Start number 4 was manually annotated 12 times for cluster Q.
- Start number 10 was manually annotated 10 times for cluster Q.

### Gene Information:

Gene: Aflac\_13 Start: 6653, Stop: 7939, Start Num: 6

Candidate Starts for Aflac\_13:

(Start: 6 @6653 has 39 MA's), (7, 6671), (9, 6725), (12, 6809), (14, 6902), (17, 7016), (19, 7064), (23, 7115), (27, 7151), (28, 7157), (39, 7343), (40, 7358), (48, 7496), (58, 7673), (61, 7718), (63, 7736), (74, 7859), (76, 7871),

Gene: AlainaMarie\_13 Start: 6643, Stop: 7929, Start Num: 6

Candidate Starts for AlainaMarie\_13:

(Start: 6 @6643 has 39 MA's), (7, 6661), (9, 6715), (12, 6799), (13, 6841), (14, 6892), (17, 7006), (19, 7054), (23, 7105), (38, 7318), (39, 7333), (48, 7486), (58, 7663), (61, 7708), (63, 7726), (74, 7849), (76, 7861),

Gene: Amochick\_32 Start: 26987, Stop: 28345, Start Num: 4

Candidate Starts for Amochick\_32:

(Start: 4 @26987 has 12 MA's), (8, 27020), (Start: 10 @27137 has 10 MA's), (11, 27143), (15, 27278), (16, 27287), (18, 27380), (20, 27428), (25, 27497), (26, 27500), (27, 27512), (30, 27542), (35, 27614), (36, 27617), (37, 27674), (41, 27719), (42, 27725), (43, 27728), (45, 27776), (46, 27788), (51, 27938), (52, 27953), (53, 28010), (54, 28016), (56, 28049), (57, 28061), (59, 28082), (60, 28103), (62, 28115), (64, 28142), (66, 28148), (67, 28160), (68, 28178), (70, 28196), (72, 28217), (73, 28223), (75, 28259), (79, 28304), (81, 28334), (82, 28337),

Gene: Amymech\_32 Start: 26981, Stop: 28339, Start Num: 4

Candidate Starts for Amymech\_32:

(Start: 4 @26981 has 12 MA's), (8, 27014), (Start: 10 @27131 has 10 MA's), (11, 27137), (15, 27272), (16, 27281), (18, 27374), (20, 27422), (25, 27491), (26, 27494), (27, 27506), (35, 27608), (36, 27611), (37, 27668), (41, 27713), (42, 27719), (43, 27722), (45, 27770), (46, 27782), (51, 27932), (52, 27947), (53, 28004), (54, 28010), (56, 28043), (57, 28055), (59, 28076), (60, 28097), (62, 28109), (64, 28136), (66, 28142), (67, 28154), (68, 28172), (70, 28190), (72, 28211), (73, 28217), (75, 28253), (79, 28298), (81, 28328), (82, 28331),

Gene: Arataki\_9 Start: 4235, Stop: 5521, Start Num: 6

Candidate Starts for Arataki\_9:

(Start: 5 @4232 has 1 MA's), (Start: 6 @4235 has 39 MA's), (7, 4253), (14, 4484), (19, 4646), (23, 4697), (24, 4700), (39, 4925), (40, 4940), (44, 4982), (48, 5078), (58, 5255), (61, 5300), (63, 5318), (80, 5492),

Gene: Artorias\_9 Start: 3802, Stop: 5085, Start Num: 6

Candidate Starts for Artorias\_9:

(Start: 6 @3802 has 39 MA's), (7, 3820), (14, 4051), (23, 4264), (29, 4309), (33, 4387), (34, 4399), (39, 4492), (40, 4507), (47, 4591), (48, 4645), (50, 4690), (54, 4771), (61, 4864), (71, 4960), (76, 5017),

Gene: Avazak\_9 Start: 3805, Stop: 5088, Start Num: 6

Candidate Starts for Avazak\_9:

(Start: 6 @3805 has 39 MA's), (7, 3823), (14, 4054), (23, 4267), (29, 4312), (33, 4390), (34, 4402), (39, 4495), (40, 4510), (47, 4594), (48, 4648), (50, 4693), (54, 4774), (61, 4867), (71, 4963), (76, 5020),

Gene: Burley\_13 Start: 6444, Stop: 7730, Start Num: 6

Candidate Starts for Burley\_13:

(1, 6432), (Start: 2 @6435 has 1 MA's), (Start: 5 @6441 has 1 MA's), (Start: 6 @6444 has 39 MA's), (7, 6462), (14, 6693), (19, 6855), (23, 6906), (24, 6909), (28, 6948), (39, 7134), (40, 7149), (48, 7287), (58, 7464), (61, 7509), (63, 7527), (74, 7650), (76, 7662), (80, 7701),

Gene: Captrips\_9 Start: 3805, Stop: 5088, Start Num: 6

Candidate Starts for Captrips\_9:

(Start: 6 @3805 has 39 MA's), (7, 3823), (14, 4054), (23, 4267), (29, 4312), (33, 4390), (34, 4402), (39, 4495), (40, 4510), (47, 4594), (48, 4648), (50, 4693), (54, 4774), (61, 4867), (71, 4963), (76, 5020),

Gene: Capybara\_9 Start: 3518, Stop: 4801, Start Num: 6

Candidate Starts for Capybara\_9:

(Start: 6 @3518 has 39 MA's), (13, 3716), (14, 3767), (23, 3980), (29, 4025), (39, 4208), (47, 4307), (48, 4361), (54, 4487), (61, 4580), (71, 4676), (76, 4733),

Gene: Chikenjars\_13 Start: 6643, Stop: 7929, Start Num: 6

Candidate Starts for Chikenjars\_13:

(Start: 6 @6643 has 39 MA's), (7, 6661), (9, 6715), (12, 6799), (13, 6841), (14, 6892), (17, 7006), (19, 7054), (23, 7105), (38, 7318), (39, 7333), (48, 7486), (58, 7663), (61, 7708), (63, 7726), (74, 7849), (76,

7861),

Gene: Conley\_9 Start: 3832, Stop: 5115, Start Num: 6

Candidate Starts for Conley\_9:

(Start: 6 @3832 has 39 MA's), (7, 3850), (9, 3904), (13, 4030), (14, 4081), (23, 4294), (29, 4339), (39, 4522), (47, 4621), (48, 4675), (49, 4678), (54, 4801), (61, 4894), (76, 5047),

Gene: Crocheter\_12 Start: 5368, Stop: 6657, Start Num: 5

Candidate Starts for Crocheter\_12:

(Start: 5 @5368 has 1 MA's), (Start: 6 @5371 has 39 MA's), (7, 5389), (14, 5620), (23, 5833), (24, 5836), (28, 5875), (39, 6061), (40, 6076), (44, 6118), (48, 6214), (58, 6391), (61, 6436), (63, 6454), (74, 6577), (76, 6589),

Gene: Daegal\_33 Start: 27275, Stop: 28633, Start Num: 4

Candidate Starts for Daegal\_33:

(Start: 4 @27275 has 12 MA's), (8, 27308), (Start: 10 @27425 has 10 MA's), (11, 27431), (15, 27566), (16, 27575), (18, 27668), (20, 27716), (25, 27785), (26, 27788), (27, 27800), (30, 27830), (35, 27902), (36, 27905), (37, 27962), (41, 28007), (42, 28013), (43, 28016), (45, 28064), (46, 28076), (51, 28226), (52, 28241), (53, 28298), (54, 28304), (56, 28337), (57, 28349), (59, 28370), (60, 28391), (62, 28403), (64, 28430), (66, 28436), (67, 28448), (68, 28466), (70, 28484), (72, 28505), (73, 28511), (75, 28547), (79, 28592), (81, 28622), (82, 28625),

Gene: DeepSoil15\_32 Start: 26981, Stop: 28339, Start Num: 4

Candidate Starts for DeepSoil15\_32:

(Start: 4 @26981 has 12 MA's), (8, 27014), (Start: 10 @27131 has 10 MA's), (11, 27137), (15, 27272), (16, 27281), (18, 27374), (20, 27422), (25, 27491), (26, 27494), (27, 27506), (35, 27608), (36, 27611), (37, 27668), (41, 27713), (42, 27719), (43, 27722), (45, 27770), (46, 27782), (51, 27932), (52, 27947), (53, 28004), (54, 28010), (56, 28043), (57, 28055), (59, 28076), (60, 28097), (62, 28109), (64, 28136), (66, 28142), (67, 28154), (68, 28172), (70, 28190), (72, 28211), (73, 28217), (75, 28253), (79, 28298), (81, 28328), (82, 28331),

Gene: Demure\_10 Start: 4235, Stop: 5521, Start Num: 6

Candidate Starts for Demure\_10:

(Start: 5 @4232 has 1 MA's), (Start: 6 @4235 has 39 MA's), (7, 4253), (14, 4484), (19, 4646), (23, 4697), (24, 4700), (39, 4925), (40, 4940), (44, 4982), (48, 5078), (58, 5255), (61, 5300), (63, 5318), (80, 5492),

Gene: Dewey\_31 Start: 27131, Stop: 28339, Start Num: 10

Candidate Starts for Dewey\_31:

(Start: 4 @26981 has 12 MA's), (8, 27014), (Start: 10 @27131 has 10 MA's), (11, 27137), (15, 27272), (16, 27281), (18, 27374), (20, 27422), (25, 27491), (26, 27494), (27, 27506), (35, 27608), (36, 27611), (37, 27668), (41, 27713), (42, 27719), (43, 27722), (45, 27770), (46, 27782), (51, 27932), (52, 27947), (53, 28004), (54, 28010), (56, 28043), (57, 28055), (59, 28076), (60, 28097), (62, 28109), (64, 28136), (66, 28142), (67, 28154), (68, 28172), (70, 28190), (72, 28211), (73, 28217), (75, 28253), (79, 28298), (81, 28328), (82, 28331),

Gene: Duffington\_13 Start: 6628, Stop: 7914, Start Num: 6

Candidate Starts for Duffington\_13:

(Start: 6 @6628 has 39 MA's), (7, 6646), (9, 6700), (12, 6784), (13, 6826), (14, 6877), (17, 6991), (19, 7039), (23, 7090), (38, 7303), (39, 7318), (48, 7471), (58, 7648), (61, 7693), (63, 7711), (74, 7834), (76, 7846),

Gene: Eddiemania\_12 Start: 5836, Stop: 7122, Start Num: 6

Candidate Starts for Eddiemania\_12:

(Start: 6 @5836 has 39 MA's), (7, 5854), (9, 5908), (14, 6085), (17, 6199), (19, 6247), (22, 6280), (23, 6298), (28, 6340), (39, 6526), (40, 6541), (44, 6583), (47, 6625), (48, 6679), (49, 6682), (58, 6856), (61, 6901), (63, 6919), (74, 7042), (76, 7054),

Gene: Ein37\_32 Start: 26981, Stop: 28339, Start Num: 4

Candidate Starts for Ein37\_32:

(Start: 4 @26981 has 12 MA's), (8, 27014), (Start: 10 @27131 has 10 MA's), (11, 27137), (15, 27272), (16, 27281), (18, 27374), (20, 27422), (25, 27491), (26, 27494), (27, 27506), (35, 27608), (36, 27611), (37, 27668), (41, 27713), (42, 27719), (43, 27722), (45, 27770), (46, 27782), (51, 27932), (52, 27947), (53, 28004), (54, 28010), (56, 28043), (57, 28055), (59, 28076), (60, 28097), (62, 28109), (64, 28136), (66, 28142), (67, 28154), (68, 28172), (70, 28190), (72, 28211), (73, 28217), (75, 28253), (79, 28298), (81, 28328), (82, 28331),

Gene: EndAve\_13 Start: 6643, Stop: 7929, Start Num: 6

Candidate Starts for EndAve\_13:

(Start: 6 @6643 has 39 MA's), (7, 6661), (9, 6715), (12, 6799), (13, 6841), (14, 6892), (17, 7006), (19, 7054), (23, 7105), (38, 7318), (39, 7333), (48, 7486), (58, 7663), (61, 7708), (63, 7726), (74, 7849), (76, 7861),

Gene: Evanesce\_31 Start: 26981, Stop: 28339, Start Num: 4

Candidate Starts for Evanesce\_31:

(Start: 4 @26981 has 12 MA's), (8, 27014), (Start: 10 @27131 has 10 MA's), (11, 27137), (15, 27272), (16, 27281), (18, 27374), (20, 27422), (25, 27491), (26, 27494), (27, 27506), (35, 27608), (36, 27611), (37, 27668), (41, 27713), (42, 27719), (43, 27722), (45, 27770), (46, 27782), (51, 27932), (52, 27947), (53, 28004), (54, 28010), (56, 28043), (57, 28055), (59, 28076), (60, 28097), (62, 28109), (64, 28136), (66, 28142), (67, 28154), (68, 28172), (70, 28190), (72, 28211), (73, 28217), (75, 28253), (79, 28298), (81, 28328), (82, 28331),

Gene: Fazel\_10 Start: 5376, Stop: 6665, Start Num: 6

Candidate Starts for Fazel\_10:

(Start: 3 @5376 has 1 MA's), (Start: 6 @5376 has 39 MA's), (7, 5394), (14, 5625), (23, 5838), (28, 5880), (31, 5907), (42, 6090), (44, 6123), (48, 6219), (52, 6285), (61, 6444), (65, 6477), (69, 6519), (71, 6540),

Gene: Figliar\_13 Start: 6653, Stop: 7939, Start Num: 6

Candidate Starts for Figliar\_13:

(Start: 6 @6653 has 39 MA's), (7, 6671), (9, 6725), (12, 6809), (14, 6902), (17, 7016), (19, 7064), (23, 7115), (27, 7151), (28, 7157), (39, 7343), (40, 7358), (48, 7496), (58, 7673), (61, 7718), (63, 7736), (74, 7859), (76, 7871),

Gene: Forge\_31 Start: 27131, Stop: 28339, Start Num: 10

Candidate Starts for Forge\_31:

(Start: 4 @26981 has 12 MA's), (8, 27014), (Start: 10 @27131 has 10 MA's), (11, 27137), (15, 27272), (16, 27281), (18, 27374), (20, 27422), (25, 27491), (26, 27494), (27, 27506), (35, 27608), (36, 27611), (37, 27668), (41, 27713), (42, 27719), (43, 27722), (45, 27770), (46, 27782), (51, 27932), (52, 27947), (53, 28004), (54, 28010), (56, 28043), (57, 28055), (59, 28076), (60, 28097), (62, 28109), (64, 28136), (66, 28142), (67, 28154), (68, 28172), (70, 28190), (72, 28211), (73, 28217), (75, 28253), (79, 28298), (81, 28328), (82, 28331),

Gene: FortCran\_9 Start: 3802, Stop: 5085, Start Num: 6

Candidate Starts for FortCran\_9:

(Start: 6 @3802 has 39 MA's), (7, 3820), (14, 4051), (23, 4264), (29, 4309), (33, 4387), (34, 4399), (39, 4492), (40, 4507), (47, 4591), (48, 4645), (50, 4690), (54, 4771), (61, 4864), (71, 4960), (76, 5017),

Gene: Gancho\_31 Start: 26704, Stop: 28062, Start Num: 4

Candidate Starts for Gancho\_31:

(Start: 4 @26704 has 12 MA's), (8, 26737), (Start: 10 @26854 has 10 MA's), (11, 26860), (12, 26884), (15, 26995), (16, 27004), (18, 27097), (20, 27145), (25, 27214), (26, 27217), (27, 27229), (35, 27331), (36, 27334), (37, 27391), (41, 27436), (42, 27442), (43, 27445), (45, 27493), (46, 27505), (50, 27649), (51, 27655), (52, 27670), (53, 27727), (54, 27733), (55, 27742), (56, 27766), (57, 27778), (59, 27799), (60, 27820), (62, 27832), (64, 27859), (66, 27865), (67, 27877), (68, 27895), (70, 27913), (72, 27934), (73, 27940), (75, 27976), (79, 28021), (81, 28051), (82, 28054),

Gene: Giles\_31 Start: 27131, Stop: 28339, Start Num: 10

Candidate Starts for Giles\_31:

(Start: 4 @26981 has 12 MA's), (8, 27014), (Start: 10 @27131 has 10 MA's), (11, 27137), (15, 27272), (16, 27281), (18, 27374), (20, 27422), (25, 27491), (26, 27494), (27, 27506), (35, 27608), (36, 27611), (37, 27668), (41, 27713), (42, 27719), (43, 27722), (45, 27770), (46, 27782), (51, 27932), (52, 27947), (53, 28004), (54, 28010), (56, 28043), (57, 28055), (59, 28076), (60, 28097), (62, 28109), (64, 28136), (66, 28142), (67, 28154), (68, 28172), (70, 28190), (72, 28211), (73, 28217), (75, 28253), (79, 28298), (81, 28328), (82, 28331),

Gene: Gill\_9 Start: 3518, Stop: 4801, Start Num: 6

Candidate Starts for Gill\_9:

(Start: 6 @3518 has 39 MA's), (13, 3716), (14, 3767), (23, 3980), (29, 4025), (39, 4208), (47, 4307), (48, 4361), (54, 4487), (61, 4580), (71, 4676), (76, 4733),

Gene: Gravaillia\_31 Start: 26860, Stop: 28068, Start Num: 10

Candidate Starts for Gravaillia\_31:

(Start: 4 @26710 has 12 MA's), (8, 26743), (Start: 10 @26860 has 10 MA's), (11, 26866), (12, 26890), (15, 27001), (16, 27010), (18, 27103), (20, 27151), (21, 27160), (25, 27220), (26, 27223), (35, 27337), (36, 27340), (37, 27397), (41, 27442), (42, 27448), (43, 27451), (45, 27499), (46, 27511), (51, 27661), (52, 27676), (53, 27733), (54, 27739), (56, 27772), (57, 27784), (59, 27805), (60, 27826), (62, 27838), (64, 27865), (66, 27871), (67, 27883), (68, 27901), (70, 27919), (72, 27940), (73, 27946), (75, 27982), (79, 28027), (81, 28057), (82, 28060),

Gene: Gravy\_9 Start: 3518, Stop: 4801, Start Num: 6

Candidate Starts for Gravy\_9:

(Start: 6 @3518 has 39 MA's), (13, 3716), (14, 3767), (23, 3980), (29, 4025), (39, 4208), (47, 4307), (48, 4361), (54, 4487), (61, 4580), (71, 4676), (76, 4733),

Gene: HH92\_31 Start: 26981, Stop: 28339, Start Num: 4

Candidate Starts for HH92\_31:

(Start: 4 @26981 has 12 MA's), (8, 27014), (Start: 10 @27131 has 10 MA's), (11, 27137), (15, 27272), (16, 27281), (18, 27374), (20, 27422), (25, 27491), (26, 27494), (27, 27506), (35, 27608), (36, 27611), (37, 27668), (41, 27713), (42, 27719), (43, 27722), (45, 27770), (46, 27782), (51, 27932), (52, 27947), (53, 28004), (54, 28010), (56, 28043), (57, 28055), (59, 28076), (60, 28097), (62, 28109), (64, 28136), (66, 28142), (67, 28154), (68, 28172), (70, 28190), (72, 28211), (73, 28217), (75, 28253), (79, 28298), (81, 28328), (82, 28331),

Gene: Hadrien\_32 Start: 27131, Stop: 28339, Start Num: 10

Candidate Starts for Hadrien\_32:

(Start: 4 @26981 has 12 MA's), (8, 27014), (Start: 10 @27131 has 10 MA's), (11, 27137), (15, 27272), (16, 27281), (18, 27374), (20, 27422), (25, 27491), (26, 27494), (27, 27506), (35, 27608), (36, 27611),



(37, 27668), (41, 27713), (42, 27719), (43, 27722), (45, 27770), (46, 27782), (51, 27932), (52, 27947), (53, 28004), (54, 28010), (56, 28043), (57, 28055), (59, 28076), (60, 28097), (62, 28109), (64, 28136), (66, 28142), (67, 28154), (68, 28172), (70, 28190), (72, 28211), (73, 28217), (75, 28253), (79, 28298), (81, 28328), (82, 28331),

Gene: Hail\_31 Start: 27131, Stop: 28339, Start Num: 10

Candidate Starts for Hail\_31:

(Start: 4 @26981 has 12 MA's), (8, 27014), (Start: 10 @27131 has 10 MA's), (11, 27137), (15, 27272), (16, 27281), (18, 27374), (20, 27422), (25, 27491), (26, 27494), (27, 27506), (35, 27608), (36, 27611), (37, 27668), (41, 27713), (42, 27719), (43, 27722), (45, 27770), (46, 27782), (51, 27932), (52, 27947), (53, 28004), (54, 28010), (56, 28043), (57, 28055), (59, 28076), (60, 28097), (62, 28109), (64, 28136), (66, 28142), (67, 28154), (68, 28172), (70, 28190), (72, 28211), (73, 28217), (75, 28253), (79, 28298), (81, 28328), (82, 28331),

Gene: Hortihabitatio\_13 Start: 5735, Stop: 7024, Start Num: 6

Candidate Starts for Hortihabitatio\_13:

(Start: 3 @5729 has 1 MA's), (Start: 6 @5735 has 39 MA's), (14, 5984), (16, 6008), (23, 6197), (31, 6266), (32, 6272), (42, 6449), (44, 6482), (48, 6578), (61, 6803), (65, 6836), (71, 6899),

Gene: Hydrus\_12 Start: 5629, Stop: 6915, Start Num: 6

Candidate Starts for Hydrus\_12:

(1, 5617), (Start: 2 @5620 has 1 MA's), (Start: 5 @5626 has 1 MA's), (Start: 6 @5629 has 39 MA's), (7, 5647), (14, 5878), (19, 6040), (23, 6091), (27, 6127), (28, 6133), (29, 6136), (39, 6319), (48, 6472), (58, 6649), (61, 6694), (63, 6712), (74, 6835), (76, 6847), (80, 6886),

Gene: Jodelie19\_13 Start: 6647, Stop: 7933, Start Num: 6

Candidate Starts for Jodelie19\_13:

(Start: 6 @6647 has 39 MA's), (7, 6665), (9, 6719), (12, 6803), (14, 6896), (17, 7010), (19, 7058), (23, 7109), (27, 7145), (28, 7151), (39, 7337), (40, 7352), (48, 7490), (58, 7667), (61, 7712), (63, 7730), (74, 7853), (76, 7865),

Gene: Kenosha\_10 Start: 4230, Stop: 5516, Start Num: 6

Candidate Starts for Kenosha\_10:

(Start: 5 @4227 has 1 MA's), (Start: 6 @4230 has 39 MA's), (7, 4248), (14, 4479), (19, 4641), (23, 4692), (24, 4695), (39, 4920), (40, 4935), (48, 5073), (58, 5250), (61, 5295), (63, 5313), (80, 5487),

Gene: Kerry\_9 Start: 3518, Stop: 4801, Start Num: 6

Candidate Starts for Kerry\_9:

(Start: 6 @3518 has 39 MA's), (13, 3716), (14, 3767), (23, 3980), (29, 4025), (39, 4208), (47, 4307), (48, 4361), (54, 4487), (61, 4580), (71, 4676), (76, 4733),

Gene: Kinbote\_32 Start: 26981, Stop: 28339, Start Num: 4

Candidate Starts for Kinbote\_32:

(Start: 4 @26981 has 12 MA's), (8, 27014), (Start: 10 @27131 has 10 MA's), (11, 27137), (15, 27272), (16, 27281), (18, 27374), (20, 27422), (25, 27491), (26, 27494), (27, 27506), (35, 27608), (36, 27611), (37, 27668), (41, 27713), (42, 27719), (43, 27722), (45, 27770), (46, 27782), (51, 27932), (52, 27947), (53, 28004), (54, 28010), (56, 28043), (57, 28055), (59, 28076), (60, 28097), (62, 28109), (64, 28136), (66, 28142), (67, 28154), (68, 28172), (70, 28190), (72, 28211), (73, 28217), (75, 28253), (79, 28298), (81, 28328), (82, 28331),

Gene: LilHazelnut\_32 Start: 26981, Stop: 28339, Start Num: 4

Candidate Starts for LilHazelnut\_32:

(Start: 4 @26981 has 12 MA's), (8, 27014), (Start: 10 @27131 has 10 MA's), (11, 27137), (15, 27272), (16, 27281), (18, 27374), (20, 27422), (25, 27491), (26, 27494), (27, 27506), (35, 27608), (36, 27611), (37, 27668), (41, 27713), (42, 27719), (43, 27722), (45, 27770), (46, 27782), (51, 27932), (52, 27947), (53, 28004), (54, 28010), (56, 28043), (57, 28055), (59, 28076), (60, 28097), (62, 28109), (64, 28136), (66, 28142), (67, 28154), (68, 28172), (70, 28190), (72, 28211), (73, 28217), (75, 28253), (79, 28298), (81, 28328), (82, 28331),

Gene: Luke\_32 Start: 27086, Stop: 28294, Start Num: 10

Candidate Starts for Luke\_32:

(Start: 4 @26936 has 12 MA's), (8, 26969), (Start: 10 @27086 has 10 MA's), (11, 27092), (15, 27227), (16, 27236), (18, 27329), (20, 27377), (25, 27446), (26, 27449), (27, 27461), (35, 27563), (36, 27566), (37, 27623), (41, 27668), (42, 27674), (43, 27677), (45, 27725), (46, 27737), (51, 27887), (52, 27902), (53, 27959), (54, 27965), (56, 27998), (57, 28010), (59, 28031), (60, 28052), (62, 28064), (64, 28091), (66, 28097), (67, 28109), (68, 28127), (70, 28145), (72, 28166), (73, 28172), (75, 28208), (79, 28253), (81, 28283), (82, 28286),

Gene: Luna22\_31 Start: 27131, Stop: 28339, Start Num: 10

Candidate Starts for Luna22\_31:

(Start: 4 @26981 has 12 MA's), (8, 27014), (Start: 10 @27131 has 10 MA's), (11, 27137), (15, 27272), (16, 27281), (18, 27374), (20, 27422), (25, 27491), (26, 27494), (27, 27506), (35, 27608), (36, 27611), (37, 27668), (41, 27713), (42, 27719), (43, 27722), (45, 27770), (46, 27782), (51, 27932), (52, 27947), (53, 28004), (54, 28010), (56, 28043), (57, 28055), (59, 28076), (60, 28097), (62, 28109), (64, 28136), (66, 28142), (67, 28154), (68, 28172), (70, 28190), (72, 28211), (73, 28217), (75, 28253), (79, 28298), (81, 28328), (82, 28331),

Gene: Madvan\_13 Start: 6444, Stop: 7730, Start Num: 6

Candidate Starts for Madvan\_13:

(Start: 2 @6435 has 1 MA's), (Start: 5 @6441 has 1 MA's), (Start: 6 @6444 has 39 MA's), (7, 6462), (14, 6693), (19, 6855), (23, 6906), (39, 7134), (40, 7149), (44, 7191), (48, 7287), (58, 7464), (61, 7509), (63, 7527), (74, 7650), (76, 7662),

Gene: Magel\_9 Start: 3518, Stop: 4801, Start Num: 6

Candidate Starts for Magel\_9:

(Start: 6 @3518 has 39 MA's), (13, 3716), (14, 3767), (23, 3980), (29, 4025), (39, 4208), (47, 4307), (48, 4361), (54, 4487), (61, 4580), (71, 4676), (76, 4733),

Gene: Mossy\_10 Start: 4506, Stop: 5792, Start Num: 6

Candidate Starts for Mossy\_10:

(1, 4494), (Start: 2 @4497 has 1 MA's), (Start: 5 @4503 has 1 MA's), (Start: 6 @4506 has 39 MA's), (7, 4524), (14, 4755), (16, 4779), (19, 4917), (23, 4968), (28, 5010), (29, 5013), (39, 5196), (44, 5253), (48, 5349), (58, 5526), (61, 5571), (63, 5589), (80, 5763),

Gene: Mysticmoon\_10 Start: 4209, Stop: 5498, Start Num: 6

Candidate Starts for Mysticmoon\_10:

(Start: 3 @4203 has 1 MA's), (Start: 6 @4209 has 39 MA's), (14, 4458), (23, 4671), (31, 4740), (39, 4899), (42, 4923), (44, 4956), (48, 5052), (61, 5277), (65, 5310), (71, 5373), (76, 5430), (77, 5439), (78, 5460),

Gene: Nadmeg\_13 Start: 6445, Stop: 7731, Start Num: 6

Candidate Starts for Nadmeg\_13:

(1, 6433), (Start: 2 @6436 has 1 MA's), (Start: 5 @6442 has 1 MA's), (Start: 6 @6445 has 39 MA's), (7, 6463), (14, 6694), (19, 6856), (23, 6907), (24, 6910), (28, 6949), (39, 7135), (40, 7150), (48, 7288), (58, 7465), (61, 7510), (63, 7528), (74, 7651), (76, 7663), (80, 7702),

Gene: Nithya\_13 Start: 6643, Stop: 7929, Start Num: 6

Candidate Starts for Nithya\_13:

(Start: 6 @6643 has 39 MA's), (7, 6661), (9, 6715), (12, 6799), (13, 6841), (14, 6892), (17, 7006), (19, 7054), (23, 7105), (38, 7318), (39, 7333), (48, 7486), (58, 7663), (61, 7708), (63, 7726), (74, 7849), (76, 7861),

Gene: NoPickles\_9 Start: 3518, Stop: 4801, Start Num: 6

Candidate Starts for NoPickles\_9:

(Start: 6 @3518 has 39 MA's), (13, 3716), (14, 3767), (23, 3980), (29, 4025), (39, 4208), (47, 4307), (48, 4361), (54, 4487), (61, 4580), (71, 4676), (76, 4733),

Gene: OBUpride\_32 Start: 26975, Stop: 28333, Start Num: 4

Candidate Starts for OBUpride\_32:

(Start: 4 @26975 has 12 MA's), (8, 27008), (Start: 10 @27125 has 10 MA's), (11, 27131), (15, 27266), (16, 27275), (18, 27368), (20, 27416), (25, 27485), (26, 27488), (27, 27500), (35, 27602), (36, 27605), (37, 27662), (41, 27707), (42, 27713), (43, 27716), (45, 27764), (46, 27776), (51, 27926), (52, 27941), (53, 27998), (54, 28004), (56, 28037), (57, 28049), (59, 28070), (60, 28091), (62, 28103), (64, 28130), (66, 28136), (67, 28148), (68, 28166), (70, 28184), (72, 28205), (73, 28211), (75, 28247), (79, 28292), (81, 28322), (82, 28325),

Gene: Odesza\_9 Start: 3518, Stop: 4801, Start Num: 6

Candidate Starts for Odesza\_9:

(Start: 6 @3518 has 39 MA's), (13, 3716), (14, 3767), (23, 3980), (29, 4025), (39, 4208), (47, 4307), (48, 4361), (54, 4487), (61, 4580), (71, 4676), (76, 4733),

Gene: OhMyWard\_13 Start: 6444, Stop: 7730, Start Num: 6

Candidate Starts for OhMyWard\_13:

(Start: 5 @6441 has 1 MA's), (Start: 6 @6444 has 39 MA's), (7, 6462), (9, 6516), (13, 6642), (14, 6693), (23, 6906), (27, 6942), (28, 6948), (39, 7134), (40, 7149), (44, 7191), (48, 7287), (58, 7464), (61, 7509), (63, 7527),

Gene: OlgasClover\_13 Start: 6644, Stop: 7930, Start Num: 6

Candidate Starts for OlgasClover\_13:

(Start: 6 @6644 has 39 MA's), (7, 6662), (9, 6716), (12, 6800), (14, 6893), (17, 7007), (19, 7055), (23, 7106), (27, 7142), (28, 7148), (39, 7334), (40, 7349), (48, 7487), (58, 7664), (61, 7709), (63, 7727), (74, 7850), (76, 7862),

Gene: Perkunas\_11 Start: 4324, Stop: 5613, Start Num: 3

Candidate Starts for Perkunas\_11:

(Start: 3 @4324 has 1 MA's), (Start: 6 @4330 has 39 MA's), (14, 4579), (23, 4792), (29, 4837), (39, 5020), (43, 5047), (47, 5119), (48, 5173), (49, 5176), (54, 5299), (61, 5392), (71, 5488), (76, 5545),

Gene: Petito\_10 Start: 4026, Stop: 5309, Start Num: 6

Candidate Starts for Petito\_10:

(Start: 6 @4026 has 39 MA's), (7, 4044), (9, 4098), (13, 4224), (14, 4275), (23, 4488), (39, 4716), (47, 4815), (48, 4869), (49, 4872), (54, 4995), (61, 5088), (76, 5241),

Gene: Phepper\_13 Start: 6443, Stop: 7729, Start Num: 6

Candidate Starts for Phepper\_13:

(Start: 5 @6440 has 1 MA's), (Start: 6 @6443 has 39 MA's), (7, 6461), (14, 6692), (19, 6854), (23, 6905), (39, 7133), (40, 7148), (48, 7286), (58, 7463), (61, 7508), (63, 7526),

Gene: Pherobrine\_10 Start: 4207, Stop: 5496, Start Num: 6

Candidate Starts for Pherobrine\_10:

(Start: 6 @4207 has 39 MA's), (7, 4225), (14, 4456), (23, 4669), (37, 4870), (39, 4897), (42, 4921), (48, 5050), (61, 5275), (71, 5371),

Gene: Rickmore\_12 Start: 5213, Stop: 6499, Start Num: 6

Candidate Starts for Rickmore\_12:

(Start: 6 @5213 has 39 MA's), (7, 5231), (9, 5285), (12, 5369), (13, 5411), (14, 5462), (19, 5624), (23, 5675), (29, 5720), (39, 5903), (44, 5960), (48, 6056), (58, 6233), (61, 6278), (63, 6296), (69, 6353), (74, 6419), (76, 6431), (80, 6470),

Gene: Roney\_9 Start: 3518, Stop: 4801, Start Num: 6

Candidate Starts for Roney\_9:

(Start: 6 @3518 has 39 MA's), (13, 3716), (14, 3767), (23, 3980), (29, 4025), (39, 4208), (47, 4307), (48, 4361), (54, 4487), (61, 4580), (71, 4676), (76, 4733),

Gene: Runhaar\_13 Start: 6445, Stop: 7731, Start Num: 6

Candidate Starts for Runhaar\_13:

(1, 6433), (Start: 2 @6436 has 1 MA's), (Start: 5 @6442 has 1 MA's), (Start: 6 @6445 has 39 MA's), (7, 6463), (14, 6694), (19, 6856), (23, 6907), (24, 6910), (28, 6949), (39, 7135), (40, 7150), (48, 7288), (58, 7465), (61, 7510), (63, 7528), (74, 7651), (76, 7663), (80, 7702),

Gene: Tanis\_9 Start: 3368, Stop: 4651, Start Num: 6

Candidate Starts for Tanis\_9:

(Start: 6 @3368 has 39 MA's), (13, 3566), (14, 3617), (23, 3830), (29, 3875), (39, 4058), (47, 4157), (48, 4211), (54, 4337), (61, 4430), (71, 4526), (76, 4583),

Gene: TenaciousP\_13 Start: 6647, Stop: 7933, Start Num: 6

Candidate Starts for TenaciousP\_13:

(Start: 6 @6647 has 39 MA's), (7, 6665), (9, 6719), (12, 6803), (14, 6896), (17, 7010), (19, 7058), (23, 7109), (27, 7145), (28, 7151), (39, 7337), (40, 7352), (48, 7490), (58, 7667), (61, 7712), (63, 7730), (74, 7853), (76, 7865),

Gene: Ubuntu\_32 Start: 27131, Stop: 28339, Start Num: 10

Candidate Starts for Ubuntu\_32:

(Start: 4 @26981 has 12 MA's), (8, 27014), (Start: 10 @27131 has 10 MA's), (11, 27137), (15, 27272), (16, 27281), (18, 27374), (20, 27422), (25, 27491), (26, 27494), (27, 27506), (35, 27608), (36, 27611), (37, 27668), (41, 27713), (42, 27719), (43, 27722), (45, 27770), (46, 27782), (51, 27932), (52, 27947), (53, 28004), (54, 28010), (56, 28043), (57, 28055), (59, 28076), (60, 28097), (62, 28109), (64, 28136), (66, 28142), (67, 28154), (68, 28172), (70, 28190), (72, 28211), (73, 28217), (75, 28253), (79, 28298), (81, 28328), (82, 28331),

Gene: Untouchable\_12 Start: 5370, Stop: 6656, Start Num: 6

Candidate Starts for Untouchable\_12:

(Start: 5 @5367 has 1 MA's), (Start: 6 @5370 has 39 MA's), (7, 5388), (14, 5619), (23, 5832), (24, 5835), (28, 5874), (39, 6060), (40, 6075), (44, 6117), (48, 6213), (58, 6390), (61, 6435), (63, 6453), (74, 6576), (76, 6588),

Gene: Vardy\_13 Start: 6443, Stop: 7729, Start Num: 6

Candidate Starts for Vardy\_13:

(1, 6431), (Start: 2 @6434 has 1 MA's), (Start: 5 @6440 has 1 MA's), (Start: 6 @6443 has 39 MA's), (7, 6461), (14, 6692), (19, 6854), (23, 6905), (24, 6908), (28, 6947), (39, 7133), (40, 7148), (48, 7286), (58, 7463), (61, 7508), (63, 7526), (74, 7649), (76, 7661), (80, 7700),

Gene: Webster2\_32 Start: 26981, Stop: 28339, Start Num: 4

Candidate Starts for Webster2\_32:

(Start: 4 @26981 has 12 MA's), (8, 27014), (Start: 10 @27131 has 10 MA's), (11, 27137), (15, 27272), (16, 27281), (18, 27374), (20, 27422), (25, 27491), (26, 27494), (27, 27506), (35, 27608), (36, 27611), (37, 27668), (41, 27713), (42, 27719), (43, 27722), (45, 27770), (46, 27782), (51, 27932), (52, 27947), (53, 28004), (54, 28010), (56, 28043), (57, 28055), (59, 28076), (60, 28097), (62, 28109), (64, 28136), (66, 28142), (67, 28154), (68, 28172), (70, 28190), (72, 28211), (73, 28217), (75, 28253), (79, 28298), (81, 28328), (82, 28331),

Gene: Wishmaker\_31 Start: 27131, Stop: 28339, Start Num: 10

Candidate Starts for Wishmaker\_31:

(Start: 4 @26981 has 12 MA's), (8, 27014), (Start: 10 @27131 has 10 MA's), (11, 27137), (15, 27272), (16, 27281), (18, 27374), (20, 27422), (25, 27491), (26, 27494), (27, 27506), (35, 27608), (36, 27611), (37, 27668), (41, 27713), (42, 27719), (43, 27722), (45, 27770), (46, 27782), (51, 27932), (52, 27947), (53, 28004), (54, 28010), (56, 28043), (57, 28055), (59, 28076), (60, 28097), (62, 28109), (64, 28136), (66, 28142), (67, 28154), (68, 28172), (70, 28190), (72, 28211), (73, 28217), (75, 28253), (79, 28298), (81, 28328), (82, 28331),

Gene: Zeph\_12 Start: 5620, Stop: 6915, Start Num: 2

Candidate Starts for Zeph\_12:

(1, 5617), (Start: 2 @5620 has 1 MA's), (Start: 5 @5626 has 1 MA's), (Start: 6 @5629 has 39 MA's), (7, 5647), (14, 5878), (19, 6040), (23, 6091), (27, 6127), (28, 6133), (29, 6136), (39, 6319), (48, 6472), (58, 6649), (61, 6694), (63, 6712), (74, 6835), (76, 6847), (80, 6886),