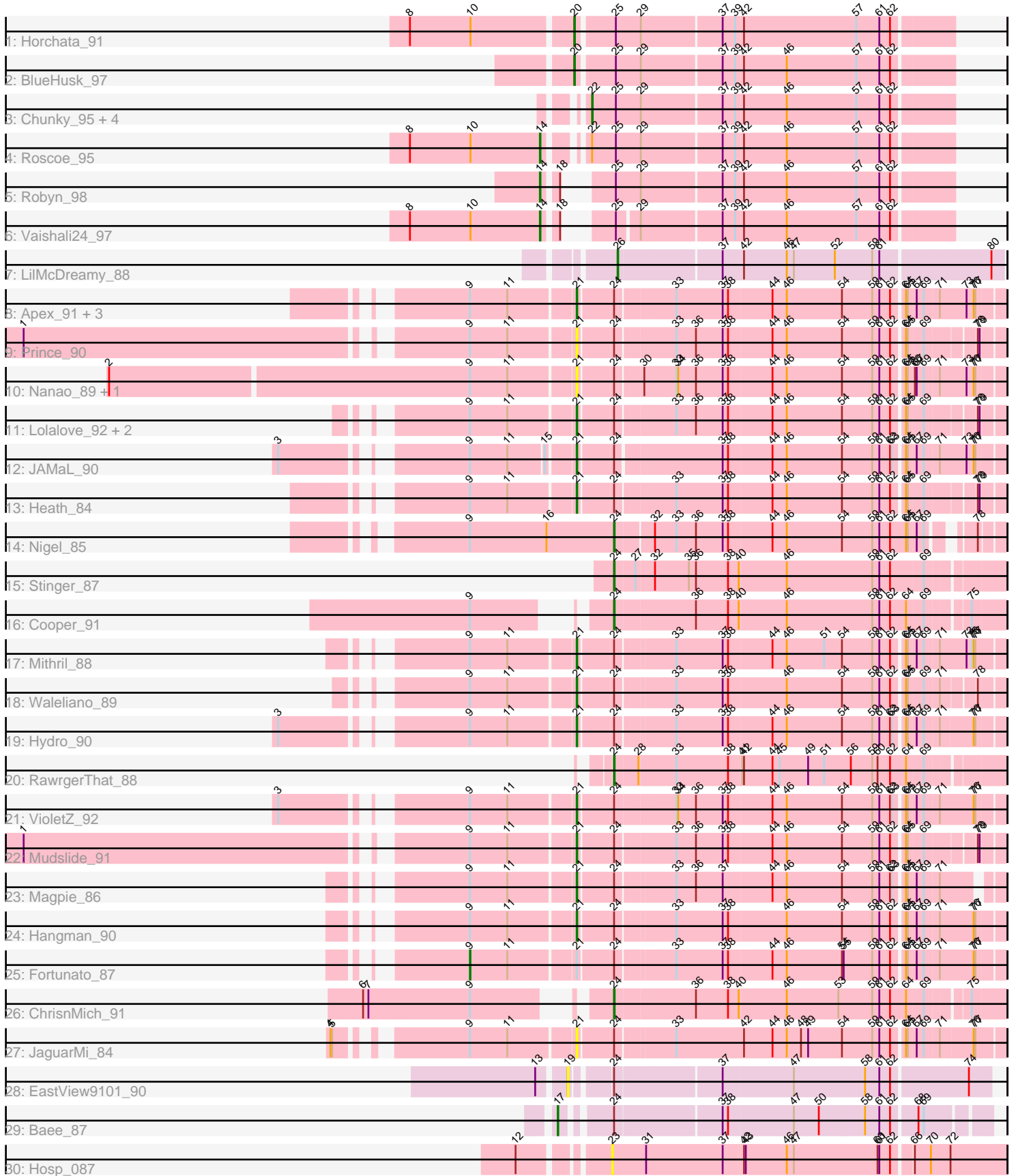


# Pham 156498



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 156498 Report

This analysis was run 04/12/24 on database version 558.

Pham number 156498 has 40 members, 8 are drafts.

Phages represented in each track:

- Track 1 : Horchata\_91
- Track 2 : BlueHusk\_97
- Track 3 : Chunky\_95, HSavage\_94, Boehler\_94, Gyarad\_0095, Vivaldi\_97
- Track 4 : Roscoe\_95
- Track 5 : Robyn\_98
- Track 6 : Vaishali24\_97
- Track 7 : LilMcDreamy\_88
- Track 8 : Apex\_91, Frederick\_88, BobbyK\_88, Zemanar\_88
- Track 9 : Prince\_90
- Track 10 : Nanao\_89, Poster\_88
- Track 11 : Lolalove\_92, BrownCNA\_90, Austelle\_90
- Track 12 : JAMaL\_90
- Track 13 : Heath\_84
- Track 14 : Nigel\_85
- Track 15 : Stinger\_87
- Track 16 : Cooper\_91
- Track 17 : Mithril\_88
- Track 18 : Waleliano\_89
- Track 19 : Hydro\_90
- Track 20 : RawrgerThat\_88
- Track 21 : VioletZ\_92
- Track 22 : Mudslide\_91
- Track 23 : Magpie\_86
- Track 24 : Hangman\_90
- Track 25 : Fortunato\_87
- Track 26 : ChrisnMich\_91
- Track 27 : JaguarMi\_84
- Track 28 : EastView9101\_90
- Track 29 : Bae\_87
- Track 30 : Hosp\_087

***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 14 of the 32 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Apex\_91, Austelle\_90, BobbyK\_88, BrownCNA\_90, Frederick\_88, Hangman\_90, Heath\_84, Hydro\_90, JAMaL\_90, JaguarMi\_84, Lolalove\_92, Magpie\_86, Mithril\_88, Mudslide\_91, Nanao\_89, Poster\_88, Prince\_90, VioletZ\_92, Waleliano\_89, Zemanar\_88,

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

- Fortunato\_87,

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

- Bae\_87, BlueHusk\_97, Boehler\_94, ChrisnMich\_91, Chunky\_95, Cooper\_91, EastView9101\_90, Gyarad\_0095, HSavage\_94, Horchata\_91, Hosp\_087, LilMcDreamy\_88, Nigel\_85, RawrgerThat\_88, Robyn\_98, Roscoe\_95, Stinger\_87, Vaishali24\_97, Vivaldi\_97,

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

Start 9:

- Found in 24 of 40 ( 60.0% ) of genes in pham
- Manual Annotations of this start: 1 of 32
- Called 4.2% of time when present
- Phage (with cluster) where this start called: Fortunato\_87 (B4),

Start 14:

- Found in 3 of 40 ( 7.5% ) of genes in pham
- Manual Annotations of this start: 3 of 32
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Robyn\_98 (B1), Roscoe\_95 (B1), Vaishali24\_97 (B1),

Start 17:

- Found in 1 of 40 ( 2.5% ) of genes in pham
- Manual Annotations of this start: 1 of 32
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Bae\_87 (B5),

Start 19:

- Found in 1 of 40 ( 2.5% ) of genes in pham
- No Manual Annotations of this start.
- Called 100.0% of time when present
- Phage (with cluster) where this start called: EastView9101\_90 (B5),

Start 20:

- Found in 2 of 40 ( 5.0% ) of genes in pham
- Manual Annotations of this start: 2 of 32
- Called 100.0% of time when present
- Phage (with cluster) where this start called: BlueHusk\_97 (B1), Horchata\_91 (B1),

Start 21:

- Found in 21 of 40 ( 52.5% ) of genes in pham

- Manual Annotations of this start: 14 of 32
- Called 95.2% of time when present
- Phage (with cluster) where this start called: Apex\_91 (B4), Austelle\_90 (B4), BobbyK\_88 (B4), BrownCNA\_90 (B4), Frederick\_88 (B4), Hangman\_90 (B4), Heath\_84 (B4), Hydro\_90 (B4), JAMaL\_90 (B4), JaguarMi\_84 (B4), Lolalove\_92 (B4), Magpie\_86 (B4), Mithril\_88 (B4), Mudslide\_91 (B4), Nanao\_89 (B4), Poster\_88 (B4), Prince\_90 (B4), VioletZ\_92 (B4), Waleliano\_89 (B4), Zemanar\_88 (B4),

#### Start 22:

- Found in 6 of 40 ( 15.0% ) of genes in pham
- Manual Annotations of this start: 5 of 32
- Called 83.3% of time when present
- Phage (with cluster) where this start called: Boehler\_94 (B1), Chunky\_95 (B1), Gyarad\_0095 (B1), HSavage\_94 (B1), Vivaldi\_97 (B1),

#### Start 23:

- Found in 1 of 40 ( 2.5% ) of genes in pham
- No Manual Annotations of this start.
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Hosp\_087 (B6),

#### Start 24:

- Found in 28 of 40 ( 70.0% ) of genes in pham
- Manual Annotations of this start: 5 of 32
- Called 17.9% of time when present
- Phage (with cluster) where this start called: ChrisnMich\_91 (B4), Cooper\_91 (B4), Nigel\_85 (B4), RawrgerThat\_88 (B4), Stinger\_87 (B4),

#### Start 26:

- Found in 1 of 40 ( 2.5% ) of genes in pham
- Manual Annotations of this start: 1 of 32
- Called 100.0% of time when present
- Phage (with cluster) where this start called: LilMcDreamy\_88 (B12),

### **Summary by clusters:**

There are 5 clusters represented in this pham: B4, B5, B6, B12, B1,

#### Info for manual annotations of cluster B1:

- Start number 14 was manually annotated 3 times for cluster B1.
- Start number 20 was manually annotated 2 times for cluster B1.
- Start number 22 was manually annotated 5 times for cluster B1.

#### Info for manual annotations of cluster B12:

- Start number 26 was manually annotated 1 time for cluster B12.

#### Info for manual annotations of cluster B4:

- Start number 9 was manually annotated 1 time for cluster B4.
- Start number 21 was manually annotated 14 times for cluster B4.
- Start number 24 was manually annotated 5 times for cluster B4.

#### Info for manual annotations of cluster B5:

- Start number 17 was manually annotated 1 time for cluster B5.

### **Gene Information:**

Gene: Apex\_91 Start: 67472, Stop: 66804, Start Num: 21

Candidate Starts for Apex\_91:

(Start: 9 @67640 has 1 MA's), (11, 67577), (Start: 21 @67472 has 14 MA's), (Start: 24 @67421 has 5 MA's), (33, 67331), (37, 67253), (38, 67244), (44, 67172), (46, 67148), (54, 67055), (59, 67004), (61, 66992), (62, 66974), (64, 66956), (65, 66953), (67, 66941), (69, 66929), (71, 66905), (73, 66860), (76, 66848), (77, 66845),

Gene: Austelle\_90 Start: 68073, Stop: 67420, Start Num: 21

Candidate Starts for Austelle\_90:

(Start: 9 @68241 has 1 MA's), (11, 68178), (Start: 21 @68073 has 14 MA's), (Start: 24 @68022 has 5 MA's), (33, 67929), (36, 67896), (37, 67851), (38, 67842), (44, 67770), (46, 67746), (54, 67653), (59, 67602), (61, 67590), (62, 67572), (64, 67554), (65, 67551), (69, 67527), (78, 67455), (79, 67452),

Gene: Bae\_87 Start: 66191, Stop: 65547, Start Num: 17

Candidate Starts for Bae\_87:

(Start: 17 @66191 has 1 MA's), (Start: 24 @66128 has 5 MA's), (37, 65963), (38, 65954), (47, 65846), (50, 65804), (58, 65729), (61, 65705), (62, 65687), (68, 65651), (69, 65642),

Gene: BlueHusk\_97 Start: 66586, Stop: 65990, Start Num: 20

Candidate Starts for BlueHusk\_97:

(Start: 20 @66586 has 2 MA's), (25, 66529), (29, 66487), (37, 66361), (39, 66340), (42, 66328), (46, 66256), (57, 66142), (61, 66103), (62, 66085),

Gene: BobbyK\_88 Start: 66980, Stop: 66312, Start Num: 21

Candidate Starts for BobbyK\_88:

(Start: 9 @67148 has 1 MA's), (11, 67085), (Start: 21 @66980 has 14 MA's), (Start: 24 @66929 has 5 MA's), (33, 66839), (37, 66761), (38, 66752), (44, 66680), (46, 66656), (54, 66563), (59, 66512), (61, 66500), (62, 66482), (64, 66464), (65, 66461), (67, 66449), (69, 66437), (71, 66413), (73, 66368), (76, 66356), (77, 66353),

Gene: Boehler\_94 Start: 66718, Stop: 66140, Start Num: 22

Candidate Starts for Boehler\_94:

(Start: 22 @66718 has 5 MA's), (25, 66679), (29, 66637), (37, 66511), (39, 66490), (42, 66478), (46, 66406), (57, 66292), (61, 66253), (62, 66235),

Gene: BrownCNA\_90 Start: 67488, Stop: 66835, Start Num: 21

Candidate Starts for BrownCNA\_90:

(Start: 9 @67656 has 1 MA's), (11, 67593), (Start: 21 @67488 has 14 MA's), (Start: 24 @67437 has 5 MA's), (33, 67344), (36, 67311), (37, 67266), (38, 67257), (44, 67185), (46, 67161), (54, 67068), (59, 67017), (61, 67005), (62, 66987), (64, 66969), (65, 66966), (69, 66942), (78, 66870), (79, 66867),

Gene: ChrisnMich\_91 Start: 66059, Stop: 65439, Start Num: 24

Candidate Starts for ChrisnMich\_91:

(6, 66395), (7, 66386), (Start: 9 @66218 has 1 MA's), (Start: 24 @66059 has 5 MA's), (36, 65930), (38, 65876), (40, 65858), (46, 65780), (53, 65693), (59, 65636), (61, 65624), (62, 65606), (64, 65579), (69, 65552), (75, 65492),

Gene: Chunky\_95 Start: 66380, Stop: 65802, Start Num: 22

Candidate Starts for Chunky\_95:

(Start: 22 @66380 has 5 MA's), (25, 66341), (29, 66299), (37, 66173), (39, 66152), (42, 66140), (46, 66068), (57, 65954), (61, 65915), (62, 65897),

Gene: Cooper\_91 Start: 66596, Stop: 65976, Start Num: 24

Candidate Starts for Cooper\_91:

(Start: 9 @66749 has 1 MA's), (Start: 24 @66596 has 5 MA's), (36, 66467), (38, 66413), (40, 66395), (46, 66317), (59, 66173), (61, 66161), (62, 66143), (64, 66116), (69, 66089), (75, 66029),

Gene: EastView9101\_90 Start: 65729, Stop: 65082, Start Num: 19

Candidate Starts for EastView9101\_90:

(13, 65771), (19, 65729), (Start: 24 @65675 has 5 MA's), (37, 65510), (47, 65393), (58, 65276), (61, 65252), (62, 65234), (74, 65117),

Gene: Fortunato\_87 Start: 66949, Stop: 66113, Start Num: 9

Candidate Starts for Fortunato\_87:

(Start: 9 @66949 has 1 MA's), (11, 66886), (Start: 21 @66781 has 14 MA's), (Start: 24 @66730 has 5 MA's), (33, 66640), (37, 66562), (38, 66553), (44, 66481), (46, 66457), (54, 66364), (55, 66361), (59, 66313), (61, 66301), (62, 66283), (64, 66265), (65, 66262), (67, 66250), (69, 66238), (71, 66214), (76, 66157), (77, 66154),

Gene: Frederick\_88 Start: 67286, Stop: 66618, Start Num: 21

Candidate Starts for Frederick\_88:

(Start: 9 @67454 has 1 MA's), (11, 67391), (Start: 21 @67286 has 14 MA's), (Start: 24 @67235 has 5 MA's), (33, 67145), (37, 67067), (38, 67058), (44, 66986), (46, 66962), (54, 66869), (59, 66818), (61, 66806), (62, 66788), (64, 66770), (65, 66767), (67, 66755), (69, 66743), (71, 66719), (73, 66674), (76, 66662), (77, 66659),

Gene: Gyarad\_0095 Start: 66382, Stop: 65804, Start Num: 22

Candidate Starts for Gyarad\_0095:

(Start: 22 @66382 has 5 MA's), (25, 66343), (29, 66301), (37, 66175), (39, 66154), (42, 66142), (46, 66070), (57, 65956), (61, 65917), (62, 65899),

Gene: HSavage\_94 Start: 66365, Stop: 65787, Start Num: 22

Candidate Starts for HSavage\_94:

(Start: 22 @66365 has 5 MA's), (25, 66326), (29, 66284), (37, 66158), (39, 66137), (42, 66125), (46, 66053), (57, 65939), (61, 65900), (62, 65882),

Gene: Hangman\_90 Start: 67581, Stop: 66913, Start Num: 21

Candidate Starts for Hangman\_90:

(Start: 9 @67749 has 1 MA's), (11, 67686), (Start: 21 @67581 has 14 MA's), (Start: 24 @67530 has 5 MA's), (33, 67440), (37, 67362), (38, 67353), (46, 67257), (54, 67164), (59, 67113), (61, 67101), (62, 67083), (64, 67065), (65, 67062), (67, 67050), (69, 67038), (71, 67014), (76, 66957), (77, 66954),

Gene: Heath\_84 Start: 65351, Stop: 64701, Start Num: 21

Candidate Starts for Heath\_84:

(Start: 9 @65519 has 1 MA's), (11, 65456), (Start: 21 @65351 has 14 MA's), (Start: 24 @65300 has 5 MA's), (33, 65210), (37, 65132), (38, 65123), (44, 65051), (46, 65027), (54, 64934), (59, 64883), (61, 64871), (62, 64853), (64, 64835), (65, 64832), (69, 64808), (78, 64736), (79, 64733),

Gene: Horchata\_91 Start: 66558, Stop: 65962, Start Num: 20

Candidate Starts for Horchata\_91:

(8, 66816), (10, 66714), (Start: 20 @66558 has 2 MA's), (25, 66501), (29, 66459), (37, 66333), (39, 66312), (42, 66300), (57, 66114), (61, 66075), (62, 66057),

Gene: Hosp\_087 Start: 64231, Stop: 63587, Start Num: 23

Candidate Starts for Hosp\_087:

(12, 64360), (23, 64231), (31, 64174), (37, 64045), (42, 64015), (43, 64012), (46, 63943), (47, 63931), (60, 63790), (61, 63787), (62, 63769), (66, 63742), (70, 63715), (72, 63682),

Gene: Hydro\_90 Start: 67357, Stop: 66692, Start Num: 21

Candidate Starts for Hydro\_90:

(3, 67777), (Start: 9 @67525 has 1 MA's), (11, 67462), (Start: 21 @67357 has 14 MA's), (Start: 24 @67306 has 5 MA's), (33, 67216), (37, 67138), (38, 67129), (44, 67057), (46, 67033), (54, 66940), (59, 66889), (61, 66877), (62, 66859), (63, 66856), (64, 66841), (65, 66838), (67, 66826), (69, 66814), (71, 66790), (76, 66736), (77, 66733),

Gene: JAMaL\_90 Start: 66895, Stop: 66227, Start Num: 21

Candidate Starts for JAMaL\_90:

(3, 67309), (Start: 9 @67057 has 1 MA's), (11, 66994), (15, 66937), (Start: 21 @66895 has 14 MA's), (Start: 24 @66844 has 5 MA's), (37, 66676), (38, 66667), (44, 66595), (46, 66571), (54, 66478), (59, 66427), (61, 66415), (62, 66397), (63, 66394), (64, 66379), (65, 66376), (67, 66364), (69, 66352), (71, 66328), (73, 66283), (76, 66271), (77, 66268),

Gene: JaguarMi\_84 Start: 67336, Stop: 66665, Start Num: 21

Candidate Starts for JaguarMi\_84:

(4, 67675), (5, 67672), (Start: 9 @67504 has 1 MA's), (11, 67441), (Start: 21 @67336 has 14 MA's), (Start: 24 @67285 has 5 MA's), (33, 67195), (42, 67081), (44, 67033), (46, 67009), (48, 66985), (49, 66973), (54, 66916), (59, 66865), (61, 66853), (62, 66835), (64, 66817), (65, 66814), (67, 66802), (69, 66790), (71, 66766), (76, 66712), (77, 66709),

Gene: LilMcDreamy\_88 Start: 66128, Stop: 65508, Start Num: 26

Candidate Starts for LilMcDreamy\_88:

(Start: 26 @66128 has 1 MA's), (37, 65966), (42, 65933), (46, 65861), (47, 65849), (52, 65780), (59, 65717), (61, 65705), (80, 65528),

Gene: Lolalove\_92 Start: 67385, Stop: 66732, Start Num: 21

Candidate Starts for Lolalove\_92:

(Start: 9 @67553 has 1 MA's), (11, 67490), (Start: 21 @67385 has 14 MA's), (Start: 24 @67334 has 5 MA's), (33, 67241), (36, 67208), (37, 67163), (38, 67154), (44, 67082), (46, 67058), (54, 66965), (59, 66914), (61, 66902), (62, 66884), (64, 66866), (65, 66863), (69, 66839), (78, 66767), (79, 66764),

Gene: Magpie\_86 Start: 67131, Stop: 66481, Start Num: 21

Candidate Starts for Magpie\_86:

(Start: 9 @67299 has 1 MA's), (11, 67236), (Start: 21 @67131 has 14 MA's), (Start: 24 @67080 has 5 MA's), (33, 66990), (36, 66957), (37, 66912), (44, 66831), (46, 66807), (54, 66714), (59, 66663), (61, 66651), (62, 66633), (63, 66630), (64, 66615), (65, 66612), (67, 66600), (69, 66588), (71, 66564),

Gene: Mithril\_88 Start: 67142, Stop: 66471, Start Num: 21

Candidate Starts for Mithril\_88:

(Start: 9 @67310 has 1 MA's), (11, 67247), (Start: 21 @67142 has 14 MA's), (Start: 24 @67091 has 5 MA's), (33, 67001), (37, 66923), (38, 66914), (44, 66842), (46, 66818), (51, 66755), (54, 66725), (59, 66674), (61, 66662), (62, 66644), (64, 66626), (65, 66623), (67, 66611), (69, 66599), (71, 66575), (73, 66530), (75, 66521), (76, 66518), (77, 66515),

Gene: Mudslide\_91 Start: 67615, Stop: 66962, Start Num: 21

Candidate Starts for Mudslide\_91:

(1, 68467), (Start: 9 @67783 has 1 MA's), (11, 67720), (Start: 21 @67615 has 14 MA's), (Start: 24 @67564 has 5 MA's), (33, 67471), (36, 67438), (37, 67393), (38, 67384), (44, 67312), (46, 67288), (54, 67195), (59, 67144), (61, 67132), (62, 67114), (64, 67096), (65, 67093), (69, 67069), (78, 66997), (79, 66994),

Gene: Nanao\_89 Start: 66221, Stop: 65553, Start Num: 21

Candidate Starts for Nanao\_89:

(2, 66983), (Start: 9 @66389 has 1 MA's), (11, 66326), (Start: 21 @66221 has 14 MA's), (Start: 24 @66170 has 5 MA's), (30, 66131), (33, 66080), (34, 66077), (36, 66047), (37, 66002), (38, 65993), (44, 65921), (46, 65897), (54, 65804), (59, 65753), (61, 65741), (62, 65723), (64, 65705), (65, 65702), (66, 65693), (67, 65690), (69, 65678), (71, 65654), (73, 65609), (76, 65597), (77, 65594),

Gene: Nigel\_85 Start: 65605, Stop: 65015, Start Num: 24

Candidate Starts for Nigel\_85:

(Start: 9 @65845 has 1 MA's), (16, 65716), (Start: 24 @65605 has 5 MA's), (32, 65548), (33, 65512), (36, 65479), (37, 65434), (38, 65425), (44, 65353), (46, 65329), (54, 65236), (59, 65185), (61, 65173), (62, 65155), (64, 65128), (65, 65125), (67, 65113), (69, 65101), (78, 65050),

Gene: Poster\_88 Start: 66222, Stop: 65554, Start Num: 21

Candidate Starts for Poster\_88:

(2, 66984), (Start: 9 @66390 has 1 MA's), (11, 66327), (Start: 21 @66222 has 14 MA's), (Start: 24 @66171 has 5 MA's), (30, 66132), (33, 66081), (34, 66078), (36, 66048), (37, 66003), (38, 65994), (44, 65922), (46, 65898), (54, 65805), (59, 65754), (61, 65742), (62, 65724), (64, 65706), (65, 65703), (66, 65694), (67, 65691), (69, 65679), (71, 65655), (73, 65610), (76, 65598), (77, 65595),

Gene: Prince\_90 Start: 67482, Stop: 66829, Start Num: 21

Candidate Starts for Prince\_90:

(1, 68334), (Start: 9 @67650 has 1 MA's), (11, 67587), (Start: 21 @67482 has 14 MA's), (Start: 24 @67431 has 5 MA's), (33, 67338), (36, 67305), (37, 67260), (38, 67251), (44, 67179), (46, 67155), (54, 67062), (59, 67011), (61, 66999), (62, 66981), (64, 66963), (65, 66960), (69, 66936), (78, 66864), (79, 66861),

Gene: RawrgerThat\_88 Start: 66936, Stop: 66319, Start Num: 24

Candidate Starts for RawrgerThat\_88:

(Start: 24 @66936 has 5 MA's), (28, 66900), (33, 66843), (38, 66756), (41, 66735), (42, 66732), (44, 66684), (45, 66672), (49, 66624), (51, 66597), (56, 66552), (59, 66516), (60, 66507), (62, 66486), (64, 66459), (69, 66432),

Gene: Robyn\_98 Start: 67147, Stop: 66548, Start Num: 14

Candidate Starts for Robyn\_98:

(Start: 14 @67147 has 3 MA's), (18, 67126), (25, 67087), (29, 67045), (37, 66919), (39, 66898), (42, 66886), (46, 66814), (57, 66700), (61, 66661), (62, 66643),

Gene: Roscoe\_95 Start: 67027, Stop: 66401, Start Num: 14

Candidate Starts for Roscoe\_95:

(8, 67246), (10, 67144), (Start: 14 @67027 has 3 MA's), (Start: 22 @66979 has 5 MA's), (25, 66940), (29, 66898), (37, 66772), (39, 66751), (42, 66739), (46, 66667), (57, 66553), (61, 66514), (62, 66496),

Gene: Stinger\_87 Start: 65601, Stop: 64981, Start Num: 24

Candidate Starts for Stinger\_87:



(Start: 24 @65601 has 5 MA's), (27, 65568), (32, 65541), (35, 65484), (36, 65472), (38, 65418), (40, 65400), (46, 65322), (59, 65178), (61, 65166), (62, 65148), (69, 65094),

Gene: Vaishali24\_97 Start: 66820, Stop: 66230, Start Num: 14

Candidate Starts for Vaishali24\_97:

(8, 67039), (10, 66937), (Start: 14 @66820 has 3 MA's), (18, 66799), (25, 66760), (29, 66727), (37, 66601), (39, 66580), (42, 66568), (46, 66496), (57, 66382), (61, 66343), (62, 66325),

Gene: VioletZ\_92 Start: 67510, Stop: 66836, Start Num: 21

Candidate Starts for VioletZ\_92:

(3, 67930), (Start: 9 @67678 has 1 MA's), (11, 67615), (Start: 21 @67510 has 14 MA's), (Start: 24 @67459 has 5 MA's), (33, 67363), (34, 67360), (36, 67330), (37, 67285), (38, 67276), (44, 67204), (46, 67180), (54, 67087), (59, 67036), (61, 67024), (62, 67006), (63, 67003), (64, 66988), (65, 66985), (67, 66973), (69, 66961), (71, 66937), (76, 66880), (77, 66877),

Gene: Vivaldi\_97 Start: 67032, Stop: 66454, Start Num: 22

Candidate Starts for Vivaldi\_97:

(Start: 22 @67032 has 5 MA's), (25, 66993), (29, 66951), (37, 66825), (39, 66804), (42, 66792), (46, 66720), (57, 66606), (61, 66567), (62, 66549),

Gene: Waleliano\_89 Start: 67237, Stop: 66587, Start Num: 21

Candidate Starts for Waleliano\_89:

(Start: 9 @67405 has 1 MA's), (11, 67342), (Start: 21 @67237 has 14 MA's), (Start: 24 @67186 has 5 MA's), (33, 67096), (37, 67018), (38, 67009), (46, 66913), (54, 66820), (59, 66769), (61, 66757), (62, 66739), (64, 66721), (65, 66718), (69, 66694), (71, 66670), (78, 66622),

Gene: Zemanar\_88 Start: 67185, Stop: 66517, Start Num: 21

Candidate Starts for Zemanar\_88:

(Start: 9 @67353 has 1 MA's), (11, 67290), (Start: 21 @67185 has 14 MA's), (Start: 24 @67134 has 5 MA's), (33, 67044), (37, 66966), (38, 66957), (44, 66885), (46, 66861), (54, 66768), (59, 66717), (61, 66705), (62, 66687), (64, 66669), (65, 66666), (67, 66654), (69, 66642), (71, 66618), (73, 66573), (76, 66561), (77, 66558),