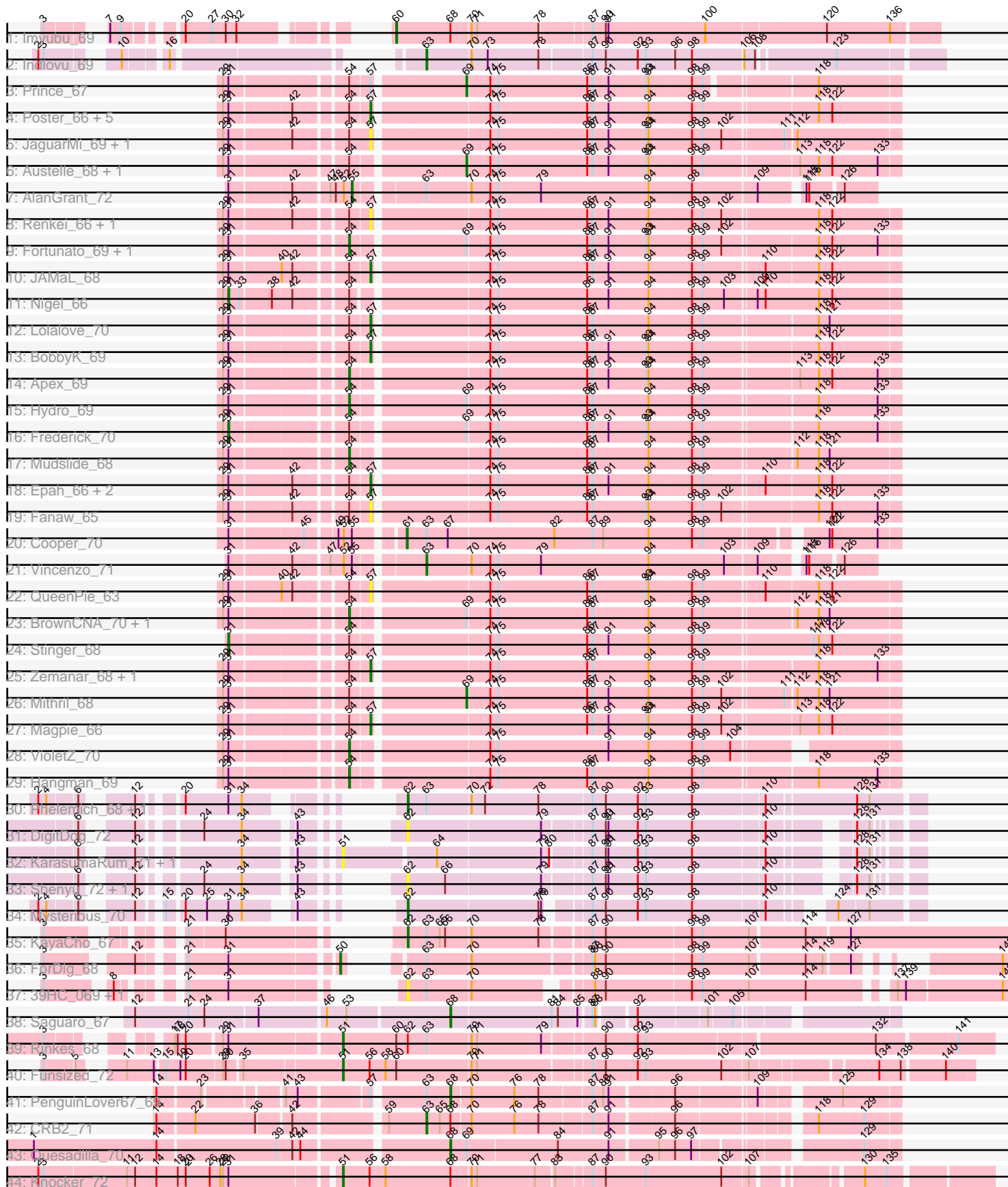


Pham 296582



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 296582 Report

This analysis was run 04/25/26 on database version 644.

Pham number 296582 has 61 members, 21 are drafts.

Phages represented in each track:

- Track 1 : Imvubu\_69
- Track 2 : Indlovu\_69
- Track 3 : Prince\_67
- Track 4 : Poster\_66, ChrisnMich\_68, Hally898\_66, Ahwei\_66, Nanao\_67, Lambano\_66
- Track 5 : JaguarMi\_69, Xincheng\_68
- Track 6 : Austelle\_68, JoyceMaria\_68
- Track 7 : AlanGrant\_72
- Track 8 : Renkei\_66, LittleDigger\_66
- Track 9 : Fortunato\_69, RawrgerThat\_69
- Track 10 : JAMaL\_68
- Track 11 : Nigel\_66
- Track 12 : Lolalove\_70
- Track 13 : BobbyK\_69
- Track 14 : Apex\_69
- Track 15 : Hydro\_69
- Track 16 : Frederick\_70
- Track 17 : Mudslide\_68
- Track 18 : Epah\_66, Antihero\_66, GinPorsche\_68
- Track 19 : Fanaw\_65
- Track 20 : Cooper\_70
- Track 21 : Vincenzo\_71
- Track 22 : QueenPie\_63
- Track 23 : BrownCNA\_70, Waleliano\_68
- Track 24 : Stinger\_68
- Track 25 : Zemanar\_68, Heath\_68
- Track 26 : Mithril\_68
- Track 27 : Magpie\_66
- Track 28 : VioletZ\_70
- Track 29 : Hangman\_69
- Track 30 : Phelemich\_68, Reprobate\_70
- Track 31 : DigitDog\_72
- Track 32 : KarasumaRum\_71, StinkyVeggy\_71
- Track 33 : Shenyu\_72, Nangang\_71
- Track 34 : Mysterious\_70
- Track 35 : KayaCho\_67
- Track 36 : ForDig\_68

- Track 37 : 39HC\_069, 40BC\_069
- Track 38 : Saguaro\_67
- Track 39 : Rinkes\_68
- Track 40 : Funsized\_72
- Track 41 : PenguinLover67\_69
- Track 42 : CRB2\_71
- Track 43 : Quesadilla\_70
- Track 44 : Knocker\_72

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

The start number called the most often in the published annotations is 54, it was called in 9 of the 40 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Apex\_69, BrownCNA\_70, Fortunato\_69, Hangman\_69, Hydro\_69, Mudslide\_68, RawrgerThat\_69, VioletZ\_70, Waleliano\_68,

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

- Ahwei\_66, Antihero\_66, Austelle\_68, BobbyK\_69, ChrisnMich\_68, Epah\_66, Fanaw\_65, Frederick\_70, GinPorsche\_68, Hally898\_66, Heath\_68, JAMaL\_68, JaguarMi\_69, JoyceMaria\_68, Lambano\_66, LittleDigger\_66, Lolalove\_70, Magpie\_66, Mithril\_68, Nanao\_67, Nigel\_66, Poster\_66, Prince\_67, QueenPie\_63, Renkei\_66, Stinger\_68, Xincheng\_68, Zemanar\_68,

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

- 39HC\_069, 40BC\_069, AlanGrant\_72, CRB2\_71, Cooper\_70, DigitDog\_72, ForDig\_68, Funsized\_72, Imvubu\_69, Indlovu\_69, KarasumaRum\_71, KayaCho\_67, Knocker\_72, Mysterious\_70, Nangang\_71, PenguinLover67\_69, Phelemich\_68, Quesadilla\_70, Reprobate\_70, Rinkes\_68, Saguaro\_67, Shenyu\_72, StinkyVeggy\_71, Vincenzo\_71,

**Summary by start number:**

Start 31:

- Found in 48 of 61 ( 78.7% ) of genes in pham
- Manual Annotations of this start: 3 of 40
- Called 6.2% of time when present
- Phage (with cluster) where this start called: Frederick\_70 (B4), Nigel\_66 (B4), Stinger\_68 (B4),

Start 50:

- Found in 1 of 61 ( 1.6% ) of genes in pham
- Manual Annotations of this start: 1 of 40
- Called 100.0% of time when present
- Phage (with cluster) where this start called: ForDig\_68 (B6),

Start 51:

- Found in 5 of 61 ( 8.2% ) of genes in pham
- Manual Annotations of this start: 3 of 40

- Called 100.0% of time when present
- Phage (with cluster) where this start called: Funsized\_72 (B9), KarasumaRum\_71 (B5), Knocker\_72 (B9), Rinkes\_68 (B9), StinkyVeggy\_71 (B5),

#### Start 54:

- Found in 37 of 61 ( 60.7% ) of genes in pham
- Manual Annotations of this start: 9 of 40
- Called 24.3% of time when present
- Phage (with cluster) where this start called: Apex\_69 (B4), BrownCNA\_70 (B4), Fortunato\_69 (B4), Hangman\_69 (B4), Hydro\_69 (B4), Mudslide\_68 (B4), RawrgerThat\_69 (B4), VioletZ\_70 (B4), Waleliano\_68 (B4),

#### Start 55:

- Found in 3 of 61 ( 4.9% ) of genes in pham
- Manual Annotations of this start: 1 of 40
- Called 33.3% of time when present
- Phage (with cluster) where this start called: AlanGrant\_72 (B4),

#### Start 57:

- Found in 23 of 61 ( 37.7% ) of genes in pham
- Manual Annotations of this start: 8 of 40
- Called 91.3% of time when present
- Phage (with cluster) where this start called: Ahwei\_66 (B4), Antihero\_66 (B4), BobbyK\_69 (B4), ChrisnMich\_68 (B4), Epah\_66 (B4), Fanaw\_65 (B4), GinPorsche\_68 (B4), Hally898\_66 (B4), Heath\_68 (B4), JAMaL\_68 (B4), JaguarMi\_69 (B4), Lambano\_66 (B4), LittleDigger\_66 (B4), Lolalove\_70 (B4), Magpie\_66 (B4), Nanao\_67 (B4), Poster\_66 (B4), QueenPie\_63 (B4), Renkei\_66 (B4), Xincheng\_68 (B4), Zemanar\_68 (B4),

#### Start 60:

- Found in 3 of 61 ( 4.9% ) of genes in pham
- Manual Annotations of this start: 1 of 40
- Called 33.3% of time when present
- Phage (with cluster) where this start called: Imvubu\_69 (B10),

#### Start 61:

- Found in 1 of 61 ( 1.6% ) of genes in pham
- Manual Annotations of this start: 1 of 40
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Cooper\_70 (B4),

#### Start 62:

- Found in 10 of 61 ( 16.4% ) of genes in pham
- Manual Annotations of this start: 4 of 40
- Called 90.0% of time when present
- Phage (with cluster) where this start called: 39HC\_069 (B6), 40BC\_069 (B6), DigitDog\_72 (B5), KayaCho\_67 (B6), Mysterious\_70 (B5), Nangang\_71 (B5), Phelemich\_68 (B5), Reprobate\_70 (B5), Shenyu\_72 (B5),

#### Start 63:

- Found in 13 of 61 ( 21.3% ) of genes in pham
- Manual Annotations of this start: 3 of 40
- Called 23.1% of time when present

- Phage (with cluster) where this start called: CRB2\_71 (B9), Indlovu\_69 (B11), Vincenzo\_71 (B4),

Start 68:

- Found in 6 of 61 ( 9.8% ) of genes in pham
- Manual Annotations of this start: 3 of 40
- Called 50.0% of time when present
- Phage (with cluster) where this start called: PenguinLover67\_69 (B9), Quesadilla\_70 (B9), Saguario\_67 (B7),

Start 69:

- Found in 11 of 61 ( 18.0% ) of genes in pham
- Manual Annotations of this start: 3 of 40
- Called 36.4% of time when present
- Phage (with cluster) where this start called: Austelle\_68 (B4), JoyceMaria\_68 (B4), Mithril\_68 (B4), Prince\_67 (B4),

### **Summary by clusters:**

There are 7 clusters represented in this pham: B4, B5, B6, B7, B10, B11, B9,

Info for manual annotations of cluster B10:

- Start number 60 was manually annotated 1 time for cluster B10.

Info for manual annotations of cluster B11:

- Start number 63 was manually annotated 1 time for cluster B11.

Info for manual annotations of cluster B4:

- Start number 31 was manually annotated 3 times for cluster B4.
- Start number 54 was manually annotated 9 times for cluster B4.
- Start number 55 was manually annotated 1 time for cluster B4.
- Start number 57 was manually annotated 8 times for cluster B4.
- Start number 61 was manually annotated 1 time for cluster B4.
- Start number 63 was manually annotated 1 time for cluster B4.
- Start number 69 was manually annotated 3 times for cluster B4.

Info for manual annotations of cluster B5:

- Start number 62 was manually annotated 3 times for cluster B5.

Info for manual annotations of cluster B6:

- Start number 50 was manually annotated 1 time for cluster B6.
- Start number 62 was manually annotated 1 time for cluster B6.

Info for manual annotations of cluster B7:

- Start number 68 was manually annotated 1 time for cluster B7.

Info for manual annotations of cluster B9:

- Start number 51 was manually annotated 3 times for cluster B9.
- Start number 63 was manually annotated 1 time for cluster B9.
- Start number 68 was manually annotated 2 times for cluster B9.

### **Gene Information:**

Gene: 39HC\_069 Start: 58780, Stop: 59388, Start Num: 62

Candidate Starts for 39HC\_069:

(3, 58525), (8, 58585), (21, 58630), (Start: 31 @58675 has 3 MA's), (Start: 62 @58780 has 4 MA's), (Start: 63 @58801 has 3 MA's), (70, 58849), (88, 58957), (90, 58969), (98, 59062), (99, 59074), (107, 59125), (114, 59188), (137, 59266), (139, 59275), (142, 59380),

Gene: 40BC\_069 Start: 58780, Stop: 59388, Start Num: 62

Candidate Starts for 40BC\_069:

(3, 58525), (8, 58585), (21, 58630), (Start: 31 @58675 has 3 MA's), (Start: 62 @58780 has 4 MA's), (Start: 63 @58801 has 3 MA's), (70, 58849), (88, 58957), (90, 58969), (98, 59062), (99, 59074), (107, 59125), (114, 59188), (137, 59266), (139, 59275), (142, 59380),

Gene: Ahwei\_66 Start: 59056, Stop: 59619, Start Num: 57

Candidate Starts for Ahwei\_66:

(29, 58912), (Start: 31 @58918 has 3 MA's), (42, 58984), (Start: 54 @59035 has 9 MA's), (Start: 57 @59056 has 8 MA's), (74, 59176), (75, 59185), (86, 59284), (87, 59290), (91, 59308), (94, 59353), (98, 59398), (99, 59410), (118, 59530), (122, 59545),

Gene: AlanGrant\_72 Start: 61390, Stop: 61929, Start Num: 55

Candidate Starts for AlanGrant\_72:

(Start: 31 @61264 has 3 MA's), (42, 61330), (47, 61366), (48, 61372), (52, 61381), (Start: 55 @61390 has 1 MA's), (Start: 63 @61456 has 3 MA's), (70, 61504), (74, 61525), (75, 61534), (79, 61582), (94, 61702), (98, 61747), (109, 61816), (115, 61858), (116, 61861), (126, 61894),

Gene: Antihero\_66 Start: 59054, Stop: 59617, Start Num: 57

Candidate Starts for Antihero\_66:

(29, 58910), (Start: 31 @58916 has 3 MA's), (42, 58982), (Start: 54 @59033 has 9 MA's), (Start: 57 @59054 has 8 MA's), (74, 59174), (75, 59183), (86, 59282), (87, 59288), (91, 59306), (94, 59351), (98, 59396), (99, 59408), (110, 59471), (118, 59528), (122, 59543),

Gene: Apex\_69 Start: 60138, Stop: 60722, Start Num: 54

Candidate Starts for Apex\_69:

(29, 60015), (Start: 31 @60021 has 3 MA's), (Start: 54 @60138 has 9 MA's), (74, 60279), (75, 60288), (86, 60387), (87, 60393), (91, 60411), (93, 60453), (94, 60456), (98, 60501), (99, 60513), (113, 60612), (118, 60633), (122, 60648), (133, 60699),

Gene: Austelle\_68 Start: 60772, Stop: 61239, Start Num: 69

Candidate Starts for Austelle\_68:

(29, 60532), (Start: 31 @60538 has 3 MA's), (Start: 54 @60655 has 9 MA's), (Start: 69 @60772 has 3 MA's), (74, 60796), (75, 60805), (86, 60904), (87, 60910), (91, 60928), (93, 60970), (94, 60973), (98, 61018), (99, 61030), (113, 61129), (118, 61150), (122, 61165), (133, 61216),

Gene: BobbyK\_69 Start: 59936, Stop: 60499, Start Num: 57

Candidate Starts for BobbyK\_69:

(29, 59792), (Start: 31 @59798 has 3 MA's), (Start: 54 @59915 has 9 MA's), (Start: 57 @59936 has 8 MA's), (74, 60056), (75, 60065), (86, 60164), (87, 60170), (91, 60188), (93, 60230), (94, 60233), (98, 60278), (99, 60290), (118, 60410), (122, 60425),

Gene: BrownCNA\_70 Start: 60292, Stop: 60873, Start Num: 54

Candidate Starts for BrownCNA\_70:

(29, 60169), (Start: 31 @60175 has 3 MA's), (Start: 54 @60292 has 9 MA's), (Start: 69 @60409 has 3 MA's), (74, 60433), (75, 60442), (86, 60541), (87, 60547), (94, 60610), (98, 60655), (99, 60667), (112, 60760), (118, 60784), (121, 60796),

Gene: CRB2\_71 Start: 61691, Stop: 62164, Start Num: 63

Candidate Starts for CRB2\_71:

(14, 61424), (22, 61463), (36, 61526), (42, 61559), (59, 61649), (Start: 63 @61691 has 3 MA's), (65, 61706), (Start: 68 @61718 has 3 MA's), (70, 61739), (76, 61787), (78, 61814), (87, 61868), (91, 61886), (96, 61949), (118, 62075), (129, 62126),

Gene: ChrisnMich\_68 Start: 59038, Stop: 59601, Start Num: 57

Candidate Starts for ChrisnMich\_68:

(29, 58894), (Start: 31 @58900 has 3 MA's), (42, 58966), (Start: 54 @59017 has 9 MA's), (Start: 57 @59038 has 8 MA's), (74, 59158), (75, 59167), (86, 59266), (87, 59272), (91, 59290), (94, 59335), (98, 59380), (99, 59392), (118, 59512), (122, 59527),

Gene: Cooper\_70 Start: 59759, Stop: 60271, Start Num: 61

Candidate Starts for Cooper\_70:

(Start: 31 @59591 has 3 MA's), (45, 59669), (49, 59699), (52, 59705), (Start: 55 @59714 has 1 MA's), (Start: 61 @59759 has 1 MA's), (Start: 63 @59780 has 3 MA's), (67, 59804), (82, 59921), (87, 59963), (89, 59975), (94, 60026), (98, 60071), (99, 60083), (121, 60194), (122, 60197), (133, 60248),

Gene: DigitDog\_72 Start: 59928, Stop: 60428, Start Num: 62

Candidate Starts for DigitDog\_72:

(6, 59703), (12, 59742), (24, 59796), (34, 59838), (43, 59886), (Start: 62 @59928 has 4 MA's), (79, 60075), (87, 60123), (90, 60138), (91, 60141), (92, 60174), (93, 60183), (98, 60234), (110, 60309), (128, 60378), (131, 60390),

Gene: Epah\_66 Start: 59054, Stop: 59617, Start Num: 57

Candidate Starts for Epah\_66:

(29, 58910), (Start: 31 @58916 has 3 MA's), (42, 58982), (Start: 54 @59033 has 9 MA's), (Start: 57 @59054 has 8 MA's), (74, 59174), (75, 59183), (86, 59282), (87, 59288), (91, 59306), (94, 59351), (98, 59396), (99, 59408), (110, 59471), (118, 59528), (122, 59543),

Gene: Fanaw\_65 Start: 60090, Stop: 60653, Start Num: 57

Candidate Starts for Fanaw\_65:

(29, 59946), (Start: 31 @59952 has 3 MA's), (42, 60018), (Start: 54 @60069 has 9 MA's), (Start: 57 @60090 has 8 MA's), (74, 60210), (75, 60219), (86, 60318), (87, 60324), (93, 60384), (94, 60387), (98, 60432), (99, 60444), (102, 60465), (118, 60564), (122, 60579), (133, 60630),

Gene: ForDig\_68 Start: 58743, Stop: 59336, Start Num: 50

Candidate Starts for ForDig\_68:

(3, 58476), (12, 58557), (21, 58590), (Start: 31 @58635 has 3 MA's), (Start: 50 @58743 has 1 MA's), (Start: 63 @58782 has 3 MA's), (70, 58830), (87, 58953), (88, 58956), (90, 58968), (98, 59061), (99, 59073), (107, 59124), (114, 59181), (119, 59199), (127, 59226), (142, 59328),

Gene: Fortunato\_69 Start: 60068, Stop: 60652, Start Num: 54

Candidate Starts for Fortunato\_69:

(29, 59945), (Start: 31 @59951 has 3 MA's), (Start: 54 @60068 has 9 MA's), (Start: 69 @60185 has 3 MA's), (74, 60209), (75, 60218), (86, 60317), (87, 60323), (91, 60341), (93, 60383), (94, 60386), (98, 60431), (99, 60443), (102, 60464), (118, 60563), (122, 60578), (133, 60629),

Gene: Frederick\_70 Start: 59898, Stop: 60596, Start Num: 31

Candidate Starts for Frederick\_70:

(29, 59892), (Start: 31 @59898 has 3 MA's), (Start: 54 @60015 has 9 MA's), (Start: 69 @60132 has 3 MA's), (74, 60156), (75, 60165), (86, 60264), (87, 60270), (91, 60288), (93, 60330), (94, 60333), (98, 60378), (99, 60390), (118, 60507), (133, 60573),

Gene: Funsized\_72 Start: 61973, Stop: 62629, Start Num: 51

Candidate Starts for Funsized\_72:

(3, 61688), (5, 61721), (11, 61751), (13, 61781), (15, 61790), (19, 61805), (20, 61811), (29, 61850), (30, 61853), (35, 61868), (Start: 51 @61973 has 3 MA's), (56, 62003), (58, 62021), (Start: 60 @62033 has 1 MA's), (70, 62114), (71, 62120), (87, 62240), (90, 62255), (92, 62291), (93, 62300), (102, 62384), (107, 62411), (134, 62534), (138, 62555), (140, 62600),

Gene: GinPorsche\_68 Start: 59054, Stop: 59617, Start Num: 57

Candidate Starts for GinPorsche\_68:

(29, 58910), (Start: 31 @58916 has 3 MA's), (42, 58982), (Start: 54 @59033 has 9 MA's), (Start: 57 @59054 has 8 MA's), (74, 59174), (75, 59183), (86, 59282), (87, 59288), (91, 59306), (94, 59351), (98, 59396), (99, 59408), (110, 59471), (118, 59528), (122, 59543),

Gene: Hally898\_66 Start: 59069, Stop: 59632, Start Num: 57

Candidate Starts for Hally898\_66:

(29, 58925), (Start: 31 @58931 has 3 MA's), (42, 58997), (Start: 54 @59048 has 9 MA's), (Start: 57 @59069 has 8 MA's), (74, 59189), (75, 59198), (86, 59297), (87, 59303), (91, 59321), (94, 59366), (98, 59411), (99, 59423), (118, 59543), (122, 59558),

Gene: Hangman\_69 Start: 60214, Stop: 60795, Start Num: 54

Candidate Starts for Hangman\_69:

(29, 60091), (Start: 31 @60097 has 3 MA's), (Start: 54 @60214 has 9 MA's), (74, 60355), (75, 60364), (86, 60463), (87, 60469), (94, 60532), (98, 60577), (99, 60589), (118, 60706), (133, 60772),

Gene: Heath\_68 Start: 59862, Stop: 60422, Start Num: 57

Candidate Starts for Heath\_68:

(29, 59718), (Start: 31 @59724 has 3 MA's), (Start: 54 @59841 has 9 MA's), (Start: 57 @59862 has 8 MA's), (74, 59982), (75, 59991), (86, 60090), (87, 60096), (94, 60159), (98, 60204), (99, 60216), (118, 60333), (133, 60399),

Gene: Hydro\_69 Start: 60152, Stop: 60733, Start Num: 54

Candidate Starts for Hydro\_69:

(29, 60029), (Start: 31 @60035 has 3 MA's), (Start: 54 @60152 has 9 MA's), (Start: 69 @60269 has 3 MA's), (74, 60293), (75, 60302), (86, 60401), (87, 60407), (94, 60470), (98, 60515), (99, 60527), (118, 60644), (133, 60710),

Gene: Imvubu\_69 Start: 58708, Stop: 59286, Start Num: 60

Candidate Starts for Imvubu\_69:

(3, 58453), (7, 58495), (9, 58507), (20, 58552), (27, 58582), (30, 58597), (32, 58609), (Start: 60 @58708 has 1 MA's), (Start: 68 @58768 has 3 MA's), (70, 58789), (71, 58795), (78, 58864), (87, 58915), (90, 58930), (91, 58933), (100, 59041), (120, 59170), (136, 59236),

Gene: Indlovu\_69 Start: 59915, Stop: 60454, Start Num: 63

Candidate Starts for Indlovu\_69:

(2, 59609), (3, 59615), (10, 59675), (16, 59714), (Start: 63 @59915 has 3 MA's), (70, 59963), (73, 59981), (78, 60038), (87, 60092), (90, 60107), (92, 60143), (93, 60152), (96, 60182), (98, 60200), (106, 60254), (108, 60266), (123, 60344),

Gene: JAMaL\_68 Start: 60063, Stop: 60626, Start Num: 57

Candidate Starts for JAMaL\_68:

(29, 59919), (Start: 31 @59925 has 3 MA's), (40, 59979), (42, 59991), (Start: 54 @60042 has 9 MA's), (Start: 57 @60063 has 8 MA's), (74, 60183), (75, 60192), (86, 60291), (87, 60297), (91, 60315), (94, 60360), (98, 60405), (99, 60417), (110, 60480), (118, 60537), (122, 60552),

Gene: JaguarMi\_69 Start: 61329, Stop: 61889, Start Num: 57

Candidate Starts for JaguarMi\_69:

(29, 61182), (Start: 31 @61188 has 3 MA's), (42, 61254), (Start: 54 @61305 has 9 MA's), (Start: 57 @61329 has 8 MA's), (74, 61449), (75, 61458), (86, 61557), (87, 61563), (91, 61581), (93, 61623), (94, 61626), (98, 61671), (99, 61683), (102, 61704), (111, 61767), (112, 61776),

Gene: JoyceMaria\_68 Start: 60295, Stop: 60762, Start Num: 69

Candidate Starts for JoyceMaria\_68:

(29, 60055), (Start: 31 @60061 has 3 MA's), (Start: 54 @60178 has 9 MA's), (Start: 69 @60295 has 3 MA's), (74, 60319), (75, 60328), (86, 60427), (87, 60433), (91, 60451), (93, 60493), (94, 60496), (98, 60541), (99, 60553), (113, 60652), (118, 60673), (122, 60688), (133, 60739),

Gene: KarasumaRum\_71 Start: 59737, Stop: 60303, Start Num: 51

Candidate Starts for KarasumaRum\_71:

(6, 59521), (12, 59560), (34, 59656), (43, 59704), (Start: 51 @59737 has 3 MA's), (64, 59836), (79, 59950), (80, 59959), (87, 59998), (90, 60013), (91, 60016), (92, 60049), (93, 60058), (98, 60109), (110, 60184), (128, 60253), (131, 60265),

Gene: KayaCho\_67 Start: 58637, Stop: 59281, Start Num: 62

Candidate Starts for KayaCho\_67:

(3, 58385), (21, 58484), (30, 58523), (Start: 62 @58637 has 4 MA's), (Start: 63 @58658 has 3 MA's), (65, 58673), (66, 58679), (70, 58706), (78, 58781), (87, 58829), (90, 58844), (98, 58937), (99, 58949), (107, 59000), (114, 59057), (127, 59102),

Gene: Kocker\_72 Start: 61176, Stop: 61832, Start Num: 51

Candidate Starts for Kocker\_72:

(2, 60855), (3, 60861), (11, 60951), (12, 60960), (14, 60984), (18, 61008), (20, 61017), (21, 61020), (26, 61044), (28, 61056), (29, 61059), (Start: 31 @61065 has 3 MA's), (Start: 51 @61176 has 3 MA's), (56, 61206), (58, 61224), (Start: 68 @61296 has 3 MA's), (70, 61317), (71, 61323), (77, 61386), (83, 61404), (87, 61440), (90, 61455), (93, 61500), (102, 61584), (107, 61611), (130, 61707), (135, 61731),

Gene: Lambano\_66 Start: 59069, Stop: 59632, Start Num: 57

Candidate Starts for Lambano\_66:

(29, 58925), (Start: 31 @58931 has 3 MA's), (42, 58997), (Start: 54 @59048 has 9 MA's), (Start: 57 @59069 has 8 MA's), (74, 59189), (75, 59198), (86, 59297), (87, 59303), (91, 59321), (94, 59366), (98, 59411), (99, 59423), (118, 59543), (122, 59558),

Gene: LittleDigger\_66 Start: 58992, Stop: 59558, Start Num: 57

Candidate Starts for LittleDigger\_66:

(29, 58848), (Start: 31 @58854 has 3 MA's), (42, 58920), (Start: 54 @58971 has 9 MA's), (Start: 57 @58992 has 8 MA's), (74, 59112), (75, 59121), (86, 59220), (87, 59226), (91, 59244), (94, 59289), (98, 59334), (99, 59346), (102, 59367), (118, 59469), (122, 59484),

Gene: Lolalove\_70 Start: 60244, Stop: 60804, Start Num: 57

Candidate Starts for Lolalove\_70:

(29, 60100), (Start: 31 @60106 has 3 MA's), (Start: 54 @60223 has 9 MA's), (Start: 57 @60244 has 8 MA's), (74, 60364), (75, 60373), (86, 60472), (87, 60478), (94, 60541), (98, 60586), (99, 60598), (118,

60715), (121, 60727),

Gene: Magpie\_66 Start: 59929, Stop: 60492, Start Num: 57

Candidate Starts for Magpie\_66:

(29, 59785), (Start: 31 @59791 has 3 MA's), (Start: 54 @59908 has 9 MA's), (Start: 57 @59929 has 8 MA's), (74, 60049), (75, 60058), (86, 60157), (87, 60163), (91, 60181), (93, 60223), (94, 60226), (98, 60271), (99, 60283), (102, 60304), (113, 60382), (118, 60403), (122, 60418),

Gene: Mithril\_68 Start: 60339, Stop: 60803, Start Num: 69

Candidate Starts for Mithril\_68:

(29, 60099), (Start: 31 @60105 has 3 MA's), (Start: 54 @60222 has 9 MA's), (Start: 69 @60339 has 3 MA's), (74, 60363), (75, 60372), (86, 60471), (87, 60477), (91, 60495), (94, 60540), (98, 60585), (99, 60597), (102, 60618), (111, 60681), (112, 60690), (118, 60714), (121, 60726),

Gene: Mudslide\_68 Start: 60243, Stop: 60824, Start Num: 54

Candidate Starts for Mudslide\_68:

(29, 60120), (Start: 31 @60126 has 3 MA's), (Start: 54 @60243 has 9 MA's), (74, 60384), (75, 60393), (86, 60492), (87, 60498), (94, 60561), (98, 60606), (99, 60618), (112, 60711), (118, 60735), (121, 60747),

Gene: Mysterious\_70 Start: 59836, Stop: 60333, Start Num: 62

Candidate Starts for Mysterious\_70:

(2, 59590), (4, 59599), (6, 59629), (12, 59668), (15, 59686), (20, 59701), (25, 59725), (Start: 31 @59749 has 3 MA's), (34, 59764), (43, 59800), (Start: 62 @59836 has 4 MA's), (78, 59980), (79, 59983), (87, 60019), (90, 60034), (92, 60070), (93, 60079), (98, 60130), (110, 60205), (124, 60250), (131, 60280),

Gene: Nanao\_67 Start: 59059, Stop: 59622, Start Num: 57

Candidate Starts for Nanao\_67:

(29, 58915), (Start: 31 @58921 has 3 MA's), (42, 58987), (Start: 54 @59038 has 9 MA's), (Start: 57 @59059 has 8 MA's), (74, 59179), (75, 59188), (86, 59287), (87, 59293), (91, 59311), (94, 59356), (98, 59401), (99, 59413), (118, 59533), (122, 59548),

Gene: Nangang\_71 Start: 59924, Stop: 60454, Start Num: 62

Candidate Starts for Nangang\_71:

(6, 59699), (12, 59738), (24, 59792), (34, 59834), (43, 59882), (Start: 62 @59924 has 4 MA's), (66, 59966), (79, 60071), (87, 60119), (90, 60134), (91, 60137), (92, 60170), (93, 60179), (98, 60230), (110, 60305), (128, 60392), (131, 60404),

Gene: Nigel\_66 Start: 58741, Stop: 59442, Start Num: 31

Candidate Starts for Nigel\_66:

(29, 58735), (Start: 31 @58741 has 3 MA's), (33, 58753), (38, 58786), (42, 58807), (Start: 54 @58858 has 9 MA's), (74, 58996), (75, 59005), (86, 59104), (91, 59128), (94, 59173), (98, 59218), (99, 59230), (103, 59254), (109, 59284), (110, 59293), (118, 59353), (122, 59368),

Gene: PenguinLover67\_69 Start: 59425, Stop: 59871, Start Num: 68

Candidate Starts for PenguinLover67\_69:

(14, 59146), (23, 59191), (41, 59266), (43, 59278), (Start: 57 @59347 has 8 MA's), (Start: 63 @59398 has 3 MA's), (Start: 68 @59425 has 3 MA's), (70, 59446), (76, 59494), (78, 59521), (87, 59575), (89, 59587), (91, 59593), (96, 59656), (109, 59737), (125, 59809),

Gene: Phelemich\_68 Start: 59668, Stop: 60213, Start Num: 62

Candidate Starts for Phelemich\_68:

(2, 59422), (4, 59431), (6, 59461), (12, 59500), (20, 59533), (Start: 31 @59581 has 3 MA's), (34, 59596), (Start: 62 @59668 has 4 MA's), (Start: 63 @59689 has 3 MA's), (70, 59737), (72, 59752), (78, 59812), (87, 59869), (90, 59884), (92, 59920), (93, 59929), (98, 59980), (110, 60055), (128, 60148), (131, 60160),

Gene: Poster\_66 Start: 59060, Stop: 59623, Start Num: 57

Candidate Starts for Poster\_66:

(29, 58916), (Start: 31 @58922 has 3 MA's), (42, 58988), (Start: 54 @59039 has 9 MA's), (Start: 57 @59060 has 8 MA's), (74, 59180), (75, 59189), (86, 59288), (87, 59294), (91, 59312), (94, 59357), (98, 59402), (99, 59414), (118, 59534), (122, 59549),

Gene: Prince\_67 Start: 60270, Stop: 60725, Start Num: 69

Candidate Starts for Prince\_67:

(29, 60030), (Start: 31 @60036 has 3 MA's), (Start: 54 @60153 has 9 MA's), (Start: 57 @60174 has 8 MA's), (Start: 69 @60270 has 3 MA's), (74, 60294), (75, 60303), (86, 60402), (87, 60408), (91, 60426), (93, 60468), (94, 60471), (98, 60516), (99, 60528), (118, 60636),

Gene: QueenPie\_63 Start: 59162, Stop: 59725, Start Num: 57

Candidate Starts for QueenPie\_63:

(29, 59018), (Start: 31 @59024 has 3 MA's), (40, 59078), (42, 59090), (Start: 54 @59141 has 9 MA's), (Start: 57 @59162 has 8 MA's), (74, 59282), (75, 59291), (86, 59390), (87, 59396), (93, 59456), (94, 59459), (98, 59504), (99, 59516), (110, 59579), (118, 59636), (122, 59651),

Gene: Quesadilla\_70 Start: 59603, Stop: 60055, Start Num: 68

Candidate Starts for Quesadilla\_70:

(1, 59162), (14, 59300), (39, 59429), (42, 59444), (44, 59453), (Start: 68 @59603 has 3 MA's), (Start: 69 @59621 has 3 MA's), (84, 59720), (91, 59777), (95, 59825), (96, 59843), (97, 59861), (129, 60017),

Gene: RawrgerThat\_69 Start: 60046, Stop: 60630, Start Num: 54

Candidate Starts for RawrgerThat\_69:

(29, 59923), (Start: 31 @59929 has 3 MA's), (Start: 54 @60046 has 9 MA's), (Start: 69 @60163 has 3 MA's), (74, 60187), (75, 60196), (86, 60295), (87, 60301), (91, 60319), (93, 60361), (94, 60364), (98, 60409), (99, 60421), (102, 60442), (118, 60541), (122, 60556), (133, 60607),

Gene: Renkei\_66 Start: 58986, Stop: 59552, Start Num: 57

Candidate Starts for Renkei\_66:

(29, 58842), (Start: 31 @58848 has 3 MA's), (42, 58914), (Start: 54 @58965 has 9 MA's), (Start: 57 @58986 has 8 MA's), (74, 59106), (75, 59115), (86, 59214), (87, 59220), (91, 59238), (94, 59283), (98, 59328), (99, 59340), (102, 59361), (118, 59463), (122, 59478),

Gene: Reprobate\_70 Start: 59673, Stop: 60218, Start Num: 62

Candidate Starts for Reprobate\_70:

(2, 59427), (4, 59436), (6, 59466), (12, 59505), (20, 59538), (Start: 31 @59586 has 3 MA's), (34, 59601), (Start: 62 @59673 has 4 MA's), (Start: 63 @59694 has 3 MA's), (70, 59742), (72, 59757), (78, 59817), (87, 59874), (90, 59889), (92, 59925), (93, 59934), (98, 59985), (110, 60060), (128, 60153), (131, 60165),

Gene: Rinkes\_68 Start: 59532, Stop: 60221, Start Num: 51

Candidate Starts for Rinkes\_68:

(3, 59274), (17, 59358), (18, 59361), (20, 59370), (29, 59406), (Start: 31 @59412 has 3 MA's), (Start: 51 @59532 has 3 MA's), (Start: 60 @59592 has 1 MA's), (Start: 62 @59604 has 4 MA's), (Start: 63 @59625 has 3 MA's), (70, 59673), (71, 59679), (79, 59748), (90, 59811), (92, 59847), (93, 59856), (132, 60099), (141, 60183),

Gene: Saguaro\_67 Start: 58827, Stop: 59270, Start Num: 68

Candidate Starts for Saguaro\_67:

(12, 58491), (21, 58551), (24, 58569), (37, 58626), (46, 58695), (53, 58716), (Start: 68 @58827 has 3 MA's), (81, 58938), (84, 58944), (85, 58965), (87, 58977), (88, 58980), (92, 59016), (101, 59088), (105, 59112),

Gene: Shenyu\_72 Start: 60293, Stop: 60793, Start Num: 62

Candidate Starts for Shenyu\_72:

(6, 60068), (12, 60107), (24, 60161), (34, 60203), (43, 60251), (Start: 62 @60293 has 4 MA's), (66, 60335), (79, 60440), (87, 60488), (90, 60503), (91, 60506), (92, 60539), (93, 60548), (98, 60599), (110, 60674), (128, 60743), (131, 60755),

Gene: Stinger\_68 Start: 58864, Stop: 59568, Start Num: 31

Candidate Starts for Stinger\_68:

(Start: 31 @58864 has 3 MA's), (Start: 54 @58981 has 9 MA's), (74, 59122), (75, 59131), (86, 59230), (87, 59236), (91, 59254), (94, 59299), (98, 59344), (99, 59356), (117, 59473), (118, 59479), (122, 59494),

Gene: StinkyVeggy\_71 Start: 59737, Stop: 60303, Start Num: 51

Candidate Starts for StinkyVeggy\_71:

(6, 59521), (12, 59560), (34, 59656), (43, 59704), (Start: 51 @59737 has 3 MA's), (64, 59836), (79, 59950), (80, 59959), (87, 59998), (90, 60013), (91, 60016), (92, 60049), (93, 60058), (98, 60109), (110, 60184), (128, 60253), (131, 60265),

Gene: Vincenzo\_71 Start: 61486, Stop: 61959, Start Num: 63

Candidate Starts for Vincenzo\_71:

(Start: 31 @61294 has 3 MA's), (42, 61360), (47, 61396), (52, 61411), (Start: 55 @61420 has 1 MA's), (Start: 63 @61486 has 3 MA's), (70, 61534), (74, 61555), (75, 61564), (79, 61612), (94, 61732), (103, 61813), (109, 61846), (115, 61888), (116, 61891), (126, 61924),

Gene: VioletZ\_70 Start: 60156, Stop: 60719, Start Num: 54

Candidate Starts for VioletZ\_70:

(29, 60033), (Start: 31 @60039 has 3 MA's), (Start: 54 @60156 has 9 MA's), (74, 60297), (75, 60306), (91, 60429), (94, 60474), (98, 60519), (99, 60531), (104, 60561),

Gene: Waleliano\_68 Start: 60045, Stop: 60626, Start Num: 54

Candidate Starts for Waleliano\_68:

(29, 59922), (Start: 31 @59928 has 3 MA's), (Start: 54 @60045 has 9 MA's), (Start: 69 @60162 has 3 MA's), (74, 60186), (75, 60195), (86, 60294), (87, 60300), (94, 60363), (98, 60408), (99, 60420), (112, 60513), (118, 60537), (121, 60549),

Gene: Xincheng\_68 Start: 61280, Stop: 61840, Start Num: 57

Candidate Starts for Xincheng\_68:

(29, 61133), (Start: 31 @61139 has 3 MA's), (42, 61205), (Start: 54 @61256 has 9 MA's), (Start: 57 @61280 has 8 MA's), (74, 61400), (75, 61409), (86, 61508), (87, 61514), (91, 61532), (93, 61574), (94, 61577), (98, 61622), (99, 61634), (102, 61655), (111, 61718), (112, 61727),

Gene: Zemanar\_68 Start: 59964, Stop: 60524, Start Num: 57

Candidate Starts for Zemanar\_68:

(29, 59820), (Start: 31 @59826 has 3 MA's), (Start: 54 @59943 has 9 MA's), (Start: 57 @59964 has 8 MA's), (74, 60084), (75, 60093), (86, 60192), (87, 60198), (94, 60261), (98, 60306), (99, 60318), (118, 60435), (133, 60501),

