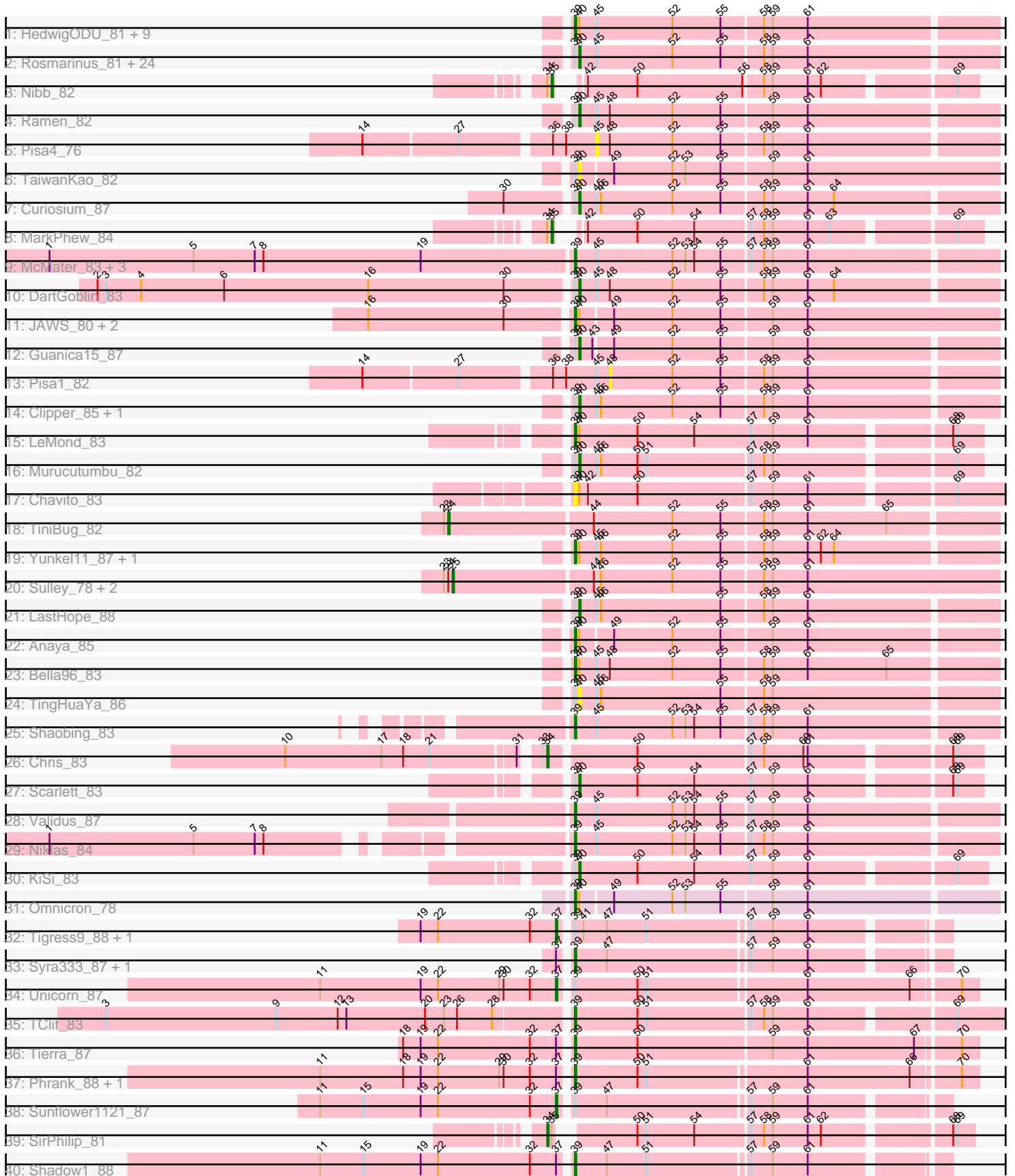


# Pham 304931



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 304931 Report

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

Pham number 304931 has 85 members, 8 are drafts.

Phages represented in each track:

- Track 1 : HedwigODU\_81, Asayake\_81, Tachez\_81, BaghaKamala\_80, Twitch\_81, Atiba\_82, Adephagia\_80, Joy99\_82, Padfoot\_81, Blizzard\_81
- Track 2 : Rosmarinus\_81, Topper\_81, Dalmuri\_81, Homura\_80, BEEST\_81, CaseJules\_83, Piatt\_80, Jarvi\_81, Capricorn\_81, Boiiii\_81, CREW\_80, Jeckyll\_81, Llorens\_81, CallaLilly\_81, Hyperbowlee\_80, ActinUp\_82, Inky\_81, Durfee\_81, TruffulaTree\_83, Peel\_81, Spock\_81, Zabiza\_77, Lunahalos\_81, ShiaSurprise\_82, Belladonna\_81
- Track 3 : Nibb\_82
- Track 4 : Ramen\_82
- Track 5 : Pisa4\_76
- Track 6 : TaiwanKao\_82
- Track 7 : Curiosium\_87
- Track 8 : MarkPhew\_84
- Track 9 : McMater\_83, Peanam\_84, Dartin\_83, Richo\_83
- Track 10 : DartGoblin\_83
- Track 11 : JAWS\_80, Slimphazie\_83, Veliki\_82
- Track 12 : Guanica15\_87
- Track 13 : Pisa1\_82
- Track 14 : Clipper\_85, MacKat\_77
- Track 15 : LeMond\_83
- Track 16 : Murucutumbu\_82
- Track 17 : Chavito\_83
- Track 18 : TiniBug\_82
- Track 19 : Yunkel11\_87, Efra2\_88
- Track 20 : Sulley\_78, Deby\_81, Angelica\_79
- Track 21 : LastHope\_88
- Track 22 : Anaya\_85
- Track 23 : Bella96\_83
- Track 24 : TingHuaYa\_86
- Track 25 : Shaobing\_83
- Track 26 : Chris\_83
- Track 27 : Scarlett\_83
- Track 28 : Validus\_87
- Track 29 : Niklas\_84
- Track 30 : KiSi\_83
- Track 31 : Omnicron\_78
- Track 32 : Tigress9\_88, Krueger\_88

- Track 33 : Syra333\_87, Ximenita\_89
- Track 34 : Unicorn\_87
- Track 35 : TClif\_83
- Track 36 : Tierra\_87
- Track 37 : Phrank\_88, Cain\_88
- Track 38 : Sunflower1121\_87
- Track 39 : SirPhilip\_81
- Track 40 : Shadow1\_88

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

The start number called the most often in the published annotations is 40, it was called in 35 of the 77 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- ActinUp\_82, BEEST\_81, Belladonna\_81, Boiiii\_81, CREW\_80, CallaLilly\_81, Capricorn\_81, CaseJules\_83, Clipper\_85, Curiosium\_87, Dalmuri\_81, DartGoblin\_83, Durfee\_81, Guanica15\_87, Homura\_80, Hyperbowlee\_80, Inky\_81, Jarvi\_81, Jeckyll\_81, KiSi\_83, LastHope\_88, Llorens\_81, Lunahalos\_81, MacKat\_77, Murucutumbu\_82, Peel\_81, Piatt\_80, Ramen\_82, Rosmarinus\_81, Scarlett\_83, ShiaSurprise\_82, Spock\_81, TaiwanKao\_82, TingHuaYa\_86, Topper\_81, TruffulaTree\_83, Zabiza\_77,

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

- Adephagia\_80, Anaya\_85, Asayake\_81, Atiba\_82, BaghaKamala\_80, Bella96\_83, Blizzard\_81, Chavito\_83, Efra2\_88, HedwigODU\_81, JAWS\_80, Joy99\_82, LeMond\_83, Omnicron\_78, Padfoot\_81, Slimphazie\_83, Tachez\_81, Twitch\_81, Veliki\_82, Yunkel11\_87,

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

- Angelica\_79, Cain\_88, Chris\_83, Dartin\_83, Deby\_81, Krueger\_88, MarkPhew\_84, McMater\_83, Nibb\_82, Niklas\_84, Peanam\_84, Phrank\_88, Pisa1\_82, Pisa4\_76, Richo\_83, Shadow1\_88, Shaobing\_83, SirPhilip\_81, Sulley\_78, Sunflower1121\_87, Syra333\_87, TClif\_83, Tierra\_87, Tigress9\_88, TiniBug\_82, Unicorn\_87, Validus\_87, Ximenita\_89,

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

Start 24:

- Found in 4 of 85 ( 4.7% ) of genes in pham
- Manual Annotations of this start: 1 of 77
- Called 25.0% of time when present
- Phage (with cluster) where this start called: TiniBug\_82 (K1),

Start 25:

- Found in 3 of 85 ( 3.5% ) of genes in pham
- Manual Annotations of this start: 3 of 77
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Angelica\_79 (K1), Deby\_81 (K1), Sulley\_78 (K1),

Start 34:

- Found in 4 of 85 ( 4.7% ) of genes in pham
- Manual Annotations of this start: 2 of 77
- Called 50.0% of time when present
- Phage (with cluster) where this start called: Chris\_83 (K1), SirPhilip\_81 (K6),

Start 35:

- Found in 3 of 85 ( 3.5% ) of genes in pham
- Manual Annotations of this start: 2 of 77
- Called 66.7% of time when present
- Phage (with cluster) where this start called: MarkPheW\_84 (K1), Nibb\_82 (K1),

Start 37:

- Found in 10 of 85 ( 11.8% ) of genes in pham
- Manual Annotations of this start: 4 of 77
- Called 40.0% of time when present
- Phage (with cluster) where this start called: Krueger\_88 (K6), Sunflower1121\_87 (K6), Tigress9\_88 (K6), Unicorn\_87 (K6),

Start 39:

- Found in 75 of 85 ( 88.2% ) of genes in pham
- Manual Annotations of this start: 30 of 77
- Called 45.3% of time when present
- Phage (with cluster) where this start called: Adephagia\_80 (K1), Anaya\_85 (K1), Asayake\_81 (K1), Atiba\_82 (K1), BaghaKamala\_80 (K1), Bella96\_83 (K1), Blizzard\_81 (K1), Cain\_88 (K6), Chavito\_83 (K1), Dartin\_83 (K1), Efra2\_88 (K1), HedwigODU\_81 (K1), JAWS\_80 (K1), Joy99\_82 (K1), LeMond\_83 (K1), McMater\_83 (K1), Niklas\_84 (K1), Omnicron\_78 (K5), Padfoot\_81 (K1), Peanam\_84 (K1), Phrank\_88 (K6), Richo\_83 (K1), Shadow1\_88 (K6), Shaobing\_83 (K1), Slimphazie\_83 (K1), Syra333\_87 (K6), TClif\_83 (K6), Tachez\_81 (K1), Tierra\_87 (K6), Twitch\_81 (K1), Validus\_87 (K1), Veliki\_82 (K1), Ximenita\_89 (K6), Yunkel11\_87 (K1),

Start 40:

- Found in 57 of 85 ( 67.1% ) of genes in pham
- Manual Annotations of this start: 35 of 77
- Called 64.9% of time when present
- Phage (with cluster) where this start called: ActinUp\_82 (K1), BEEST\_81 (K1), Belladonna\_81 (K1), Boiiii\_81 (K1), CREW\_80 (K1), CallaLilly\_81 (K1), Capricorn\_81 (K1), CaseJules\_83 (K1), Clipper\_85 (K1), Curiosium\_87 (K1), Dalmuri\_81 (K1), DartGoblin\_83 (K1), Durfee\_81 (K1), Guanica15\_87 (K1), Homura\_80 (K1), Hyperbowlee\_80 (K1), Inky\_81 (K1), Jarvi\_81 (K1), Jeckyll\_81 (K1), KiSi\_83 (K1), LastHope\_88 (K1), Llorens\_81 (K1), Lunahalos\_81 (K1), MacKat\_77 (K1), Murucutumbu\_82 (K1), Peel\_81 (K1), Piatt\_80 (K1), Ramen\_82 (K1), Rosmarinus\_81 (K1), Scarlett\_83 (K1), ShiaSurprise\_82 (K1), Spock\_81 (K1), TaiwanKao\_82 (K1), TingHuaYa\_86 (K1), Topper\_81 (K1), TruffulaTree\_83 (K1), Zabiza\_77 (K1),

Start 45:

- Found in 55 of 85 ( 64.7% ) of genes in pham
- No Manual Annotations of this start.
- Called 1.8% of time when present
- Phage (with cluster) where this start called: Pisa4\_76 (K1),

Start 48:

- Found in 5 of 85 ( 5.9% ) of genes in pham
- No Manual Annotations of this start.
- Called 20.0% of time when present
- Phage (with cluster) where this start called: Pisa1\_82 (K1),

### **Summary by clusters:**

There are 3 clusters represented in this pham: K1, K6, K5,

Info for manual annotations of cluster K1:

- Start number 24 was manually annotated 1 time for cluster K1.
- Start number 25 was manually annotated 3 times for cluster K1.
- Start number 34 was manually annotated 1 time for cluster K1.
- Start number 35 was manually annotated 2 times for cluster K1.
- Start number 39 was manually annotated 22 times for cluster K1.
- Start number 40 was manually annotated 35 times for cluster K1.

Info for manual annotations of cluster K5:

- Start number 39 was manually annotated 1 time for cluster K5.

Info for manual annotations of cluster K6:

- Start number 34 was manually annotated 1 time for cluster K6.
- Start number 37 was manually annotated 4 times for cluster K6.
- Start number 39 was manually annotated 7 times for cluster K6.

### **Gene Information:**

Gene: ActinUp\_82 Start: 52951, Stop: 53229, Start Num: 40

Candidate Starts for ActinUp\_82:

(Start: 39 @52948 has 30 MA's), (Start: 40 @52951 has 35 MA's), (45, 52963), (52, 53014), (55, 53047), (58, 53074), (59, 53080), (61, 53104),

Gene: Adephagia\_80 Start: 52785, Stop: 53066, Start Num: 39

Candidate Starts for Adephagia\_80:

(Start: 39 @52785 has 30 MA's), (Start: 40 @52788 has 35 MA's), (45, 52800), (52, 52851), (55, 52884), (58, 52911), (59, 52917), (61, 52941),

Gene: Anaya\_85 Start: 53830, Stop: 54108, Start Num: 39

Candidate Starts for Anaya\_85:

(Start: 39 @53830 has 30 MA's), (Start: 40 @53833 has 35 MA's), (49, 53854), (52, 53893), (55, 53926), (59, 53959), (61, 53983),

Gene: Angelica\_79 Start: 52375, Stop: 52740, Start Num: 25

Candidate Starts for Angelica\_79:

(23, 52369), (Start: 24 @52372 has 1 MA's), (Start: 25 @52375 has 3 MA's), (44, 52468), (46, 52471), (52, 52519), (55, 52552), (58, 52579), (59, 52585), (61, 52609),

Gene: Asayake\_81 Start: 53100, Stop: 53381, Start Num: 39

Candidate Starts for Asayake\_81:

(Start: 39 @53100 has 30 MA's), (Start: 40 @53103 has 35 MA's), (45, 53115), (52, 53166), (55, 53199), (58, 53226), (59, 53232), (61, 53256),

Gene: Atiba\_82 Start: 52748, Stop: 53029, Start Num: 39

Candidate Starts for Atiba\_82:

(Start: 39 @52748 has 30 MA's), (Start: 40 @52751 has 35 MA's), (45, 52763), (52, 52814), (55, 52847), (58, 52874), (59, 52880), (61, 52904),

Gene: BEEST\_81 Start: 53103, Stop: 53381, Start Num: 40

Candidate Starts for BEEST\_81:

(Start: 39 @53100 has 30 MA's), (Start: 40 @53103 has 35 MA's), (45, 53115), (52, 53166), (55, 53199), (58, 53226), (59, 53232), (61, 53256),

Gene: BaghaKamala\_80 Start: 52334, Stop: 52615, Start Num: 39

Candidate Starts for BaghaKamala\_80:

(Start: 39 @52334 has 30 MA's), (Start: 40 @52337 has 35 MA's), (45, 52349), (52, 52400), (55, 52433), (58, 52460), (59, 52466), (61, 52490),

Gene: Bella96\_83 Start: 53274, Stop: 53555, Start Num: 39

Candidate Starts for Bella96\_83:

(Start: 39 @53274 has 30 MA's), (Start: 40 @53277 has 35 MA's), (45, 53289), (48, 53298), (52, 53340), (55, 53373), (58, 53400), (59, 53406), (61, 53430), (65, 53484),

Gene: Belladonna\_81 Start: 52906, Stop: 53184, Start Num: 40

Candidate Starts for Belladonna\_81:

(Start: 39 @52903 has 30 MA's), (Start: 40 @52906 has 35 MA's), (45, 52918), (52, 52969), (55, 53002), (58, 53029), (59, 53035), (61, 53059),

Gene: Blizzard\_81 Start: 53100, Stop: 53381, Start Num: 39

Candidate Starts for Blizzard\_81:

(Start: 39 @53100 has 30 MA's), (Start: 40 @53103 has 35 MA's), (45, 53115), (52, 53166), (55, 53199), (58, 53226), (59, 53232), (61, 53256),

Gene: Boiiii\_81 Start: 53105, Stop: 53383, Start Num: 40

Candidate Starts for Boiiii\_81:

(Start: 39 @53102 has 30 MA's), (Start: 40 @53105 has 35 MA's), (45, 53117), (52, 53168), (55, 53201), (58, 53228), (59, 53234), (61, 53258),

Gene: CREW\_80 Start: 52906, Stop: 53184, Start Num: 40

Candidate Starts for CREW\_80:

(Start: 39 @52903 has 30 MA's), (Start: 40 @52906 has 35 MA's), (45, 52918), (52, 52969), (55, 53002), (58, 53029), (59, 53035), (61, 53059),

Gene: Cain\_88 Start: 53666, Stop: 53929, Start Num: 39

Candidate Starts for Cain\_88:

(11, 53498), (18, 53555), (19, 53567), (22, 53579), (29, 53621), (30, 53624), (32, 53642), (Start: 37 @53660 has 4 MA's), (Start: 39 @53666 has 30 MA's), (50, 53708), (51, 53714), (61, 53819), (66, 53888), (70, 53918),

Gene: CallaLilly\_81 Start: 52829, Stop: 53107, Start Num: 40

Candidate Starts for CallaLilly\_81:

(Start: 39 @52826 has 30 MA's), (Start: 40 @52829 has 35 MA's), (45, 52841), (52, 52892), (55, 52925), (58, 52952), (59, 52958), (61, 52982),

Gene: Capricorn\_81 Start: 52906, Stop: 53184, Start Num: 40

Candidate Starts for Capricorn\_81:

(Start: 39 @52903 has 30 MA's), (Start: 40 @52906 has 35 MA's), (45, 52918), (52, 52969), (55, 53002), (58, 53029), (59, 53035), (61, 53059),

Gene: CaseJules\_83 Start: 53103, Stop: 53381, Start Num: 40

Candidate Starts for CaseJules\_83:

(Start: 39 @53100 has 30 MA's), (Start: 40 @53103 has 35 MA's), (45, 53115), (52, 53166), (55, 53199), (58, 53226), (59, 53232), (61, 53256),

Gene: Chavito\_83 Start: 54564, Stop: 54908, Start Num: 39

Candidate Starts for Chavito\_83:

(Start: 39 @54564 has 30 MA's), (Start: 40 @54567 has 35 MA's), (42, 54573), (50, 54606), (57, 54681), (59, 54696), (61, 54720), (69, 54810),

Gene: Chris\_83 Start: 53462, Stop: 53737, Start Num: 34

Candidate Starts for Chris\_83:

(10, 53297), (17, 53363), (18, 53378), (21, 53396), (31, 53450), (33, 53459), (Start: 34 @53462 has 2 MA's), (50, 53516), (57, 53591), (58, 53600), (60, 53627), (61, 53630), (68, 53717), (69, 53720),

Gene: Clipper\_85 Start: 53469, Stop: 53747, Start Num: 40

Candidate Starts for Clipper\_85:

(Start: 39 @53466 has 30 MA's), (Start: 40 @53469 has 35 MA's), (45, 53481), (46, 53484), (52, 53532), (55, 53565), (58, 53592), (59, 53598), (61, 53622),

Gene: Curiosium\_87 Start: 52762, Stop: 53040, Start Num: 40

Candidate Starts for Curiosium\_87:

(30, 52717), (Start: 39 @52759 has 30 MA's), (Start: 40 @52762 has 35 MA's), (45, 52774), (46, 52777), (52, 52825), (55, 52858), (58, 52885), (59, 52891), (61, 52915), (64, 52933),

Gene: Dalmuri\_81 Start: 52906, Stop: 53184, Start Num: 40

Candidate Starts for Dalmuri\_81:

(Start: 39 @52903 has 30 MA's), (Start: 40 @52906 has 35 MA's), (45, 52918), (52, 52969), (55, 53002), (58, 53029), (59, 53035), (61, 53059),

Gene: DartGoblin\_83 Start: 53240, Stop: 53518, Start Num: 40

Candidate Starts for DartGoblin\_83:

(2, 52916), (3, 52922), (4, 52946), (6, 53003), (16, 53102), (30, 53195), (Start: 39 @53237 has 30 MA's), (Start: 40 @53240 has 35 MA's), (45, 53252), (48, 53261), (52, 53303), (55, 53336), (58, 53363), (59, 53369), (61, 53393), (64, 53411),

Gene: Dartin\_83 Start: 54044, Stop: 54325, Start Num: 39

Candidate Starts for Dartin\_83:

(1, 53687), (5, 53786), (7, 53828), (8, 53834), (19, 53942), (Start: 39 @54044 has 30 MA's), (45, 54059), (52, 54110), (53, 54119), (54, 54125), (55, 54143), (57, 54161), (58, 54170), (59, 54176), (61, 54200),

Gene: Deby\_81 Start: 53273, Stop: 53638, Start Num: 25

Candidate Starts for Deby\_81:

(23, 53267), (Start: 24 @53270 has 1 MA's), (Start: 25 @53273 has 3 MA's), (44, 53366), (46, 53369), (52, 53417), (55, 53450), (58, 53477), (59, 53483), (61, 53507),

Gene: Durfee\_81 Start: 53103, Stop: 53381, Start Num: 40

Candidate Starts for Durfee\_81:

(Start: 39 @53100 has 30 MA's), (Start: 40 @53103 has 35 MA's), (45, 53115), (52, 53166), (55, 53199), (58, 53226), (59, 53232), (61, 53256),

Gene: Efra2\_88 Start: 53692, Stop: 53973, Start Num: 39

Candidate Starts for Efra2\_88:

(Start: 39 @53692 has 30 MA's), (Start: 40 @53695 has 35 MA's), (45, 53707), (46, 53710), (52, 53758), (55, 53791), (58, 53818), (59, 53824), (61, 53848), (62, 53857), (64, 53866),

Gene: Guanica15\_87 Start: 53392, Stop: 53667, Start Num: 40

Candidate Starts for Guanica15\_87:

(Start: 39 @53389 has 30 MA's), (Start: 40 @53392 has 35 MA's), (43, 53401), (49, 53413), (52, 53452), (55, 53485), (59, 53518), (61, 53542),

Gene: HedwigODU\_81 Start: 52948, Stop: 53229, Start Num: 39

Candidate Starts for HedwigODU\_81:

(Start: 39 @52948 has 30 MA's), (Start: 40 @52951 has 35 MA's), (45, 52963), (52, 53014), (55, 53047), (58, 53074), (59, 53080), (61, 53104),

Gene: Homura\_80 Start: 52906, Stop: 53184, Start Num: 40

Candidate Starts for Homura\_80:

(Start: 39 @52903 has 30 MA's), (Start: 40 @52906 has 35 MA's), (45, 52918), (52, 52969), (55, 53002), (58, 53029), (59, 53035), (61, 53059),

Gene: Hyperbowlee\_80 Start: 53103, Stop: 53381, Start Num: 40

Candidate Starts for Hyperbowlee\_80:

(Start: 39 @53100 has 30 MA's), (Start: 40 @53103 has 35 MA's), (45, 53115), (52, 53166), (55, 53199), (58, 53226), (59, 53232), (61, 53256),

Gene: Inky\_81 Start: 52906, Stop: 53184, Start Num: 40

Candidate Starts for Inky\_81:

(Start: 39 @52903 has 30 MA's), (Start: 40 @52906 has 35 MA's), (45, 52918), (52, 52969), (55, 53002), (58, 53029), (59, 53035), (61, 53059),

Gene: JAWS\_80 Start: 52865, Stop: 53149, Start Num: 39

Candidate Starts for JAWS\_80:

(16, 52730), (30, 52823), (Start: 39 @52865 has 30 MA's), (Start: 40 @52868 has 35 MA's), (49, 52889), (52, 52928), (55, 52961), (59, 52994), (61, 53018),

Gene: Jarvi\_81 Start: 52906, Stop: 53184, Start Num: 40

Candidate Starts for Jarvi\_81:

(Start: 39 @52903 has 30 MA's), (Start: 40 @52906 has 35 MA's), (45, 52918), (52, 52969), (55, 53002), (58, 53029), (59, 53035), (61, 53059),

Gene: Jeckyll\_81 Start: 52906, Stop: 53184, Start Num: 40

Candidate Starts for Jeckyll\_81:

(Start: 39 @52903 has 30 MA's), (Start: 40 @52906 has 35 MA's), (45, 52918), (52, 52969), (55, 53002), (58, 53029), (59, 53035), (61, 53059),

Gene: Joy99\_82 Start: 53032, Stop: 53313, Start Num: 39

Candidate Starts for Joy99\_82:

(Start: 39 @53032 has 30 MA's), (Start: 40 @53035 has 35 MA's), (45, 53047), (52, 53098), (55, 53131), (58, 53158), (59, 53164), (61, 53188),

Gene: KiSi\_83 Start: 53332, Stop: 53598, Start Num: 40

Candidate Starts for KiSi\_83:

(Start: 39 @53329 has 30 MA's), (Start: 40 @53332 has 35 MA's), (50, 53371), (54, 53410), (57, 53449), (59, 53464), (61, 53488), (69, 53578),

Gene: Krueger\_88 Start: 53939, Stop: 54181, Start Num: 37

Candidate Starts for Krueger\_88:

(19, 53846), (22, 53858), (32, 53921), (Start: 37 @53939 has 4 MA's), (Start: 39 @53945 has 30 MA's), (41, 53951), (47, 53966), (51, 53993), (57, 54059), (59, 54074), (61, 54098),

Gene: LastHope\_88 Start: 53488, Stop: 53766, Start Num: 40

Candidate Starts for LastHope\_88:

(Start: 39 @53485 has 30 MA's), (Start: 40 @53488 has 35 MA's), (45, 53500), (46, 53503), (55, 53584), (58, 53611), (59, 53617), (61, 53641),

Gene: LeMond\_83 Start: 53391, Stop: 53657, Start Num: 39

Candidate Starts for LeMond\_83:

(Start: 39 @53391 has 30 MA's), (Start: 40 @53394 has 35 MA's), (50, 53433), (54, 53472), (57, 53511), (59, 53526), (61, 53550), (68, 53637), (69, 53640),

Gene: Llorens\_81 Start: 52906, Stop: 53184, Start Num: 40

Candidate Starts for Llorens\_81:

(Start: 39 @52903 has 30 MA's), (Start: 40 @52906 has 35 MA's), (45, 52918), (52, 52969), (55, 53002), (58, 53029), (59, 53035), (61, 53059),

Gene: Lunahalos\_81 Start: 52906, Stop: 53184, Start Num: 40

Candidate Starts for Lunahalos\_81:

(Start: 39 @52903 has 30 MA's), (Start: 40 @52906 has 35 MA's), (45, 52918), (52, 52969), (55, 53002), (58, 53029), (59, 53035), (61, 53059),

Gene: MacKat\_77 Start: 48353, Stop: 48631, Start Num: 40

Candidate Starts for MacKat\_77:

(Start: 39 @48350 has 30 MA's), (Start: 40 @48353 has 35 MA's), (45, 48365), (46, 48368), (52, 48416), (55, 48449), (58, 48476), (59, 48482), (61, 48506),

Gene: MarkPhew\_84 Start: 53449, Stop: 53709, Start Num: 35

Candidate Starts for MarkPhew\_84:

(Start: 34 @53446 has 2 MA's), (Start: 35 @53449 has 2 MA's), (42, 53455), (50, 53488), (54, 53527), (57, 53563), (58, 53572), (59, 53578), (61, 53602), (63, 53617), (69, 53692),

Gene: McMater\_83 Start: 54044, Stop: 54325, Start Num: 39

Candidate Starts for McMater\_83:

(1, 53687), (5, 53786), (7, 53828), (8, 53834), (19, 53942), (Start: 39 @54044 has 30 MA's), (45, 54059), (52, 54110), (53, 54119), (54, 54125), (55, 54143), (57, 54161), (58, 54170), (59, 54176), (61, 54200),

Gene: Murucutumbu\_82 Start: 54127, Stop: 54387, Start Num: 40

Candidate Starts for Murucutumbu\_82:

(Start: 39 @54124 has 30 MA's), (Start: 40 @54127 has 35 MA's), (45, 54139), (46, 54142), (50, 54166), (51, 54172), (57, 54241), (58, 54250), (59, 54256), (69, 54370),

Gene: Nibb\_82 Start: 52761, Stop: 53018, Start Num: 35

Candidate Starts for Nibb\_82:

(Start: 34 @52758 has 2 MA's), (Start: 35 @52761 has 2 MA's), (42, 52767), (50, 52800), (56, 52872), (58, 52884), (59, 52890), (61, 52914), (62, 52923), (69, 53004),

Gene: Niklas\_84 Start: 54084, Stop: 54365, Start Num: 39

Candidate Starts for Niklas\_84:

(1, 53763), (5, 53862), (7, 53904), (8, 53910), (Start: 39 @54084 has 30 MA's), (45, 54099), (52, 54150), (53, 54159), (54, 54165), (55, 54183), (57, 54201), (58, 54210), (59, 54216), (61, 54240),

Gene: Omnicron\_78 Start: 52916, Stop: 53194, Start Num: 39

Candidate Starts for Omnicron\_78:

(Start: 39 @52916 has 30 MA's), (Start: 40 @52919 has 35 MA's), (49, 52940), (52, 52979), (53, 52988), (55, 53012), (59, 53045), (61, 53069),

Gene: Padfoot\_81 Start: 53100, Stop: 53381, Start Num: 39

Candidate Starts for Padfoot\_81:

(Start: 39 @53100 has 30 MA's), (Start: 40 @53103 has 35 MA's), (45, 53115), (52, 53166), (55, 53199), (58, 53226), (59, 53232), (61, 53256),

Gene: Peanam\_84 Start: 54063, Stop: 54344, Start Num: 39

Candidate Starts for Peanam\_84:

(1, 53706), (5, 53805), (7, 53847), (8, 53853), (19, 53961), (Start: 39 @54063 has 30 MA's), (45, 54078), (52, 54129), (53, 54138), (54, 54144), (55, 54162), (57, 54180), (58, 54189), (59, 54195), (61, 54219),

Gene: Peel\_81 Start: 52908, Stop: 53186, Start Num: 40

Candidate Starts for Peel\_81:

(Start: 39 @52905 has 30 MA's), (Start: 40 @52908 has 35 MA's), (45, 52920), (52, 52971), (55, 53004), (58, 53031), (59, 53037), (61, 53061),

Gene: Phrank\_88 Start: 53653, Stop: 53916, Start Num: 39

Candidate Starts for Phrank\_88:

(11, 53485), (18, 53542), (19, 53554), (22, 53566), (29, 53608), (30, 53611), (32, 53629), (Start: 37 @53647 has 4 MA's), (Start: 39 @53653 has 30 MA's), (50, 53695), (51, 53701), (61, 53806), (66, 53875), (70, 53905),

Gene: Piatt\_80 Start: 53103, Stop: 53381, Start Num: 40

Candidate Starts for Piatt\_80:

(Start: 39 @53100 has 30 MA's), (Start: 40 @53103 has 35 MA's), (45, 53115), (52, 53166), (55, 53199), (58, 53226), (59, 53232), (61, 53256),

Gene: Pisa1\_82 Start: 53600, Stop: 53857, Start Num: 48

Candidate Starts for Pisa1\_82:

(14, 53441), (27, 53504), (36, 53561), (38, 53570), (45, 53591), (48, 53600), (52, 53642), (55, 53675), (58, 53702), (59, 53708), (61, 53732),

Gene: Pisa4\_76 Start: 48960, Stop: 49226, Start Num: 45

Candidate Starts for Pisa4\_76:

(14, 48810), (27, 48873), (36, 48930), (38, 48939), (45, 48960), (48, 48969), (52, 49011), (55, 49044), (58, 49071), (59, 49077), (61, 49101),

Gene: Ramen\_82 Start: 52676, Stop: 52954, Start Num: 40

Candidate Starts for Ramen\_82:

(Start: 39 @52673 has 30 MA's), (Start: 40 @52676 has 35 MA's), (45, 52688), (48, 52697), (52, 52739), (55, 52772), (59, 52805), (61, 52829),

Gene: Richo\_83 Start: 54044, Stop: 54325, Start Num: 39

Candidate Starts for Richo\_83:

(1, 53687), (5, 53786), (7, 53828), (8, 53834), (19, 53942), (Start: 39 @54044 has 30 MA's), (45, 54059), (52, 54110), (53, 54119), (54, 54125), (55, 54143), (57, 54161), (58, 54170), (59, 54176), (61, 54200),

Gene: Rosmarinus\_81 Start: 52894, Stop: 53172, Start Num: 40

Candidate Starts for Rosmarinus\_81:

(Start: 39 @52891 has 30 MA's), (Start: 40 @52894 has 35 MA's), (45, 52906), (52, 52957), (55, 52990), (58, 53017), (59, 53023), (61, 53047),

Gene: Scarlett\_83 Start: 53191, Stop: 53454, Start Num: 40

Candidate Starts for Scarlett\_83:

(Start: 39 @53188 has 30 MA's), (Start: 40 @53191 has 35 MA's), (50, 53230), (54, 53269), (57, 53308), (59, 53323), (61, 53347), (68, 53434), (69, 53437),

Gene: Shadow1\_88 Start: 54085, Stop: 54321, Start Num: 39

Candidate Starts for Shadow1\_88:

(11, 53917), (15, 53947), (19, 53986), (22, 53998), (32, 54061), (Start: 37 @54079 has 4 MA's), (Start: 39 @54085 has 30 MA's), (47, 54106), (51, 54133), (57, 54199), (59, 54214), (61, 54238),

Gene: Shaobing\_83 Start: 54131, Stop: 54412, Start Num: 39

Candidate Starts for Shaobing\_83:

(Start: 39 @54131 has 30 MA's), (45, 54146), (52, 54197), (53, 54206), (54, 54212), (55, 54230), (57, 54248), (58, 54257), (59, 54263), (61, 54287),

Gene: ShiaSurprise\_82 Start: 53103, Stop: 53381, Start Num: 40

Candidate Starts for ShiaSurprise\_82:

(Start: 39 @53100 has 30 MA's), (Start: 40 @53103 has 35 MA's), (45, 53115), (52, 53166), (55, 53199), (58, 53226), (59, 53232), (61, 53256),

Gene: SirPhilip\_81 Start: 53235, Stop: 53495, Start Num: 34

Candidate Starts for SirPhilip\_81:

(Start: 34 @53235 has 2 MA's), (Start: 35 @53238 has 2 MA's), (50, 53280), (51, 53286), (54, 53319), (57, 53355), (58, 53364), (59, 53370), (61, 53394), (62, 53403), (68, 53481), (69, 53484),

Gene: Slimphazie\_83 Start: 53315, Stop: 53599, Start Num: 39

Candidate Starts for Slimphazie\_83:

(16, 53180), (30, 53273), (Start: 39 @53315 has 30 MA's), (Start: 40 @53318 has 35 MA's), (49, 53339), (52, 53378), (55, 53411), (59, 53444), (61, 53468),

Gene: Spock\_81 Start: 52907, Stop: 53185, Start Num: 40

Candidate Starts for Spock\_81:

(Start: 39 @52904 has 30 MA's), (Start: 40 @52907 has 35 MA's), (45, 52919), (52, 52970), (55, 53003), (58, 53030), (59, 53036), (61, 53060),

Gene: Sulley\_78 Start: 52370, Stop: 52735, Start Num: 25

Candidate Starts for Sulley\_78:

(23, 52364), (Start: 24 @52367 has 1 MA's), (Start: 25 @52370 has 3 MA's), (44, 52463), (46, 52466), (52, 52514), (55, 52547), (58, 52574), (59, 52580), (61, 52604),

Gene: Sunflower1121\_87 Start: 53623, Stop: 53865, Start Num: 37

Candidate Starts for Sunflower1121\_87:

(11, 53461), (15, 53491), (19, 53530), (22, 53542), (32, 53605), (Start: 37 @53623 has 4 MA's), (Start: 39 @53629 has 30 MA's), (47, 53650), (57, 53743), (59, 53758), (61, 53782),

Gene: Syra333\_87 Start: 53998, Stop: 54234, Start Num: 39

Candidate Starts for Syra333\_87:

(Start: 37 @53992 has 4 MA's), (Start: 39 @53998 has 30 MA's), (47, 54019), (57, 54112), (59, 54127), (61, 54151),

Gene: TClif\_83 Start: 52831, Stop: 53172, Start Num: 39

Candidate Starts for TClif\_83:

(3, 52519), (9, 52636), (12, 52678), (13, 52684), (20, 52738), (23, 52750), (26, 52759), (28, 52783), (Start: 39 @52831 has 30 MA's), (50, 52873), (51, 52879), (57, 52948), (58, 52957), (59, 52963), (61, 52987), (69, 53077),

Gene: Tachez\_81 Start: 52748, Stop: 53029, Start Num: 39

Candidate Starts for Tachez\_81:

(Start: 39 @52748 has 30 MA's), (Start: 40 @52751 has 35 MA's), (45, 52763), (52, 52814), (55, 52847), (58, 52874), (59, 52880), (61, 52904),

Gene: TaiwanKao\_82 Start: 52883, Stop: 53164, Start Num: 40

Candidate Starts for TaiwanKao\_82:

(Start: 39 @52880 has 30 MA's), (Start: 40 @52883 has 35 MA's), (49, 52904), (52, 52943), (53, 52952), (55, 52976), (59, 53009), (61, 53033),

Gene: Tierra\_87 Start: 54067, Stop: 54333, Start Num: 39

Candidate Starts for Tierra\_87:

(18, 53956), (19, 53968), (22, 53980), (32, 54043), (Start: 37 @54061 has 4 MA's), (Start: 39 @54067 has 30 MA's), (50, 54109), (59, 54199), (61, 54223), (67, 54295), (70, 54322),

Gene: Tigress9\_88 Start: 54267, Stop: 54509, Start Num: 37

Candidate Starts for Tigress9\_88:

(19, 54174), (22, 54186), (32, 54249), (Start: 37 @54267 has 4 MA's), (Start: 39 @54273 has 30 MA's), (41, 54279), (47, 54294), (51, 54321), (57, 54387), (59, 54402), (61, 54426),

Gene: TingHuaYa\_86 Start: 53796, Stop: 54074, Start Num: 40

Candidate Starts for TingHuaYa\_86:

(Start: 39 @53793 has 30 MA's), (Start: 40 @53796 has 35 MA's), (45, 53808), (46, 53811), (55, 53892), (58, 53919), (59, 53925),

Gene: TiniBug\_82 Start: 53409, Stop: 53771, Start Num: 24

Candidate Starts for TiniBug\_82:

(23, 53406), (Start: 24 @53409 has 1 MA's), (44, 53505), (52, 53556), (55, 53589), (58, 53616), (59, 53622), (61, 53646), (65, 53700),

Gene: Topper\_81 Start: 52906, Stop: 53184, Start Num: 40

Candidate Starts for Topper\_81:

(Start: 39 @52903 has 30 MA's), (Start: 40 @52906 has 35 MA's), (45, 52918), (52, 52969), (55, 53002), (58, 53029), (59, 53035), (61, 53059),

Gene: TruffulaTree\_83 Start: 53314, Stop: 53592, Start Num: 40

Candidate Starts for TruffulaTree\_83:

(Start: 39 @53311 has 30 MA's), (Start: 40 @53314 has 35 MA's), (45, 53326), (52, 53377), (55, 53410), (58, 53437), (59, 53443), (61, 53467),

Gene: Twitch\_81 Start: 52905, Stop: 53186, Start Num: 39

Candidate Starts for Twitch\_81:

(Start: 39 @52905 has 30 MA's), (Start: 40 @52908 has 35 MA's), (45, 52920), (52, 52971), (55, 53004), (58, 53031), (59, 53037), (61, 53061),

Gene: Unicorn\_87 Start: 53787, Stop: 54056, Start Num: 37

Candidate Starts for Unicorn\_87:

(11, 53625), (19, 53694), (22, 53706), (29, 53748), (30, 53751), (32, 53769), (Start: 37 @53787 has 4 MA's), (Start: 39 @53793 has 30 MA's), (50, 53835), (51, 53841), (61, 53946), (66, 54015), (70, 54045),

Gene: Validus\_87 Start: 54683, Stop: 54964, Start Num: 39

Candidate Starts for Validus\_87:

(Start: 39 @54683 has 30 MA's), (45, 54698), (52, 54749), (53, 54758), (54, 54764), (55, 54782), (57, 54800), (59, 54815), (61, 54839),

Gene: Veliki\_82 Start: 52850, Stop: 53134, Start Num: 39

Candidate Starts for Veliki\_82:

(16, 52715), (30, 52808), (Start: 39 @52850 has 30 MA's), (Start: 40 @52853 has 35 MA's), (49, 52874), (52, 52913), (55, 52946), (59, 52979), (61, 53003),

Gene: Ximenita\_89 Start: 54322, Stop: 54558, Start Num: 39

Candidate Starts for Ximenita\_89:

(Start: 37 @54316 has 4 MA's), (Start: 39 @54322 has 30 MA's), (47, 54343), (57, 54436), (59, 54451), (61, 54475),

Gene: Yunkel11\_87 Start: 53374, Stop: 53655, Start Num: 39

Candidate Starts for Yunkel11\_87:

(Start: 39 @53374 has 30 MA's), (Start: 40 @53377 has 35 MA's), (45, 53389), (46, 53392), (52, 53440), (55, 53473), (58, 53500), (59, 53506), (61, 53530), (62, 53539), (64, 53548),

Gene: Zabiza\_77 Start: 49256, Stop: 49534, Start Num: 40

Candidate Starts for Zabiza\_77:

(Start: 39 @49253 has 30 MA's), (Start: 40 @49256 has 35 MA's), (45, 49268), (52, 49319), (55, 49352), (58, 49379), (59, 49385), (61, 49409),