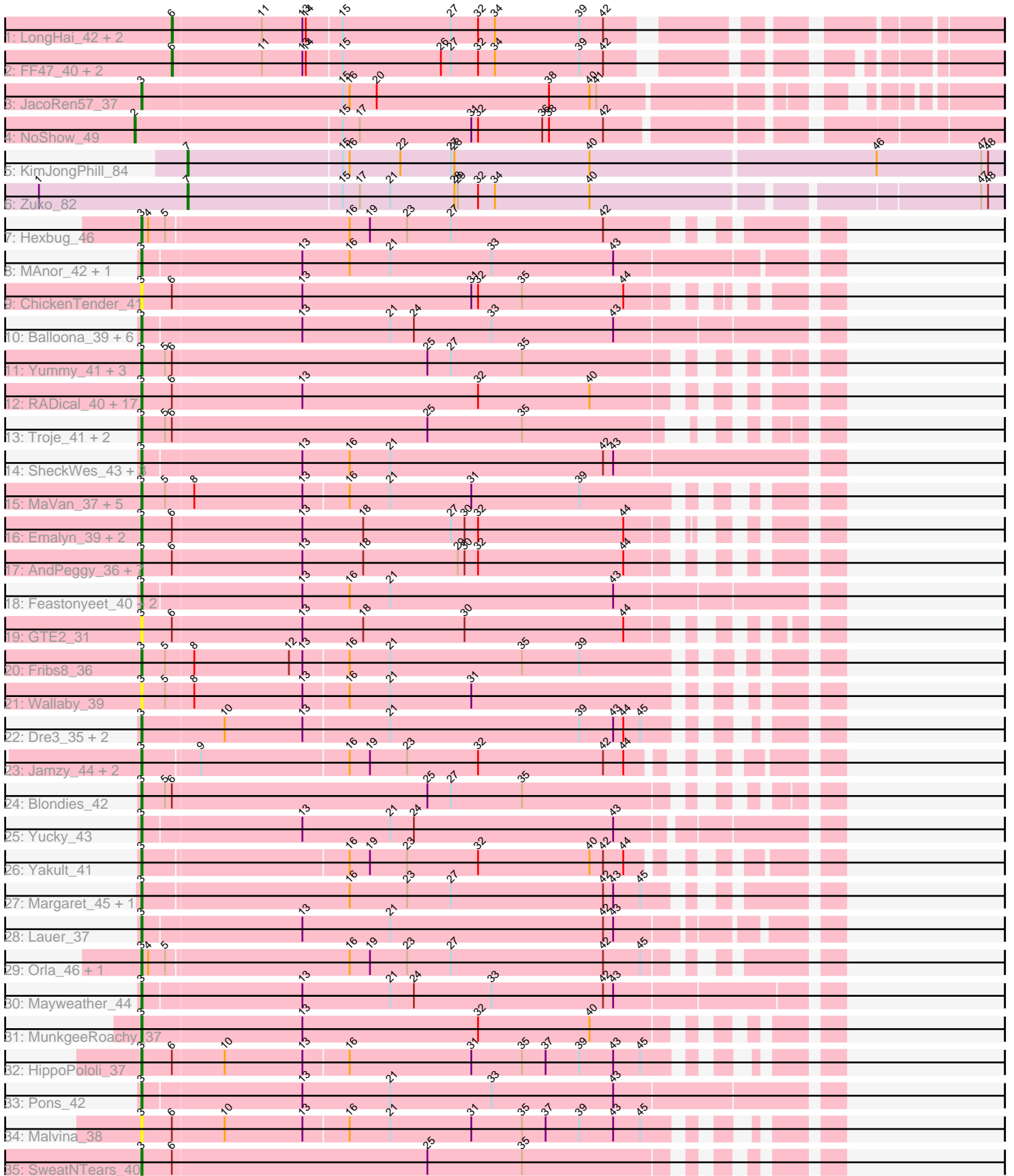


Pham 311451



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 311451 Report

This analysis was run 06/27/26 on database version 652.

Pham number 311451 has 93 members, 24 are drafts.

Phages represented in each track:

- Track 1 : LongHai\_42, Salvus\_42, Muddy\_41
- Track 2 : FF47\_40, Maco6\_39, 8UZL\_41
- Track 3 : JacoRen57\_37
- Track 4 : NoShow\_49
- Track 5 : KimJongPhill\_84
- Track 6 : Zuko\_82
- Track 7 : Hexbug\_46
- Track 8 : MAnor\_42, PotPie\_41
- Track 9 : ChickenTender\_41
- Track 10 : Balloona\_39, Tarnish\_41, SummitAcademy\_40, Elinal\_44, Vine\_43, Bavailard\_40, KayGee\_42
- Track 11 : Yummy\_41, Buttrmilkdreams\_41, MScarn\_42, Horseradish\_41
- Track 12 : RADical\_40, GoldHunter\_40, Axym\_38, Burnsey\_38, RSchmailzl\_40, RedBaron\_42, Sopespian\_38, Typhonmarchy\_37, Nina\_38, Socotra\_39, PsychoKiller\_38, Agatha\_38, Elliott\_39, Cozz\_37, Quasar\_39, Carsonalex\_42, Bubble\_37, Starburst\_40
- Track 13 : Troje\_41, SketchMex\_39, Biskit\_41
- Track 14 : SheckWes\_43, McDazzle\_42, ElJefes\_41, CherryonLim\_42
- Track 15 : MaVan\_37, Azira\_37, Zareef\_37, Wolfwood\_37, Nibbles\_36, Survivors\_37
- Track 16 : Emalyn\_39, AikoCarson\_40, Amok\_40
- Track 17 : AndPeggy\_36, BillDoor\_39, SteamedHams\_40, Yarn\_36, Caramellatte\_38, CanesSauce\_38, ChocoMunchkin\_38, Tolls\_40
- Track 18 : Feastonyeet\_40, BigChungus\_40, CocoaPuff\_41
- Track 19 : GTE2\_31
- Track 20 : Fribs8\_36
- Track 21 : Wallaby\_39
- Track 22 : Dre3\_35, Gibbous\_35, Cleo\_35
- Track 23 : Jamzy\_44, GiKK\_44, Button\_42
- Track 24 : Blondies\_42
- Track 25 : Yucky\_43
- Track 26 : Yakult\_41
- Track 27 : Margaret\_45, RanchParmCat\_44
- Track 28 : Lauer\_37
- Track 29 : Orla\_46, Nodigi\_46
- Track 30 : Mayweather\_44
- Track 31 : MunkgeeRoachy\_37

- Track 32 : HippoPololi\_37
- Track 33 : Pons\_42
- Track 34 : Malvina\_38
- Track 35 : SweatNTears\_40

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

The start number called the most often in the published annotations is 3, it was called in 64 of the 69 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Agatha\_38, AikoCarson\_40, Amok\_40, AndPeggy\_36, Axym\_38, Azira\_37, Balloona\_39, Bavidard\_40, BigChungus\_40, BillDoor\_39, Biskit\_41, Blondies\_42, Bubble\_37, Burnsey\_38, Button\_42, Buttrmlkdreams\_41, CanesSauce\_38, CaramelLatte\_38, Carsonalex\_42, CherryonLim\_42, ChickenTender\_41, ChocoMunchkin\_38, Cleo\_35, CocoaPuff\_41, Cozz\_37, Dre3\_35, ElJefes\_41, Elinal\_44, Elliott\_39, Emalyn\_39, Feastonyeet\_40, Fribs8\_36, GTE2\_31, GiKK\_44, Gibbous\_35, GoldHunter\_40, Hexbug\_46, HippoPololi\_37, Horseradish\_41, JacoRen57\_37, Jamzy\_44, KayGee\_42, Lauer\_37, MAnor\_42, MScarn\_42, MaVan\_37, Malvina\_38, Margaret\_45, Mayweather\_44, McDazzle\_42, MunkgeeRoachy\_37, Nibbles\_36, Nina\_38, Nodigi\_46, Orla\_46, Pons\_42, PotPie\_41, PsychoKiller\_38, Quasar\_39, RADical\_40, RSchmailzl\_40, RanchParmCat\_44, RedBaron\_42, SheckWes\_43, SketchMex\_39, Socotra\_39, Sopespian\_38, Starburst\_40, SteamedHams\_40, SummitAcademy\_40, Survivors\_37, SweatNTears\_40, Tarnish\_41, Tolls\_40, Troje\_41, Typhonmarchy\_37, Vine\_43, Wallaby\_39, Wolfwood\_37, Yakult\_41, Yarn\_36, Yucky\_43, Yummy\_41, Zareef\_37,

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

- 

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

- 8UZL\_41, FF47\_40, KimJongPhill\_84, LongHai\_42, Maco6\_39, Muddy\_41, NoShow\_49, Salvus\_42, Zuko\_82,

**Summary by start number:**

Start 2:

- Found in 1 of 93 ( 1.1% ) of genes in pham
- Manual Annotations of this start: 1 of 69
- Called 100.0% of time when present
- Phage (with cluster) where this start called: NoShow\_49 (AB),

Start 3:

- Found in 84 of 93 ( 90.3% ) of genes in pham
- Manual Annotations of this start: 64 of 69
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Agatha\_38 (CT), AikoCarson\_40 (CT), Amok\_40 (CT), AndPeggy\_36 (CT), Axym\_38 (CT), Azira\_37 (CT), Balloona\_39 (CT), Bavidard\_40 (CT), BigChungus\_40 (CT), BillDoor\_39 (CT), Biskit\_41 (CT), Blondies\_42 (CT), Bubble\_37 (CT), Burnsey\_38 (CT), Button\_42 (CT),

Buttrmlkdreams\_41 (CT), CanesSauce\_38 (CT), CaramelLatte\_38 (CT), Carsonalex\_42 (CT), CherryonLim\_42 (CT), ChickenTender\_41 (CT), ChocoMunchkin\_38 (CT), Cleo\_35 (CT), CocoaPuff\_41 (CT), Cozz\_37 (CT), Dre3\_35 (CT), ElJefes\_41 (CT), Elinal\_44 (CT), Elliott\_39 (CT), Emalyn\_39 (CT), Feastonyeet\_40 (CT), Fribs8\_36 (CT), GTE2\_31 (CT), GiKK\_44 (CT), Gibbous\_35 (CT), GoldHunter\_40 (CT), Hexbug\_46 (CT), HippoPololi\_37 (CT), Horseradish\_41 (CT), JacoRen57\_37 (AB), Jamzy\_44 (CT), KayGee\_42 (CT), Lauer\_37 (CT), MAnor\_42 (CT), MScarn\_42 (CT), MaVan\_37 (CT), Malvina\_38 (CT), Margaret\_45 (CT), Mayweather\_44 (CT), McDazzle\_42 (CT), MunkgeeRoachy\_37 (CT), Nibbles\_36 (CT), Nina\_38 (CT), Nodigi\_46 (CT), Orla\_46 (CT), Pons\_42 (CT), PotPie\_41 (CT), PsychoKiller\_38 (CT), Quasar\_39 (CT), RADical\_40 (CT), RSchmailzl\_40 (CT), RanchParmCat\_44 (CT), RedBaron\_42 (CT), SheckWes\_43 (CT), SketchMex\_39 (CT), Socotra\_39 (CT), Sopespian\_38 (CT), Starburst\_40 (CT), SteamedHams\_40 (CT), SummitAcademy\_40 (CT), Survivors\_37 (CT), SweatNTears\_40 (CT), Tarnish\_41 (CT), Tolls\_40 (CT), Troje\_41 (CT), Typhonomachy\_37 (CT), Vine\_43 (CT), Wallaby\_39 (CT), Wolfwood\_37 (CT), Yakult\_41 (CT), Yarn\_36 (CT), Yucky\_43 (CT), Yummy\_41 (CT), Zareef\_37 (CT),

#### Start 6:

- Found in 48 of 93 ( 51.6% ) of genes in pham
- Manual Annotations of this start: 2 of 69
- Called 12.5% of time when present
- Phage (with cluster) where this start called: 8UZL\_41 (AB), FF47\_40 (AB), LongHai\_42 (AB), Maco6\_39 (AB), Muddy\_41 (AB), Salvus\_42 (AB),

#### Start 7:

- Found in 2 of 93 ( 2.2% ) of genes in pham
- Manual Annotations of this start: 2 of 69
- Called 100.0% of time when present
- Phage (with cluster) where this start called: KimJongPhill\_84 (BR), Zuko\_82 (BR),

### Summary by clusters:

There are 3 clusters represented in this pham: AB, BR, CT,

Info for manual annotations of cluster AB:

- Start number 2 was manually annotated 1 time for cluster AB.
- Start number 3 was manually annotated 1 time for cluster AB.
- Start number 6 was manually annotated 2 times for cluster AB.

Info for manual annotations of cluster BR:

- Start number 7 was manually annotated 2 times for cluster BR.

Info for manual annotations of cluster CT:

- Start number 3 was manually annotated 63 times for cluster CT.

### Gene Information:

Gene: 8UZL\_41 Start: 30093, Stop: 29446, Start Num: 6

Candidate Starts for 8UZL\_41:

(Start: 6 @30093 has 2 MA's), (11, 30015), (13, 29979), (14, 29976), (15, 29946), (26, 29859), (27, 29850), (32, 29826), (34, 29811), (39, 29736), (42, 29715),

Gene: Agatha\_38 Start: 27790, Stop: 27239, Start Num: 3

Candidate Starts for Agatha\_38:

(Start: 3 @27790 has 64 MA's), (Start: 6 @27763 has 2 MA's), (13, 27649), (32, 27493), (40, 27394),

Gene: AikoCarson\_40 Start: 28146, Stop: 27598, Start Num: 3

Candidate Starts for AikoCarson\_40:

(Start: 3 @28146 has 64 MA's), (Start: 6 @28119 has 2 MA's), (13, 28005), (18, 27951), (27, 27873), (30, 27861), (32, 27849), (44, 27720),

Gene: Amok\_40 Start: 28170, Stop: 27622, Start Num: 3

Candidate Starts for Amok\_40:

(Start: 3 @28170 has 64 MA's), (Start: 6 @28143 has 2 MA's), (13, 28029), (18, 27975), (27, 27897), (30, 27885), (32, 27873), (44, 27744),

Gene: AndPeggy\_36 Start: 27570, Stop: 27022, Start Num: 3

Candidate Starts for AndPeggy\_36:

(Start: 3 @27570 has 64 MA's), (Start: 6 @27543 has 2 MA's), (13, 27429), (18, 27375), (29, 27291), (30, 27285), (32, 27273), (44, 27144),

Gene: Axym\_38 Start: 27768, Stop: 27217, Start Num: 3

Candidate Starts for Axym\_38:

(Start: 3 @27768 has 64 MA's), (Start: 6 @27741 has 2 MA's), (13, 27627), (32, 27471), (40, 27372),

Gene: Azira\_37 Start: 27822, Stop: 27271, Start Num: 3

Candidate Starts for Azira\_37:

(Start: 3 @27822 has 64 MA's), (5, 27801), (8, 27777), (13, 27681), (16, 27642), (21, 27606), (31, 27534), (39, 27438),

Gene: Balloona\_39 Start: 28980, Stop: 28381, Start Num: 3

Candidate Starts for Balloona\_39:

(Start: 3 @28980 has 64 MA's), (13, 28842), (21, 28764), (24, 28743), (33, 28674), (43, 28566),

Gene: Bavilard\_40 Start: 29201, Stop: 28599, Start Num: 3

Candidate Starts for Bavilard\_40:

(Start: 3 @29201 has 64 MA's), (13, 29063), (21, 28985), (24, 28964), (33, 28895), (43, 28787),

Gene: BigChungus\_40 Start: 29381, Stop: 28782, Start Num: 3

Candidate Starts for BigChungus\_40:

(Start: 3 @29381 has 64 MA's), (13, 29243), (16, 29201), (21, 29165), (43, 28967),

Gene: BillDoor\_39 Start: 27241, Stop: 26699, Start Num: 3

Candidate Starts for BillDoor\_39:

(Start: 3 @27241 has 64 MA's), (Start: 6 @27214 has 2 MA's), (13, 27100), (18, 27046), (29, 26962), (30, 26956), (32, 26944), (44, 26815),

Gene: Biskit\_41 Start: 27935, Stop: 27390, Start Num: 3

Candidate Starts for Biskit\_41:

(Start: 3 @27935 has 64 MA's), (5, 27914), (Start: 6 @27908 has 2 MA's), (25, 27683), (35, 27599),

Gene: Blondies\_42 Start: 28251, Stop: 27706, Start Num: 3

Candidate Starts for Blondies\_42:

(Start: 3 @28251 has 64 MA's), (5, 28230), (Start: 6 @28224 has 2 MA's), (25, 27999), (27, 27978), (35, 27915),

Gene: Bubble\_37 Start: 27377, Stop: 26826, Start Num: 3

Candidate Starts for Bubble\_37:

(Start: 3 @27377 has 64 MA's), (Start: 6 @27350 has 2 MA's), (13, 27236), (32, 27080), (40, 26981),

Gene: Burnsey\_38 Start: 27781, Stop: 27230, Start Num: 3

Candidate Starts for Burnsey\_38:

(Start: 3 @27781 has 64 MA's), (Start: 6 @27754 has 2 MA's), (13, 27640), (32, 27484), (40, 27385),

Gene: Button\_42 Start: 28421, Stop: 27879, Start Num: 3

Candidate Starts for Button\_42:

(Start: 3 @28421 has 64 MA's), (9, 28373), (16, 28244), (19, 28226), (23, 28193), (32, 28130), (42, 28019), (44, 28001),

Gene: Buttrmlkdreams\_41 Start: 28267, Stop: 27722, Start Num: 3

Candidate Starts for Buttrmlkdreams\_41:

(Start: 3 @28267 has 64 MA's), (5, 28246), (Start: 6 @28240 has 2 MA's), (25, 28015), (27, 27994), (35, 27931),

Gene: CanesSauce\_38 Start: 27743, Stop: 27195, Start Num: 3

Candidate Starts for CanesSauce\_38:

(Start: 3 @27743 has 64 MA's), (Start: 6 @27716 has 2 MA's), (13, 27602), (18, 27548), (29, 27464), (30, 27458), (32, 27446), (44, 27317),

Gene: CaramellLatte\_38 Start: 27743, Stop: 27195, Start Num: 3

Candidate Starts for CaramellLatte\_38:

(Start: 3 @27743 has 64 MA's), (Start: 6 @27716 has 2 MA's), (13, 27602), (18, 27548), (29, 27464), (30, 27458), (32, 27446), (44, 27317),

Gene: Carsonalex\_42 Start: 27818, Stop: 27267, Start Num: 3

Candidate Starts for Carsonalex\_42:

(Start: 3 @27818 has 64 MA's), (Start: 6 @27791 has 2 MA's), (13, 27677), (32, 27521), (40, 27422),

Gene: CherryonLim\_42 Start: 30519, Stop: 29932, Start Num: 3

Candidate Starts for CherryonLim\_42:

(Start: 3 @30519 has 64 MA's), (13, 30381), (16, 30339), (21, 30303), (42, 30114), (43, 30105),

Gene: ChickenTender\_41 Start: 27551, Stop: 27003, Start Num: 3

Candidate Starts for ChickenTender\_41:

(Start: 3 @27551 has 64 MA's), (Start: 6 @27524 has 2 MA's), (13, 27410), (31, 27260), (32, 27254), (35, 27215), (44, 27125),

Gene: ChocoMunchkin\_38 Start: 27743, Stop: 27195, Start Num: 3

Candidate Starts for ChocoMunchkin\_38:

(Start: 3 @27743 has 64 MA's), (Start: 6 @27716 has 2 MA's), (13, 27602), (18, 27548), (29, 27464), (30, 27458), (32, 27446), (44, 27317),

Gene: Cleo\_35 Start: 27367, Stop: 26819, Start Num: 3

Candidate Starts for Cleo\_35:

(Start: 3 @27367 has 64 MA's), (10, 27295), (13, 27226), (21, 27151), (39, 26983), (43, 26953), (44, 26944), (45, 26929),

Gene: CocoaPuff\_41 Start: 29386, Stop: 28796, Start Num: 3

Candidate Starts for CocoaPuff\_41:

(Start: 3 @29386 has 64 MA's), (13, 29248), (16, 29206), (21, 29170), (43, 28972),

Gene: Cozz\_37 Start: 27378, Stop: 26827, Start Num: 3

Candidate Starts for Cozz\_37:

(Start: 3 @27378 has 64 MA's), (Start: 6 @27351 has 2 MA's), (13, 27237), (32, 27081), (40, 26982),

Gene: Dre3\_35 Start: 27110, Stop: 26562, Start Num: 3

Candidate Starts for Dre3\_35:

(Start: 3 @27110 has 64 MA's), (10, 27038), (13, 26969), (21, 26894), (39, 26726), (43, 26696), (44, 26687), (45, 26672),

Gene: ElJefes\_41 Start: 29726, Stop: 29121, Start Num: 3

Candidate Starts for ElJefes\_41:

(Start: 3 @29726 has 64 MA's), (13, 29588), (16, 29546), (21, 29510), (42, 29321), (43, 29312),

Gene: Elinal\_44 Start: 29769, Stop: 29167, Start Num: 3

Candidate Starts for Elinal\_44:

(Start: 3 @29769 has 64 MA's), (13, 29631), (21, 29553), (24, 29532), (33, 29463), (43, 29355),

Gene: Elliott\_39 Start: 27789, Stop: 27238, Start Num: 3

Candidate Starts for Elliott\_39:

(Start: 3 @27789 has 64 MA's), (Start: 6 @27762 has 2 MA's), (13, 27648), (32, 27492), (40, 27393),

Gene: Emalyn\_39 Start: 27338, Stop: 26793, Start Num: 3

Candidate Starts for Emalyn\_39:

(Start: 3 @27338 has 64 MA's), (Start: 6 @27311 has 2 MA's), (13, 27197), (18, 27143), (27, 27065), (30, 27053), (32, 27041), (44, 26912),

Gene: FF47\_40 Start: 30004, Stop: 29357, Start Num: 6

Candidate Starts for FF47\_40:

(Start: 6 @30004 has 2 MA's), (11, 29926), (13, 29890), (14, 29887), (15, 29857), (26, 29770), (27, 29761), (32, 29737), (34, 29722), (39, 29647), (42, 29626),

Gene: Feastonyeet\_40 Start: 29381, Stop: 28782, Start Num: 3

Candidate Starts for Feastonyeet\_40:

(Start: 3 @29381 has 64 MA's), (13, 29243), (16, 29201), (21, 29165), (43, 28967),

Gene: Fribs8\_36 Start: 27549, Stop: 26995, Start Num: 3

Candidate Starts for Fribs8\_36:

(Start: 3 @27549 has 64 MA's), (5, 27528), (8, 27504), (12, 27420), (13, 27408), (16, 27369), (21, 27333), (35, 27216), (39, 27165),

Gene: GTE2\_31 Start: 27554, Stop: 27012, Start Num: 3

Candidate Starts for GTE2\_31:

(Start: 3 @27554 has 64 MA's), (Start: 6 @27527 has 2 MA's), (13, 27413), (18, 27359), (30, 27269), (44, 27128),

Gene: GiKK\_44 Start: 28751, Stop: 28209, Start Num: 3

Candidate Starts for GiKK\_44:

(Start: 3 @28751 has 64 MA's), (9, 28703), (16, 28574), (19, 28556), (23, 28523), (32, 28460), (42, 28349), (44, 28331),

Gene: Gibbous\_35 Start: 27110, Stop: 26562, Start Num: 3

Candidate Starts for Gibbous\_35:

(Start: 3 @27110 has 64 MA's), (10, 27038), (13, 26969), (21, 26894), (39, 26726), (43, 26696), (44, 26687), (45, 26672),

Gene: GoldHunter\_40 Start: 27790, Stop: 27239, Start Num: 3

Candidate Starts for GoldHunter\_40:

(Start: 3 @27790 has 64 MA's), (Start: 6 @27763 has 2 MA's), (13, 27649), (32, 27493), (40, 27394),

Gene: Hexbug\_46 Start: 30533, Stop: 29970, Start Num: 3

Candidate Starts for Hexbug\_46:

(Start: 3 @30533 has 64 MA's), (4, 30527), (5, 30512), (16, 30353), (19, 30335), (23, 30302), (27, 30263), (42, 30128),

Gene: HippoPololi\_37 Start: 27564, Stop: 27016, Start Num: 3

Candidate Starts for HippoPololi\_37:

(Start: 3 @27564 has 64 MA's), (Start: 6 @27537 has 2 MA's), (10, 27492), (13, 27423), (16, 27384), (31, 27276), (35, 27231), (37, 27210), (39, 27180), (43, 27150), (45, 27126),

Gene: Horseradish\_41 Start: 27795, Stop: 27250, Start Num: 3

Candidate Starts for Horseradish\_41:

(Start: 3 @27795 has 64 MA's), (5, 27774), (Start: 6 @27768 has 2 MA's), (25, 27543), (27, 27522), (35, 27459),

Gene: JacoRen57\_37 Start: 30872, Stop: 30189, Start Num: 3

Candidate Starts for JacoRen57\_37:

(Start: 3 @30872 has 64 MA's), (15, 30695), (16, 30689), (20, 30665), (38, 30512), (40, 30476), (41, 30470),

Gene: Jamzy\_44 Start: 28734, Stop: 28192, Start Num: 3

Candidate Starts for Jamzy\_44:

(Start: 3 @28734 has 64 MA's), (9, 28686), (16, 28557), (19, 28539), (23, 28506), (32, 28443), (42, 28332), (44, 28314),

Gene: KayGee\_42 Start: 29769, Stop: 29167, Start Num: 3

Candidate Starts for KayGee\_42:

(Start: 3 @29769 has 64 MA's), (13, 29631), (21, 29553), (24, 29532), (33, 29463), (43, 29355),

Gene: KimJongPhill\_84 Start: 62747, Stop: 63463, Start Num: 7

Candidate Starts for KimJongPhill\_84:

(Start: 7 @62747 has 2 MA's), (15, 62882), (16, 62888), (22, 62933), (27, 62978), (28, 62981), (40, 63101), (46, 63350), (47, 63443), (48, 63449),

Gene: Lauer\_37 Start: 30578, Stop: 29997, Start Num: 3

Candidate Starts for Lauer\_37:

(Start: 3 @30578 has 64 MA's), (13, 30440), (21, 30362), (42, 30173), (43, 30164),

Gene: LongHai\_42 Start: 30402, Stop: 29746, Start Num: 6

Candidate Starts for LongHai\_42:

(Start: 6 @30402 has 2 MA's), (11, 30324), (13, 30288), (14, 30285), (15, 30255), (27, 30159), (32, 30135), (34, 30120), (39, 30045), (42, 30024),

Gene: MAnor\_42 Start: 30111, Stop: 29515, Start Num: 3

Candidate Starts for MAnor\_42:

(Start: 3 @30111 has 64 MA's), (13, 29973), (16, 29931), (21, 29895), (33, 29805), (43, 29697),

Gene: MScarn\_42 Start: 27935, Stop: 27390, Start Num: 3

Candidate Starts for MScarn\_42:

(Start: 3 @27935 has 64 MA's), (5, 27914), (Start: 6 @27908 has 2 MA's), (25, 27683), (27, 27662), (35, 27599),

Gene: MaVan\_37 Start: 27851, Stop: 27303, Start Num: 3

Candidate Starts for MaVan\_37:

(Start: 3 @27851 has 64 MA's), (5, 27830), (8, 27806), (13, 27710), (16, 27671), (21, 27635), (31, 27563), (39, 27467),

Gene: Maco6\_39 Start: 29344, Stop: 28697, Start Num: 6

Candidate Starts for Maco6\_39:

(Start: 6 @29344 has 2 MA's), (11, 29266), (13, 29230), (14, 29227), (15, 29197), (26, 29110), (27, 29101), (32, 29077), (34, 29062), (39, 28987), (42, 28966),

Gene: Malvina\_38 Start: 27562, Stop: 27014, Start Num: 3

Candidate Starts for Malvina\_38:

(Start: 3 @27562 has 64 MA's), (Start: 6 @27535 has 2 MA's), (10, 27490), (13, 27421), (16, 27382), (21, 27346), (31, 27274), (35, 27229), (37, 27208), (39, 27178), (43, 27148), (45, 27124),

Gene: Margaret\_45 Start: 29479, Stop: 28916, Start Num: 3

Candidate Starts for Margaret\_45:

(Start: 3 @29479 has 64 MA's), (16, 29299), (23, 29248), (27, 29209), (42, 29074), (43, 29065), (45, 29041),

Gene: Mayweather\_44 Start: 30390, Stop: 29791, Start Num: 3

Candidate Starts for Mayweather\_44:

(Start: 3 @30390 has 64 MA's), (13, 30252), (21, 30174), (24, 30153), (33, 30084), (42, 29985), (43, 29976),

Gene: McDazzle\_42 Start: 29720, Stop: 29115, Start Num: 3

Candidate Starts for McDazzle\_42:

(Start: 3 @29720 has 64 MA's), (13, 29582), (16, 29540), (21, 29504), (42, 29315), (43, 29306),

Gene: Muddy\_41 Start: 30576, Stop: 29920, Start Num: 6

Candidate Starts for Muddy\_41:

(Start: 6 @30576 has 2 MA's), (11, 30498), (13, 30462), (14, 30459), (15, 30429), (27, 30333), (32, 30309), (34, 30294), (39, 30219), (42, 30198),

Gene: MunkgeeRoachy\_37 Start: 27252, Stop: 26701, Start Num: 3

Candidate Starts for MunkgeeRoachy\_37:

(Start: 3 @27252 has 64 MA's), (13, 27111), (32, 26955), (40, 26856),

Gene: Nibbles\_36 Start: 27538, Stop: 26987, Start Num: 3

Candidate Starts for Nibbles\_36:

(Start: 3 @27538 has 64 MA's), (5, 27517), (8, 27493), (13, 27397), (16, 27358), (21, 27322), (31, 27250), (39, 27154),

Gene: Nina\_38 Start: 27914, Stop: 27363, Start Num: 3

Candidate Starts for Nina\_38:

(Start: 3 @27914 has 64 MA's), (Start: 6 @27887 has 2 MA's), (13, 27773), (32, 27617), (40, 27518),

Gene: NoShow\_49 Start: 33469, Stop: 32750, Start Num: 2

Candidate Starts for NoShow\_49:

(Start: 2 @33469 has 1 MA's), (15, 33289), (17, 33274), (31, 33175), (32, 33169), (36, 33112), (38, 33106), (42, 33058),

Gene: Nodigi\_46 Start: 30519, Stop: 29959, Start Num: 3

Candidate Starts for Nodigi\_46:

(Start: 3 @30519 has 64 MA's), (4, 30513), (5, 30498), (16, 30339), (19, 30321), (23, 30288), (27, 30249), (42, 30114), (45, 30081),

Gene: Orla\_46 Start: 30492, Stop: 29932, Start Num: 3

Candidate Starts for Orla\_46:

(Start: 3 @30492 has 64 MA's), (4, 30486), (5, 30471), (16, 30312), (19, 30294), (23, 30261), (27, 30222), (42, 30087), (45, 30054),

Gene: Pons\_42 Start: 29741, Stop: 29139, Start Num: 3

Candidate Starts for Pons\_42:

(Start: 3 @29741 has 64 MA's), (13, 29603), (21, 29525), (33, 29435), (43, 29327),

Gene: PotPie\_41 Start: 30672, Stop: 30073, Start Num: 3

Candidate Starts for PotPie\_41:

(Start: 3 @30672 has 64 MA's), (13, 30534), (16, 30492), (21, 30456), (33, 30366), (43, 30258),

Gene: PsychoKiller\_38 Start: 27790, Stop: 27239, Start Num: 3

Candidate Starts for PsychoKiller\_38:

(Start: 3 @27790 has 64 MA's), (Start: 6 @27763 has 2 MA's), (13, 27649), (32, 27493), (40, 27394),

Gene: Quasar\_39 Start: 28338, Stop: 27787, Start Num: 3

Candidate Starts for Quasar\_39:

(Start: 3 @28338 has 64 MA's), (Start: 6 @28311 has 2 MA's), (13, 28197), (32, 28041), (40, 27942),

Gene: RADical\_40 Start: 27784, Stop: 27233, Start Num: 3

Candidate Starts for RADical\_40:

(Start: 3 @27784 has 64 MA's), (Start: 6 @27757 has 2 MA's), (13, 27643), (32, 27487), (40, 27388),

Gene: RSchmailzl\_40 Start: 27827, Stop: 27276, Start Num: 3

Candidate Starts for RSchmailzl\_40:

(Start: 3 @27827 has 64 MA's), (Start: 6 @27800 has 2 MA's), (13, 27686), (32, 27530), (40, 27431),

Gene: RanchParmCat\_44 Start: 29617, Stop: 29066, Start Num: 3

Candidate Starts for RanchParmCat\_44:

(Start: 3 @29617 has 64 MA's), (16, 29437), (23, 29386), (27, 29347), (42, 29212), (43, 29203), (45, 29179),

Gene: RedBaron\_42 Start: 28027, Stop: 27476, Start Num: 3

Candidate Starts for RedBaron\_42:

(Start: 3 @28027 has 64 MA's), (Start: 6 @28000 has 2 MA's), (13, 27886), (32, 27730), (40, 27631),

Gene: Salvus\_42 Start: 30402, Stop: 29746, Start Num: 6

Candidate Starts for Salvus\_42:

(Start: 6 @30402 has 2 MA's), (11, 30324), (13, 30288), (14, 30285), (15, 30255), (27, 30159), (32, 30135), (34, 30120), (39, 30045), (42, 30024),

Gene: SheckWes\_43 Start: 29265, Stop: 28660, Start Num: 3

Candidate Starts for SheckWes\_43:

(Start: 3 @29265 has 64 MA's), (13, 29127), (16, 29085), (21, 29049), (42, 28860), (43, 28851),

Gene: SketchMex\_39 Start: 27935, Stop: 27390, Start Num: 3

Candidate Starts for SketchMex\_39:

(Start: 3 @27935 has 64 MA's), (5, 27914), (Start: 6 @27908 has 2 MA's), (25, 27683), (35, 27599),

Gene: Socotra\_39 Start: 27789, Stop: 27238, Start Num: 3

Candidate Starts for Socotra\_39:

(Start: 3 @27789 has 64 MA's), (Start: 6 @27762 has 2 MA's), (13, 27648), (32, 27492), (40, 27393),

Gene: Sopespian\_38 Start: 27791, Stop: 27240, Start Num: 3

Candidate Starts for Sopespian\_38:

(Start: 3 @27791 has 64 MA's), (Start: 6 @27764 has 2 MA's), (13, 27650), (32, 27494), (40, 27395),

Gene: Starburst\_40 Start: 27784, Stop: 27233, Start Num: 3

Candidate Starts for Starburst\_40:

(Start: 3 @27784 has 64 MA's), (Start: 6 @27757 has 2 MA's), (13, 27643), (32, 27487), (40, 27388),

Gene: SteamedHams\_40 Start: 27710, Stop: 27168, Start Num: 3

Candidate Starts for SteamedHams\_40:

(Start: 3 @27710 has 64 MA's), (Start: 6 @27683 has 2 MA's), (13, 27569), (18, 27515), (29, 27431), (30, 27425), (32, 27413), (44, 27284),

Gene: SummitAcademy\_40 Start: 29301, Stop: 28702, Start Num: 3

Candidate Starts for SummitAcademy\_40:

(Start: 3 @29301 has 64 MA's), (13, 29163), (21, 29085), (24, 29064), (33, 28995), (43, 28887),

Gene: Survivors\_37 Start: 27747, Stop: 27196, Start Num: 3

Candidate Starts for Survivors\_37:

(Start: 3 @27747 has 64 MA's), (5, 27726), (8, 27702), (13, 27606), (16, 27567), (21, 27531), (31, 27459), (39, 27363),

Gene: SweatNTears\_40 Start: 27687, Stop: 27136, Start Num: 3

Candidate Starts for SweatNTears\_40:

(Start: 3 @27687 has 64 MA's), (Start: 6 @27660 has 2 MA's), (25, 27435), (35, 27351),

Gene: Tarnish\_41 Start: 29811, Stop: 29209, Start Num: 3

Candidate Starts for Tarnish\_41:

(Start: 3 @29811 has 64 MA's), (13, 29673), (21, 29595), (24, 29574), (33, 29505), (43, 29397),

Gene: Tolls\_40 Start: 27815, Stop: 27267, Start Num: 3

Candidate Starts for Tolls\_40:

(Start: 3 @27815 has 64 MA's), (Start: 6 @27788 has 2 MA's), (13, 27674), (18, 27620), (29, 27536), (30, 27530), (32, 27518), (44, 27389),

Gene: Troje\_41 Start: 28273, Stop: 27737, Start Num: 3

Candidate Starts for Troje\_41:

(Start: 3 @28273 has 64 MA's), (5, 28252), (Start: 6 @28246 has 2 MA's), (25, 28021), (35, 27937),

Gene: Typhonomachy\_37 Start: 27409, Stop: 26858, Start Num: 3

Candidate Starts for Typhonomachy\_37:

(Start: 3 @27409 has 64 MA's), (Start: 6 @27382 has 2 MA's), (13, 27268), (32, 27112), (40, 27013),

Gene: Vine\_43 Start: 30028, Stop: 29438, Start Num: 3

Candidate Starts for Vine\_43:

(Start: 3 @30028 has 64 MA's), (13, 29890), (21, 29812), (24, 29791), (33, 29722), (43, 29614),

Gene: Wallaby\_39 Start: 27848, Stop: 27297, Start Num: 3

Candidate Starts for Wallaby\_39:

(Start: 3 @27848 has 64 MA's), (5, 27827), (8, 27803), (13, 27707), (16, 27668), (21, 27632), (31, 27560),

Gene: Wolfwood\_37 Start: 27819, Stop: 27268, Start Num: 3

Candidate Starts for Wolfwood\_37:

(Start: 3 @27819 has 64 MA's), (5, 27798), (8, 27774), (13, 27678), (16, 27639), (21, 27603), (31, 27531), (39, 27435),

Gene: Yakult\_41 Start: 28566, Stop: 28024, Start Num: 3

Candidate Starts for Yakult\_41:

(Start: 3 @28566 has 64 MA's), (16, 28389), (19, 28371), (23, 28338), (32, 28275), (40, 28176), (42, 28164), (44, 28146),

Gene: Yarn\_36 Start: 27575, Stop: 27027, Start Num: 3

Candidate Starts for Yarn\_36:

(Start: 3 @27575 has 64 MA's), (Start: 6 @27548 has 2 MA's), (13, 27434), (18, 27380), (29, 27296), (30, 27290), (32, 27278), (44, 27149),

Gene: Yucky\_43 Start: 29968, Stop: 29378, Start Num: 3

Candidate Starts for Yucky\_43:

(Start: 3 @29968 has 64 MA's), (13, 29830), (21, 29752), (24, 29731), (43, 29554),

Gene: Yummy\_41 Start: 27909, Stop: 27364, Start Num: 3

Candidate Starts for Yummy\_41:

(Start: 3 @27909 has 64 MA's), (5, 27888), (Start: 6 @27882 has 2 MA's), (25, 27657), (27, 27636), (35, 27573),

Gene: Zareef\_37 Start: 27841, Stop: 27290, Start Num: 3

Candidate Starts for Zareef\_37:

(Start: 3 @27841 has 64 MA's), (5, 27820), (8, 27796), (13, 27700), (16, 27661), (21, 27625), (31, 27553), (39, 27457),

Gene: Zuko\_82 Start: 62610, Stop: 63302, Start Num: 7

Candidate Starts for Zuko\_82:

(1, 62478), (Start: 7 @62610 has 2 MA's), (15, 62745), (17, 62760), (21, 62787), (28, 62844), (29, 62847), (32, 62865), (34, 62880), (40, 62964), (47, 63282), (48, 63288),