





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 296513 Report

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

Pham number 296513 has 76 members, 20 are drafts.

Phages represented in each track:

- Track 1 : Elva\_33
- Track 2 : Softsoap\_31
- Track 3 : Stromboli\_33, DirtyBubble\_32
- Track 4 : Albright\_30, CroZenni\_31
- Track 5 : BelmontSKP\_33
- Track 6 : Rona\_29
- Track 7 : Franklin22\_29
- Track 8 : BAjuniper\_30
- Track 9 : Kenzers\_32
- Track 10 : BabyYoda\_33
- Track 11 : Clayda5\_29, Bernstein\_28, Rollins\_28, Coltrane\_28, Armstrong\_28, Skylord\_28, Vitas\_28, Brahms\_28
- Track 12 : Icarian\_35, Stoor\_33
- Track 13 : Katzastrophic\_29
- Track 14 : CanFranMach\_33
- Track 15 : Cashington\_30
- Track 16 : MsUbiquitous\_32
- Track 17 : WalkingDead\_33
- Track 18 : AylexOG\_33
- Track 19 : Eden\_28
- Track 20 : Lahqtemish\_31
- Track 21 : Lynlen\_32
- Track 22 : Dismas\_29
- Track 23 : SanaSana\_35, Loviatar\_34, Akino08\_33, PondAmelia\_42
- Track 24 : TukTuk\_32, Albedo\_32
- Track 25 : AvGardian\_34
- Track 26 : Jabb\_32, CupcakePrincess\_32
- Track 27 : Kamdara\_29, Kieran\_29
- Track 28 : Bengal\_32
- Track 29 : Sharkboy\_30
- Track 30 : Celaena\_29
- Track 31 : Didgeridoo\_33
- Track 32 : Gack\_28
- Track 33 : SirBeanington\_32
- Track 34 : Bachaco\_29
- Track 35 : AnnaLie\_33
- Track 36 : IndyLu\_31, BabyDaisy\_31

- Track 37 : ChiliPepper\_28
- Track 38 : PastaFagioli\_31
- Track 39 : BubbaBear\_31
- Track 40 : FlameThrower\_29
- Track 41 : ChamoyPickle\_36, Gerri43\_35, Roberts\_34, ChipsNGuac\_35, AnnabelLee\_34, CardboardBox\_35, Neuville\_34
- Track 42 : TripleC\_34
- Track 43 : LastNadiia\_36, Audell\_33
- Track 44 : Studio\_36
- Track 45 : Agamoto\_34
- Track 46 : TMaxx\_35
- Track 47 : Mireles\_37
- Track 48 : Ezurina\_33
- Track 49 : Makima\_34
- Track 50 : Triscuit\_63
- Track 51 : Huwbert\_64
- Track 52 : Shrew\_73

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

The start number called the most often in the published annotations is 15, it was called in 32 of the 56 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Akino08\_33, Albright\_30, Armstrong\_28, AvGardian\_34, AylexOG\_33, BAjuniper\_30, BabyYoda\_33, Bachaco\_29, BelmontSKP\_33, Bernstein\_28, Brahms\_28, CanFranMach\_33, Celaena\_29, Clayda5\_29, Coltrane\_28, CroZenni\_31, DirtyBubble\_32, Dismas\_29, Elva\_33, FlameThrower\_29, Icarian\_35, Katzastrophic\_29, Kenzers\_32, Loviatar\_34, MsUbiquitous\_32, PondAmelia\_42, Rollins\_28, Rona\_29, SanaSana\_35, Sharkboy\_30, SirBeanington\_32, Skylord\_28, Softsoap\_31, Stoor\_33, Stromboli\_33, Vitas\_28,

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

- Albedo\_32, AnnaLie\_33, BabyDaisy\_31, Bengal\_32, BubbaBear\_31, Cashington\_30, ChiliPepper\_28, CupcakePrincess\_32, Didgeridoo\_33, IndyLu\_31, Jabb\_32, Kamdara\_29, Kieran\_29, Lahqtemish\_31, Lynlen\_32, PastaFagioli\_31, TukTuk\_32, WalkingDead\_33,

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

- Agamoto\_34, AnnabelLee\_34, Audell\_33, CardboardBox\_35, ChamoyPickle\_36, ChipsNGuac\_35, Eden\_28, Ezurina\_33, Franklin22\_29, Gack\_28, Gerri43\_35, Huwbert\_64, LastNadiia\_36, Makima\_34, Mireles\_37, Neuville\_34, Roberts\_34, Shrew\_73, Studio\_36, TMaxx\_35, TripleC\_34, Triscuit\_63,

**Summary by start number:**

Start 5:

- Found in 23 of 76 ( 30.3% ) of genes in pham
- Manual Annotations of this start: 12 of 56
- Called 52.2% of time when present

- Phage (with cluster) where this start called: Albedo\_32 (EB), AnnaLie\_33 (EB), BabyDaisy\_31 (EB), Bengal\_32 (EB), BubbaBear\_31 (EB), CupcakePrincess\_32 (EB), Didgeridoo\_33 (EB), IndyLu\_31 (EB), Jabb\_32 (EB), Lahqtemish\_31 (EB), PastaFagioli\_31 (EB), TukTuk\_32 (EB),

#### Start 11:

- Found in 6 of 76 ( 7.9% ) of genes in pham
- Manual Annotations of this start: 2 of 56
- Called 50.0% of time when present
- Phage (with cluster) where this start called: ChiliPepper\_28 (EB), Kamdara\_29 (EB), Kieran\_29 (EB),

#### Start 14:

- Found in 37 of 76 ( 48.7% ) of genes in pham
- Manual Annotations of this start: 1 of 56
- Called 8.1% of time when present
- Phage (with cluster) where this start called: Cashington\_30 (EB), Lynlen\_32 (EB), WalkingDead\_33 (EB),

#### Start 15:

- Found in 54 of 76 ( 71.1% ) of genes in pham
- Manual Annotations of this start: 32 of 56
- Called 66.7% of time when present
- Phage (with cluster) where this start called: Akino08\_33 (EB), Albright\_30 (EB), Armstrong\_28 (EB), AvGardian\_34 (EB), AylexOG\_33 (EB), BAJuniper\_30 (EB), BabyYoda\_33 (EB), Bachaco\_29 (EB), BelmontSKP\_33 (EB), Bernstein\_28 (EB), Brahms\_28 (EB), CanFranMach\_33 (EB), Celaena\_29 (EB), Clayda5\_29 (EB), Coltrane\_28 (EB), CroZenni\_31 (EB), DirtyBubble\_32 (EB), Dismas\_29 (EB), Elva\_33 (EB), FlameThrower\_29 (EB), Icarian\_35 (EB), Katzastrophic\_29 (EB), Kenzers\_32 (EB), Loviatar\_34 (EB), MsUbiquitous\_32 (EB), PondAmelia\_42 (EB), Rollins\_28 (EB), Rona\_29 (EB), SanaSana\_35 (EB), Sharkboy\_30 (EB), SirBeanington\_32 (EB), Skylord\_28 (EB), Softsoap\_31 (EB), Stoor\_33 (EB), Stromboli\_33 (EB), Vitas\_28 (EB),

#### Start 17:

- Found in 1 of 76 ( 1.3% ) of genes in pham
- Manual Annotations of this start: 1 of 56
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Shrew\_73 (singleton),

#### Start 18:

- Found in 2 of 76 ( 2.6% ) of genes in pham
- Manual Annotations of this start: 2 of 56
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Huwbert\_64 (GG), Triscuit\_63 (GG),

#### Start 20:

- Found in 4 of 76 ( 5.3% ) of genes in pham
- Manual Annotations of this start: 3 of 56
- Called 75.0% of time when present
- Phage (with cluster) where this start called: Eden\_28 (EB), Franklin22\_29 (EB), Gack\_28 (EB),

#### Start 21:

- Found in 4 of 76 ( 5.3% ) of genes in pham
- Manual Annotations of this start: 1 of 56
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Agamoto\_34 (FR), Mireles\_37 (FR), TMaxx\_35 (FR), TripleC\_34 (FR),

#### Start 22:

- Found in 12 of 76 ( 15.8% ) of genes in pham
- Manual Annotations of this start: 2 of 56
- Called 100.0% of time when present
- Phage (with cluster) where this start called: AnnabelLee\_34 (FR), Audell\_33 (FR), CardboardBox\_35 (FR), ChamoyPickle\_36 (FR), ChipsNGuac\_35 (FR), Ezurina\_33 (FR), Gerri43\_35 (FR), LastNadiia\_36 (FR), Makima\_34 (FR), Neuville\_34 (FR), Roberts\_34 (FR), Studio\_36 (FR),

### Summary by clusters:

There are 4 clusters represented in this pham: GG, FR, singleton, EB,

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

- Start number 5 was manually annotated 12 times for cluster EB.
- Start number 11 was manually annotated 2 times for cluster EB.
- Start number 14 was manually annotated 1 time for cluster EB.
- Start number 15 was manually annotated 32 times for cluster EB.
- Start number 20 was manually annotated 3 times for cluster EB.

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

- Start number 21 was manually annotated 1 time for cluster FR.
- Start number 22 was manually annotated 2 times for cluster FR.

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

- Start number 18 was manually annotated 2 times for cluster GG.

### Gene Information:

Gene: Agamoto\_34 Start: 24994, Stop: 24515, Start Num: 21

Candidate Starts for Agamoto\_34:

(Start: 21 @24994 has 1 MA's), (24, 24982), (25, 24979), (41, 24877), (47, 24832), (50, 24784), (51, 24769), (69, 24574), (70, 24571), (71, 24568),

Gene: Akino08\_33 Start: 24925, Stop: 25521, Start Num: 15

Candidate Starts for Akino08\_33:

(Start: 14 @24916 has 1 MA's), (Start: 15 @24925 has 32 MA's), (27, 25000), (29, 25021), (35, 25072), (42, 25105), (53, 25228), (54, 25231),

Gene: Albedo\_32 Start: 22977, Stop: 23642, Start Num: 5

Candidate Starts for Albedo\_32:

(1, 22641), (4, 22878), (Start: 5 @22977 has 12 MA's), (Start: 14 @23085 has 1 MA's), (Start: 15 @23094 has 32 MA's), (27, 23118), (53, 23346), (54, 23349), (64, 23502), (75, 23547),

Gene: Albright\_30 Start: 22216, Stop: 22803, Start Num: 15

Candidate Starts for Albright\_30:

(Start: 5 @22099 has 12 MA's), (Start: 14 @22207 has 1 MA's), (Start: 15 @22216 has 32 MA's), (27, 22276), (29, 22297), (36, 22354), (40, 22378), (53, 22507), (54, 22510),

Gene: AnnaLie\_33 Start: 23260, Stop: 23925, Start Num: 5

Candidate Starts for AnnaLie\_33:

(4, 23161), (Start: 5 @23260 has 12 MA's), (Start: 14 @23368 has 1 MA's), (Start: 15 @23377 has 32 MA's), (27, 23401), (53, 23629), (54, 23632), (64, 23785), (75, 23830),

Gene: AnnabelLee\_34 Start: 22212, Stop: 21736, Start Num: 22

Candidate Starts for AnnabelLee\_34:

(Start: 22 @22212 has 2 MA's), (29, 22170), (41, 22098), (47, 22053), (51, 21990), (54, 21969), (66, 21804), (69, 21795), (70, 21792), (76, 21771),

Gene: Armstrong\_28 Start: 20941, Stop: 21507, Start Num: 15

Candidate Starts for Armstrong\_28:

(Start: 14 @20932 has 1 MA's), (Start: 15 @20941 has 32 MA's), (51, 21208), (54, 21229), (57, 21253), (63, 21367), (67, 21397),

Gene: Audell\_33 Start: 24613, Stop: 24143, Start Num: 22

Candidate Starts for Audell\_33:

(9, 24724), (12, 24673), (Start: 22 @24613 has 2 MA's), (24, 24604), (41, 24499), (43, 24475), (46, 24463), (48, 24421), (51, 24391), (55, 24358), (64, 24217), (69, 24196),

Gene: AvGardian\_34 Start: 23607, Stop: 24188, Start Num: 15

Candidate Starts for AvGardian\_34:

(Start: 14 @23598 has 1 MA's), (Start: 15 @23607 has 32 MA's), (27, 23631), (29, 23652), (53, 23859), (54, 23862),

Gene: AylexOG\_33 Start: 23405, Stop: 23989, Start Num: 15

Candidate Starts for AylexOG\_33:

(4, 23189), (Start: 5 @23288 has 12 MA's), (Start: 15 @23405 has 32 MA's), (27, 23465), (29, 23486), (33, 23525), (40, 23567), (53, 23696), (54, 23699), (57, 23723), (64, 23852),

Gene: BAjuniper\_30 Start: 23839, Stop: 24396, Start Num: 15

Candidate Starts for BAjuniper\_30:

(13, 23821), (Start: 14 @23830 has 1 MA's), (Start: 15 @23839 has 32 MA's), (41, 23992), (51, 24100), (57, 24145), (62, 24226), (67, 24289),

Gene: BabyDaisy\_31 Start: 22831, Stop: 23553, Start Num: 5

Candidate Starts for BabyDaisy\_31:

(Start: 5 @22831 has 12 MA's), (Start: 14 @22939 has 1 MA's), (Start: 15 @22948 has 32 MA's), (27, 23002), (52, 23245), (57, 23284), (58, 23299), (62, 23365), (64, 23413),

Gene: BabyYoda\_33 Start: 24127, Stop: 24666, Start Num: 15

Candidate Starts for BabyYoda\_33:

(Start: 14 @24118 has 1 MA's), (Start: 15 @24127 has 32 MA's), (27, 24151), (29, 24172), (42, 24256), (53, 24379), (54, 24382), (64, 24535),

Gene: Bachaco\_29 Start: 24051, Stop: 24608, Start Num: 15

Candidate Starts for Bachaco\_29:

(Start: 15 @24051 has 32 MA's), (27, 24105), (43, 24216), (48, 24270), (52, 24306), (59, 24363),

Gene: BelmontSKP\_33 Start: 23377, Stop: 23925, Start Num: 15  
Candidate Starts for BelmontSKP\_33:  
(4, 23161), (Start: 5 @23260 has 12 MA's), (Start: 14 @23368 has 1 MA's), (Start: 15 @23377 has 32 MA's), (27, 23401), (53, 23629), (54, 23632), (64, 23785), (75, 23830),

Gene: Bengal\_32 Start: 22846, Stop: 23553, Start Num: 5  
Candidate Starts for Bengal\_32:  
(2, 22651), (4, 22747), (Start: 5 @22846 has 12 MA's), (Start: 14 @22954 has 1 MA's), (Start: 15 @22963 has 32 MA's), (27, 23017), (52, 23260), (57, 23299), (65, 23431), (75, 23473),

Gene: Bernstein\_28 Start: 20996, Stop: 21562, Start Num: 15  
Candidate Starts for Bernstein\_28:  
(Start: 14 @20987 has 1 MA's), (Start: 15 @20996 has 32 MA's), (51, 21263), (54, 21284), (57, 21308), (63, 21422), (67, 21452),

Gene: Brahms\_28 Start: 20943, Stop: 21509, Start Num: 15  
Candidate Starts for Brahms\_28:  
(Start: 14 @20934 has 1 MA's), (Start: 15 @20943 has 32 MA's), (51, 21210), (54, 21231), (57, 21255), (63, 21369), (67, 21399),

Gene: BubbaBear\_31 Start: 22778, Stop: 23494, Start Num: 5  
Candidate Starts for BubbaBear\_31:  
(Start: 5 @22778 has 12 MA's), (Start: 14 @22886 has 1 MA's), (Start: 15 @22895 has 32 MA's), (27, 22949), (52, 23192), (57, 23231), (58, 23246),

Gene: CanFranMach\_33 Start: 23077, Stop: 23664, Start Num: 15  
Candidate Starts for CanFranMach\_33:  
(1, 22624), (3, 22855), (4, 22861), (Start: 5 @22960 has 12 MA's), (Start: 15 @23077 has 32 MA's), (27, 23137), (29, 23158), (40, 23239), (53, 23368), (54, 23371),

Gene: CardboardBox\_35 Start: 22215, Stop: 21739, Start Num: 22  
Candidate Starts for CardboardBox\_35:  
(Start: 22 @22215 has 2 MA's), (29, 22173), (41, 22101), (47, 22056), (51, 21993), (54, 21972), (66, 21807), (69, 21798), (70, 21795), (76, 21774),

Gene: Cashington\_30 Start: 22242, Stop: 22841, Start Num: 14  
Candidate Starts for Cashington\_30:  
(2, 21939), (4, 22035), (Start: 5 @22134 has 12 MA's), (Start: 14 @22242 has 1 MA's), (Start: 15 @22251 has 32 MA's), (27, 22305), (52, 22548), (57, 22587), (65, 22719),

Gene: Celaena\_29 Start: 23736, Stop: 24290, Start Num: 15  
Candidate Starts for Celaena\_29:  
(Start: 15 @23736 has 32 MA's), (27, 23790), (36, 23847), (43, 23898), (48, 23952), (52, 23988), (58, 24042), (61, 24078), (74, 24198),

Gene: ChamoyPickle\_36 Start: 22755, Stop: 22279, Start Num: 22  
Candidate Starts for ChamoyPickle\_36:  
(Start: 22 @22755 has 2 MA's), (29, 22713), (41, 22641), (47, 22596), (51, 22533), (54, 22512), (66, 22347), (69, 22338), (70, 22335), (76, 22314),

Gene: ChiliPepper\_28 Start: 23178, Stop: 23786, Start Num: 11  
Candidate Starts for ChiliPepper\_28:

(Start: 11 @23178 has 2 MA's), (Start: 15 @23214 has 32 MA's), (27, 23268), (43, 23379), (48, 23433), (52, 23469), (58, 23523), (64, 23637), (77, 23691),

Gene: ChipsNGuac\_35 Start: 22215, Stop: 21739, Start Num: 22  
Candidate Starts for ChipsNGuac\_35:

(Start: 22 @22215 has 2 MA's), (29, 22173), (41, 22101), (47, 22056), (51, 21993), (54, 21972), (66, 21807), (69, 21798), (70, 21795), (76, 21774),

Gene: Clayda5\_29 Start: 20930, Stop: 21496, Start Num: 15  
Candidate Starts for Clayda5\_29:

(Start: 14 @20921 has 1 MA's), (Start: 15 @20930 has 32 MA's), (51, 21197), (54, 21218), (57, 21242), (63, 21356), (67, 21386),

Gene: Coltrane\_28 Start: 20943, Stop: 21509, Start Num: 15  
Candidate Starts for Coltrane\_28:

(Start: 14 @20934 has 1 MA's), (Start: 15 @20943 has 32 MA's), (51, 21210), (54, 21231), (57, 21255), (63, 21369), (67, 21399),

Gene: CroZenni\_31 Start: 22800, Stop: 23387, Start Num: 15  
Candidate Starts for CroZenni\_31:

(Start: 5 @22683 has 12 MA's), (Start: 14 @22791 has 1 MA's), (Start: 15 @22800 has 32 MA's), (27, 22860), (29, 22881), (36, 22938), (40, 22962), (53, 23091), (54, 23094),

Gene: CupcakePrincess\_32 Start: 22975, Stop: 23676, Start Num: 5  
Candidate Starts for CupcakePrincess\_32:

(1, 22639), (4, 22876), (Start: 5 @22975 has 12 MA's), (Start: 15 @23092 has 32 MA's), (27, 23152), (29, 23173), (33, 23212), (40, 23254), (53, 23383), (54, 23386), (57, 23410), (64, 23539),

Gene: Didgeridoo\_33 Start: 23183, Stop: 23950, Start Num: 5  
Candidate Starts for Didgeridoo\_33:

(Start: 5 @23183 has 12 MA's), (Start: 14 @23291 has 1 MA's), (Start: 15 @23300 has 32 MA's), (27, 23354), (48, 23561), (52, 23597), (57, 23636), (58, 23651), (73, 23807), (82, 23867), (83, 23873),

Gene: DirtyBubble\_32 Start: 23754, Stop: 24350, Start Num: 15  
Candidate Starts for DirtyBubble\_32:

(7, 23667), (Start: 14 @23745 has 1 MA's), (Start: 15 @23754 has 32 MA's), (27, 23829), (29, 23850), (35, 23901), (42, 23934), (53, 24057), (54, 24060), (64, 24213), (66, 24222),

Gene: Dismas\_29 Start: 23391, Stop: 23957, Start Num: 15  
Candidate Starts for Dismas\_29:

(6, 23304), (Start: 11 @23355 has 2 MA's), (Start: 15 @23391 has 32 MA's), (27, 23445), (43, 23550), (48, 23604), (52, 23640), (58, 23694), (64, 23808), (77, 23862), (80, 23895),

Gene: Eden\_28 Start: 21161, Stop: 21682, Start Num: 20  
Candidate Starts for Eden\_28:

(16, 21152), (Start: 20 @21161 has 3 MA's), (35, 21263), (36, 21266), (57, 21446), (64, 21575),

Gene: Elva\_33 Start: 23789, Stop: 24370, Start Num: 15  
Candidate Starts for Elva\_33:

(Start: 14 @23780 has 1 MA's), (Start: 15 @23789 has 32 MA's), (27, 23813), (29, 23834), (35, 23885), (53, 24041), (54, 24044),

Gene: Ezurina\_33 Start: 23256, Stop: 22780, Start Num: 22

Candidate Starts for Ezurina\_33:

(19, 23274), (Start: 20 @23265 has 3 MA's), (Start: 22 @23256 has 2 MA's), (29, 23214), (41, 23142), (47, 23097), (51, 23034), (54, 23013), (56, 22998), (66, 22848), (69, 22839), (70, 22836), (76, 22815),

Gene: FlameThrower\_29 Start: 23222, Stop: 23782, Start Num: 15

Candidate Starts for FlameThrower\_29:

(Start: 15 @23222 has 32 MA's), (27, 23276), (32, 23315), (37, 23345), (43, 23390), (44, 23393), (48, 23444), (52, 23480), (58, 23534), (61, 23570),

Gene: Franklin22\_29 Start: 21323, Stop: 21847, Start Num: 20

Candidate Starts for Franklin22\_29:

(10, 21251), (16, 21314), (Start: 20 @21323 has 3 MA's), (57, 21608),

Gene: Gack\_28 Start: 21205, Stop: 21726, Start Num: 20

Candidate Starts for Gack\_28:

(16, 21196), (Start: 20 @21205 has 3 MA's), (42, 21340), (57, 21490), (64, 21619),

Gene: Gerri43\_35 Start: 22215, Stop: 21739, Start Num: 22

Candidate Starts for Gerri43\_35:

(Start: 22 @22215 has 2 MA's), (29, 22173), (41, 22101), (47, 22056), (51, 21993), (54, 21972), (66, 21807), (69, 21798), (70, 21795), (76, 21774),

Gene: Huwbert\_64 Start: 39565, Stop: 40128, Start Num: 18

Candidate Starts for Huwbert\_64:

(Start: 18 @39565 has 2 MA's), (28, 39613), (38, 39721), (39, 39724), (45, 39766), (49, 39817), (52, 39847), (53, 39859), (68, 40030), (77, 40069),

Gene: Icarian\_35 Start: 24388, Stop: 24984, Start Num: 15

Candidate Starts for Icarian\_35:

(Start: 14 @24379 has 1 MA's), (Start: 15 @24388 has 32 MA's), (27, 24463), (29, 24484), (35, 24535), (42, 24568), (53, 24691), (54, 24694), (64, 24847), (66, 24856),

Gene: IndyLu\_31 Start: 22792, Stop: 23514, Start Num: 5

Candidate Starts for IndyLu\_31:

(Start: 5 @22792 has 12 MA's), (Start: 14 @22900 has 1 MA's), (Start: 15 @22909 has 32 MA's), (27, 22963), (52, 23206), (57, 23245), (58, 23260), (62, 23326), (64, 23374),

Gene: Jabb\_32 Start: 22975, Stop: 23676, Start Num: 5

Candidate Starts for Jabb\_32:

(1, 22639), (4, 22876), (Start: 5 @22975 has 12 MA's), (Start: 15 @23092 has 32 MA's), (27, 23152), (29, 23173), (33, 23212), (40, 23254), (53, 23383), (54, 23386), (57, 23410), (64, 23539),

Gene: Kamdara\_29 Start: 23354, Stop: 23962, Start Num: 11

Candidate Starts for Kamdara\_29:

(6, 23303), (Start: 11 @23354 has 2 MA's), (Start: 15 @23390 has 32 MA's), (27, 23444), (43, 23555), (48, 23609), (52, 23645), (58, 23699), (64, 23813), (77, 23867), (80, 23900),

Gene: Katzastrophic\_29 Start: 23340, Stop: 23900, Start Num: 15

Candidate Starts for Katzastrophic\_29:

(Start: 15 @23340 has 32 MA's), (27, 23394), (32, 23433), (37, 23463), (43, 23508), (48, 23562), (52, 23598), (58, 23652), (61, 23688),

Gene: Kenzers\_32 Start: 23043, Stop: 23639, Start Num: 15

Candidate Starts for Kenzers\_32:

(1, 22590), (4, 22827), (Start: 5 @22926 has 12 MA's), (Start: 14 @23034 has 1 MA's), (Start: 15 @23043 has 32 MA's), (27, 23067), (35, 23139), (53, 23295), (54, 23298), (64, 23451), (80, 23535),

Gene: Kieran\_29 Start: 23358, Stop: 23966, Start Num: 11

Candidate Starts for Kieran\_29:

(6, 23307), (Start: 11 @23358 has 2 MA's), (Start: 15 @23394 has 32 MA's), (27, 23448), (43, 23559), (48, 23613), (52, 23649), (58, 23703), (64, 23817), (77, 23871), (80, 23904),

Gene: Lahqtemish\_31 Start: 22843, Stop: 23547, Start Num: 5

Candidate Starts for Lahqtemish\_31:

(2, 22648), (4, 22744), (Start: 5 @22843 has 12 MA's), (Start: 15 @22960 has 32 MA's), (27, 23020), (29, 23041), (36, 23098), (40, 23122), (53, 23251), (54, 23254), (64, 23407),

Gene: LastNadiia\_36 Start: 24572, Stop: 24102, Start Num: 22

Candidate Starts for LastNadiia\_36:

(9, 24683), (12, 24632), (Start: 22 @24572 has 2 MA's), (24, 24563), (41, 24458), (43, 24434), (46, 24422), (48, 24380), (51, 24350), (55, 24317), (64, 24176), (69, 24155),

Gene: Loviatar\_34 Start: 24940, Stop: 25536, Start Num: 15

Candidate Starts for Loviatar\_34:

(Start: 14 @24931 has 1 MA's), (Start: 15 @24940 has 32 MA's), (27, 25015), (29, 25036), (35, 25087), (42, 25120), (53, 25243), (54, 25246),

Gene: Lynlen\_32 Start: 23034, Stop: 23639, Start Num: 14

Candidate Starts for Lynlen\_32:

(4, 22827), (Start: 5 @22926 has 12 MA's), (Start: 14 @23034 has 1 MA's), (Start: 15 @23043 has 32 MA's), (27, 23067), (35, 23139), (53, 23295), (54, 23298), (64, 23451), (80, 23535),

Gene: Makima\_34 Start: 23688, Stop: 23212, Start Num: 22

Candidate Starts for Makima\_34:

(Start: 22 @23688 has 2 MA's), (24, 23679), (26, 23673), (41, 23574), (43, 23550), (48, 23496), (51, 23466), (55, 23433), (63, 23307), (67, 23277), (72, 23256),

Gene: Mireles\_37 Start: 23247, Stop: 22771, Start Num: 21

Candidate Starts for Mireles\_37:

(Start: 21 @23247 has 1 MA's), (24, 23238), (29, 23205), (41, 23133), (43, 23109), (47, 23088), (51, 23025), (54, 23004), (58, 22965), (79, 22791),

Gene: MsUbiquitous\_32 Start: 23092, Stop: 23676, Start Num: 15

Candidate Starts for MsUbiquitous\_32:

(1, 22639), (4, 22876), (Start: 5 @22975 has 12 MA's), (Start: 15 @23092 has 32 MA's), (27, 23152), (29, 23173), (33, 23212), (40, 23254), (53, 23383), (54, 23386), (57, 23410), (64, 23539),

Gene: Neuville\_34 Start: 22215, Stop: 21739, Start Num: 22

Candidate Starts for Neuville\_34:

(Start: 22 @22215 has 2 MA's), (29, 22173), (41, 22101), (47, 22056), (51, 21993), (54, 21972), (66, 21807), (69, 21798), (70, 21795), (76, 21774),

Gene: PastaFagioli\_31 Start: 22828, Stop: 23532, Start Num: 5

Candidate Starts for PastaFagioli\_31:

(2, 22633), (3, 22723), (4, 22729), (Start: 5 @22828 has 12 MA's), (Start: 14 @22936 has 1 MA's), (Start: 15 @22945 has 32 MA's), (27, 23005), (29, 23026), (36, 23083), (40, 23107), (53, 23236), (54,

23239),

Gene: PondAmelia\_42 Start: 23954, Stop: 24535, Start Num: 15

Candidate Starts for PondAmelia\_42:

(Start: 14 @23945 has 1 MA's), (Start: 15 @23954 has 32 MA's), (27, 23978), (29, 23999), (35, 24050), (42, 24083), (53, 24206), (54, 24209),

Gene: Roberts\_34 Start: 22215, Stop: 21739, Start Num: 22

Candidate Starts for Roberts\_34:

(Start: 22 @22215 has 2 MA's), (29, 22173), (41, 22101), (47, 22056), (51, 21993), (54, 21972), (66, 21807), (69, 21798), (70, 21795), (76, 21774),

Gene: Rollins\_28 Start: 20996, Stop: 21562, Start Num: 15

Candidate Starts for Rollins\_28:

(Start: 14 @20987 has 1 MA's), (Start: 15 @20996 has 32 MA's), (51, 21263), (54, 21284), (57, 21308), (63, 21422), (67, 21452),

Gene: Rona\_29 Start: 23391, Stop: 23948, Start Num: 15

Candidate Starts for Rona\_29:

(6, 23304), (Start: 11 @23355 has 2 MA's), (Start: 15 @23391 has 32 MA's), (27, 23445), (30, 23475), (31, 23481), (42, 23535), (57, 23685), (58, 23700), (59, 23703), (60, 23706),

Gene: SanaSana\_35 Start: 24590, Stop: 25186, Start Num: 15

Candidate Starts for SanaSana\_35:

(Start: 14 @24581 has 1 MA's), (Start: 15 @24590 has 32 MA's), (27, 24665), (29, 24686), (35, 24737), (42, 24770), (53, 24893), (54, 24896),

Gene: Sharkboy\_30 Start: 23475, Stop: 24047, Start Num: 15

Candidate Starts for Sharkboy\_30:

(Start: 11 @23439 has 2 MA's), (Start: 15 @23475 has 32 MA's), (27, 23529), (43, 23640), (48, 23694), (52, 23730), (58, 23784), (64, 23898), (77, 23952),

Gene: Shrew\_73 Start: 43134, Stop: 43658, Start Num: 17

Candidate Starts for Shrew\_73:

(8, 43047), (Start: 17 @43134 has 1 MA's), (23, 43173), (27, 43191), (29, 43212), (41, 43296), (47, 43341), (50, 43389), (54, 43425), (55, 43437), (64, 43578),

Gene: SirBeanington\_32 Start: 23102, Stop: 23689, Start Num: 15

Candidate Starts for SirBeanington\_32:

(1, 22649), (4, 22886), (Start: 5 @22985 has 12 MA's), (Start: 15 @23102 has 32 MA's), (27, 23162), (29, 23183), (33, 23222), (40, 23264), (53, 23393), (54, 23396), (57, 23420), (75, 23594),

Gene: Skylord\_28 Start: 20927, Stop: 21493, Start Num: 15

Candidate Starts for Skylord\_28:

(Start: 14 @20918 has 1 MA's), (Start: 15 @20927 has 32 MA's), (51, 21194), (54, 21215), (57, 21239), (63, 21353), (67, 21383),

Gene: Softsoap\_31 Start: 22801, Stop: 23400, Start Num: 15

Candidate Starts for Softsoap\_31:

(Start: 5 @22684 has 12 MA's), (Start: 14 @22792 has 1 MA's), (Start: 15 @22801 has 32 MA's), (27, 22855), (52, 23098), (57, 23137), (58, 23152),

Gene: Stoor\_33 Start: 24258, Stop: 24854, Start Num: 15

Candidate Starts for Stoor\_33:

(Start: 14 @24249 has 1 MA's), (Start: 15 @24258 has 32 MA's), (27, 24333), (29, 24354), (35, 24405), (42, 24438), (53, 24561), (54, 24564), (64, 24717), (66, 24726),

Gene: Stromboli\_33 Start: 24124, Stop: 24720, Start Num: 15

Candidate Starts for Stromboli\_33:

(7, 24037), (Start: 14 @24115 has 1 MA's), (Start: 15 @24124 has 32 MA's), (27, 24199), (29, 24220), (35, 24271), (42, 24304), (53, 24427), (54, 24430), (64, 24583), (66, 24592),

Gene: Studio\_36 Start: 23580, Stop: 23104, Start Num: 22

Candidate Starts for Studio\_36:

(Start: 22 @23580 has 2 MA's), (29, 23538), (41, 23466), (47, 23421), (51, 23358), (54, 23337), (63, 23199), (66, 23172), (69, 23163), (70, 23160), (76, 23139),

Gene: TMaxx\_35 Start: 22869, Stop: 22390, Start Num: 21

Candidate Starts for TMaxx\_35:

(Start: 21 @22869 has 1 MA's), (24, 22857), (34, 22788), (41, 22752), (47, 22707), (51, 22644), (54, 22623), (56, 22608), (64, 22470), (66, 22458), (69, 22449), (70, 22446),

Gene: TripleC\_34 Start: 25213, Stop: 24734, Start Num: 21

Candidate Starts for TripleC\_34:

(Start: 21 @25213 has 1 MA's), (24, 25201), (25, 25198), (47, 25051), (51, 24988), (69, 24793), (70, 24790),

Gene: Triscuit\_63 Start: 39489, Stop: 40052, Start Num: 18

Candidate Starts for Triscuit\_63:

(Start: 18 @39489 has 2 MA's), (27, 39534), (28, 39537), (38, 39645), (39, 39648), (44, 39684), (45, 39690), (49, 39741), (52, 39771), (53, 39783), (77, 39993), (78, 40005), (81, 40032),

Gene: TukTuk\_32 Start: 22975, Stop: 23640, Start Num: 5

Candidate Starts for TukTuk\_32:

(1, 22639), (4, 22876), (Start: 5 @22975 has 12 MA's), (Start: 14 @23083 has 1 MA's), (Start: 15 @23092 has 32 MA's), (27, 23116), (53, 23344), (54, 23347), (64, 23500), (75, 23545),

Gene: Vitas\_28 Start: 20936, Stop: 21502, Start Num: 15

Candidate Starts for Vitas\_28:

(Start: 14 @20927 has 1 MA's), (Start: 15 @20936 has 32 MA's), (51, 21203), (54, 21224), (57, 21248), (63, 21362), (67, 21392),

Gene: WalkingDead\_33 Start: 24355, Stop: 24960, Start Num: 14

Candidate Starts for WalkingDead\_33:

(Start: 14 @24355 has 1 MA's), (Start: 15 @24364 has 32 MA's), (27, 24439), (29, 24460), (35, 24511), (42, 24544), (53, 24667), (54, 24670), (64, 24823), (66, 24832),