



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 311644 Report

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

WARNING: Pham size does not match number of genes in report. Either unphamerated genes have been added (by you) or starterator has removed genes due to invalid start codon.

Pham number 311644 has 55 members, 14 are drafts.

Phages represented in each track:

- Track 1 : GalaxyEater\_34
- Track 2 : LadyJasley\_37
- Track 3 : Adat\_33, GurgleFerb\_33, Nellie\_33, Brad\_33
- Track 4 : Casserole\_33
- Track 5 : Phroglets\_29
- Track 6 : PigHeaded\_35
- Track 7 : Jasmine\_36
- Track 8 : Wolfstar\_62
- Track 9 : Alleb\_58
- Track 10 : Hortus1\_57, OlinDD\_57, Platte\_57
- Track 11 : Lupine\_59, Hubbs\_61, Roman\_61, Solimine\_61, Pavlo\_60, Uterion\_63
- Track 12 : PhillyPhilly\_60
- Track 13 : DejaVu\_62
- Track 14 : Saradis\_61
- Track 15 : Pioneer3\_57
- Track 16 : Jacko\_61
- Track 17 : Tandem\_57
- Track 18 : Casablanacas\_66
- Track 19 : SteakFry\_67, Shroomer\_69
- Track 20 : Necrophoxinus\_67
- Track 21 : Yuma\_64, ASegato\_64
- Track 22 : DustyDino\_68
- Track 23 : Welcome\_66, HollowPurple\_66, Erenyeager\_65, StevieWelch\_65
- Track 24 : Issa7\_64
- Track 25 : Deschain\_66, Musetta\_65, Fork\_61
- Track 26 : RunningBrook\_66
- Track 27 : Lyell\_65
- Track 28 : Mistmere\_58
- Track 29 : Gerri43\_39, Roberts\_39
- Track 30 : CardboardBox\_40, ChamoyPickle\_41, ChipsNGuac\_39, Neuville\_39
- Track 31 : AnnabelLee\_39
- Track 32 : Ezurina\_38
- Track 33 : Studio\_41

- Track 34 : CN1A\_29

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

The start number called the most often in the published annotations is 14, it was called in 14 of the 41 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Alleb\_58, DejaVu\_62, Hortus1\_57, Hubbs\_61, Jacko\_61, Lupine\_59, OlinDD\_57, Pavlo\_60, PhillyPhilly\_60, Pioneer3\_57, Platte\_57, Roman\_61, Saradis\_61, Solimine\_61, Tandem\_57, Uterion\_63, Wolfstar\_62,

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

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

- ASegato\_64, Adat\_33, AnnabelLee\_39, Brad\_33, CN1A\_29, CardboardBox\_40, Casablancas\_66, Casserole\_33, ChamoyPickle\_41, ChipsNGuac\_39, Deschain\_66, DustyDino\_68, Erenyeager\_65, Ezurina\_38, Fork\_61, GalaxyEater\_34, Gerri43\_39, GurgleFerb\_33, HollowPurple\_66, Issa7\_64, Jasmine\_36, LadyJasley\_37, Lyell\_65, Mistmere\_58, Musetta\_65, Necrophoxinus\_67, Nellie\_33, Neuville\_39, Phroglets\_29, PigHeaded\_35, Roberts\_39, RunningBrook\_66, Shroomer\_69, SteakFry\_67, StevieWelch\_65, Studio\_41, Welcome\_66, Yuma\_64,

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

Start 5:

- Found in 9 of 55 ( 16.4% ) of genes in pham
- Manual Annotations of this start: 2 of 41
- Called 22.2% of time when present
- Phage (with cluster) where this start called: Gerri43\_39 (FR), Roberts\_39 (FR),

Start 8:

- Found in 3 of 55 ( 5.5% ) of genes in pham
- Manual Annotations of this start: 1 of 41
- Called 100.0% of time when present
- Phage (with cluster) where this start called: GalaxyEater\_34 (AV), Phroglets\_29 (AV), PigHeaded\_35 (AV),

Start 9:

- Found in 7 of 55 ( 12.7% ) of genes in pham
- Manual Annotations of this start: 7 of 41
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Adat\_33 (AV), Brad\_33 (AV), Casserole\_33 (AV), GurgleFerb\_33 (AV), Jasmine\_36 (AV), LadyJasley\_37 (AV), Nellie\_33 (AV),

Start 10:

- Found in 1 of 55 ( 1.8% ) of genes in pham
- No Manual Annotations of this start.

- Called 100.0% of time when present
- Phage (with cluster) where this start called: CN1A\_29 (singleton),

#### Start 11:

- Found in 18 of 55 ( 32.7% ) of genes in pham
- Manual Annotations of this start: 4 of 41
- Called 22.2% of time when present
- Phage (with cluster) where this start called: ASegato\_64 (ED2), Shroomer\_69 (ED2), SteakFry\_67 (ED2), Yuma\_64 (ED2),

#### Start 12:

- Found in 9 of 55 ( 16.4% ) of genes in pham
- Manual Annotations of this start: 2 of 41
- Called 77.8% of time when present
- Phage (with cluster) where this start called: AnnabelLee\_39 (FR), CardboardBox\_40 (FR), ChamoyPickle\_41 (FR), ChipsNGuac\_39 (FR), Ezurina\_38 (FR), Neuville\_39 (FR), Studio\_41 (FR),

#### Start 14:

- Found in 17 of 55 ( 30.9% ) of genes in pham
- Manual Annotations of this start: 14 of 41
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Alleb\_58 (ED1), DejaVu\_62 (ED1), Hortus1\_57 (ED1), Hubbs\_61 (ED1), Jacko\_61 (ED1), Lupine\_59 (ED1), OlinDD\_57 (ED1), Pavlo\_60 (ED1), PhillyPhilly\_60 (ED1), Pioneer3\_57 (ED1), Platte\_57 (ED1), Roman\_61 (ED1), Saradis\_61 (ED1), Solimine\_61 (ED1), Tandem\_57 (ED1), Uterion\_63 (ED1), Wolfstar\_62 (ED),

#### Start 15:

- Found in 19 of 55 ( 34.5% ) of genes in pham
- Manual Annotations of this start: 4 of 41
- Called 31.6% of time when present
- Phage (with cluster) where this start called: Deschain\_66 (ED2), DustyDino\_68 (ED2), Fork\_61 (ED2), Issa7\_64 (ED2), Lyell\_65 (ED2), Musetta\_65 (ED2),

#### Start 16:

- Found in 17 of 55 ( 30.9% ) of genes in pham
- Manual Annotations of this start: 7 of 41
- Called 41.2% of time when present
- Phage (with cluster) where this start called: Casablanacas\_66 (ED2), Erenyeager\_65 (ED2), HollowPurple\_66 (ED2), Necrophoxinus\_67 (ED2), RunningBrook\_66 (ED2), StevieWelch\_65 (ED2), Welcome\_66 (ED2),

#### Start 22:

- Found in 1 of 55 ( 1.8% ) of genes in pham
- No Manual Annotations of this start.
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Mistmere\_58 (ED3),

### Summary by clusters:

There are 7 clusters represented in this pham: FR, ED, singleton, ED2, ED3, ED1, AV,

Info for manual annotations of cluster AV:

- Start number 8 was manually annotated 1 time for cluster AV.
- Start number 9 was manually annotated 7 times for cluster AV.

Info for manual annotations of cluster ED:

- Start number 14 was manually annotated 1 time for cluster ED.

Info for manual annotations of cluster ED1:

- Start number 14 was manually annotated 13 times for cluster ED1.

Info for manual annotations of cluster ED2:

- Start number 11 was manually annotated 4 times for cluster ED2.
- Start number 15 was manually annotated 4 times for cluster ED2.
- Start number 16 was manually annotated 7 times for cluster ED2.

Info for manual annotations of cluster FR:

- Start number 5 was manually annotated 2 times for cluster FR.
- Start number 12 was manually annotated 2 times for cluster FR.

### **Gene Information:**

Gene: ASegato\_64 Start: 36670, Stop: 36224, Start Num: 11

Candidate Starts for ASegato\_64:

(Start: 11 @36670 has 4 MA's), (Start: 15 @36655 has 4 MA's), (Start: 16 @36649 has 7 MA's), (21, 36577), (38, 36475), (57, 36373), (74, 36247), (75, 36244),

Gene: Adat\_33 Start: 29536, Stop: 29057, Start Num: 9

Candidate Starts for Adat\_33:

(Start: 9 @29536 has 7 MA's), (24, 29407), (44, 29302), (53, 29260), (65, 29155), (66, 29152), (70, 29122), (76, 29092), (79, 29080),

Gene: Alleb\_58 Start: 36582, Stop: 36139, Start Num: 14

Candidate Starts for Alleb\_58:

(1, 36714), (Start: 14 @36582 has 14 MA's), (27, 36456), (30, 36441), (32, 36435), (38, 36402), (44, 36369), (66, 36234), (68, 36216),

Gene: AnnabelLee\_39 Start: 26816, Stop: 26370, Start Num: 12

Candidate Starts for AnnabelLee\_39:

(2, 26915), (3, 26888), (Start: 5 @26852 has 2 MA's), (Start: 12 @26816 has 2 MA's), (37, 26630), (45, 26588), (59, 26507), (71, 26417),

Gene: Brad\_33 Start: 29534, Stop: 29055, Start Num: 9

Candidate Starts for Brad\_33:

(Start: 9 @29534 has 7 MA's), (24, 29405), (44, 29300), (53, 29258), (65, 29153), (66, 29150), (70, 29120), (76, 29090), (79, 29078),

Gene: CN1A\_29 Start: 18265, Stop: 18729, Start Num: 10

Candidate Starts for CN1A\_29:

(10, 18265), (17, 18295), (34, 18442), (41, 18478), (47, 18517), (48, 18520), (49, 18523), (57, 18574), (65, 18649),

Gene: CardboardBox\_40 Start: 26819, Stop: 26373, Start Num: 12

Candidate Starts for CardboardBox\_40:

(2, 26918), (3, 26891), (Start: 5 @26855 has 2 MA's), (Start: 12 @26819 has 2 MA's), (37, 26633), (45, 26591), (59, 26510), (71, 26420),

Gene: Casablancas\_66 Start: 36389, Stop: 35964, Start Num: 16

Candidate Starts for Casablancas\_66:

(Start: 11 @36410 has 4 MA's), (Start: 15 @36395 has 4 MA's), (Start: 16 @36389 has 7 MA's), (21, 36317), (38, 36215), (57, 36113), (74, 35987), (75, 35984),

Gene: Casserole\_33 Start: 30729, Stop: 30250, Start Num: 9

Candidate Starts for Casserole\_33:

(7, 30744), (Start: 9 @30729 has 7 MA's), (24, 30600), (28, 30573), (44, 30495), (53, 30453), (65, 30348), (70, 30315), (76, 30285), (79, 30273), (81, 30255),

Gene: ChamoyPickle\_41 Start: 27359, Stop: 26913, Start Num: 12

Candidate Starts for ChamoyPickle\_41:

(2, 27458), (3, 27431), (Start: 5 @27395 has 2 MA's), (Start: 12 @27359 has 2 MA's), (37, 27173), (45, 27131), (59, 27050), (71, 26960),

Gene: ChipsNGuac\_39 Start: 26819, Stop: 26373, Start Num: 12

Candidate Starts for ChipsNGuac\_39:

(2, 26918), (3, 26891), (Start: 5 @26855 has 2 MA's), (Start: 12 @26819 has 2 MA's), (37, 26633), (45, 26591), (59, 26510), (71, 26420),

Gene: DejaVu\_62 Start: 36569, Stop: 36126, Start Num: 14

Candidate Starts for DejaVu\_62:

(Start: 14 @36569 has 14 MA's), (17, 36554), (27, 36443), (38, 36389), (42, 36377), (43, 36365), (57, 36290), (66, 36221), (69, 36197),

Gene: Deschain\_66 Start: 37059, Stop: 36628, Start Num: 15

Candidate Starts for Deschain\_66:

(Start: 11 @37074 has 4 MA's), (Start: 15 @37059 has 4 MA's), (Start: 16 @37053 has 7 MA's), (21, 36981), (38, 36879), (57, 36777), (74, 36651), (75, 36648),

Gene: DustyDino\_68 Start: 37618, Stop: 37178, Start Num: 15

Candidate Starts for DustyDino\_68:

(Start: 11 @37633 has 4 MA's), (Start: 15 @37618 has 4 MA's), (Start: 16 @37612 has 7 MA's), (21, 37540), (57, 37336),

Gene: Erenyeager\_65 Start: 36644, Stop: 36219, Start Num: 16

Candidate Starts for Erenyeager\_65:

(Start: 11 @36665 has 4 MA's), (Start: 15 @36650 has 4 MA's), (Start: 16 @36644 has 7 MA's), (21, 36572), (38, 36470), (43, 36446), (57, 36368), (74, 36242), (75, 36239),

Gene: Ezurina\_38 Start: 27906, Stop: 27460, Start Num: 12

Candidate Starts for Ezurina\_38:

(2, 28005), (3, 27978), (Start: 5 @27942 has 2 MA's), (Start: 12 @27906 has 2 MA's), (26, 27771), (37, 27720), (45, 27678), (59, 27597),

Gene: Fork\_61 Start: 36305, Stop: 35874, Start Num: 15

Candidate Starts for Fork\_61:

(Start: 11 @36320 has 4 MA's), (Start: 15 @36305 has 4 MA's), (Start: 16 @36299 has 7 MA's), (21, 36227), (38, 36125), (57, 36023), (74, 35897), (75, 35894),

Gene: GalaxyEater\_34 Start: 30877, Stop: 30413, Start Num: 8

Candidate Starts for GalaxyEater\_34:

(Start: 8 @30877 has 1 MA's), (19, 30811), (25, 30742), (31, 30715), (35, 30700), (44, 30646), (51, 30616), (58, 30568), (63, 30523), (80, 30424),

Gene: Gerri43\_39 Start: 26855, Stop: 26373, Start Num: 5

Candidate Starts for Gerri43\_39:

(2, 26918), (3, 26891), (Start: 5 @26855 has 2 MA's), (Start: 12 @26819 has 2 MA's), (37, 26633), (45, 26591), (59, 26510), (71, 26420),

Gene: GurgleFerb\_33 Start: 29535, Stop: 29056, Start Num: 9

Candidate Starts for GurgleFerb\_33:

(Start: 9 @29535 has 7 MA's), (24, 29406), (44, 29301), (53, 29259), (65, 29154), (66, 29151), (70, 29121), (76, 29091), (79, 29079),

Gene: HollowPurple\_66 Start: 36855, Stop: 36430, Start Num: 16

Candidate Starts for HollowPurple\_66:

(Start: 11 @36876 has 4 MA's), (Start: 15 @36861 has 4 MA's), (Start: 16 @36855 has 7 MA's), (21, 36783), (38, 36681), (43, 36657), (57, 36579), (74, 36453), (75, 36450),

Gene: Hortus1\_57 Start: 36572, Stop: 36129, Start Num: 14

Candidate Starts for Hortus1\_57:

(Start: 14 @36572 has 14 MA's), (Start: 15 @36566 has 4 MA's), (27, 36446), (30, 36431), (38, 36392), (44, 36359), (66, 36224),

Gene: Hubbs\_61 Start: 36777, Stop: 36334, Start Num: 14

Candidate Starts for Hubbs\_61:

(Start: 14 @36777 has 14 MA's), (27, 36651), (38, 36597), (42, 36585), (43, 36573), (57, 36498), (66, 36429), (69, 36405),

Gene: Issa7\_64 Start: 36312, Stop: 35881, Start Num: 15

Candidate Starts for Issa7\_64:

(Start: 11 @36327 has 4 MA's), (Start: 15 @36312 has 4 MA's), (Start: 16 @36306 has 7 MA's), (21, 36234), (38, 36132), (43, 36108), (57, 36030), (75, 35901),

Gene: Jacko\_61 Start: 35556, Stop: 35110, Start Num: 14

Candidate Starts for Jacko\_61:

(Start: 14 @35556 has 14 MA's), (18, 35526), (27, 35430), (30, 35415), (33, 35406), (38, 35376), (43, 35352), (50, 35316), (64, 35217),

Gene: Jasmine\_36 Start: 31411, Stop: 30932, Start Num: 9

Candidate Starts for Jasmine\_36:

(Start: 9 @31411 has 7 MA's), (24, 31282), (28, 31255), (44, 31177), (53, 31135), (65, 31030), (66, 31027), (70, 30997), (76, 30967), (79, 30955),

Gene: LadyJasley\_37 Start: 30740, Stop: 30273, Start Num: 9

Candidate Starts for LadyJasley\_37:

(Start: 9 @30740 has 7 MA's), (20, 30653), (25, 30608), (30, 30584), (51, 30482), (54, 30455), (73, 30320), (79, 30296),

Gene: Lupine\_59 Start: 35983, Stop: 35540, Start Num: 14

Candidate Starts for Lupine\_59:

(Start: 14 @35983 has 14 MA's), (27, 35857), (38, 35803), (42, 35791), (43, 35779), (57, 35704), (66, 35635), (69, 35611),

Gene: Lyell\_65 Start: 36564, Stop: 36133, Start Num: 15

Candidate Starts for Lyell\_65:

(Start: 11 @36579 has 4 MA's), (Start: 15 @36564 has 4 MA's), (Start: 16 @36558 has 7 MA's), (21, 36486), (38, 36384), (43, 36360), (57, 36282), (74, 36156), (75, 36153),

Gene: Mistmere\_58 Start: 35322, Stop: 34981, Start Num: 22

Candidate Starts for Mistmere\_58:

(Start: 11 @35424 has 4 MA's), (21, 35334), (22, 35322), (23, 35313), (52, 35163), (57, 35130),

Gene: Musetta\_65 Start: 37025, Stop: 36594, Start Num: 15

Candidate Starts for Musetta\_65:

(Start: 11 @37040 has 4 MA's), (Start: 15 @37025 has 4 MA's), (Start: 16 @37019 has 7 MA's), (21, 36947), (38, 36845), (57, 36743), (74, 36617), (75, 36614),

Gene: Necrophoxinus\_67 Start: 37253, Stop: 36828, Start Num: 16

Candidate Starts for Necrophoxinus\_67:

(Start: 11 @37274 has 4 MA's), (Start: 16 @37253 has 7 MA's), (21, 37181), (38, 37079), (57, 36977), (74, 36851), (75, 36848),

Gene: Nellie\_33 Start: 29536, Stop: 29057, Start Num: 9

Candidate Starts for Nellie\_33:

(Start: 9 @29536 has 7 MA's), (24, 29407), (44, 29302), (53, 29260), (65, 29155), (66, 29152), (70, 29122), (76, 29092), (79, 29080),

Gene: Neuville\_39 Start: 26819, Stop: 26373, Start Num: 12

Candidate Starts for Neuville\_39:

(2, 26918), (3, 26891), (Start: 5 @26855 has 2 MA's), (Start: 12 @26819 has 2 MA's), (37, 26633), (45, 26591), (59, 26510), (71, 26420),

Gene: OlinDD\_57 Start: 36571, Stop: 36128, Start Num: 14

Candidate Starts for OlinDD\_57:

(Start: 14 @36571 has 14 MA's), (Start: 15 @36565 has 4 MA's), (27, 36445), (30, 36430), (38, 36391), (44, 36358), (66, 36223),

Gene: Pavlo\_60 Start: 36628, Stop: 36185, Start Num: 14

Candidate Starts for Pavlo\_60:

(Start: 14 @36628 has 14 MA's), (27, 36502), (38, 36448), (42, 36436), (43, 36424), (57, 36349), (66, 36280), (69, 36256),

Gene: PhillyPhilly\_60 Start: 36162, Stop: 35719, Start Num: 14

Candidate Starts for PhillyPhilly\_60:

(Start: 14 @36162 has 14 MA's), (27, 36036), (42, 35970), (57, 35883), (66, 35814),

Gene: Phroglets\_29 Start: 29140, Stop: 28685, Start Num: 8

Candidate Starts for Phroglets\_29:

(Start: 8 @29140 has 1 MA's), (13, 29128), (29, 28999), (35, 28978), (36, 28972), (39, 28957), (46, 28921), (55, 28867), (62, 28822), (70, 28756), (77, 28723), (79, 28714),

Gene: PigHeaded\_35 Start: 29523, Stop: 29038, Start Num: 8

Candidate Starts for PigHeaded\_35:

(4, 29550), (6, 29547), (Start: 8 @29523 has 1 MA's), (40, 29319), (51, 29262), (56, 29223), (60, 29193), (64, 29157), (66, 29145), (72, 29109), (76, 29085), (78, 29079), (79, 29073),

Gene: Pioneer3\_57 Start: 36579, Stop: 36136, Start Num: 14

Candidate Starts for Pioneer3\_57:

(1, 36711), (Start: 14 @36579 has 14 MA's), (27, 36453), (30, 36438), (38, 36399), (66, 36231),

Gene: Platte\_57 Start: 36364, Stop: 35921, Start Num: 14

Candidate Starts for Platte\_57:

(Start: 14 @36364 has 14 MA's), (Start: 15 @36358 has 4 MA's), (27, 36238), (30, 36223), (38, 36184), (44, 36151), (66, 36016),

Gene: Roberts\_39 Start: 26855, Stop: 26373, Start Num: 5

Candidate Starts for Roberts\_39:

(2, 26918), (3, 26891), (Start: 5 @26855 has 2 MA's), (Start: 12 @26819 has 2 MA's), (37, 26633), (45, 26591), (59, 26510), (71, 26420),

Gene: Roman\_61 Start: 36625, Stop: 36182, Start Num: 14

Candidate Starts for Roman\_61:

(Start: 14 @36625 has 14 MA's), (27, 36499), (38, 36445), (42, 36433), (43, 36421), (57, 36346), (66, 36277), (69, 36253),

Gene: RunningBrook\_66 Start: 37612, Stop: 37178, Start Num: 16

Candidate Starts for RunningBrook\_66:

(Start: 11 @37633 has 4 MA's), (Start: 15 @37618 has 4 MA's), (Start: 16 @37612 has 7 MA's), (21, 37540), (57, 37336),

Gene: Saradis\_61 Start: 36221, Stop: 35778, Start Num: 14

Candidate Starts for Saradis\_61:

(Start: 14 @36221 has 14 MA's), (27, 36095), (42, 36029), (57, 35942), (66, 35873), (69, 35849),

Gene: Shroomer\_69 Start: 36810, Stop: 36364, Start Num: 11

Candidate Starts for Shroomer\_69:

(Start: 11 @36810 has 4 MA's), (Start: 15 @36795 has 4 MA's), (Start: 16 @36789 has 7 MA's), (21, 36717), (38, 36615), (43, 36591), (57, 36513), (74, 36387), (75, 36384),

Gene: Solimine\_61 Start: 36635, Stop: 36192, Start Num: 14

Candidate Starts for Solimine\_61:

(Start: 14 @36635 has 14 MA's), (27, 36509), (38, 36455), (42, 36443), (43, 36431), (57, 36356), (66, 36287), (69, 36263),

Gene: SteakFry\_67 Start: 36876, Stop: 36430, Start Num: 11

Candidate Starts for SteakFry\_67:

(Start: 11 @36876 has 4 MA's), (Start: 15 @36861 has 4 MA's), (Start: 16 @36855 has 7 MA's), (21, 36783), (38, 36681), (43, 36657), (57, 36579), (74, 36453), (75, 36450),

Gene: StevieWelch\_65 Start: 36644, Stop: 36219, Start Num: 16

Candidate Starts for StevieWelch\_65:

(Start: 11 @36665 has 4 MA's), (Start: 15 @36650 has 4 MA's), (Start: 16 @36644 has 7 MA's), (21, 36572), (38, 36470), (43, 36446), (57, 36368), (74, 36242), (75, 36239),

Gene: Studio\_41 Start: 28182, Stop: 27736, Start Num: 12

Candidate Starts for Studio\_41:

(2, 28281), (3, 28254), (Start: 5 @28218 has 2 MA's), (Start: 12 @28182 has 2 MA's), (37, 27996), (39, 27987), (45, 27954), (59, 27873), (61, 27858),

Gene: Tandem\_57 Start: 36518, Stop: 36075, Start Num: 14

Candidate Starts for Tandem\_57:

(1, 36650), (Start: 14 @36518 has 14 MA's), (27, 36392), (30, 36377), (38, 36338), (44, 36305), (66, 36170),

Gene: Uterion\_63 Start: 36730, Stop: 36287, Start Num: 14

Candidate Starts for Uterion\_63:

(Start: 14 @36730 has 14 MA's), (27, 36604), (38, 36550), (42, 36538), (43, 36526), (57, 36451), (66, 36382), (69, 36358),

Gene: Welcome\_66 Start: 37004, Stop: 36579, Start Num: 16

Candidate Starts for Welcome\_66:

(Start: 11 @37025 has 4 MA's), (Start: 15 @37010 has 4 MA's), (Start: 16 @37004 has 7 MA's), (21, 36932), (38, 36830), (43, 36806), (57, 36728), (74, 36602), (75, 36599),

Gene: Wolfstar\_62 Start: 37671, Stop: 37219, Start Num: 14

Candidate Starts for Wolfstar\_62:

(1, 37803), (Start: 14 @37671 has 14 MA's), (27, 37545), (38, 37491), (43, 37467), (52, 37425), (66, 37323), (67, 37311), (68, 37305), (69, 37299),

Gene: Yuma\_64 Start: 36594, Stop: 36148, Start Num: 11

Candidate Starts for Yuma\_64:

(Start: 11 @36594 has 4 MA's), (Start: 15 @36579 has 4 MA's), (Start: 16 @36573 has 7 MA's), (21, 36501), (38, 36399), (57, 36297), (74, 36171), (75, 36168),