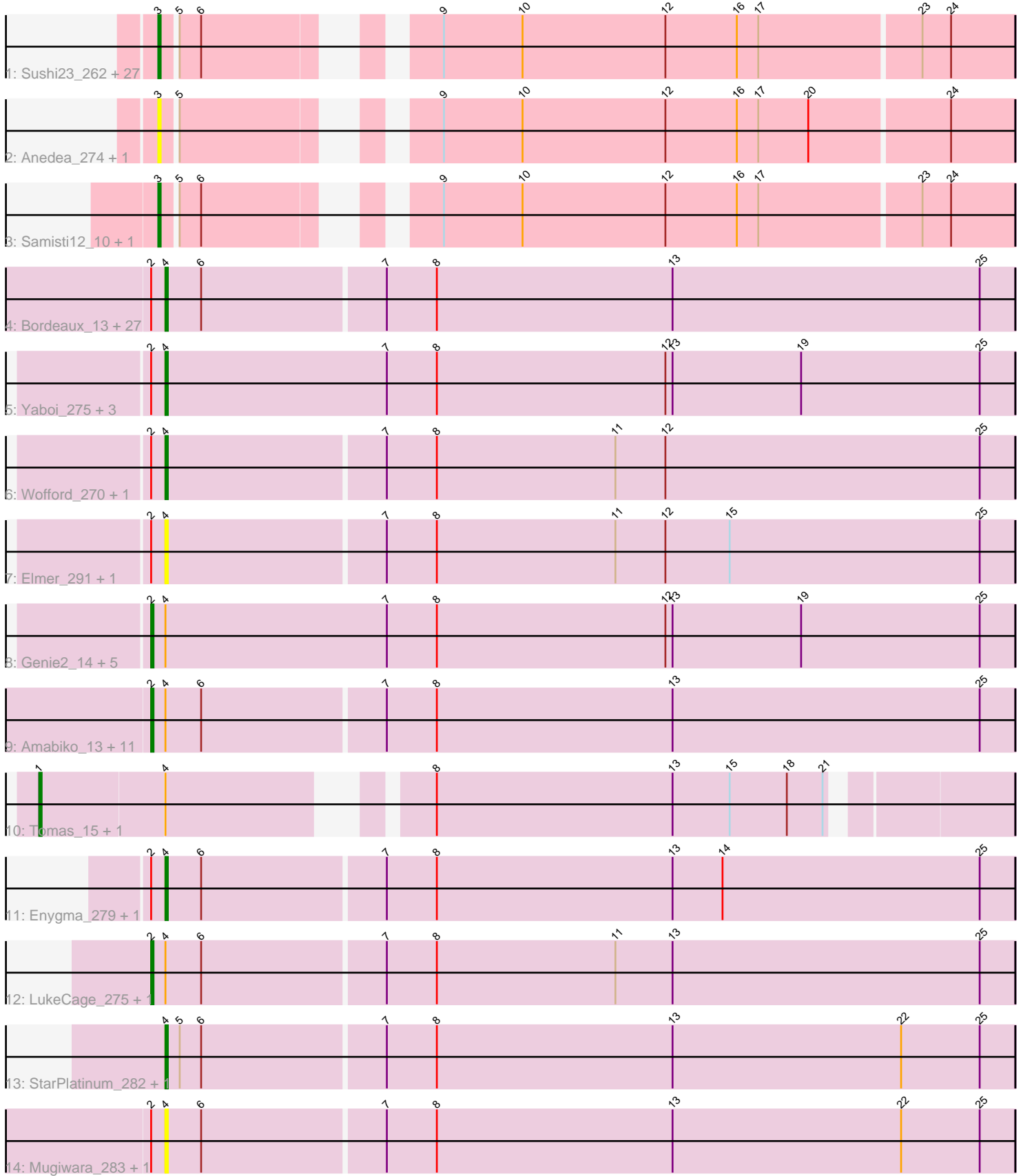


# Pham 157762



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 157762 Report

This analysis was run 04/22/24 on database version 561.

Pham number 157762 has 96 members, 24 are drafts.

Phages represented in each track:

- Track 1 : Sushi23\_262, Cursive\_263, Larnav\_272, Watermoore\_258, Larnav\_13, HangryHippo\_263, Lululemon\_260, Peebs\_258, Pepperwood\_12, PacManQ\_261, Tribute\_11, Cursive\_9, Cross\_259, PacManQ\_10, Peebs\_11, Sushi23\_12, EGole\_265, Teutsch\_11, Pepperwood\_261, Watermoore\_11, Tribute\_257, Teutsch\_258, EGole\_11, BlueOtter\_263, Cross\_11, HangryHippo\_11, BlueOtter\_11, Lululemon\_10
- Track 2 : Anedea\_274, Anedea\_12
- Track 3 : Samisti12\_10, Samisti12\_261
- Track 4 : Bordeaux\_13, MindFlayer\_264, MindFlayer\_12, IchabodCrane\_12, Spelly\_13, Quarant19\_13, TomSawyer\_278, CeilingFan\_286, Wipeout\_265, Battuta\_13, PumpkinSpice\_277, CeilingFan\_12, Quarant19\_274, Spelly\_279, Karimac\_271, SaltySpittoon\_13, Wipeout\_12, Gibbi\_283, PumpkinSpice\_13, TomSawyer\_13, KentuckyRacer\_287, Gibbi\_12, Battuta\_270, Karimac\_13, Bordeaux\_270, Birchlyn\_10, IchabodCrane\_265, KentuckyRacer\_13
- Track 5 : Yaboi\_275, Sollertia\_14, Yaboi\_14, Sollertia\_270
- Track 6 : Wofford\_270, Wofford\_12
- Track 7 : Elmer\_291, Elmer\_15
- Track 8 : Genie2\_14, BoomerJR\_14, Stanimal\_269, Stanimal\_14, Genie2\_269, BoomerJR\_269
- Track 9 : Amabiko\_13, Spilled\_12, Jollison\_277, Spilled\_280, Starbow\_270, Birchlyn\_270, SaltySpittoon\_273, Jollison\_13, Amabiko\_277, JimJam\_281, Starbow\_13, JimJam\_13
- Track 10 : Tomas\_15, Tomas\_271
- Track 11 : Enygma\_279, Enygma\_11
- Track 12 : LukeCage\_275, LukeCage\_12
- Track 13 : StarPlatinum\_282, StarPlatinum\_12
- Track 14 : Mugiwara\_283, Mugiwara\_11

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

The start number called the most often in the published annotations is 4, it was called in 32 of the 72 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Battuta\_13, Battuta\_270, Birchlyn\_10, Bordeaux\_13, Bordeaux\_270, CeilingFan\_12, CeilingFan\_286, Elmer\_15, Elmer\_291, Enygma\_11, Enygma\_279, Gibbi\_12, Gibbi\_283, IchabodCrane\_12, IchabodCrane\_265, Karimac\_13, Karimac\_271, KentuckyRacer\_13, KentuckyRacer\_287, MindFlayer\_12, MindFlayer\_264, Mugiwara\_11, Mugiwara\_283, PumpkinSpice\_13, PumpkinSpice\_277, Quaran19\_13, Quaran19\_274, SaltySpittoon\_13, Sollertia\_14, Sollertia\_270, Spelly\_13, Spelly\_279, StarPlatinum\_12, StarPlatinum\_282, TomSawyer\_13, TomSawyer\_278, Wipeout\_12, Wipeout\_265, Wofford\_12, Wofford\_270, Yaboi\_14, Yaboi\_275,

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

- Amabiko\_13, Amabiko\_277, Birchlyn\_270, BoomerJR\_14, BoomerJR\_269, Genie2\_14, Genie2\_269, JimJam\_13, JimJam\_281, Jollison\_13, Jollison\_277, LukeCage\_12, LukeCage\_275, SaltySpittoon\_273, Spilled\_12, Spilled\_280, Stanimal\_14, Stanimal\_269, Starbow\_13, Starbow\_270, Tomas\_15, Tomas\_271,

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

- Anedea\_12, Anedea\_274, BlueOtter\_11, BlueOtter\_263, Cross\_11, Cross\_259, Cursive\_263, Cursive\_9, EGole\_11, EGole\_265, HangryHippo\_11, HangryHippo\_263, Larnav\_13, Larnav\_272, Lululemon\_10, Lululemon\_260, PacManQ\_10, PacManQ\_261, Peebs\_11, Peebs\_258, Pepperwood\_12, Pepperwood\_261, Samisti12\_10, Samisti12\_261, Sushi23\_12, Sushi23\_262, Teutsch\_11, Teutsch\_258, Tribute\_11, Tribute\_257, Watermoore\_11, Watermoore\_258,

### Summary by start number:

Start 1:

- Found in 2 of 96 ( 2.1% ) of genes in pham
- Manual Annotations of this start: 2 of 72
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Tomas\_15 (BE2), Tomas\_271 (BE2),

Start 2:

- Found in 60 of 96 ( 62.5% ) of genes in pham
- Manual Annotations of this start: 18 of 72
- Called 33.3% of time when present
- Phage (with cluster) where this start called: Amabiko\_13 (BE2), Amabiko\_277 (BE2), Birchlyn\_270 (BE2), BoomerJR\_14 (BE2), BoomerJR\_269 (BE2), Genie2\_14 (BE2), Genie2\_269 (BE2), JimJam\_13 (BE2), JimJam\_281 (BE2), Jollison\_13 (BE2), Jollison\_277 (BE2), LukeCage\_12 (BE2), LukeCage\_275 (BE2), SaltySpittoon\_273 (BE2), Spilled\_12 (BE2), Spilled\_280 (BE2), Stanimal\_14 (BE2), Stanimal\_269 (BE2), Starbow\_13 (BE2), Starbow\_270 (BE2),

Start 3:

- Found in 32 of 96 ( 33.3% ) of genes in pham
- Manual Annotations of this start: 20 of 72
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Anedea\_12 (BE1), Anedea\_274 (BE1), BlueOtter\_11 (BE1), BlueOtter\_263 (BE1), Cross\_11 (BE1), Cross\_259 (BE1), Cursive\_263 (BE1), Cursive\_9 (BE1), EGole\_11 (BE1), EGole\_265 (BE1), HangryHippo\_11 (BE1), HangryHippo\_263 (BE1), Larnav\_13 (BE1), Larnav\_272 (BE1), Lululemon\_10 (BE1), Lululemon\_260 (BE1), PacManQ\_10 (BE1),

PacManQ\_261 (BE1), Peebs\_11 (BE1), Peebs\_258 (BE1), Pepperwood\_12 (BE1), Pepperwood\_261 (BE1), Samisti12\_10 (BE1), Samisti12\_261 (BE1), Sushi23\_12 (BE1), Sushi23\_262 (BE1), Teutsch\_11 (BE1), Teutsch\_258 (BE1), Tribute\_11 (BE1), Tribute\_257 (BE1), Watermoore\_11 (BE1), Watermoore\_258 (BE1),

Start 4:

- Found in 64 of 96 ( 66.7% ) of genes in pham
- Manual Annotations of this start: 32 of 72
- Called 65.6% of time when present
- Phage (with cluster) where this start called: Battuta\_13 (BE2), Battuta\_270 (BE2), Birchlyn\_10 (BE2), Bordeaux\_13 (BE2), Bordeaux\_270 (BE2), CeilingFan\_12 (BE2), CeilingFan\_286 (BE2), Elmer\_15 (BE2), Elmer\_291 (BE2), Enygma\_11 (BE2), Enygma\_279 (BE2), Gibbi\_12 (BE2), Gibbi\_283 (BE2), IchabodCrane\_12 (BE2), IchabodCrane\_265 (BE2), Karimac\_13 (BE2), Karimac\_271 (BE2), KentuckyRacer\_13 (BE2), KentuckyRacer\_287 (BE2), MindFlayer\_12 (BE2), MindFlayer\_264 (BE2), Mugiwara\_11 (BE2), Mugiwara\_283 (BE2), PumpkinSpice\_13 (BE2), PumpkinSpice\_277 (BE2), Quaran19\_13 (BE2), Quaran19\_274 (BE2), SaltySpittoon\_13 (BE2), Sollertia\_14 (BE2), Sollertia\_270 (BE2), Spelly\_13 (BE2), Spelly\_279 (BE2), StarPlatinum\_12 (BE2), StarPlatinum\_282 (BE2), TomSawyer\_13 (BE2), TomSawyer\_278 (BE2), Wipeout\_12 (BE2), Wipeout\_265 (BE2), Wofford\_12 (BE2), Wofford\_270 (BE2), Yaboi\_14 (BE2), Yaboi\_275 (BE2),

### **Summary by clusters:**

There are 2 clusters represented in this pham: BE2, BE1,

Info for manual annotations of cluster BE1:

- Start number 3 was manually annotated 20 times for cluster BE1.

Info for manual annotations of cluster BE2:

- Start number 1 was manually annotated 2 times for cluster BE2.
- Start number 2 was manually annotated 18 times for cluster BE2.
- Start number 4 was manually annotated 32 times for cluster BE2.

### **Gene Information:**

Gene: Amabiko\_13 Start: 7147, Stop: 6788, Start Num: 2

Candidate Starts for Amabiko\_13:

(Start: 2 @7147 has 18 MA's), (Start: 4 @7141 has 32 MA's), (6, 7126), (7, 7051), (8, 7030), (13, 6931), (25, 6802),

Gene: Amabiko\_277 Start: 125973, Stop: 125614, Start Num: 2

Candidate Starts for Amabiko\_277:

(Start: 2 @125973 has 18 MA's), (Start: 4 @125967 has 32 MA's), (6, 125952), (7, 125877), (8, 125856), (13, 125757), (25, 125628),

Gene: Anedea\_274 Start: 129542, Stop: 129219, Start Num: 3

Candidate Starts for Anedea\_274:

(Start: 3 @129542 has 20 MA's), (5, 129536), (9, 129455), (10, 129422), (12, 129362), (16, 129332), (17, 129323), (20, 129302), (24, 129245),

Gene: Anedea\_12 Start: 6493, Stop: 6170, Start Num: 3  
Candidate Starts for Anedea\_12:  
(Start: 3 @6493 has 20 MA's), (5, 6487), (9, 6406), (10, 6373), (12, 6313), (16, 6283), (17, 6274), (20, 6253), (24, 6196),

Gene: Battuta\_13 Start: 7141, Stop: 6788, Start Num: 4  
Candidate Starts for Battuta\_13:  
(Start: 2 @7147 has 18 MA's), (Start: 4 @7141 has 32 MA's), (6, 7126), (7, 7051), (8, 7030), (13, 6931), (25, 6802),

Gene: Battuta\_270 Start: 125296, Stop: 124943, Start Num: 4  
Candidate Starts for Battuta\_270:  
(Start: 2 @125302 has 18 MA's), (Start: 4 @125296 has 32 MA's), (6, 125281), (7, 125206), (8, 125185), (13, 125086), (25, 124957),

Gene: Birchlyn\_270 Start: 121091, Stop: 120732, Start Num: 2  
Candidate Starts for Birchlyn\_270:  
(Start: 2 @121091 has 18 MA's), (Start: 4 @121085 has 32 MA's), (6, 121070), (7, 120995), (8, 120974), (13, 120875), (25, 120746),

Gene: Birchlyn\_10 Start: 4994, Stop: 4641, Start Num: 4  
Candidate Starts for Birchlyn\_10:  
(Start: 2 @5000 has 18 MA's), (Start: 4 @4994 has 32 MA's), (6, 4979), (7, 4904), (8, 4883), (13, 4784), (25, 4655),

Gene: BlueOtter\_263 Start: 127448, Stop: 127125, Start Num: 3  
Candidate Starts for BlueOtter\_263:  
(Start: 3 @127448 has 20 MA's), (5, 127442), (6, 127433), (9, 127361), (10, 127328), (12, 127268), (16, 127238), (17, 127229), (23, 127163), (24, 127151),

Gene: BlueOtter\_11 Start: 6361, Stop: 6038, Start Num: 3  
Candidate Starts for BlueOtter\_11:  
(Start: 3 @6361 has 20 MA's), (5, 6355), (6, 6346), (9, 6274), (10, 6241), (12, 6181), (16, 6151), (17, 6142), (23, 6076), (24, 6064),

Gene: BoomerJR\_14 Start: 7130, Stop: 6768, Start Num: 2  
Candidate Starts for BoomerJR\_14:  
(Start: 2 @7130 has 18 MA's), (Start: 4 @7124 has 32 MA's), (7, 7031), (8, 7010), (12, 6914), (13, 6911), (19, 6857), (25, 6782),

Gene: BoomerJR\_269 Start: 125918, Stop: 125556, Start Num: 2  
Candidate Starts for BoomerJR\_269:  
(Start: 2 @125918 has 18 MA's), (Start: 4 @125912 has 32 MA's), (7, 125819), (8, 125798), (12, 125702), (13, 125699), (19, 125645), (25, 125570),

Gene: Bordeaux\_13 Start: 7141, Stop: 6788, Start Num: 4  
Candidate Starts for Bordeaux\_13:  
(Start: 2 @7147 has 18 MA's), (Start: 4 @7141 has 32 MA's), (6, 7126), (7, 7051), (8, 7030), (13, 6931), (25, 6802),

Gene: Bordeaux\_270 Start: 125879, Stop: 125526, Start Num: 4  
Candidate Starts for Bordeaux\_270:

(Start: 2 @125885 has 18 MA's), (Start: 4 @125879 has 32 MA's), (6, 125864), (7, 125789), (8, 125768), (13, 125669), (25, 125540),

Gene: CeilingFan\_286 Start: 127359, Stop: 127006, Start Num: 4

Candidate Starts for CeilingFan\_286:

(Start: 2 @127365 has 18 MA's), (Start: 4 @127359 has 32 MA's), (6, 127344), (7, 127269), (8, 127248), (13, 127149), (25, 127020),

Gene: CeilingFan\_12 Start: 6752, Stop: 6399, Start Num: 4

Candidate Starts for CeilingFan\_12:

(Start: 2 @6758 has 18 MA's), (Start: 4 @6752 has 32 MA's), (6, 6737), (7, 6662), (8, 6641), (13, 6542), (25, 6413),

Gene: Cross\_259 Start: 128093, Stop: 127770, Start Num: 3

Candidate Starts for Cross\_259:

(Start: 3 @128093 has 20 MA's), (5, 128087), (6, 128078), (9, 128006), (10, 127973), (12, 127913), (16, 127883), (17, 127874), (23, 127808), (24, 127796),

Gene: Cross\_11 Start: 6361, Stop: 6038, Start Num: 3

Candidate Starts for Cross\_11:

(Start: 3 @6361 has 20 MA's), (5, 6355), (6, 6346), (9, 6274), (10, 6241), (12, 6181), (16, 6151), (17, 6142), (23, 6076), (24, 6064),

Gene: Cursive\_263 Start: 127188, Stop: 126865, Start Num: 3

Candidate Starts for Cursive\_263:

(Start: 3 @127188 has 20 MA's), (5, 127182), (6, 127173), (9, 127101), (10, 127068), (12, 127008), (16, 126978), (17, 126969), (23, 126903), (24, 126891),

Gene: Cursive\_9 Start: 5179, Stop: 4856, Start Num: 3

Candidate Starts for Cursive\_9:

(Start: 3 @5179 has 20 MA's), (5, 5173), (6, 5164), (9, 5092), (10, 5059), (12, 4999), (16, 4969), (17, 4960), (23, 4894), (24, 4882),

Gene: EGole\_265 Start: 131094, Stop: 130771, Start Num: 3

Candidate Starts for EGole\_265:

(Start: 3 @131094 has 20 MA's), (5, 131088), (6, 131079), (9, 131007), (10, 130974), (12, 130914), (16, 130884), (17, 130875), (23, 130809), (24, 130797),

Gene: EGole\_11 Start: 6782, Stop: 6459, Start Num: 3

Candidate Starts for EGole\_11:

(Start: 3 @6782 has 20 MA's), (5, 6776), (6, 6767), (9, 6695), (10, 6662), (12, 6602), (16, 6572), (17, 6563), (23, 6497), (24, 6485),

Gene: Elmer\_291 Start: 128639, Stop: 128286, Start Num: 4

Candidate Starts for Elmer\_291:

(Start: 2 @128645 has 18 MA's), (Start: 4 @128639 has 32 MA's), (7, 128549), (8, 128528), (11, 128453), (12, 128432), (15, 128405), (25, 128300),

Gene: Elmer\_15 Start: 6271, Stop: 5918, Start Num: 4

Candidate Starts for Elmer\_15:

(Start: 2 @6277 has 18 MA's), (Start: 4 @6271 has 32 MA's), (7, 6181), (8, 6160), (11, 6085), (12, 6064), (15, 6037), (25, 5932),

Gene: Enygma\_279 Start: 128827, Stop: 128474, Start Num: 4

Candidate Starts for Enygma\_279:

(Start: 2 @128833 has 18 MA's), (Start: 4 @128827 has 32 MA's), (6, 128812), (7, 128737), (8, 128716), (13, 128617), (14, 128596), (25, 128488),

Gene: Enygma\_11 Start: 6403, Stop: 6050, Start Num: 4

Candidate Starts for Enygma\_11:

(Start: 2 @6409 has 18 MA's), (Start: 4 @6403 has 32 MA's), (6, 6388), (7, 6313), (8, 6292), (13, 6193), (14, 6172), (25, 6064),

Gene: Genie2\_14 Start: 7130, Stop: 6768, Start Num: 2

Candidate Starts for Genie2\_14:

(Start: 2 @7130 has 18 MA's), (Start: 4 @7124 has 32 MA's), (7, 7031), (8, 7010), (12, 6914), (13, 6911), (19, 6857), (25, 6782),

Gene: Genie2\_269 Start: 126031, Stop: 125669, Start Num: 2

Candidate Starts for Genie2\_269:

(Start: 2 @126031 has 18 MA's), (Start: 4 @126025 has 32 MA's), (7, 125932), (8, 125911), (12, 125815), (13, 125812), (19, 125758), (25, 125683),

Gene: Gibbi\_283 Start: 126852, Stop: 126499, Start Num: 4

Candidate Starts for Gibbi\_283:

(Start: 2 @126858 has 18 MA's), (Start: 4 @126852 has 32 MA's), (6, 126837), (7, 126762), (8, 126741), (13, 126642), (25, 126513),

Gene: Gibbi\_12 Start: 6752, Stop: 6399, Start Num: 4

Candidate Starts for Gibbi\_12:

(Start: 2 @6758 has 18 MA's), (Start: 4 @6752 has 32 MA's), (6, 6737), (7, 6662), (8, 6641), (13, 6542), (25, 6413),

Gene: HangryHippo\_263 Start: 127448, Stop: 127125, Start Num: 3

Candidate Starts for HangryHippo\_263:

(Start: 3 @127448 has 20 MA's), (5, 127442), (6, 127433), (9, 127361), (10, 127328), (12, 127268), (16, 127238), (17, 127229), (23, 127163), (24, 127151),

Gene: HangryHippo\_11 Start: 6361, Stop: 6038, Start Num: 3

Candidate Starts for HangryHippo\_11:

(Start: 3 @6361 has 20 MA's), (5, 6355), (6, 6346), (9, 6274), (10, 6241), (12, 6181), (16, 6151), (17, 6142), (23, 6076), (24, 6064),

Gene: IchabodCrane\_12 Start: 6749, Stop: 6396, Start Num: 4

Candidate Starts for IchabodCrane\_12:

(Start: 2 @6755 has 18 MA's), (Start: 4 @6749 has 32 MA's), (6, 6734), (7, 6659), (8, 6638), (13, 6539), (25, 6410),

Gene: IchabodCrane\_265 Start: 125292, Stop: 124939, Start Num: 4

Candidate Starts for IchabodCrane\_265:

(Start: 2 @125298 has 18 MA's), (Start: 4 @125292 has 32 MA's), (6, 125277), (7, 125202), (8, 125181), (13, 125082), (25, 124953),

Gene: JimJam\_281 Start: 128682, Stop: 128323, Start Num: 2

Candidate Starts for JimJam\_281:

(Start: 2 @128682 has 18 MA's), (Start: 4 @128676 has 32 MA's), (6, 128661), (7, 128586), (8, 128565), (13, 128466), (25, 128337),

Gene: JimJam\_13 Start: 7146, Stop: 6787, Start Num: 2

Candidate Starts for JimJam\_13:

(Start: 2 @7146 has 18 MA's), (Start: 4 @7140 has 32 MA's), (6, 7125), (7, 7050), (8, 7029), (13, 6930), (25, 6801),

Gene: Jollison\_277 Start: 125822, Stop: 125463, Start Num: 2

Candidate Starts for Jollison\_277:

(Start: 2 @125822 has 18 MA's), (Start: 4 @125816 has 32 MA's), (6, 125801), (7, 125726), (8, 125705), (13, 125606), (25, 125477),

Gene: Jollison\_13 Start: 7147, Stop: 6788, Start Num: 2

Candidate Starts for Jollison\_13:

(Start: 2 @7147 has 18 MA's), (Start: 4 @7141 has 32 MA's), (6, 7126), (7, 7051), (8, 7030), (13, 6931), (25, 6802),

Gene: Karimac\_271 Start: 126462, Stop: 126109, Start Num: 4

Candidate Starts for Karimac\_271:

(Start: 2 @126468 has 18 MA's), (Start: 4 @126462 has 32 MA's), (6, 126447), (7, 126372), (8, 126351), (13, 126252), (25, 126123),

Gene: Karimac\_13 Start: 7143, Stop: 6790, Start Num: 4

Candidate Starts for Karimac\_13:

(Start: 2 @7149 has 18 MA's), (Start: 4 @7143 has 32 MA's), (6, 7128), (7, 7053), (8, 7032), (13, 6933), (25, 6804),

Gene: KentuckyRacer\_287 Start: 128204, Stop: 127851, Start Num: 4

Candidate Starts for KentuckyRacer\_287:

(Start: 2 @128210 has 18 MA's), (Start: 4 @128204 has 32 MA's), (6, 128189), (7, 128114), (8, 128093), (13, 127994), (25, 127865),

Gene: KentuckyRacer\_13 Start: 6753, Stop: 6400, Start Num: 4

Candidate Starts for KentuckyRacer\_13:

(Start: 2 @6759 has 18 MA's), (Start: 4 @6753 has 32 MA's), (6, 6738), (7, 6663), (8, 6642), (13, 6543), (25, 6414),

Gene: Larnav\_272 Start: 128366, Stop: 128043, Start Num: 3

Candidate Starts for Larnav\_272:

(Start: 3 @128366 has 20 MA's), (5, 128360), (6, 128351), (9, 128279), (10, 128246), (12, 128186), (16, 128156), (17, 128147), (23, 128081), (24, 128069),

Gene: Larnav\_13 Start: 6361, Stop: 6038, Start Num: 3

Candidate Starts for Larnav\_13:

(Start: 3 @6361 has 20 MA's), (5, 6355), (6, 6346), (9, 6274), (10, 6241), (12, 6181), (16, 6151), (17, 6142), (23, 6076), (24, 6064),

Gene: LukeCage\_275 Start: 127593, Stop: 127234, Start Num: 2

Candidate Starts for LukeCage\_275:

(Start: 2 @127593 has 18 MA's), (Start: 4 @127587 has 32 MA's), (6, 127572), (7, 127497), (8, 127476), (11, 127401), (13, 127377), (25, 127248),



Gene: LukeCage\_12 Start: 6689, Stop: 6330, Start Num: 2

Candidate Starts for LukeCage\_12:

(Start: 2 @6689 has 18 MA's), (Start: 4 @6683 has 32 MA's), (6, 6668), (7, 6593), (8, 6572), (11, 6497), (13, 6473), (25, 6344),

Gene: Lululemon\_260 Start: 126633, Stop: 126310, Start Num: 3

Candidate Starts for Lululemon\_260:

(Start: 3 @126633 has 20 MA's), (5, 126627), (6, 126618), (9, 126546), (10, 126513), (12, 126453), (16, 126423), (17, 126414), (23, 126348), (24, 126336),

Gene: Lululemon\_10 Start: 5741, Stop: 5418, Start Num: 3

Candidate Starts for Lululemon\_10:

(Start: 3 @5741 has 20 MA's), (5, 5735), (6, 5726), (9, 5654), (10, 5621), (12, 5561), (16, 5531), (17, 5522), (23, 5456), (24, 5444),

Gene: MindFlayer\_264 Start: 124811, Stop: 124458, Start Num: 4

Candidate Starts for MindFlayer\_264:

(Start: 2 @124817 has 18 MA's), (Start: 4 @124811 has 32 MA's), (6, 124796), (7, 124721), (8, 124700), (13, 124601), (25, 124472),

Gene: MindFlayer\_12 Start: 6751, Stop: 6398, Start Num: 4

Candidate Starts for MindFlayer\_12:

(Start: 2 @6757 has 18 MA's), (Start: 4 @6751 has 32 MA's), (6, 6736), (7, 6661), (8, 6640), (13, 6541), (25, 6412),

Gene: Mugiwara\_283 Start: 127795, Stop: 127442, Start Num: 4

Candidate Starts for Mugiwara\_283:

(Start: 2 @127801 has 18 MA's), (Start: 4 @127795 has 32 MA's), (6, 127780), (7, 127705), (8, 127684), (13, 127585), (22, 127489), (25, 127456),

Gene: Mugiwara\_11 Start: 6410, Stop: 6057, Start Num: 4

Candidate Starts for Mugiwara\_11:

(Start: 2 @6416 has 18 MA's), (Start: 4 @6410 has 32 MA's), (6, 6395), (7, 6320), (8, 6299), (13, 6200), (22, 6104), (25, 6071),

Gene: PacManQ\_261 Start: 126633, Stop: 126310, Start Num: 3

Candidate Starts for PacManQ\_261:

(Start: 3 @126633 has 20 MA's), (5, 126627), (6, 126618), (9, 126546), (10, 126513), (12, 126453), (16, 126423), (17, 126414), (23, 126348), (24, 126336),

Gene: PacManQ\_10 Start: 5741, Stop: 5418, Start Num: 3

Candidate Starts for PacManQ\_10:

(Start: 3 @5741 has 20 MA's), (5, 5735), (6, 5726), (9, 5654), (10, 5621), (12, 5561), (16, 5531), (17, 5522), (23, 5456), (24, 5444),

Gene: Peebs\_258 Start: 128335, Stop: 128012, Start Num: 3

Candidate Starts for Peebs\_258:

(Start: 3 @128335 has 20 MA's), (5, 128329), (6, 128320), (9, 128248), (10, 128215), (12, 128155), (16, 128125), (17, 128116), (23, 128050), (24, 128038),

Gene: Peebs\_11 Start: 6360, Stop: 6037, Start Num: 3

Candidate Starts for Peebs\_11:

(Start: 3 @6360 has 20 MA's), (5, 6354), (6, 6345), (9, 6273), (10, 6240), (12, 6180), (16, 6150), (17, 6141), (23, 6075), (24, 6063),

Gene: Pepperwood\_12 Start: 6515, Stop: 6192, Start Num: 3

Candidate Starts for Pepperwood\_12:

(Start: 3 @6515 has 20 MA's), (5, 6509), (6, 6500), (9, 6428), (10, 6395), (12, 6335), (16, 6305), (17, 6296), (23, 6230), (24, 6218),

Gene: Pepperwood\_261 Start: 128300, Stop: 127977, Start Num: 3

Candidate Starts for Pepperwood\_261:

(Start: 3 @128300 has 20 MA's), (5, 128294), (6, 128285), (9, 128213), (10, 128180), (12, 128120), (16, 128090), (17, 128081), (23, 128015), (24, 128003),

Gene: PumpkinSpice\_277 Start: 127033, Stop: 126680, Start Num: 4

Candidate Starts for PumpkinSpice\_277:

(Start: 2 @127039 has 18 MA's), (Start: 4 @127033 has 32 MA's), (6, 127018), (7, 126943), (8, 126922), (13, 126823), (25, 126694),

Gene: PumpkinSpice\_13 Start: 7141, Stop: 6788, Start Num: 4

Candidate Starts for PumpkinSpice\_13:

(Start: 2 @7147 has 18 MA's), (Start: 4 @7141 has 32 MA's), (6, 7126), (7, 7051), (8, 7030), (13, 6931), (25, 6802),

Gene: Quaran19\_13 Start: 7141, Stop: 6788, Start Num: 4

Candidate Starts for Quaran19\_13:

(Start: 2 @7147 has 18 MA's), (Start: 4 @7141 has 32 MA's), (6, 7126), (7, 7051), (8, 7030), (13, 6931), (25, 6802),

Gene: Quaran19\_274 Start: 126323, Stop: 125970, Start Num: 4

Candidate Starts for Quaran19\_274:

(Start: 2 @126329 has 18 MA's), (Start: 4 @126323 has 32 MA's), (6, 126308), (7, 126233), (8, 126212), (13, 126113), (25, 125984),

Gene: SaltySpittoon\_13 Start: 7141, Stop: 6788, Start Num: 4

Candidate Starts for SaltySpittoon\_13:

(Start: 2 @7147 has 18 MA's), (Start: 4 @7141 has 32 MA's), (6, 7126), (7, 7051), (8, 7030), (13, 6931), (25, 6802),

Gene: SaltySpittoon\_273 Start: 125411, Stop: 125052, Start Num: 2

Candidate Starts for SaltySpittoon\_273:

(Start: 2 @125411 has 18 MA's), (Start: 4 @125405 has 32 MA's), (6, 125390), (7, 125315), (8, 125294), (13, 125195), (25, 125066),

Gene: Samisti12\_10 Start: 6360, Stop: 6037, Start Num: 3

Candidate Starts for Samisti12\_10:

(Start: 3 @6360 has 20 MA's), (5, 6354), (6, 6345), (9, 6273), (10, 6240), (12, 6180), (16, 6150), (17, 6141), (23, 6075), (24, 6063),

Gene: Samisti12\_261 Start: 129404, Stop: 129081, Start Num: 3

Candidate Starts for Samisti12\_261:

(Start: 3 @129404 has 20 MA's), (5, 129398), (6, 129389), (9, 129317), (10, 129284), (12, 129224), (16, 129194), (17, 129185), (23, 129119), (24, 129107),

Gene: Sollertia\_14 Start: 7124, Stop: 6768, Start Num: 4  
Candidate Starts for Sollertia\_14:  
(Start: 2 @7130 has 18 MA's), (Start: 4 @7124 has 32 MA's), (7, 7031), (8, 7010), (12, 6914), (13, 6911), (19, 6857), (25, 6782),

Gene: Sollertia\_270 Start: 126014, Stop: 125658, Start Num: 4  
Candidate Starts for Sollertia\_270:  
(Start: 2 @126020 has 18 MA's), (Start: 4 @126014 has 32 MA's), (7, 125921), (8, 125900), (12, 125804), (13, 125801), (19, 125747), (25, 125672),

Gene: Spelly\_13 Start: 7141, Stop: 6788, Start Num: 4  
Candidate Starts for Spelly\_13:  
(Start: 2 @7147 has 18 MA's), (Start: 4 @7141 has 32 MA's), (6, 7126), (7, 7051), (8, 7030), (13, 6931), (25, 6802),

Gene: Spelly\_279 Start: 125945, Stop: 125592, Start Num: 4  
Candidate Starts for Spelly\_279:  
(Start: 2 @125951 has 18 MA's), (Start: 4 @125945 has 32 MA's), (6, 125930), (7, 125855), (8, 125834), (13, 125735), (25, 125606),

Gene: Spilled\_12 Start: 6757, Stop: 6398, Start Num: 2  
Candidate Starts for Spilled\_12:  
(Start: 2 @6757 has 18 MA's), (Start: 4 @6751 has 32 MA's), (6, 6736), (7, 6661), (8, 6640), (13, 6541), (25, 6412),

Gene: Spilled\_280 Start: 127226, Stop: 126867, Start Num: 2  
Candidate Starts for Spilled\_280:  
(Start: 2 @127226 has 18 MA's), (Start: 4 @127220 has 32 MA's), (6, 127205), (7, 127130), (8, 127109), (13, 127010), (25, 126881),

Gene: Stanimal\_269 Start: 126404, Stop: 126042, Start Num: 2  
Candidate Starts for Stanimal\_269:  
(Start: 2 @126404 has 18 MA's), (Start: 4 @126398 has 32 MA's), (7, 126305), (8, 126284), (12, 126188), (13, 126185), (19, 126131), (25, 126056),

Gene: Stanimal\_14 Start: 7130, Stop: 6768, Start Num: 2  
Candidate Starts for Stanimal\_14:  
(Start: 2 @7130 has 18 MA's), (Start: 4 @7124 has 32 MA's), (7, 7031), (8, 7010), (12, 6914), (13, 6911), (19, 6857), (25, 6782),

Gene: StarPlatinum\_282 Start: 128529, Stop: 128176, Start Num: 4  
Candidate Starts for StarPlatinum\_282:  
(Start: 4 @128529 has 32 MA's), (5, 128523), (6, 128514), (7, 128439), (8, 128418), (13, 128319), (22, 128223), (25, 128190),

Gene: StarPlatinum\_12 Start: 6842, Stop: 6489, Start Num: 4  
Candidate Starts for StarPlatinum\_12:  
(Start: 4 @6842 has 32 MA's), (5, 6836), (6, 6827), (7, 6752), (8, 6731), (13, 6632), (22, 6536), (25, 6503),

Gene: Starbow\_270 Start: 125995, Stop: 125636, Start Num: 2  
Candidate Starts for Starbow\_270:

(Start: 2 @125995 has 18 MA's), (Start: 4 @125989 has 32 MA's), (6, 125974), (7, 125899), (8, 125878), (13, 125779), (25, 125650),

Gene: Starbow\_13 Start: 7147, Stop: 6788, Start Num: 2

Candidate Starts for Starbow\_13:

(Start: 2 @7147 has 18 MA's), (Start: 4 @7141 has 32 MA's), (6, 7126), (7, 7051), (8, 7030), (13, 6931), (25, 6802),

Gene: Sushi23\_262 Start: 129204, Stop: 128881, Start Num: 3

Candidate Starts for Sushi23\_262:

(Start: 3 @129204 has 20 MA's), (5, 129198), (6, 129189), (9, 129117), (10, 129084), (12, 129024), (16, 128994), (17, 128985), (23, 128919), (24, 128907),

Gene: Sushi23\_12 Start: 6361, Stop: 6038, Start Num: 3

Candidate Starts for Sushi23\_12:

(Start: 3 @6361 has 20 MA's), (5, 6355), (6, 6346), (9, 6274), (10, 6241), (12, 6181), (16, 6151), (17, 6142), (23, 6076), (24, 6064),

Gene: Teutsch\_11 Start: 6362, Stop: 6039, Start Num: 3

Candidate Starts for Teutsch\_11:

(Start: 3 @6362 has 20 MA's), (5, 6356), (6, 6347), (9, 6275), (10, 6242), (12, 6182), (16, 6152), (17, 6143), (23, 6077), (24, 6065),

Gene: Teutsch\_258 Start: 128571, Stop: 128248, Start Num: 3

Candidate Starts for Teutsch\_258:

(Start: 3 @128571 has 20 MA's), (5, 128565), (6, 128556), (9, 128484), (10, 128451), (12, 128391), (16, 128361), (17, 128352), (23, 128286), (24, 128274),

Gene: TomSawyer\_278 Start: 128513, Stop: 128160, Start Num: 4

Candidate Starts for TomSawyer\_278:

(Start: 2 @128519 has 18 MA's), (Start: 4 @128513 has 32 MA's), (6, 128498), (7, 128423), (8, 128402), (13, 128303), (25, 128174),

Gene: TomSawyer\_13 Start: 6734, Stop: 6381, Start Num: 4

Candidate Starts for TomSawyer\_13:

(Start: 2 @6740 has 18 MA's), (Start: 4 @6734 has 32 MA's), (6, 6719), (7, 6644), (8, 6623), (13, 6524), (25, 6395),

Gene: Tomas\_15 Start: 7771, Stop: 7403, Start Num: 1

Candidate Starts for Tomas\_15:

(Start: 1 @7771 has 2 MA's), (Start: 4 @7720 has 32 MA's), (8, 7633), (13, 7534), (15, 7510), (18, 7486), (21, 7471),

Gene: Tomas\_271 Start: 129478, Stop: 129110, Start Num: 1

Candidate Starts for Tomas\_271:

(Start: 1 @129478 has 2 MA's), (Start: 4 @129427 has 32 MA's), (8, 129340), (13, 129241), (15, 129217), (18, 129193), (21, 129178),

Gene: Tribute\_11 Start: 6361, Stop: 6038, Start Num: 3

Candidate Starts for Tribute\_11:

(Start: 3 @6361 has 20 MA's), (5, 6355), (6, 6346), (9, 6274), (10, 6241), (12, 6181), (16, 6151), (17, 6142), (23, 6076), (24, 6064),

Gene: Tribute\_257 Start: 128905, Stop: 128582, Start Num: 3

Candidate Starts for Tribute\_257:

(Start: 3 @128905 has 20 MA's), (5, 128899), (6, 128890), (9, 128818), (10, 128785), (12, 128725), (16, 128695), (17, 128686), (23, 128620), (24, 128608),

Gene: Watermoore\_258 Start: 128958, Stop: 128635, Start Num: 3

Candidate Starts for Watermoore\_258:

(Start: 3 @128958 has 20 MA's), (5, 128952), (6, 128943), (9, 128871), (10, 128838), (12, 128778), (16, 128748), (17, 128739), (23, 128673), (24, 128661),

Gene: Watermoore\_11 Start: 6362, Stop: 6039, Start Num: 3

Candidate Starts for Watermoore\_11:

(Start: 3 @6362 has 20 MA's), (5, 6356), (6, 6347), (9, 6275), (10, 6242), (12, 6182), (16, 6152), (17, 6143), (23, 6077), (24, 6065),

Gene: Wipeout\_265 Start: 127487, Stop: 127134, Start Num: 4

Candidate Starts for Wipeout\_265:

(Start: 2 @127493 has 18 MA's), (Start: 4 @127487 has 32 MA's), (6, 127472), (7, 127397), (8, 127376), (13, 127277), (25, 127148),

Gene: Wipeout\_12 Start: 6756, Stop: 6403, Start Num: 4

Candidate Starts for Wipeout\_12:

(Start: 2 @6762 has 18 MA's), (Start: 4 @6756 has 32 MA's), (6, 6741), (7, 6666), (8, 6645), (13, 6546), (25, 6417),

Gene: Wofford\_270 Start: 128069, Stop: 127716, Start Num: 4

Candidate Starts for Wofford\_270:

(Start: 2 @128075 has 18 MA's), (Start: 4 @128069 has 32 MA's), (7, 127979), (8, 127958), (11, 127883), (12, 127862), (25, 127730),

Gene: Wofford\_12 Start: 6276, Stop: 5923, Start Num: 4

Candidate Starts for Wofford\_12:

(Start: 2 @6282 has 18 MA's), (Start: 4 @6276 has 32 MA's), (7, 6186), (8, 6165), (11, 6090), (12, 6069), (25, 5937),

Gene: Yaboi\_275 Start: 125942, Stop: 125586, Start Num: 4

Candidate Starts for Yaboi\_275:

(Start: 2 @125948 has 18 MA's), (Start: 4 @125942 has 32 MA's), (7, 125849), (8, 125828), (12, 125732), (13, 125729), (19, 125675), (25, 125600),

Gene: Yaboi\_14 Start: 7124, Stop: 6768, Start Num: 4

Candidate Starts for Yaboi\_14:

(Start: 2 @7130 has 18 MA's), (Start: 4 @7124 has 32 MA's), (7, 7031), (8, 7010), (12, 6914), (13, 6911), (19, 6857), (25, 6782),