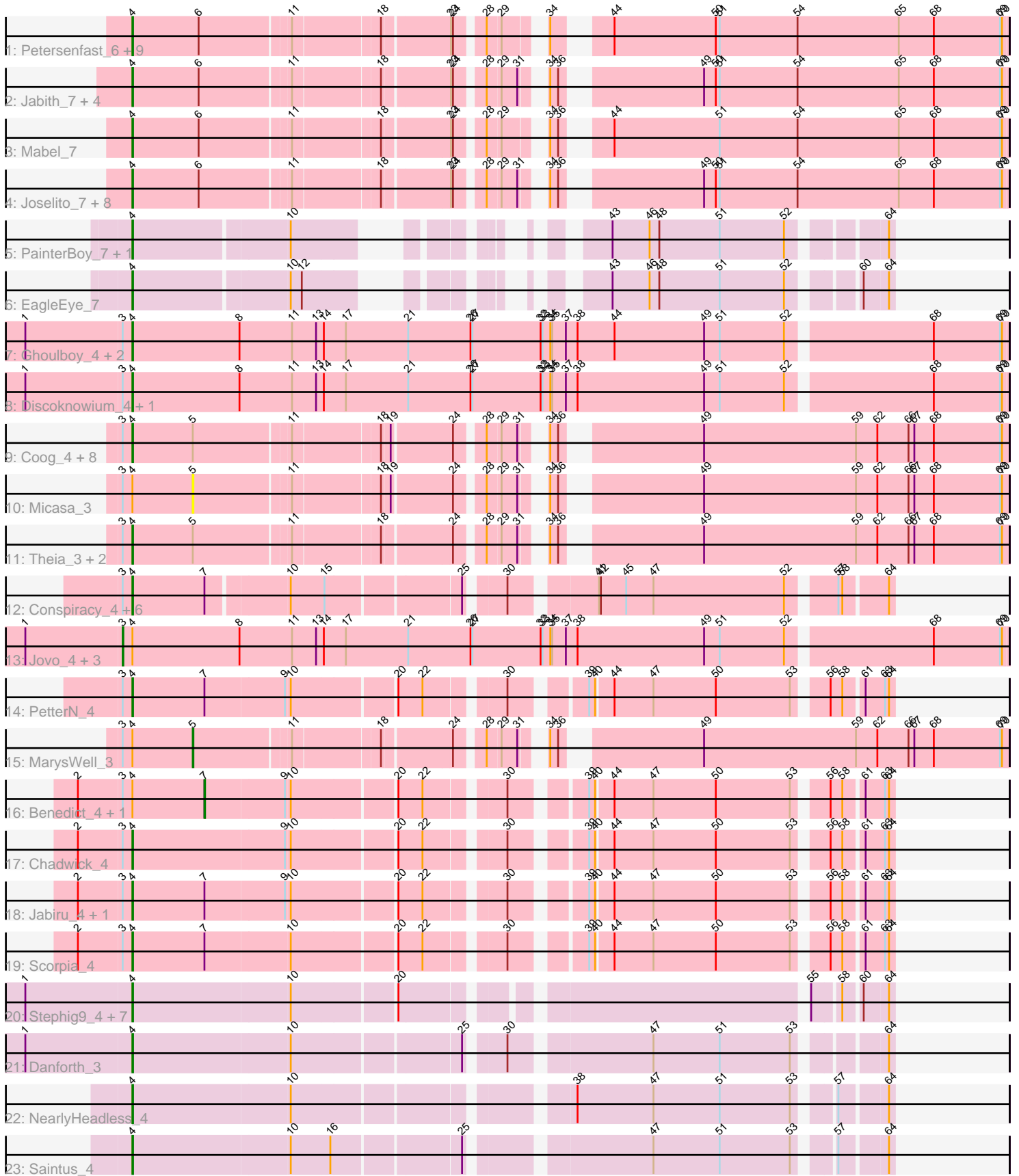


Pham 157818



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 157818 Report

This analysis was run 04/13/24 on database version 558.

Pham number 157818 has 76 members, 4 are drafts.

Phages represented in each track:

- Track 1 : Petersenfast_6, Bud_7, Et2Brutus_6, Salz_7, Hutc2_7, Bachome_7, Fibonacci_7, Mulciber_7, Snape_7, Sham4_7
- Track 2 : Jabith_7, MaCh_7, Gilberta_7, TinyTimmy_6, Ebony_7
- Track 3 : Mabel_7
- Track 4 : Joselito_7, Aneem_7, Timothy_7, Lucivia_7, Flaverint_7, Bowtie_7, Insomnia_6, Orange_7, Munch_7
- Track 5 : PainterBoy_7, Lucyedi_7
- Track 6 : EagleEye_7
- Track 7 : Ghoulboy_4, Zolita_3, SydNat_4
- Track 8 : Discoknowium_4, Bluefalcon_3
- Track 9 : Coog_4, George_3, Midas2_4, Milcery_4, LittleCherry_4, Tarynearal_3, Swirley_4, HuhtaEnerson15_4, Bonamassa_4
- Track 10 : Micasa_3
- Track 11 : Theia_3, Cuco_4, Dublin_3
- Track 12 : Conspiracy_4, PickleBack_4, Lev2_4, Archetta_4, ForGetIt_4, Tiger_4, UnionJack_4
- Track 13 : Jovo_4, Phlorence_4, Aragog_4, AgentM_4
- Track 14 : PetterN_4
- Track 15 : MarysWell_3
- Track 16 : Benedict_4, Airmid_4
- Track 17 : Chadwick_4
- Track 18 : Jabiru_4, EITiger69_4
- Track 19 : Scorpia_4
- Track 20 : Stephig9_4, Dixon_4, Phillis_4, Smeadley_4, Roary_4, Astro_4, Expelliarmus_3, Groundhog_3
- Track 21 : Danforth_3
- Track 22 : NearlyHeadless_4
- Track 23 : Saintus_4

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 65 of the 72 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Aneem_7, Archetta_4, Astro_4, Bachome_7, Bluefalcon_3, Bonamassa_4, Bowtie_7, Bud_7, Chadwick_4, Conspiracy_4, Coog_4, Cuco_4, Danforth_3, Discoknowium_4, Dixon_4, Dublin_3, EagleEye_7, Ebony_7, EITiger69_4, Et2Brutus_6, Expelliarmus_3, Fibonacci_7, Flaverint_7, ForGetIt_4, George_3, Ghoulboy_4, Gilberta_7, Groundhog_3, HuhtaEnerson15_4, Hutc2_7, Insomnia_6, Jabiru_4, Jabith_7, Joselito_7, Lev2_4, LittleCherry_4, Lucivia_7, Lucyedi_7, MaCh_7, Mabel_7, Midas2_4, Milcery_4, Mulciber_7, Munch_7, NearlyHeadless_4, Orange_7, PainterBoy_7, Petersenfast_6, PetterN_4, Phillis_4, PickleBack_4, Roary_4, Saintus_4, Salz_7, Scorpia_4, Sham4_7, Smeadley_4, Snape_7, Stephig9_4, Swirley_4, SydNat_4, Tarynearal_3, Theia_3, Tiger_4, Timothy_7, TinyTimmy_6, UnionJack_4, Zolita_3,

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

- AgentM_4, Airmid_4, Aragog_4, Benedict_4, Jovo_4, MarysWell_3, Micasa_3, Phlorence_4,

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

-

Summary by start number:

Start 3:

- Found in 37 of 76 (48.7%) of genes in pham
- Manual Annotations of this start: 4 of 72
- Called 10.8% of time when present
- Phage (with cluster) where this start called: AgentM_4 (A5), Aragog_4 (A5), Jovo_4 (A5), Phlorence_4 (A5),

Start 4:

- Found in 76 of 76 (100.0%) of genes in pham
- Manual Annotations of this start: 65 of 72
- Called 89.5% of time when present
- Phage (with cluster) where this start called: Aneem_7 (A11), Archetta_4 (A5), Astro_4 (A8), Bachome_7 (A11), Bluefalcon_3 (A5), Bonamassa_4 (A5), Bowtie_7 (A11), Bud_7 (A11), Chadwick_4 (A5), Conspiracy_4 (A5), Coog_4 (A5), Cuco_4 (A5), Danforth_3 (A8), Discoknowium_4 (A5), Dixon_4 (A8), Dublin_3 (A5), EagleEye_7 (A16), Ebony_7 (A11), EITiger69_4 (A5), Et2Brutus_6 (A11), Expelliarmus_3 (A8), Fibonacci_7 (A11), Flaverint_7 (A11), ForGetIt_4 (A5), George_3 (A5), Ghoulboy_4 (A5), Gilberta_7 (A11), Groundhog_3 (A8), HuhtaEnerson15_4 (A5), Hutc2_7 (A11), Insomnia_6 (A11), Jabiru_4 (A5), Jabith_7 (A11), Joselito_7 (A11), Lev2_4 (A5), LittleCherry_4 (A5), Lucivia_7 (A11), Lucyedi_7 (A16), MaCh_7 (A11), Mabel_7 (A11), Midas2_4 (A5), Milcery_4 (A5), Mulciber_7 (A11), Munch_7 (A11), NearlyHeadless_4 (A8), Orange_7 (A11), PainterBoy_7 (A16), Petersenfast_6 (A11), PetterN_4 (A5), Phillis_4 (A8), PickleBack_4 (A5), Roary_4 (A8), Saintus_4 (A8), Salz_7 (A11), Scorpia_4 (A5), Sham4_7 (A11), Smeadley_4 (A8), Snape_7 (A11), Stephig9_4 (A8), Swirley_4 (A5), SydNat_4 (A5), Tarynearal_3 (A5), Theia_3 (A5), Tiger_4 (A5), Timothy_7 (A11), TinyTimmy_6 (A11), UnionJack_4 (A5), Zolita_3 (A5),

Start 5:

- Found in 14 of 76 (18.4%) of genes in pham
- Manual Annotations of this start: 1 of 72

- Called 14.3% of time when present
- Phage (with cluster) where this start called: MarysWell_3 (A5), Micasa_3 (A5),

Start 7:

- Found in 13 of 76 (17.1%) of genes in pham
- Manual Annotations of this start: 2 of 72
- Called 15.4% of time when present
- Phage (with cluster) where this start called: Airmid_4 (A5), Benedict_4 (A5),

Summary by clusters:

There are 4 clusters represented in this pham: A8, A11, A5, A16,

Info for manual annotations of cluster A11:

- Start number 4 was manually annotated 22 times for cluster A11.

Info for manual annotations of cluster A16:

- Start number 4 was manually annotated 3 times for cluster A16.

Info for manual annotations of cluster A5:

- Start number 3 was manually annotated 4 times for cluster A5.
- Start number 4 was manually annotated 29 times for cluster A5.
- Start number 5 was manually annotated 1 time for cluster A5.
- Start number 7 was manually annotated 2 times for cluster A5.

Info for manual annotations of cluster A8:

- Start number 4 was manually annotated 11 times for cluster A8.

Gene Information:

Gene: AgentM_4 Start: 2343, Stop: 3680, Start Num: 3

Candidate Starts for AgentM_4:

(1, 2196), (Start: 3 @2343 has 4 MA's), (Start: 4 @2355 has 65 MA's), (8, 2520), (11, 2601), (13, 2637), (14, 2649), (17, 2682), (21, 2778), (26, 2874), (27, 2877), (32, 2982), (33, 2985), (34, 2997), (35, 3000), (37, 3021), (38, 3039), (49, 3234), (51, 3258), (52, 3357), (68, 3567), (69, 3669), (70, 3672),

Gene: Airmid_4 Start: 2465, Stop: 3403, Start Num: 7

Candidate Starts for Airmid_4:

(2, 2276), (Start: 3 @2342 has 4 MA's), (Start: 4 @2354 has 65 MA's), (Start: 7 @2465 has 2 MA's), (9, 2585), (10, 2591), (20, 2738), (22, 2774), (30, 2879), (39, 2972), (40, 2981), (44, 3005), (47, 3065), (50, 3161), (53, 3275), (56, 3317), (58, 3335), (61, 3362), (63, 3389), (64, 3395),

Gene: Aneem_7 Start: 4196, Stop: 5410, Start Num: 4

Candidate Starts for Aneem_7:

(Start: 4 @4196 has 65 MA's), (6, 4298), (11, 4430), (18, 4556), (23, 4649), (24, 4652), (28, 4688), (29, 4706), (31, 4730), (34, 4748), (36, 4760), (49, 4943), (50, 4961), (51, 4967), (54, 5087), (65, 5243), (68, 5297), (69, 5399), (70, 5402),

Gene: Aragog_4 Start: 2373, Stop: 3710, Start Num: 3

Candidate Starts for Aragog_4:

(1, 2226), (Start: 3 @2373 has 4 MA's), (Start: 4 @2385 has 65 MA's), (8, 2550), (11, 2631), (13, 2667), (14, 2679), (17, 2712), (21, 2808), (26, 2904), (27, 2907), (32, 3012), (33, 3015), (34, 3027), (35, 3030), (37, 3051), (38, 3069), (49, 3264), (51, 3288), (52, 3387), (68, 3597), (69, 3699), (70, 3702),

Gene: Archetta_4 Start: 2385, Stop: 3440, Start Num: 4

Candidate Starts for Archetta_4:

(Start: 3 @2373 has 4 MA's), (Start: 4 @2385 has 65 MA's), (Start: 7 @2496 has 2 MA's), (10, 2613), (15, 2661), (25, 2853), (30, 2901), (41, 3015), (42, 3018), (45, 3057), (47, 3099), (52, 3300), (57, 3363), (58, 3369), (64, 3432),

Gene: Astro_4 Start: 2306, Stop: 3343, Start Num: 4

Candidate Starts for Astro_4:

(1, 2147), (Start: 4 @2306 has 65 MA's), (10, 2543), (20, 2690), (55, 3236), (58, 3275), (60, 3299), (64, 3335),

Gene: Bachome_7 Start: 4193, Stop: 5407, Start Num: 4

Candidate Starts for Bachome_7:

(Start: 4 @4193 has 65 MA's), (6, 4295), (11, 4427), (18, 4553), (23, 4646), (24, 4649), (28, 4685), (29, 4703), (34, 4745), (44, 4802), (50, 4958), (51, 4964), (54, 5084), (65, 5240), (68, 5294), (69, 5396), (70, 5399),

Gene: Benedict_4 Start: 2467, Stop: 3405, Start Num: 7

Candidate Starts for Benedict_4:

(2, 2278), (Start: 3 @2344 has 4 MA's), (Start: 4 @2356 has 65 MA's), (Start: 7 @2467 has 2 MA's), (9, 2587), (10, 2593), (20, 2740), (22, 2776), (30, 2881), (39, 2974), (40, 2983), (44, 3007), (47, 3067), (50, 3163), (53, 3277), (56, 3319), (58, 3337), (61, 3364), (63, 3391), (64, 3397),

Gene: Bluefalcon_3 Start: 2352, Stop: 3677, Start Num: 4

Candidate Starts for Bluefalcon_3:

(1, 2193), (Start: 3 @2340 has 4 MA's), (Start: 4 @2352 has 65 MA's), (8, 2517), (11, 2598), (13, 2634), (14, 2646), (17, 2679), (21, 2775), (26, 2871), (27, 2874), (32, 2979), (33, 2982), (34, 2994), (35, 2997), (37, 3018), (38, 3036), (49, 3231), (51, 3255), (52, 3354), (68, 3564), (69, 3666), (70, 3669),

Gene: Bonamassa_4 Start: 2386, Stop: 3603, Start Num: 4

Candidate Starts for Bonamassa_4:

(Start: 3 @2374 has 4 MA's), (Start: 4 @2386 has 65 MA's), (Start: 5 @2479 has 1 MA's), (11, 2620), (18, 2746), (19, 2758), (24, 2842), (28, 2878), (29, 2896), (31, 2920), (34, 2938), (36, 2950), (49, 3133), (59, 3367), (62, 3400), (66, 3448), (67, 3457), (68, 3487), (69, 3589), (70, 3592),

Gene: Bowtie_7 Start: 4196, Stop: 5410, Start Num: 4

Candidate Starts for Bowtie_7:

(Start: 4 @4196 has 65 MA's), (6, 4298), (11, 4430), (18, 4556), (23, 4649), (24, 4652), (28, 4688), (29, 4706), (31, 4730), (34, 4748), (36, 4760), (49, 4943), (50, 4961), (51, 4967), (54, 5087), (65, 5243), (68, 5297), (69, 5399), (70, 5402),

Gene: Bud_7 Start: 4202, Stop: 5416, Start Num: 4

Candidate Starts for Bud_7:

(Start: 4 @4202 has 65 MA's), (6, 4304), (11, 4436), (18, 4562), (23, 4655), (24, 4658), (28, 4694), (29, 4712), (34, 4754), (44, 4811), (50, 4967), (51, 4973), (54, 5093), (65, 5249), (68, 5303), (69, 5405), (70, 5408),

Gene: Chadwick_4 Start: 2353, Stop: 3402, Start Num: 4

Candidate Starts for Chadwick_4:

(2, 2275), (Start: 3 @2341 has 4 MA's), (Start: 4 @2353 has 65 MA's), (9, 2584), (10, 2590), (20, 2737), (22, 2773), (30, 2878), (39, 2971), (40, 2980), (44, 3004), (47, 3064), (50, 3160), (53, 3274), (56, 3316), (58, 3334), (61, 3361), (63, 3388), (64, 3394),

Gene: Conspiracy_4 Start: 2386, Stop: 3441, Start Num: 4

Candidate Starts for Conspiracy_4:

(Start: 3 @2374 has 4 MA's), (Start: 4 @2386 has 65 MA's), (Start: 7 @2497 has 2 MA's), (10, 2614), (15, 2662), (25, 2854), (30, 2902), (41, 3016), (42, 3019), (45, 3058), (47, 3100), (52, 3301), (57, 3364), (58, 3370), (64, 3433),

Gene: Coog_4 Start: 2354, Stop: 3571, Start Num: 4

Candidate Starts for Coog_4:

(Start: 3 @2342 has 4 MA's), (Start: 4 @2354 has 65 MA's), (Start: 5 @2447 has 1 MA's), (11, 2588), (18, 2714), (19, 2726), (24, 2810), (28, 2846), (29, 2864), (31, 2888), (34, 2906), (36, 2918), (49, 3101), (59, 3335), (62, 3368), (66, 3416), (67, 3425), (68, 3455), (69, 3557), (70, 3560),

Gene: Cuco_4 Start: 2385, Stop: 3602, Start Num: 4

Candidate Starts for Cuco_4:

(Start: 3 @2373 has 4 MA's), (Start: 4 @2385 has 65 MA's), (Start: 5 @2478 has 1 MA's), (11, 2619), (18, 2745), (24, 2841), (28, 2877), (29, 2895), (31, 2919), (34, 2937), (36, 2949), (49, 3132), (59, 3366), (62, 3399), (66, 3447), (67, 3456), (68, 3486), (69, 3588), (70, 3591),

Gene: Danforth_3 Start: 2306, Stop: 3358, Start Num: 4

Candidate Starts for Danforth_3:

(1, 2147), (Start: 4 @2306 has 65 MA's), (10, 2543), (25, 2783), (30, 2831), (47, 3029), (51, 3131), (53, 3239), (64, 3350),

Gene: Discoknowium_4 Start: 2385, Stop: 3710, Start Num: 4

Candidate Starts for Discoknowium_4:

(1, 2226), (Start: 3 @2373 has 4 MA's), (Start: 4 @2385 has 65 MA's), (8, 2550), (11, 2631), (13, 2667), (14, 2679), (17, 2712), (21, 2808), (26, 2904), (27, 2907), (32, 3012), (33, 3015), (34, 3027), (35, 3030), (37, 3051), (38, 3069), (49, 3264), (51, 3288), (52, 3387), (68, 3597), (69, 3699), (70, 3702),

Gene: Dixon_4 Start: 2307, Stop: 3344, Start Num: 4

Candidate Starts for Dixon_4:

(1, 2148), (Start: 4 @2307 has 65 MA's), (10, 2544), (20, 2691), (55, 3237), (58, 3276), (60, 3300), (64, 3336),

Gene: Dublin_3 Start: 2354, Stop: 3571, Start Num: 4

Candidate Starts for Dublin_3:

(Start: 3 @2342 has 4 MA's), (Start: 4 @2354 has 65 MA's), (Start: 5 @2447 has 1 MA's), (11, 2588), (18, 2714), (24, 2810), (28, 2846), (29, 2864), (31, 2888), (34, 2906), (36, 2918), (49, 3101), (59, 3335), (62, 3368), (66, 3416), (67, 3425), (68, 3455), (69, 3557), (70, 3560),

Gene: EagleEye_7 Start: 3969, Stop: 4871, Start Num: 4

Candidate Starts for EagleEye_7:

(Start: 4 @3969 has 65 MA's), (10, 4197), (12, 4212), (43, 4479), (46, 4536), (48, 4551), (51, 4644), (52, 4743), (60, 4827), (64, 4863),

Gene: Ebony_7 Start: 4202, Stop: 5416, Start Num: 4

Candidate Starts for Ebony_7:

(Start: 4 @4202 has 65 MA's), (6, 4304), (11, 4436), (18, 4562), (23, 4655), (24, 4658), (28, 4694), (29, 4712), (31, 4736), (34, 4754), (36, 4766), (49, 4949), (50, 4967), (51, 4973), (54, 5093), (65, 5249), (68, 5303), (69, 5405), (70, 5408),

Gene: EITiger69_4 Start: 2354, Stop: 3403, Start Num: 4

Candidate Starts for EITiger69_4:

(2, 2276), (Start: 3 @2342 has 4 MA's), (Start: 4 @2354 has 65 MA's), (Start: 7 @2465 has 2 MA's), (9, 2585), (10, 2591), (20, 2738), (22, 2774), (30, 2879), (39, 2972), (40, 2981), (44, 3005), (47, 3065), (50, 3161), (53, 3275), (56, 3317), (58, 3335), (61, 3362), (63, 3389), (64, 3395),

Gene: Et2Brutus_6 Start: 4199, Stop: 5413, Start Num: 4

Candidate Starts for Et2Brutus_6:

(Start: 4 @4199 has 65 MA's), (6, 4301), (11, 4433), (18, 4559), (23, 4652), (24, 4655), (28, 4691), (29, 4709), (34, 4751), (44, 4808), (50, 4964), (51, 4970), (54, 5090), (65, 5246), (68, 5300), (69, 5402), (70, 5405),

Gene: Expelliarmus_3 Start: 2307, Stop: 3344, Start Num: 4

Candidate Starts for Expelliarmus_3:

(1, 2148), (Start: 4 @2307 has 65 MA's), (10, 2544), (20, 2691), (55, 3237), (58, 3276), (60, 3300), (64, 3336),

Gene: Fibonacci_7 Start: 4199, Stop: 5413, Start Num: 4

Candidate Starts for Fibonacci_7:

(Start: 4 @4199 has 65 MA's), (6, 4301), (11, 4433), (18, 4559), (23, 4652), (24, 4655), (28, 4691), (29, 4709), (34, 4751), (44, 4808), (50, 4964), (51, 4970), (54, 5090), (65, 5246), (68, 5300), (69, 5402), (70, 5405),

Gene: Flaverint_7 Start: 4196, Stop: 5410, Start Num: 4

Candidate Starts for Flaverint_7:

(Start: 4 @4196 has 65 MA's), (6, 4298), (11, 4430), (18, 4556), (23, 4649), (24, 4652), (28, 4688), (29, 4706), (31, 4730), (34, 4748), (36, 4760), (49, 4943), (50, 4961), (51, 4967), (54, 5087), (65, 5243), (68, 5297), (69, 5399), (70, 5402),

Gene: ForGetIt_4 Start: 2412, Stop: 3467, Start Num: 4

Candidate Starts for ForGetIt_4:

(Start: 3 @2400 has 4 MA's), (Start: 4 @2412 has 65 MA's), (Start: 7 @2523 has 2 MA's), (10, 2640), (15, 2688), (25, 2880), (30, 2928), (41, 3042), (42, 3045), (45, 3084), (47, 3126), (52, 3327), (57, 3390), (58, 3396), (64, 3459),

Gene: George_3 Start: 2385, Stop: 3602, Start Num: 4

Candidate Starts for George_3:

(Start: 3 @2373 has 4 MA's), (Start: 4 @2385 has 65 MA's), (Start: 5 @2478 has 1 MA's), (11, 2619), (18, 2745), (19, 2757), (24, 2841), (28, 2877), (29, 2895), (31, 2919), (34, 2937), (36, 2949), (49, 3132), (59, 3366), (62, 3399), (66, 3447), (67, 3456), (68, 3486), (69, 3588), (70, 3591),

Gene: Ghouboy_4 Start: 2354, Stop: 3679, Start Num: 4

Candidate Starts for Ghouboy_4:

(1, 2195), (Start: 3 @2342 has 4 MA's), (Start: 4 @2354 has 65 MA's), (8, 2519), (11, 2600), (13, 2636), (14, 2648), (17, 2681), (21, 2777), (26, 2873), (27, 2876), (32, 2981), (33, 2984), (34, 2996), (35, 2999), (37, 3020), (38, 3038), (44, 3095), (49, 3233), (51, 3257), (52, 3356), (68, 3566), (69, 3668), (70, 3671),

Gene: Gilberta_7 Start: 4193, Stop: 5407, Start Num: 4

Candidate Starts for Gilberta_7:

(Start: 4 @4193 has 65 MA's), (6, 4295), (11, 4427), (18, 4553), (23, 4646), (24, 4649), (28, 4685), (29, 4703), (31, 4727), (34, 4745), (36, 4757), (49, 4940), (50, 4958), (51, 4964), (54, 5084), (65, 5240), (68, 5294), (69, 5396), (70, 5399),

Gene: Groundhog_3 Start: 2308, Stop: 3345, Start Num: 4

Candidate Starts for Groundhog_3:

(1, 2149), (Start: 4 @2308 has 65 MA's), (10, 2545), (20, 2692), (55, 3238), (58, 3277), (60, 3301), (64, 3337),

Gene: HuhtaEnerson15_4 Start: 2386, Stop: 3603, Start Num: 4

Candidate Starts for HuhtaEnerson15_4:

(Start: 3 @2374 has 4 MA's), (Start: 4 @2386 has 65 MA's), (Start: 5 @2479 has 1 MA's), (11, 2620), (18, 2746), (19, 2758), (24, 2842), (28, 2878), (29, 2896), (31, 2920), (34, 2938), (36, 2950), (49, 3133), (59, 3367), (62, 3400), (66, 3448), (67, 3457), (68, 3487), (69, 3589), (70, 3592),

Gene: Hutc2_7 Start: 4199, Stop: 5413, Start Num: 4

Candidate Starts for Hutc2_7:

(Start: 4 @4199 has 65 MA's), (6, 4301), (11, 4433), (18, 4559), (23, 4652), (24, 4655), (28, 4691), (29, 4709), (34, 4751), (44, 4808), (50, 4964), (51, 4970), (54, 5090), (65, 5246), (68, 5300), (69, 5402), (70, 5405),

Gene: Insomnia_6 Start: 4196, Stop: 5410, Start Num: 4

Candidate Starts for Insomnia_6:

(Start: 4 @4196 has 65 MA's), (6, 4298), (11, 4430), (18, 4556), (23, 4649), (24, 4652), (28, 4688), (29, 4706), (31, 4730), (34, 4748), (36, 4760), (49, 4943), (50, 4961), (51, 4967), (54, 5087), (65, 5243), (68, 5297), (69, 5399), (70, 5402),

Gene: Jabiru_4 Start: 2354, Stop: 3403, Start Num: 4

Candidate Starts for Jabiru_4:

(2, 2276), (Start: 3 @2342 has 4 MA's), (Start: 4 @2354 has 65 MA's), (Start: 7 @2465 has 2 MA's), (9, 2585), (10, 2591), (20, 2738), (22, 2774), (30, 2879), (39, 2972), (40, 2981), (44, 3005), (47, 3065), (50, 3161), (53, 3275), (56, 3317), (58, 3335), (61, 3362), (63, 3389), (64, 3395),

Gene: Jabith_7 Start: 4196, Stop: 5410, Start Num: 4

Candidate Starts for Jabith_7:

(Start: 4 @4196 has 65 MA's), (6, 4298), (11, 4430), (18, 4556), (23, 4649), (24, 4652), (28, 4688), (29, 4706), (31, 4730), (34, 4748), (36, 4760), (49, 4943), (50, 4961), (51, 4967), (54, 5087), (65, 5243), (68, 5297), (69, 5399), (70, 5402),

Gene: Joselito_7 Start: 4196, Stop: 5410, Start Num: 4

Candidate Starts for Joselito_7:

(Start: 4 @4196 has 65 MA's), (6, 4298), (11, 4430), (18, 4556), (23, 4649), (24, 4652), (28, 4688), (29, 4706), (31, 4730), (34, 4748), (36, 4760), (49, 4943), (50, 4961), (51, 4967), (54, 5087), (65, 5243), (68, 5297), (69, 5399), (70, 5402),

Gene: Jovo_4 Start: 2374, Stop: 3711, Start Num: 3

Candidate Starts for Jovo_4:

(1, 2227), (Start: 3 @2374 has 4 MA's), (Start: 4 @2386 has 65 MA's), (8, 2551), (11, 2632), (13, 2668), (14, 2680), (17, 2713), (21, 2809), (26, 2905), (27, 2908), (32, 3013), (33, 3016), (34, 3028), (35, 3031), (37, 3052), (38, 3070), (49, 3265), (51, 3289), (52, 3388), (68, 3598), (69, 3700), (70, 3703),

Gene: Lev2_4 Start: 2385, Stop: 3440, Start Num: 4

Candidate Starts for Lev2_4:

(Start: 3 @2373 has 4 MA's), (Start: 4 @2385 has 65 MA's), (Start: 7 @2496 has 2 MA's), (10, 2613), (15, 2661), (25, 2853), (30, 2901), (41, 3015), (42, 3018), (45, 3057), (47, 3099), (52, 3300), (57, 3363), (58, 3369), (64, 3432),

Gene: LittleCherry_4 Start: 2387, Stop: 3604, Start Num: 4

Candidate Starts for LittleCherry_4:

(Start: 3 @2375 has 4 MA's), (Start: 4 @2387 has 65 MA's), (Start: 5 @2480 has 1 MA's), (11, 2621), (18, 2747), (19, 2759), (24, 2843), (28, 2879), (29, 2897), (31, 2921), (34, 2939), (36, 2951), (49, 3134), (59, 3368), (62, 3401), (66, 3449), (67, 3458), (68, 3488), (69, 3590), (70, 3593),

Gene: Lucivia_7 Start: 4193, Stop: 5407, Start Num: 4

Candidate Starts for Lucivia_7:

(Start: 4 @4193 has 65 MA's), (6, 4295), (11, 4427), (18, 4553), (23, 4646), (24, 4649), (28, 4685), (29, 4703), (31, 4727), (34, 4745), (36, 4757), (49, 4940), (50, 4958), (51, 4964), (54, 5084), (65, 5240), (68, 5294), (69, 5396), (70, 5399),

Gene: Lucyedi_7 Start: 3969, Stop: 4871, Start Num: 4

Candidate Starts for Lucyedi_7:

(Start: 4 @3969 has 65 MA's), (10, 4197), (43, 4479), (46, 4536), (48, 4551), (51, 4644), (52, 4743), (64, 4863),

Gene: MaCh_7 Start: 4193, Stop: 5407, Start Num: 4

Candidate Starts for MaCh_7:

(Start: 4 @4193 has 65 MA's), (6, 4295), (11, 4427), (18, 4553), (23, 4646), (24, 4649), (28, 4685), (29, 4703), (31, 4727), (34, 4745), (36, 4757), (49, 4940), (50, 4958), (51, 4964), (54, 5084), (65, 5240), (68, 5294), (69, 5396), (70, 5399),

Gene: Mabel_7 Start: 4208, Stop: 5422, Start Num: 4

Candidate Starts for Mabel_7:

(Start: 4 @4208 has 65 MA's), (6, 4310), (11, 4442), (18, 4568), (23, 4661), (24, 4664), (28, 4700), (29, 4718), (34, 4760), (36, 4772), (44, 4817), (51, 4979), (54, 5099), (65, 5255), (68, 5309), (69, 5411), (70, 5414),

Gene: MarysWell_3 Start: 2448, Stop: 3572, Start Num: 5

Candidate Starts for MarysWell_3:

(Start: 3 @2343 has 4 MA's), (Start: 4 @2355 has 65 MA's), (Start: 5 @2448 has 1 MA's), (11, 2589), (18, 2715), (24, 2811), (28, 2847), (29, 2865), (31, 2889), (34, 2907), (36, 2919), (49, 3102), (59, 3336), (62, 3369), (66, 3417), (67, 3426), (68, 3456), (69, 3558), (70, 3561),

Gene: Micasa_3 Start: 2448, Stop: 3572, Start Num: 5

Candidate Starts for Micasa_3:

(Start: 3 @2343 has 4 MA's), (Start: 4 @2355 has 65 MA's), (Start: 5 @2448 has 1 MA's), (11, 2589), (18, 2715), (19, 2727), (24, 2811), (28, 2847), (29, 2865), (31, 2889), (34, 2907), (36, 2919), (49, 3102), (59, 3336), (62, 3369), (66, 3417), (67, 3426), (68, 3456), (69, 3558), (70, 3561),

Gene: Midas2_4 Start: 2354, Stop: 3571, Start Num: 4

Candidate Starts for Midas2_4:

(Start: 3 @2342 has 4 MA's), (Start: 4 @2354 has 65 MA's), (Start: 5 @2447 has 1 MA's), (11, 2588), (18, 2714), (19, 2726), (24, 2810), (28, 2846), (29, 2864), (31, 2888), (34, 2906), (36, 2918), (49, 3101), (59, 3335), (62, 3368), (66, 3416), (67, 3425), (68, 3455), (69, 3557), (70, 3560),

Gene: Milcery_4 Start: 2385, Stop: 3602, Start Num: 4

Candidate Starts for Milcery_4:

(Start: 3 @2373 has 4 MA's), (Start: 4 @2385 has 65 MA's), (Start: 5 @2478 has 1 MA's), (11, 2619), (18, 2745), (19, 2757), (24, 2841), (28, 2877), (29, 2895), (31, 2919), (34, 2937), (36, 2949), (49, 3132), (59, 3366), (62, 3399), (66, 3447), (67, 3456), (68, 3486), (69, 3588), (70, 3591),

Gene: Mulciber_7 Start: 4199, Stop: 5413, Start Num: 4

Candidate Starts for Mulciber_7:

(Start: 4 @4199 has 65 MA's), (6, 4301), (11, 4433), (18, 4559), (23, 4652), (24, 4655), (28, 4691), (29, 4709), (34, 4751), (44, 4808), (50, 4964), (51, 4970), (54, 5090), (65, 5246), (68, 5300), (69, 5402), (70, 5405),

Gene: Munch_7 Start: 4196, Stop: 5410, Start Num: 4

Candidate Starts for Munch_7:

(Start: 4 @4196 has 65 MA's), (6, 4298), (11, 4430), (18, 4556), (23, 4649), (24, 4652), (28, 4688), (29, 4706), (31, 4730), (34, 4748), (36, 4760), (49, 4943), (50, 4961), (51, 4967), (54, 5087), (65, 5243), (68, 5297), (69, 5399), (70, 5402),

Gene: NearlyHeadless_4 Start: 2306, Stop: 3358, Start Num: 4

Candidate Starts for NearlyHeadless_4:

(Start: 4 @2306 has 65 MA's), (10, 2543), (38, 2912), (47, 3029), (51, 3131), (53, 3239), (57, 3284), (64, 3350),

Gene: Orange_7 Start: 4196, Stop: 5410, Start Num: 4

Candidate Starts for Orange_7:

(Start: 4 @4196 has 65 MA's), (6, 4298), (11, 4430), (18, 4556), (23, 4649), (24, 4652), (28, 4688), (29, 4706), (31, 4730), (34, 4748), (36, 4760), (49, 4943), (50, 4961), (51, 4967), (54, 5087), (65, 5243), (68, 5297), (69, 5399), (70, 5402),

Gene: PainterBoy_7 Start: 3969, Stop: 4871, Start Num: 4

Candidate Starts for PainterBoy_7:

(Start: 4 @3969 has 65 MA's), (10, 4197), (43, 4479), (46, 4536), (48, 4551), (51, 4644), (52, 4743), (64, 4863),

Gene: Petersenfast_6 Start: 4199, Stop: 5413, Start Num: 4

Candidate Starts for Petersenfast_6:

(Start: 4 @4199 has 65 MA's), (6, 4301), (11, 4433), (18, 4559), (23, 4652), (24, 4655), (28, 4691), (29, 4709), (34, 4751), (44, 4808), (50, 4964), (51, 4970), (54, 5090), (65, 5246), (68, 5300), (69, 5402), (70, 5405),

Gene: PetterN_4 Start: 2354, Stop: 3403, Start Num: 4

Candidate Starts for PetterN_4:

(Start: 3 @2342 has 4 MA's), (Start: 4 @2354 has 65 MA's), (Start: 7 @2465 has 2 MA's), (9, 2585), (10, 2591), (20, 2738), (22, 2774), (30, 2879), (39, 2972), (40, 2981), (44, 3005), (47, 3065), (50, 3161), (53, 3275), (56, 3317), (58, 3335), (61, 3362), (63, 3389), (64, 3395),

Gene: Phillis_4 Start: 2306, Stop: 3343, Start Num: 4

Candidate Starts for Phillis_4:

(1, 2147), (Start: 4 @2306 has 65 MA's), (10, 2543), (20, 2690), (55, 3236), (58, 3275), (60, 3299), (64, 3335),

Gene: Phlorence_4 Start: 2373, Stop: 3710, Start Num: 3

Candidate Starts for Phlorence_4:

(1, 2226), (Start: 3 @2373 has 4 MA's), (Start: 4 @2385 has 65 MA's), (8, 2550), (11, 2631), (13, 2667), (14, 2679), (17, 2712), (21, 2808), (26, 2904), (27, 2907), (32, 3012), (33, 3015), (34, 3027), (35, 3030), (37, 3051), (38, 3069), (49, 3264), (51, 3288), (52, 3387), (68, 3597), (69, 3699), (70, 3702),

Gene: PickleBack_4 Start: 2386, Stop: 3441, Start Num: 4

Candidate Starts for PickleBack_4:

(Start: 3 @2374 has 4 MA's), (Start: 4 @2386 has 65 MA's), (Start: 7 @2497 has 2 MA's), (10, 2614), (15, 2662), (25, 2854), (30, 2902), (41, 3016), (42, 3019), (45, 3058), (47, 3100), (52, 3301), (57, 3364), (58, 3370), (64, 3433),

Gene: Roary_4 Start: 2306, Stop: 3343, Start Num: 4

Candidate Starts for Roary_4:

(1, 2147), (Start: 4 @2306 has 65 MA's), (10, 2543), (20, 2690), (55, 3236), (58, 3275), (60, 3299), (64, 3335),

Gene: Saintus_4 Start: 2306, Stop: 3358, Start Num: 4

Candidate Starts for Saintus_4:

(Start: 4 @2306 has 65 MA's), (10, 2543), (16, 2600), (25, 2783), (47, 3029), (51, 3131), (53, 3239), (57, 3284), (64, 3350),

Gene: Salz_7 Start: 4196, Stop: 5410, Start Num: 4

Candidate Starts for Salz_7:

(Start: 4 @4196 has 65 MA's), (6, 4298), (11, 4430), (18, 4556), (23, 4649), (24, 4652), (28, 4688), (29, 4706), (34, 4748), (44, 4805), (50, 4961), (51, 4967), (54, 5087), (65, 5243), (68, 5297), (69, 5399), (70, 5402),

Gene: Scorpia_4 Start: 2355, Stop: 3404, Start Num: 4

Candidate Starts for Scorpia_4:

(2, 2277), (Start: 3 @2343 has 4 MA's), (Start: 4 @2355 has 65 MA's), (Start: 7 @2466 has 2 MA's), (10, 2592), (20, 2739), (22, 2775), (30, 2880), (39, 2973), (40, 2982), (44, 3006), (47, 3066), (50, 3162), (53, 3276), (56, 3318), (58, 3336), (61, 3363), (63, 3390), (64, 3396),

Gene: Sham4_7 Start: 4199, Stop: 5413, Start Num: 4

Candidate Starts for Sham4_7:

(Start: 4 @4199 has 65 MA's), (6, 4301), (11, 4433), (18, 4559), (23, 4652), (24, 4655), (28, 4691), (29, 4709), (34, 4751), (44, 4808), (50, 4964), (51, 4970), (54, 5090), (65, 5246), (68, 5300), (69, 5402), (70, 5405),

Gene: Smeadley_4 Start: 2306, Stop: 3343, Start Num: 4

Candidate Starts for Smeadley_4:

(1, 2147), (Start: 4 @2306 has 65 MA's), (10, 2543), (20, 2690), (55, 3236), (58, 3275), (60, 3299), (64, 3335),

Gene: Snape_7 Start: 4202, Stop: 5416, Start Num: 4

Candidate Starts for Snape_7:

(Start: 4 @4202 has 65 MA's), (6, 4304), (11, 4436), (18, 4562), (23, 4655), (24, 4658), (28, 4694), (29, 4712), (34, 4754), (44, 4811), (50, 4967), (51, 4973), (54, 5093), (65, 5249), (68, 5303), (69, 5405), (70, 5408),

Gene: Stephig9_4 Start: 2307, Stop: 3344, Start Num: 4

Candidate Starts for Stephig9_4:

(1, 2148), (Start: 4 @2307 has 65 MA's), (10, 2544), (20, 2691), (55, 3237), (58, 3276), (60, 3300), (64, 3336),

Gene: Swirley_4 Start: 2354, Stop: 3571, Start Num: 4

Candidate Starts for Swirley_4:

(Start: 3 @2342 has 4 MA's), (Start: 4 @2354 has 65 MA's), (Start: 5 @2447 has 1 MA's), (11, 2588), (18, 2714), (19, 2726), (24, 2810), (28, 2846), (29, 2864), (31, 2888), (34, 2906), (36, 2918), (49, 3101), (59, 3335), (62, 3368), (66, 3416), (67, 3425), (68, 3455), (69, 3557), (70, 3560),

Gene: SydNat_4 Start: 2354, Stop: 3679, Start Num: 4

Candidate Starts for SydNat_4:

(1, 2195), (Start: 3 @2342 has 4 MA's), (Start: 4 @2354 has 65 MA's), (8, 2519), (11, 2600), (13, 2636), (14, 2648), (17, 2681), (21, 2777), (26, 2873), (27, 2876), (32, 2981), (33, 2984), (34, 2996), (35, 2999), (37, 3020), (38, 3038), (44, 3095), (49, 3233), (51, 3257), (52, 3356), (68, 3566), (69, 3668), (70, 3671),

Gene: Tarynearal_3 Start: 2383, Stop: 3600, Start Num: 4

Candidate Starts for Tarynearal_3:

(Start: 3 @2371 has 4 MA's), (Start: 4 @2383 has 65 MA's), (Start: 5 @2476 has 1 MA's), (11, 2617), (18, 2743), (19, 2755), (24, 2839), (28, 2875), (29, 2893), (31, 2917), (34, 2935), (36, 2947), (49, 3130), (59, 3364), (62, 3397), (66, 3445), (67, 3454), (68, 3484), (69, 3586), (70, 3589),

Gene: Theia_3 Start: 2355, Stop: 3572, Start Num: 4

Candidate Starts for Theia_3:

(Start: 3 @2343 has 4 MA's), (Start: 4 @2355 has 65 MA's), (Start: 5 @2448 has 1 MA's), (11, 2589), (18, 2715), (24, 2811), (28, 2847), (29, 2865), (31, 2889), (34, 2907), (36, 2919), (49, 3102), (59, 3336), (62, 3369), (66, 3417), (67, 3426), (68, 3456), (69, 3558), (70, 3561),

Gene: Tiger_4 Start: 2385, Stop: 3440, Start Num: 4

Candidate Starts for Tiger_4:

(Start: 3 @2373 has 4 MA's), (Start: 4 @2385 has 65 MA's), (Start: 7 @2496 has 2 MA's), (10, 2613), (15, 2661), (25, 2853), (30, 2901), (41, 3015), (42, 3018), (45, 3057), (47, 3099), (52, 3300), (57, 3363), (58, 3369), (64, 3432),

Gene: Timothy_7 Start: 4196, Stop: 5410, Start Num: 4

Candidate Starts for Timothy_7:

(Start: 4 @4196 has 65 MA's), (6, 4298), (11, 4430), (18, 4556), (23, 4649), (24, 4652), (28, 4688), (29, 4706), (31, 4730), (34, 4748), (36, 4760), (49, 4943), (50, 4961), (51, 4967), (54, 5087), (65, 5243), (68, 5297), (69, 5399), (70, 5402),

Gene: TinyTimmy_6 Start: 4196, Stop: 5410, Start Num: 4

Candidate Starts for TinyTimmy_6:

(Start: 4 @4196 has 65 MA's), (6, 4298), (11, 4430), (18, 4556), (23, 4649), (24, 4652), (28, 4688), (29, 4706), (31, 4730), (34, 4748), (36, 4760), (49, 4943), (50, 4961), (51, 4967), (54, 5087), (65, 5243), (68, 5297), (69, 5399), (70, 5402),

Gene: UnionJack_4 Start: 2352, Stop: 3407, Start Num: 4

Candidate Starts for UnionJack_4:

(Start: 3 @2340 has 4 MA's), (Start: 4 @2352 has 65 MA's), (Start: 7 @2463 has 2 MA's), (10, 2580), (15, 2628), (25, 2820), (30, 2868), (41, 2982), (42, 2985), (45, 3024), (47, 3066), (52, 3267), (57, 3330), (58, 3336), (64, 3399),

Gene: Zolita_3 Start: 2354, Stop: 3679, Start Num: 4

Candidate Starts for Zolita_3:

(1, 2195), (Start: 3 @2342 has 4 MA's), (Start: 4 @2354 has 65 MA's), (8, 2519), (11, 2600), (13, 2636), (14, 2648), (17, 2681), (21, 2777), (26, 2873), (27, 2876), (32, 2981), (33, 2984), (34, 2996), (35, 2999), (37, 3020), (38, 3038), (44, 3095), (49, 3233), (51, 3257), (52, 3356), (68, 3566), (69, 3668), (70, 3671),