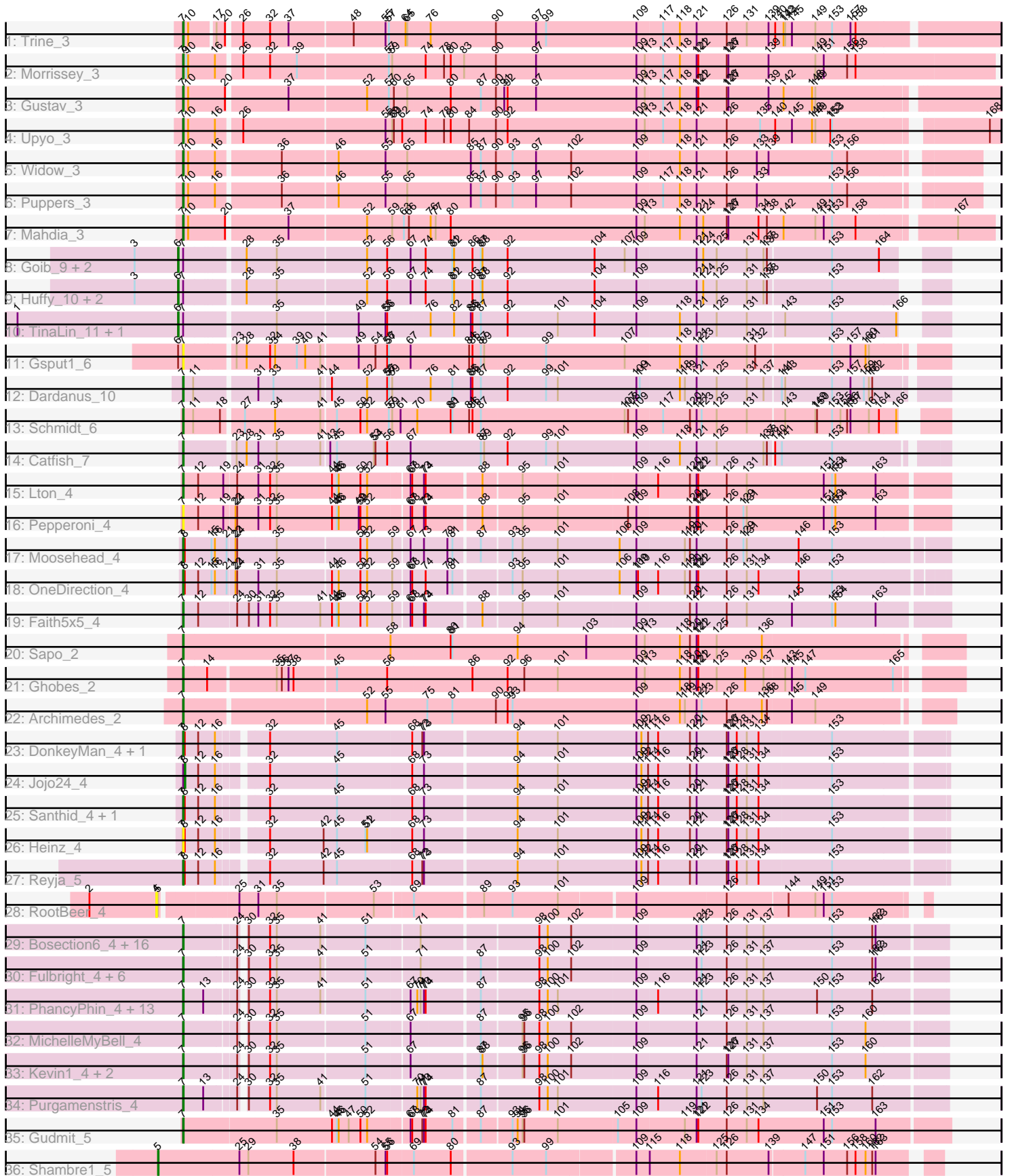


Pham 162999



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 162999 Report

This analysis was run 04/28/24 on database version 559.

Pham number 162999 has 80 members, 10 are drafts.

Phages represented in each track:

- Track 1 : Trine\_3
- Track 2 : Morrissey\_3
- Track 3 : Gustav\_3
- Track 4 : Upyo\_3
- Track 5 : Widow\_3
- Track 6 : Puppies\_3
- Track 7 : Mahdia\_3
- Track 8 : Goib\_9, Vendetta\_8, Splinter\_8
- Track 9 : Huffy\_10, TZGordon\_10, DinoDaryn\_10
- Track 10 : TinaLin\_11, Banquo\_12
- Track 11 : Gspu1\_6
- Track 12 : Dardanus\_10
- Track 13 : Schmidt\_6
- Track 14 : Catfish\_7
- Track 15 : Lton\_4
- Track 16 : Pepperoni\_4
- Track 17 : Moosehead\_4
- Track 18 : OneDirection\_4
- Track 19 : Faith5x5\_4
- Track 20 : Sapo\_2
- Track 21 : Ghobes\_2
- Track 22 : Archimedes\_2
- Track 23 : DonkeyMan\_4, Hibiscus\_4
- Track 24 : Jojo24\_4
- Track 25 : Santhid\_4, Tarzan\_4
- Track 26 : Heinz\_4
- Track 27 : Reyja\_5
- Track 28 : RootBeer\_4
- Track 29 : Bosection6\_4, Philonius\_4, Aggie\_4, Parmesanjohn\_4, Charlie\_4, Melville\_4, Duplicity\_4, Magsby\_4, Pipsqueaks\_4, Gex\_4, Smurph\_4, Schnauzer\_4, Silvy\_4, Xerxes\_4, Journey\_4, Chewbacca\_4, Tapioca\_4
- Track 30 : Fulbright\_4, Xeno\_4, Andies\_4, Scitech\_4, Carcharodon\_4, Silvafighter\_4, Phloss\_4
- Track 31 : PhancyPhin\_4, Snekmaggedon\_4, SpongeBob\_4, Nenae\_4, SkinnyPete\_4, BabeRuth\_4, ShrimpFriedEgg\_4, Raymond7\_4, Rebel\_4, Panchino\_4, Phrann\_4, Shweta\_4, Jamie19\_4, Redi\_4
- Track 32 : MichelleMyBell\_4

- Track 33 : Kevin1\_4, Butters\_4, Rubeelu\_4
- Track 34 : Purgamenstris\_4
- Track 35 : Gudmit\_5
- Track 36 : Shambre1\_5

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

The start number called the most often in the published annotations is 7, it was called in 60 of the 70 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Aggie\_4, Andies\_4, Archimedes\_2, BabeRuth\_4, Bosection6\_4, Butters\_4, Carcharodon\_4, Catfish\_7, Charlie\_4, Chewbacca\_4, Dardanus\_10, DonkeyMan\_4, Duplicity\_4, Faith5x5\_4, Fulbright\_4, Gex\_4, Ghobes\_2, Gspu1\_6, Gudmit\_5, Gustav\_3, Heinz\_4, Hibiscus\_4, Jamie19\_4, Journey\_4, Kevin1\_4, Lton\_4, Magsby\_4, Mahdia\_3, Melville\_4, MichelleMyBell\_4, Moosehead\_4, Morrissey\_3, Nenae\_4, OneDirection\_4, Panchino\_4, ParmesanJohn\_4, Pepperoni\_4, PhancyPhin\_4, Philonius\_4, Phloss\_4, Phrann\_4, Pipsqueaks\_4, Puppies\_3, Purgamenstris\_4, Raymond7\_4, Rebel\_4, Redi\_4, Reyja\_5, Rubeelu\_4, Santhid\_4, Sapo\_2, Schmidt\_6, Schnauzer\_4, Scitech\_4, ShrimpFriedEgg\_4, Shweta\_4, Silvafighter\_4, Silvy\_4, SkinnyPete\_4, Smurph\_4, Snekmaggon\_4, SpongeBob\_4, Tapioca\_4, Tarzan\_4, Trine\_3, Upyo\_3, Widow\_3, Xeno\_4, Xerxes\_4,

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

- Banquo\_12, DinoDaryn\_10, Goib\_9, Huffy\_10, Jojo24\_4, Splinter\_8, TZGordon\_10, TinaLin\_11, Vendetta\_8,

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

- RootBeer\_4, Shambre1\_5,

**Summary by start number:**

Start 4:

- Found in 1 of 80 ( 1.2% ) of genes in pham
- No Manual Annotations of this start.
- Called 100.0% of time when present
- Phage (with cluster) where this start called: RootBeer\_4 (FA),

Start 5:

- Found in 2 of 80 ( 2.5% ) of genes in pham
- Manual Annotations of this start: 1 of 70
- Called 50.0% of time when present
- Phage (with cluster) where this start called: Shambre1\_5 (singleton),

Start 6:

- Found in 9 of 80 ( 11.2% ) of genes in pham
- Manual Annotations of this start: 8 of 70
- Called 88.9% of time when present
- Phage (with cluster) where this start called: Banquo\_12 (CU1), DinoDaryn\_10 (CU1), Goib\_9 (CU1), Huffy\_10 (CU1), Splinter\_8 (CU1), TZGordon\_10 (CU1),

TinaLin\_11 (CU1), Vendetta\_8 (CU1),

Start 7:

- Found in 78 of 80 ( 97.5% ) of genes in pham
- Manual Annotations of this start: 60 of 70
- Called 88.5% of time when present
- Phage (with cluster) where this start called: Aggie\_4 (N), Andies\_4 (N), Archimedes\_2 (DA), BabeRuth\_4 (N), Bosection6\_4 (N), Butters\_4 (N), Carcharodon\_4 (N), Catfish\_7 (CU5), Charlie\_4 (N), Chewbacca\_4 (N), Dardanus\_10 (CU3), DonkeyMan\_4 (DY), Duplicity\_4 (N), Faith5x5\_4 (CZ6), Fulbright\_4 (N), Gex\_4 (N), Ghobes\_2 (DA), Gspu1\_6 (CU2), Gudmit\_5 (singleton), Gustav\_3 (CD), Heinz\_4 (DY), Hibiscus\_4 (DY), Jamie19\_4 (N), Journey\_4 (N), Kevin1\_4 (N), Lton\_4 (CZ), Magsby\_4 (N), Mahdia\_3 (CD), Melville\_4 (N), MichelleMyBell\_4 (N), Moosehead\_4 (CZ6), Morrissey\_3 (CD), Nenae\_4 (N), OneDirection\_4 (CZ6), Panchino\_4 (N), Parmesanjohn\_4 (N), Pepperoni\_4 (CZ), PhancyPhin\_4 (N), Philonius\_4 (N), Phloss\_4 (N), Phrann\_4 (N), Pipsqueaks\_4 (N), Puppies\_3 (CD), Purgamenstris\_4 (N), Raymond7\_4 (N), Rebel\_4 (N), Redi\_4 (N), Reyja\_5 (DY), Rubeelu\_4 (N), Santhid\_4 (DY), Sapo\_2 (DA), Schmidt\_6 (CU4), Schnauzer\_4 (N), Scitech\_4 (N), ShrimpFriedEgg\_4 (N), Shweta\_4 (N), Silvafighter\_4 (N), Silvy\_4 (N), SkinnyPete\_4 (N), Smurph\_4 (N), Snekmaggon\_4 (N), SpongeBob\_4 (N), Tapioca\_4 (N), Tarzan\_4 (DY), Trine\_3 (CD), Upyo\_3 (CD), Widow\_3 (CD), Xeno\_4 (N), Xerxes\_4 (N),

Start 8:

- Found in 9 of 80 ( 11.2% ) of genes in pham
- Manual Annotations of this start: 1 of 70
- Called 11.1% of time when present
- Phage (with cluster) where this start called: Jojo24\_4 (DY),

### Summary by clusters:

There are 13 clusters represented in this pham: singleton, CU4, DA, CU2, CU1, CZ, CZ6, CU5, CD, FA, DY, CU3, N,

Info for manual annotations of cluster CD:

- Start number 7 was manually annotated 7 times for cluster CD.

Info for manual annotations of cluster CU1:

- Start number 6 was manually annotated 8 times for cluster CU1.

Info for manual annotations of cluster CU3:

- Start number 7 was manually annotated 1 time for cluster CU3.

Info for manual annotations of cluster CU4:

- Start number 7 was manually annotated 1 time for cluster CU4.

Info for manual annotations of cluster CU5:

- Start number 7 was manually annotated 1 time for cluster CU5.

Info for manual annotations of cluster CZ:

- Start number 7 was manually annotated 1 time for cluster CZ.

Info for manual annotations of cluster CZ6:

- Start number 7 was manually annotated 3 times for cluster CZ6.

Info for manual annotations of cluster DA:

- Start number 7 was manually annotated 3 times for cluster DA.

Info for manual annotations of cluster DY:

- Start number 7 was manually annotated 4 times for cluster DY.
- Start number 8 was manually annotated 1 time for cluster DY.

Info for manual annotations of cluster N:

- Start number 7 was manually annotated 38 times for cluster N.

### **Gene Information:**

Gene: Aggie\_4 Start: 2249, Stop: 3538, Start Num: 7

Candidate Starts for Aggie\_4:

(Start: 7 @2249 has 60 MA's), (24, 2336), (30, 2342), (32, 2378), (35, 2390), (41, 2468), (51, 2543), (71, 2630), (98, 2825), (100, 2840), (102, 2882), (109, 2996), (121, 3101), (123, 3110), (126, 3155), (131, 3191), (137, 3221), (153, 3344), (162, 3416), (163, 3422),

Gene: Andies\_4 Start: 2249, Stop: 3538, Start Num: 7

Candidate Starts for Andies\_4:

(Start: 7 @2249 has 60 MA's), (24, 2336), (30, 2342), (32, 2378), (35, 2390), (41, 2468), (51, 2543), (71, 2630), (87, 2726), (98, 2825), (100, 2840), (102, 2882), (109, 2996), (121, 3101), (123, 3110), (126, 3155), (131, 3191), (137, 3221), (153, 3344), (162, 3416), (163, 3422),

Gene: Archimedes\_2 Start: 1796, Stop: 3112, Start Num: 7

Candidate Starts for Archimedes\_2:

(Start: 7 @1796 has 60 MA's), (52, 2105), (55, 2138), (75, 2213), (81, 2258), (90, 2333), (92, 2351), (93, 2360), (109, 2582), (118, 2657), (119, 2666), (121, 2687), (123, 2696), (126, 2741), (136, 2804), (138, 2813), (145, 2855), (149, 2897),

Gene: BabeRuth\_4 Start: 2263, Stop: 3552, Start Num: 7

Candidate Starts for BabeRuth\_4:

(Start: 7 @2263 has 60 MA's), (13, 2299), (24, 2350), (30, 2356), (32, 2392), (35, 2404), (41, 2482), (51, 2557), (67, 2629), (70, 2638), (71, 2644), (73, 2650), (74, 2653), (87, 2740), (98, 2839), (100, 2854), (101, 2872), (109, 3010), (116, 3046), (121, 3115), (123, 3124), (126, 3169), (131, 3205), (137, 3235), (150, 3331), (153, 3358), (162, 3430),

Gene: Banquo\_12 Start: 6215, Stop: 7504, Start Num: 6

Candidate Starts for Banquo\_12:

(1, 5927), (Start: 6 @6215 has 8 MA's), (Start: 7 @6224 has 60 MA's), (35, 6374), (49, 6515), (55, 6563), (56, 6566), (76, 6638), (82, 6680), (85, 6707), (86, 6710), (87, 6725), (92, 6770), (101, 6860), (104, 6926), (109, 6998), (118, 7073), (121, 7103), (125, 7139), (131, 7193), (143, 7256), (153, 7340), (166, 7454),

Gene: Bosection6\_4 Start: 2249, Stop: 3538, Start Num: 7

Candidate Starts for Bosection6\_4:

(Start: 7 @2249 has 60 MA's), (24, 2336), (30, 2342), (32, 2378), (35, 2390), (41, 2468), (51, 2543), (71, 2630), (98, 2825), (100, 2840), (102, 2882), (109, 2996), (121, 3101), (123, 3110), (126, 3155), (131, 3191), (137, 3221), (153, 3344), (162, 3416), (163, 3422),

Gene: Butters\_4 Start: 2249, Stop: 3535, Start Num: 7

Candidate Starts for Butters\_4:

(Start: 7 @2249 has 60 MA's), (24, 2336), (30, 2342), (32, 2378), (35, 2390), (51, 2543), (67, 2615), (87, 2726), (88, 2729), (95, 2795), (96, 2798), (98, 2825), (100, 2840), (102, 2882), (109, 2996), (121, 3101), (126, 3155), (127, 3158), (131, 3191), (137, 3221), (153, 3344), (160, 3404),

Gene: Carcharodon\_4 Start: 2249, Stop: 3538, Start Num: 7

Candidate Starts for Carcharodon\_4:

(Start: 7 @2249 has 60 MA's), (24, 2336), (30, 2342), (32, 2378), (35, 2390), (41, 2468), (51, 2543), (71, 2630), (87, 2726), (98, 2825), (100, 2840), (102, 2882), (109, 2996), (121, 3101), (123, 3110), (126, 3155), (131, 3191), (137, 3221), (153, 3344), (162, 3416), (163, 3422),

Gene: Catfish\_7 Start: 4168, Stop: 5466, Start Num: 7

Candidate Starts for Catfish\_7:

(Start: 7 @4168 has 60 MA's), (23, 4246), (28, 4264), (31, 4285), (35, 4318), (41, 4396), (43, 4408), (45, 4420), (53, 4486), (54, 4489), (56, 4510), (67, 4549), (87, 4669), (89, 4675), (92, 4714), (99, 4783), (101, 4804), (109, 4942), (118, 5017), (121, 5047), (125, 5083), (137, 5167), (138, 5173), (140, 5182), (141, 5194), (153, 5284),

Gene: Charlie\_4 Start: 2249, Stop: 3538, Start Num: 7

Candidate Starts for Charlie\_4:

(Start: 7 @2249 has 60 MA's), (24, 2336), (30, 2342), (32, 2378), (35, 2390), (41, 2468), (51, 2543), (71, 2630), (98, 2825), (100, 2840), (102, 2882), (109, 2996), (121, 3101), (123, 3110), (126, 3155), (131, 3191), (137, 3221), (153, 3344), (162, 3416), (163, 3422),

Gene: Chewbacca\_4 Start: 2249, Stop: 3538, Start Num: 7

Candidate Starts for Chewbacca\_4:

(Start: 7 @2249 has 60 MA's), (24, 2336), (30, 2342), (32, 2378), (35, 2390), (41, 2468), (51, 2543), (71, 2630), (98, 2825), (100, 2840), (102, 2882), (109, 2996), (121, 3101), (123, 3110), (126, 3155), (131, 3191), (137, 3221), (153, 3344), (162, 3416), (163, 3422),

Gene: Dardanus\_10 Start: 5244, Stop: 6548, Start Num: 7

Candidate Starts for Dardanus\_10:

(Start: 7 @5244 has 60 MA's), (11, 5262), (31, 5361), (33, 5388), (41, 5472), (44, 5487), (52, 5550), (56, 5586), (57, 5589), (59, 5592), (76, 5658), (81, 5697), (85, 5727), (86, 5730), (87, 5745), (92, 5790), (99, 5859), (101, 5880), (109, 6018), (111, 6024), (118, 6093), (119, 6102), (121, 6123), (125, 6159), (131, 6213), (137, 6243), (141, 6270), (143, 6276), (153, 6360), (157, 6393), (159, 6417), (161, 6426), (162, 6432),

Gene: DinoDaryn\_10 Start: 5301, Stop: 6593, Start Num: 6

Candidate Starts for DinoDaryn\_10:

(3, 5223), (Start: 6 @5301 has 8 MA's), (Start: 7 @5310 has 60 MA's), (28, 5406), (35, 5460), (52, 5616), (56, 5652), (67, 5691), (74, 5715), (81, 5763), (82, 5766), (86, 5796), (87, 5811), (88, 5814), (92, 5856), (104, 6012), (109, 6084), (121, 6189), (124, 6201), (125, 6225), (131, 6279), (137, 6309), (138, 6315), (153, 6426),

Gene: DonkeyMan\_4 Start: 2354, Stop: 3652, Start Num: 7

Candidate Starts for DonkeyMan\_4:

(Start: 7 @2354 has 60 MA's), (Start: 8 @2357 has 1 MA's), (12, 2381), (16, 2411), (32, 2483), (45, 2600), (68, 2732), (72, 2747), (73, 2750), (94, 2906), (101, 2978), (109, 3119), (112, 3128), (114, 3140), (116, 3155), (120, 3212), (121, 3224), (126, 3278), (127, 3281), (128, 3296), (131, 3314), (134, 3335), (153, 3461),

Gene: Duplicity\_4 Start: 2249, Stop: 3538, Start Num: 7

Candidate Starts for Duplicity\_4:

(Start: 7 @2249 has 60 MA's), (24, 2336), (30, 2342), (32, 2378), (35, 2390), (41, 2468), (51, 2543), (71, 2630), (98, 2825), (100, 2840), (102, 2882), (109, 2996), (121, 3101), (123, 3110), (126, 3155), (131, 3191), (137, 3221), (153, 3344), (162, 3416), (163, 3422),

Gene: Faith5x5\_4 Start: 2170, Stop: 3483, Start Num: 7

Candidate Starts for Faith5x5\_4:

(Start: 7 @2170 has 60 MA's), (12, 2197), (24, 2260), (30, 2281), (31, 2296), (32, 2317), (35, 2329), (41, 2407), (44, 2428), (45, 2437), (46, 2440), (50, 2479), (52, 2491), (59, 2533), (67, 2557), (68, 2560), (73, 2578), (74, 2581), (88, 2671), (95, 2737), (101, 2800), (109, 2938), (120, 3031), (121, 3043), (126, 3097), (131, 3133), (145, 3214), (153, 3286), (154, 3292), (163, 3364),

Gene: Fulbright\_4 Start: 2249, Stop: 3538, Start Num: 7

Candidate Starts for Fulbright\_4:

(Start: 7 @2249 has 60 MA's), (24, 2336), (30, 2342), (32, 2378), (35, 2390), (41, 2468), (51, 2543), (71, 2630), (87, 2726), (98, 2825), (100, 2840), (102, 2882), (109, 2996), (121, 3101), (123, 3110), (126, 3155), (131, 3191), (137, 3221), (153, 3344), (162, 3416), (163, 3422),

Gene: Gex\_4 Start: 2249, Stop: 3538, Start Num: 7

Candidate Starts for Gex\_4:

(Start: 7 @2249 has 60 MA's), (24, 2336), (30, 2342), (32, 2378), (35, 2390), (41, 2468), (51, 2543), (71, 2630), (98, 2825), (100, 2840), (102, 2882), (109, 2996), (121, 3101), (123, 3110), (126, 3155), (131, 3191), (137, 3221), (153, 3344), (162, 3416), (163, 3422),

Gene: Ghobes\_2 Start: 1804, Stop: 3138, Start Num: 7

Candidate Starts for Ghobes\_2:

(Start: 7 @1804 has 60 MA's), (14, 1846), (35, 1960), (36, 1969), (37, 1981), (38, 1990), (45, 2062), (56, 2152), (86, 2299), (92, 2359), (96, 2389), (101, 2449), (109, 2590), (113, 2605), (118, 2665), (120, 2683), (121, 2695), (122, 2698), (125, 2731), (130, 2782), (137, 2815), (143, 2851), (145, 2863), (147, 2887), (165, 3043),

Gene: Goib\_9 Start: 5071, Stop: 6363, Start Num: 6

Candidate Starts for Goib\_9:

(3, 4993), (Start: 6 @5071 has 8 MA's), (Start: 7 @5080 has 60 MA's), (28, 5176), (35, 5230), (52, 5386), (56, 5422), (67, 5461), (74, 5485), (81, 5533), (82, 5536), (86, 5566), (87, 5581), (88, 5584), (92, 5626), (104, 5782), (107, 5833), (109, 5854), (121, 5959), (124, 5971), (125, 5995), (131, 6049), (137, 6079), (138, 6085), (153, 6196), (164, 6280),

Gene: Gspu1\_6 Start: 3629, Stop: 4933, Start Num: 7

Candidate Starts for Gspu1\_6:

(Start: 6 @3623 has 8 MA's), (Start: 7 @3629 has 60 MA's), (23, 3707), (28, 3725), (32, 3767), (34, 3776), (39, 3815), (40, 3830), (41, 3857), (49, 3920), (54, 3950), (56, 3971), (57, 3974), (67, 4010), (84, 4109), (86, 4115), (87, 4130), (89, 4136), (99, 4244), (107, 4382), (118, 4478), (121, 4508), (123, 4517), (131, 4598), (132, 4613), (153, 4745), (157, 4778), (160, 4805), (161, 4811),

Gene: Gudmit\_5 Start: 2938, Stop: 4251, Start Num: 7

Candidate Starts for Gudmit\_5:

(Start: 7 @2938 has 60 MA's), (35, 3097), (44, 3196), (45, 3205), (46, 3208), (47, 3226), (50, 3247), (52, 3259), (67, 3325), (68, 3328), (72, 3343), (73, 3346), (74, 3349), (81, 3394), (87, 3436), (93, 3487), (94, 3496), (95, 3505), (96, 3508), (101, 3568), (105, 3673), (109, 3706), (119, 3790), (121, 3811), (122, 3814), (126, 3865), (131, 3901), (134, 3922), (151, 4039), (153, 4054), (163, 4132),

Gene: Gustav\_3 Start: 2120, Stop: 3523, Start Num: 7

Candidate Starts for Gustav\_3:

(Start: 7 @2120 has 60 MA's), (10, 2129), (20, 2192), (37, 2294), (52, 2429), (57, 2468), (60, 2477), (65, 2501), (80, 2576), (87, 2627), (90, 2654), (91, 2666), (92, 2672), (97, 2723), (109, 2903), (113, 2918), (117, 2948), (118, 2978), (121, 3008), (122, 3011), (126, 3062), (127, 3065), (139, 3137), (142, 3164), (148, 3215), (149, 3221),

Gene: Heinz\_4 Start: 2356, Stop: 3654, Start Num: 7

Candidate Starts for Heinz\_4:

(Start: 7 @2356 has 60 MA's), (Start: 8 @2359 has 1 MA's), (12, 2383), (16, 2413), (32, 2485), (42, 2578), (45, 2602), (51, 2653), (52, 2656), (68, 2734), (73, 2752), (94, 2908), (101, 2980), (109, 3121), (112, 3130), (114, 3142), (116, 3157), (120, 3214), (121, 3226), (126, 3280), (127, 3283), (128, 3298), (131, 3316), (134, 3337), (153, 3463),

Gene: Hibiscus\_4 Start: 2356, Stop: 3654, Start Num: 7

Candidate Starts for Hibiscus\_4:

(Start: 7 @2356 has 60 MA's), (Start: 8 @2359 has 1 MA's), (12, 2383), (16, 2413), (32, 2485), (45, 2602), (68, 2734), (72, 2749), (73, 2752), (94, 2908), (101, 2980), (109, 3121), (112, 3130), (114, 3142), (116, 3157), (120, 3214), (121, 3226), (126, 3280), (127, 3283), (128, 3298), (131, 3316), (134, 3337), (153, 3463),

Gene: Huff\_10 Start: 5301, Stop: 6593, Start Num: 6

Candidate Starts for Huff\_10:

(3, 5223), (Start: 6 @5301 has 8 MA's), (Start: 7 @5310 has 60 MA's), (28, 5406), (35, 5460), (52, 5616), (56, 5652), (67, 5691), (74, 5715), (81, 5763), (82, 5766), (86, 5796), (87, 5811), (88, 5814), (92, 5856), (104, 6012), (109, 6084), (121, 6189), (124, 6201), (125, 6225), (131, 6279), (137, 6309), (138, 6315), (153, 6426),

Gene: Jamie19\_4 Start: 2263, Stop: 3552, Start Num: 7

Candidate Starts for Jamie19\_4:

(Start: 7 @2263 has 60 MA's), (13, 2299), (24, 2350), (30, 2356), (32, 2392), (35, 2404), (41, 2482), (51, 2557), (67, 2629), (70, 2638), (71, 2644), (73, 2650), (74, 2653), (87, 2740), (98, 2839), (100, 2854), (101, 2872), (109, 3010), (116, 3046), (121, 3115), (123, 3124), (126, 3169), (131, 3205), (137, 3235), (150, 3331), (153, 3358), (162, 3430),

Gene: Jojo24\_4 Start: 2354, Stop: 3649, Start Num: 8

Candidate Starts for Jojo24\_4:

(Start: 7 @2351 has 60 MA's), (Start: 8 @2354 has 1 MA's), (12, 2378), (16, 2408), (32, 2480), (45, 2597), (68, 2729), (73, 2747), (94, 2903), (101, 2975), (109, 3116), (112, 3125), (114, 3137), (116, 3152), (120, 3209), (121, 3221), (126, 3275), (127, 3278), (128, 3293), (131, 3311), (134, 3332), (153, 3458),

Gene: Journey\_4 Start: 2249, Stop: 3538, Start Num: 7

Candidate Starts for Journey\_4:

(Start: 7 @2249 has 60 MA's), (24, 2336), (30, 2342), (32, 2378), (35, 2390), (41, 2468), (51, 2543), (71, 2630), (98, 2825), (100, 2840), (102, 2882), (109, 2996), (121, 3101), (123, 3110), (126, 3155), (131, 3191), (137, 3221), (153, 3344), (162, 3416), (163, 3422),



Gene: Kevin1\_4 Start: 2249, Stop: 3535, Start Num: 7

Candidate Starts for Kevin1\_4:

(Start: 7 @2249 has 60 MA's), (24, 2336), (30, 2342), (32, 2378), (35, 2390), (51, 2543), (67, 2615), (87, 2726), (88, 2729), (95, 2795), (96, 2798), (98, 2825), (100, 2840), (102, 2882), (109, 2996), (121, 3101), (126, 3155), (127, 3158), (131, 3191), (137, 3221), (153, 3344), (160, 3404),

Gene: Lton\_4 Start: 2174, Stop: 3487, Start Num: 7

Candidate Starts for Lton\_4:

(Start: 7 @2174 has 60 MA's), (12, 2201), (19, 2243), (24, 2264), (31, 2300), (32, 2321), (35, 2333), (44, 2432), (45, 2441), (46, 2444), (50, 2483), (52, 2495), (67, 2561), (68, 2564), (73, 2582), (74, 2585), (88, 2675), (95, 2741), (101, 2804), (109, 2942), (116, 2978), (120, 3035), (121, 3047), (122, 3050), (126, 3101), (131, 3137), (151, 3275), (153, 3290), (154, 3296), (163, 3368),

Gene: Magsby\_4 Start: 2249, Stop: 3538, Start Num: 7

Candidate Starts for Magsby\_4:

(Start: 7 @2249 has 60 MA's), (24, 2336), (30, 2342), (32, 2378), (35, 2390), (41, 2468), (51, 2543), (71, 2630), (98, 2825), (100, 2840), (102, 2882), (109, 2996), (121, 3101), (123, 3110), (126, 3155), (131, 3191), (137, 3221), (153, 3344), (162, 3416), (163, 3422),

Gene: Mahdia\_3 Start: 2134, Stop: 3525, Start Num: 7

Candidate Starts for Mahdia\_3:

(Start: 7 @2134 has 60 MA's), (10, 2143), (20, 2206), (37, 2308), (52, 2443), (59, 2488), (63, 2509), (66, 2518), (76, 2554), (77, 2563), (80, 2590), (109, 2917), (113, 2932), (118, 2992), (121, 3022), (124, 3034), (126, 3076), (127, 3079), (134, 3133), (138, 3148), (142, 3178), (149, 3235), (151, 3250), (153, 3265), (158, 3307), (167, 3463),

Gene: Melville\_4 Start: 2249, Stop: 3538, Start Num: 7

Candidate Starts for Melville\_4:

(Start: 7 @2249 has 60 MA's), (24, 2336), (30, 2342), (32, 2378), (35, 2390), (41, 2468), (51, 2543), (71, 2630), (98, 2825), (100, 2840), (102, 2882), (109, 2996), (121, 3101), (123, 3110), (126, 3155), (131, 3191), (137, 3221), (153, 3344), (162, 3416), (163, 3422),

Gene: MichelleMyBell\_4 Start: 2263, Stop: 3549, Start Num: 7

Candidate Starts for MichelleMyBell\_4:

(Start: 7 @2263 has 60 MA's), (24, 2350), (30, 2356), (32, 2392), (35, 2404), (51, 2557), (67, 2629), (87, 2740), (95, 2809), (96, 2812), (98, 2839), (100, 2854), (102, 2896), (109, 3010), (121, 3115), (126, 3169), (131, 3205), (137, 3235), (153, 3358), (160, 3418),

Gene: Moosehead\_4 Start: 2170, Stop: 3477, Start Num: 7

Candidate Starts for Moosehead\_4:

(Start: 7 @2170 has 60 MA's), (Start: 8 @2173 has 1 MA's), (15, 2221), (16, 2227), (21, 2248), (22, 2260), (24, 2263), (35, 2332), (50, 2476), (52, 2488), (59, 2530), (67, 2554), (73, 2575), (79, 2614), (81, 2623), (87, 2665), (93, 2716), (95, 2734), (101, 2797), (106, 2905), (109, 2935), (119, 3019), (120, 3028), (121, 3040), (126, 3094), (129, 3124), (131, 3130), (146, 3223), (153, 3283),

Gene: Morrissey\_3 Start: 2106, Stop: 3524, Start Num: 7

Candidate Starts for Morrissey\_3:

(Start: 7 @2106 has 60 MA's), (9, 2112), (10, 2115), (16, 2163), (26, 2202), (32, 2250), (39, 2298), (57, 2457), (59, 2463), (74, 2520), (78, 2553), (80, 2565), (83, 2586), (90, 2643), (97, 2712), (109, 2892), (113, 2907), (117, 2937), (118, 2967), (121, 2997), (122, 3000), (126, 3051), (127, 3054), (139, 3126), (149, 3210), (151, 3225), (156, 3267), (158, 3282),

Gene: Nenae\_4 Start: 2263, Stop: 3552, Start Num: 7

Candidate Starts for Nenae\_4:

(Start: 7 @2263 has 60 MA's), (13, 2299), (24, 2350), (30, 2356), (32, 2392), (35, 2404), (41, 2482), (51, 2557), (67, 2629), (70, 2638), (71, 2644), (73, 2650), (74, 2653), (87, 2740), (98, 2839), (100, 2854), (101, 2872), (109, 3010), (116, 3046), (121, 3115), (123, 3124), (126, 3169), (131, 3205), (137, 3235), (150, 3331), (153, 3358), (162, 3430),

Gene: OneDirection\_4 Start: 2171, Stop: 3472, Start Num: 7

Candidate Starts for OneDirection\_4:

(Start: 7 @2171 has 60 MA's), (Start: 8 @2174 has 1 MA's), (12, 2198), (15, 2222), (16, 2228), (21, 2249), (22, 2261), (24, 2264), (31, 2300), (35, 2333), (44, 2426), (46, 2438), (50, 2477), (52, 2489), (59, 2531), (67, 2555), (68, 2558), (74, 2579), (79, 2615), (81, 2624), (93, 2717), (95, 2735), (101, 2798), (106, 2906), (109, 2936), (110, 2939), (116, 2972), (119, 3020), (120, 3029), (121, 3041), (122, 3044), (126, 3095), (131, 3131), (134, 3152), (146, 3224), (153, 3284),

Gene: Panchino\_4 Start: 2263, Stop: 3552, Start Num: 7

Candidate Starts for Panchino\_4:

(Start: 7 @2263 has 60 MA's), (13, 2299), (24, 2350), (30, 2356), (32, 2392), (35, 2404), (41, 2482), (51, 2557), (67, 2629), (70, 2638), (71, 2644), (73, 2650), (74, 2653), (87, 2740), (98, 2839), (100, 2854), (101, 2872), (109, 3010), (116, 3046), (121, 3115), (123, 3124), (126, 3169), (131, 3205), (137, 3235), (150, 3331), (153, 3358), (162, 3430),

Gene: Parmesanjohn\_4 Start: 2249, Stop: 3538, Start Num: 7

Candidate Starts for Parmesanjohn\_4:

(Start: 7 @2249 has 60 MA's), (24, 2336), (30, 2342), (32, 2378), (35, 2390), (41, 2468), (51, 2543), (71, 2630), (98, 2825), (100, 2840), (102, 2882), (109, 2996), (121, 3101), (123, 3110), (126, 3155), (131, 3191), (137, 3221), (153, 3344), (162, 3416), (163, 3422),

Gene: Pepperoni\_4 Start: 2468, Stop: 3781, Start Num: 7

Candidate Starts for Pepperoni\_4:

(Start: 7 @2468 has 60 MA's), (12, 2495), (19, 2537), (22, 2555), (24, 2558), (31, 2594), (32, 2615), (35, 2627), (44, 2726), (45, 2735), (46, 2738), (49, 2774), (50, 2777), (52, 2789), (67, 2855), (68, 2858), (73, 2876), (74, 2879), (88, 2969), (95, 3035), (101, 3098), (108, 3221), (109, 3236), (120, 3329), (121, 3341), (122, 3344), (126, 3395), (129, 3425), (131, 3431), (151, 3569), (153, 3584), (154, 3590), (163, 3662),

Gene: PhancyPhin\_4 Start: 2263, Stop: 3552, Start Num: 7

Candidate Starts for PhancyPhin\_4:

(Start: 7 @2263 has 60 MA's), (13, 2299), (24, 2350), (30, 2356), (32, 2392), (35, 2404), (41, 2482), (51, 2557), (67, 2629), (70, 2638), (71, 2644), (73, 2650), (74, 2653), (87, 2740), (98, 2839), (100, 2854), (101, 2872), (109, 3010), (116, 3046), (121, 3115), (123, 3124), (126, 3169), (131, 3205), (137, 3235), (150, 3331), (153, 3358), (162, 3430),

Gene: Philonius\_4 Start: 2249, Stop: 3538, Start Num: 7

Candidate Starts for Philonius\_4:

(Start: 7 @2249 has 60 MA's), (24, 2336), (30, 2342), (32, 2378), (35, 2390), (41, 2468), (51, 2543), (71, 2630), (98, 2825), (100, 2840), (102, 2882), (109, 2996), (121, 3101), (123, 3110), (126, 3155), (131, 3191), (137, 3221), (153, 3344), (162, 3416), (163, 3422),

Gene: Phloss\_4 Start: 2249, Stop: 3538, Start Num: 7

Candidate Starts for Phloss\_4:

(Start: 7 @2249 has 60 MA's), (24, 2336), (30, 2342), (32, 2378), (35, 2390), (41, 2468), (51, 2543), (71, 2630), (87, 2726), (98, 2825), (100, 2840), (102, 2882), (109, 2996), (121, 3101), (123, 3110), (126, 3155), (131, 3191), (137, 3221), (153, 3344), (162, 3416), (163, 3422),

Gene: Phrann\_4 Start: 2263, Stop: 3552, Start Num: 7

Candidate Starts for Phrann\_4:

(Start: 7 @2263 has 60 MA's), (13, 2299), (24, 2350), (30, 2356), (32, 2392), (35, 2404), (41, 2482), (51, 2557), (67, 2629), (70, 2638), (71, 2644), (73, 2650), (74, 2653), (87, 2740), (98, 2839), (100, 2854), (101, 2872), (109, 3010), (116, 3046), (121, 3115), (123, 3124), (126, 3169), (131, 3205), (137, 3235), (150, 3331), (153, 3358), (162, 3430),

Gene: Pipsqueaks\_4 Start: 2249, Stop: 3538, Start Num: 7

Candidate Starts for Pipsqueaks\_4:

(Start: 7 @2249 has 60 MA's), (24, 2336), (30, 2342), (32, 2378), (35, 2390), (41, 2468), (51, 2543), (71, 2630), (98, 2825), (100, 2840), (102, 2882), (109, 2996), (121, 3101), (123, 3110), (126, 3155), (131, 3191), (137, 3221), (153, 3344), (162, 3416), (163, 3422),

Gene: Puppies\_3 Start: 2078, Stop: 3436, Start Num: 7

Candidate Starts for Puppies\_3:

(Start: 7 @2078 has 60 MA's), (10, 2087), (16, 2135), (36, 2243), (46, 2339), (55, 2423), (65, 2462), (85, 2570), (87, 2588), (90, 2615), (93, 2642), (97, 2684), (102, 2747), (109, 2864), (117, 2909), (118, 2939), (121, 2969), (126, 3023), (133, 3077), (153, 3212), (156, 3239),

Gene: Purgamenstris\_4 Start: 2263, Stop: 3552, Start Num: 7

Candidate Starts for Purgamenstris\_4:

(Start: 7 @2263 has 60 MA's), (13, 2299), (24, 2350), (30, 2356), (32, 2392), (35, 2404), (41, 2482), (51, 2557), (70, 2638), (71, 2644), (73, 2650), (74, 2653), (87, 2740), (98, 2839), (100, 2854), (101, 2872), (109, 3010), (116, 3046), (121, 3115), (123, 3124), (126, 3169), (131, 3205), (137, 3235), (150, 3331), (153, 3358), (162, 3430),

Gene: Raymond7\_4 Start: 2263, Stop: 3552, Start Num: 7

Candidate Starts for Raymond7\_4:

(Start: 7 @2263 has 60 MA's), (13, 2299), (24, 2350), (30, 2356), (32, 2392), (35, 2404), (41, 2482), (51, 2557), (67, 2629), (70, 2638), (71, 2644), (73, 2650), (74, 2653), (87, 2740), (98, 2839), (100, 2854), (101, 2872), (109, 3010), (116, 3046), (121, 3115), (123, 3124), (126, 3169), (131, 3205), (137, 3235), (150, 3331), (153, 3358), (162, 3430),

Gene: Rebel\_4 Start: 2263, Stop: 3552, Start Num: 7

Candidate Starts for Rebel\_4:

(Start: 7 @2263 has 60 MA's), (13, 2299), (24, 2350), (30, 2356), (32, 2392), (35, 2404), (41, 2482), (51, 2557), (67, 2629), (70, 2638), (71, 2644), (73, 2650), (74, 2653), (87, 2740), (98, 2839), (100, 2854), (101, 2872), (109, 3010), (116, 3046), (121, 3115), (123, 3124), (126, 3169), (131, 3205), (137, 3235), (150, 3331), (153, 3358), (162, 3430),

Gene: Redi\_4 Start: 2263, Stop: 3552, Start Num: 7

Candidate Starts for Redi\_4:

(Start: 7 @2263 has 60 MA's), (13, 2299), (24, 2350), (30, 2356), (32, 2392), (35, 2404), (41, 2482), (51, 2557), (67, 2629), (70, 2638), (71, 2644), (73, 2650), (74, 2653), (87, 2740), (98, 2839), (100, 2854), (101, 2872), (109, 3010), (116, 3046), (121, 3115), (123, 3124), (126, 3169), (131, 3205), (137, 3235), (150, 3331), (153, 3358), (162, 3430),

Gene: Reyja\_5 Start: 2467, Stop: 3768, Start Num: 7

Candidate Starts for Reyja\_5:

(Start: 7 @2467 has 60 MA's), (Start: 8 @2470 has 1 MA's), (12, 2494), (16, 2524), (32, 2596), (42, 2689), (45, 2713), (68, 2845), (72, 2860), (73, 2863), (94, 3019), (101, 3091), (109, 3232), (112, 3241), (114, 3253), (116, 3268), (120, 3325), (121, 3337), (126, 3391), (127, 3394), (128, 3409), (131, 3427),

(134, 3448), (153, 3574),

Gene: RootBeer\_4 Start: 2459, Stop: 3739, Start Num: 4

Candidate Starts for RootBeer\_4:

(2, 2339), (4, 2459), (Start: 5 @2462 has 1 MA's), (25, 2582), (31, 2615), (35, 2648), (53, 2816), (69, 2879), (89, 2993), (93, 3044), (101, 3125), (109, 3251), (126, 3410), (144, 3515), (149, 3563), (151, 3578), (153, 3593),

Gene: Rubeelu\_4 Start: 2249, Stop: 3535, Start Num: 7

Candidate Starts for Rubeelu\_4:

(Start: 7 @2249 has 60 MA's), (24, 2336), (30, 2342), (32, 2378), (35, 2390), (51, 2543), (67, 2615), (87, 2726), (88, 2729), (95, 2795), (96, 2798), (98, 2825), (100, 2840), (102, 2882), (109, 2996), (121, 3101), (126, 3155), (127, 3158), (131, 3191), (137, 3221), (153, 3344), (160, 3404),

Gene: Santhid\_4 Start: 2353, Stop: 3651, Start Num: 7

Candidate Starts for Santhid\_4:

(Start: 7 @2353 has 60 MA's), (Start: 8 @2356 has 1 MA's), (12, 2380), (16, 2410), (32, 2482), (45, 2599), (68, 2731), (73, 2749), (94, 2905), (101, 2977), (109, 3118), (112, 3127), (114, 3139), (116, 3154), (120, 3211), (121, 3223), (126, 3277), (127, 3280), (128, 3295), (131, 3313), (134, 3334), (153, 3460),

Gene: Sapo\_2 Start: 1792, Stop: 3132, Start Num: 7

Candidate Starts for Sapo\_2:

(Start: 7 @1792 has 60 MA's), (58, 2155), (80, 2260), (81, 2263), (94, 2374), (103, 2497), (109, 2587), (113, 2602), (118, 2662), (120, 2680), (121, 2692), (122, 2695), (125, 2728), (136, 2809),

Gene: Schmidt\_6 Start: 3556, Stop: 4848, Start Num: 7

Candidate Starts for Schmidt\_6:

(Start: 7 @3556 has 60 MA's), (11, 3574), (18, 3619), (27, 3652), (34, 3706), (41, 3787), (45, 3811), (50, 3853), (52, 3865), (57, 3904), (59, 3907), (61, 3922), (70, 3949), (80, 4009), (81, 4012), (84, 4042), (86, 4048), (87, 4063), (107, 4315), (108, 4321), (109, 4336), (117, 4381), (120, 4429), (121, 4441), (123, 4450), (125, 4477), (131, 4531), (143, 4594), (149, 4648), (150, 4651), (153, 4678), (155, 4693), (156, 4705), (157, 4711), (161, 4744), (164, 4762), (166, 4792),

Gene: Schnauzer\_4 Start: 2249, Stop: 3538, Start Num: 7

Candidate Starts for Schnauzer\_4:

(Start: 7 @2249 has 60 MA's), (24, 2336), (30, 2342), (32, 2378), (35, 2390), (41, 2468), (51, 2543), (71, 2630), (98, 2825), (100, 2840), (102, 2882), (109, 2996), (121, 3101), (123, 3110), (126, 3155), (131, 3191), (137, 3221), (153, 3344), (162, 3416), (163, 3422),

Gene: Scitech\_4 Start: 2249, Stop: 3538, Start Num: 7

Candidate Starts for Scitech\_4:

(Start: 7 @2249 has 60 MA's), (24, 2336), (30, 2342), (32, 2378), (35, 2390), (41, 2468), (51, 2543), (71, 2630), (87, 2726), (98, 2825), (100, 2840), (102, 2882), (109, 2996), (121, 3101), (123, 3110), (126, 3155), (131, 3191), (137, 3221), (153, 3344), (162, 3416), (163, 3422),

Gene: Shambre1\_5 Start: 3925, Stop: 5259, Start Num: 5

Candidate Starts for Shambre1\_5:

(Start: 5 @3925 has 1 MA's), (25, 4069), (29, 4084), (38, 4165), (54, 4306), (55, 4324), (56, 4327), (69, 4372), (80, 4438), (93, 4540), (99, 4600), (109, 4747), (115, 4771), (118, 4825), (125, 4888), (126, 4906), (139, 4981), (147, 5041), (151, 5074), (156, 5116), (158, 5131), (160, 5149), (162, 5161), (163, 5167),

Gene: ShrimpFriedEgg\_4 Start: 2263, Stop: 3552, Start Num: 7

Candidate Starts for ShrimpFriedEgg\_4:

(Start: 7 @2263 has 60 MA's), (13, 2299), (24, 2350), (30, 2356), (32, 2392), (35, 2404), (41, 2482), (51, 2557), (67, 2629), (70, 2638), (71, 2644), (73, 2650), (74, 2653), (87, 2740), (98, 2839), (100, 2854), (101, 2872), (109, 3010), (116, 3046), (121, 3115), (123, 3124), (126, 3169), (131, 3205), (137, 3235), (150, 3331), (153, 3358), (162, 3430),

Gene: Shweta\_4 Start: 2263, Stop: 3552, Start Num: 7

Candidate Starts for Shweta\_4:

(Start: 7 @2263 has 60 MA's), (13, 2299), (24, 2350), (30, 2356), (32, 2392), (35, 2404), (41, 2482), (51, 2557), (67, 2629), (70, 2638), (71, 2644), (73, 2650), (74, 2653), (87, 2740), (98, 2839), (100, 2854), (101, 2872), (109, 3010), (116, 3046), (121, 3115), (123, 3124), (126, 3169), (131, 3205), (137, 3235), (150, 3331), (153, 3358), (162, 3430),

Gene: Silvafighter\_4 Start: 2249, Stop: 3538, Start Num: 7

Candidate Starts for Silvafighter\_4:

(Start: 7 @2249 has 60 MA's), (24, 2336), (30, 2342), (32, 2378), (35, 2390), (41, 2468), (51, 2543), (71, 2630), (87, 2726), (98, 2825), (100, 2840), (102, 2882), (109, 2996), (121, 3101), (123, 3110), (126, 3155), (131, 3191), (137, 3221), (153, 3344), (162, 3416), (163, 3422),

Gene: Silvy\_4 Start: 2249, Stop: 3538, Start Num: 7

Candidate Starts for Silvy\_4:

(Start: 7 @2249 has 60 MA's), (24, 2336), (30, 2342), (32, 2378), (35, 2390), (41, 2468), (51, 2543), (71, 2630), (98, 2825), (100, 2840), (102, 2882), (109, 2996), (121, 3101), (123, 3110), (126, 3155), (131, 3191), (137, 3221), (153, 3344), (162, 3416), (163, 3422),

Gene: SkinnyPete\_4 Start: 2263, Stop: 3552, Start Num: 7

Candidate Starts for SkinnyPete\_4:

(Start: 7 @2263 has 60 MA's), (13, 2299), (24, 2350), (30, 2356), (32, 2392), (35, 2404), (41, 2482), (51, 2557), (67, 2629), (70, 2638), (71, 2644), (73, 2650), (74, 2653), (87, 2740), (98, 2839), (100, 2854), (101, 2872), (109, 3010), (116, 3046), (121, 3115), (123, 3124), (126, 3169), (131, 3205), (137, 3235), (150, 3331), (153, 3358), (162, 3430),

Gene: Smurph\_4 Start: 2249, Stop: 3538, Start Num: 7

Candidate Starts for Smurph\_4:

(Start: 7 @2249 has 60 MA's), (24, 2336), (30, 2342), (32, 2378), (35, 2390), (41, 2468), (51, 2543), (71, 2630), (98, 2825), (100, 2840), (102, 2882), (109, 2996), (121, 3101), (123, 3110), (126, 3155), (131, 3191), (137, 3221), (153, 3344), (162, 3416), (163, 3422),

Gene: Snekmaggedon\_4 Start: 2263, Stop: 3552, Start Num: 7

Candidate Starts for Snekmaggedon\_4:

(Start: 7 @2263 has 60 MA's), (13, 2299), (24, 2350), (30, 2356), (32, 2392), (35, 2404), (41, 2482), (51, 2557), (67, 2629), (70, 2638), (71, 2644), (73, 2650), (74, 2653), (87, 2740), (98, 2839), (100, 2854), (101, 2872), (109, 3010), (116, 3046), (121, 3115), (123, 3124), (126, 3169), (131, 3205), (137, 3235), (150, 3331), (153, 3358), (162, 3430),

Gene: Splinter\_8 Start: 5071, Stop: 6363, Start Num: 6

Candidate Starts for Splinter\_8:

(3, 4993), (Start: 6 @5071 has 8 MA's), (Start: 7 @5080 has 60 MA's), (28, 5176), (35, 5230), (52, 5386), (56, 5422), (67, 5461), (74, 5485), (81, 5533), (82, 5536), (86, 5566), (87, 5581), (88, 5584), (92, 5626), (104, 5782), (107, 5833), (109, 5854), (121, 5959), (124, 5971), (125, 5995), (131, 6049), (137, 6079), (138, 6085), (153, 6196), (164, 6280),

Gene: SpongeBob\_4 Start: 2263, Stop: 3552, Start Num: 7

Candidate Starts for SpongeBob\_4:

(Start: 7 @2263 has 60 MA's), (13, 2299), (24, 2350), (30, 2356), (32, 2392), (35, 2404), (41, 2482), (51, 2557), (67, 2629), (70, 2638), (71, 2644), (73, 2650), (74, 2653), (87, 2740), (98, 2839), (100, 2854), (101, 2872), (109, 3010), (116, 3046), (121, 3115), (123, 3124), (126, 3169), (131, 3205), (137, 3235), (150, 3331), (153, 3358), (162, 3430),

Gene: TZGordon\_10 Start: 5216, Stop: 6508, Start Num: 6

Candidate Starts for TZGordon\_10:

(3, 5138), (Start: 6 @5216 has 8 MA's), (Start: 7 @5225 has 60 MA's), (28, 5321), (35, 5375), (52, 5531), (56, 5567), (67, 5606), (74, 5630), (81, 5678), (82, 5681), (86, 5711), (87, 5726), (88, 5729), (92, 5771), (104, 5927), (109, 5999), (121, 6104), (124, 6116), (125, 6140), (131, 6194), (137, 6224), (138, 6230), (153, 6341),

Gene: Tapioca\_4 Start: 2249, Stop: 3538, Start Num: 7

Candidate Starts for Tapioca\_4:

(Start: 7 @2249 has 60 MA's), (24, 2336), (30, 2342), (32, 2378), (35, 2390), (41, 2468), (51, 2543), (71, 2630), (98, 2825), (100, 2840), (102, 2882), (109, 2996), (121, 3101), (123, 3110), (126, 3155), (131, 3191), (137, 3221), (153, 3344), (162, 3416), (163, 3422),

Gene: Tarzan\_4 Start: 2353, Stop: 3654, Start Num: 7

Candidate Starts for Tarzan\_4:

(Start: 7 @2353 has 60 MA's), (Start: 8 @2356 has 1 MA's), (12, 2380), (16, 2410), (32, 2482), (45, 2599), (68, 2731), (73, 2749), (94, 2905), (101, 2977), (109, 3118), (112, 3127), (114, 3139), (116, 3154), (120, 3211), (121, 3223), (126, 3277), (127, 3280), (128, 3295), (131, 3313), (134, 3334), (153, 3460),

Gene: TinaLin\_11 Start: 5838, Stop: 7127, Start Num: 6

Candidate Starts for TinaLin\_11:

(1, 5550), (Start: 6 @5838 has 8 MA's), (Start: 7 @5847 has 60 MA's), (35, 5997), (49, 6138), (55, 6186), (56, 6189), (76, 6261), (82, 6303), (85, 6330), (86, 6333), (87, 6348), (92, 6393), (101, 6483), (104, 6549), (109, 6621), (118, 6696), (121, 6726), (125, 6762), (131, 6816), (143, 6879), (153, 6963), (166, 7077),

Gene: Trine\_3 Start: 2126, Stop: 3523, Start Num: 7

Candidate Starts for Trine\_3:

(Start: 7 @2126 has 60 MA's), (10, 2135), (17, 2177), (20, 2192), (26, 2213), (32, 2261), (37, 2294), (48, 2405), (55, 2462), (57, 2468), (64, 2498), (65, 2501), (76, 2540), (90, 2654), (97, 2723), (99, 2741), (109, 2903), (117, 2948), (118, 2978), (121, 3008), (126, 3062), (131, 3098), (139, 3137), (140, 3149), (142, 3164), (143, 3167), (145, 3179), (149, 3221), (153, 3251), (157, 3284), (158, 3293),

Gene: Upyo\_3 Start: 2133, Stop: 3530, Start Num: 7

Candidate Starts for Upyo\_3:

(Start: 7 @2133 has 60 MA's), (10, 2142), (16, 2187), (26, 2226), (55, 2475), (59, 2487), (60, 2490), (62, 2505), (74, 2544), (78, 2577), (80, 2589), (84, 2619), (90, 2667), (92, 2685), (109, 2916), (113, 2931), (117, 2961), (118, 2991), (121, 3021), (126, 3075), (135, 3135), (140, 3162), (145, 3192), (148, 3228), (149, 3234), (152, 3261), (153, 3264), (168, 3510),

Gene: Vendetta\_8 Start: 5071, Stop: 6363, Start Num: 6

Candidate Starts for Vendetta\_8:

(3, 4993), (Start: 6 @5071 has 8 MA's), (Start: 7 @5080 has 60 MA's), (28, 5176), (35, 5230), (52, 5386), (56, 5422), (67, 5461), (74, 5485), (81, 5533), (82, 5536), (86, 5566), (87, 5581), (88, 5584), (92, 5626), (104, 5782), (107, 5833), (109, 5854), (121, 5959), (124, 5971), (125, 5995), (131, 6049),

(137, 6079), (138, 6085), (153, 6196), (164, 6280),

Gene: Widow\_3 Start: 2078, Stop: 3436, Start Num: 7

Candidate Starts for Widow\_3:

(Start: 7 @2078 has 60 MA's), (10, 2087), (16, 2135), (36, 2243), (46, 2339), (55, 2423), (65, 2462), (85, 2570), (87, 2588), (90, 2615), (93, 2642), (97, 2684), (102, 2747), (109, 2864), (118, 2939), (121, 2969), (126, 3023), (133, 3077), (139, 3098), (153, 3212), (156, 3239),

Gene: Xeno\_4 Start: 2249, Stop: 3538, Start Num: 7

Candidate Starts for Xeno\_4:

(Start: 7 @2249 has 60 MA's), (24, 2336), (30, 2342), (32, 2378), (35, 2390), (41, 2468), (51, 2543), (71, 2630), (87, 2726), (98, 2825), (100, 2840), (102, 2882), (109, 2996), (121, 3101), (123, 3110), (126, 3155), (131, 3191), (137, 3221), (153, 3344), (162, 3416), (163, 3422),

Gene: Xerxes\_4 Start: 2249, Stop: 3538, Start Num: 7

Candidate Starts for Xerxes\_4:

(Start: 7 @2249 has 60 MA's), (24, 2336), (30, 2342), (32, 2378), (35, 2390), (41, 2468), (51, 2543), (71, 2630), (98, 2825), (100, 2840), (102, 2882), (109, 2996), (121, 3101), (123, 3110), (126, 3155), (131, 3191), (137, 3221), (153, 3344), (162, 3416), (163, 3422),