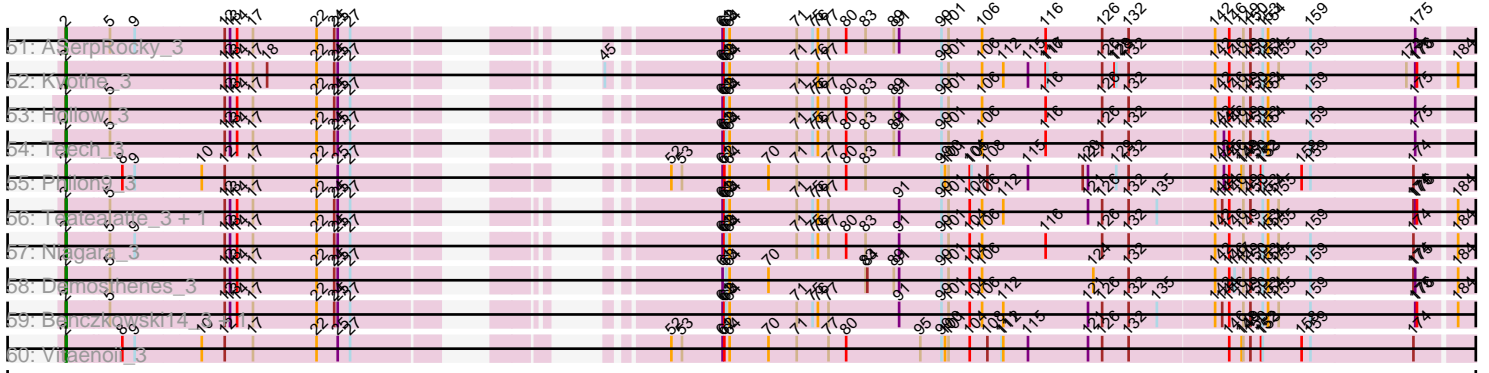




Pham 294649



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 294649 Report

This analysis was run 04/18/26 on database version 643.

Pham number 294649 has 83 members, 7 are drafts.

Phages represented in each track:

- Track 1 : HayZem\_4
- Track 2 : Austin\_4
- Track 3 : Amore2\_4
- Track 4 : GMA7\_97
- Track 5 : GTE7\_97
- Track 6 : Diabla\_4
- Track 7 : Flakey\_4
- Track 8 : Exiguo\_4, Sam12\_4
- Track 9 : Worcestershire\_4
- Track 10 : Lizzo\_4, CathyBurgh\_4
- Track 11 : BenoitCattle\_4
- Track 12 : Chelms\_4
- Track 13 : Beaver\_4, Hotorobo\_4, Kelzog\_4, CinnamonToast\_5, Breezic\_4, Monty\_4, BillyBobJr\_5, Sombrero\_4
- Track 14 : PokyPuppy\_4
- Track 15 : BigShaq\_4
- Track 16 : Dakiti\_4, PierreThree\_4
- Track 17 : Adgers\_5
- Track 18 : Eggsie\_4
- Track 19 : Ekhein\_4
- Track 20 : Squibbles\_4
- Track 21 : Gorko\_4
- Track 22 : RoyalG\_5
- Track 23 : Jellybones\_4
- Track 24 : Boneham\_4, BirksAndSocks\_4
- Track 25 : Poland\_5
- Track 26 : Butterball\_4
- Track 27 : John316\_4
- Track 28 : Crete\_5
- Track 29 : RemRem\_4
- Track 30 : GourdThymes\_4
- Track 31 : Msay19\_5
- Track 32 : FelixAlejandro\_5
- Track 33 : Barbochs\_4
- Track 34 : SteveFrench\_4
- Track 35 : Linetti\_5
- Track 36 : Guillaume\_2

- Track 37 : Bianmat\_2
- Track 38 : Woes\_2
- Track 39 : Minos\_2
- Track 40 : MrWormie\_2
- Track 41 : Damp\_2
- Track 42 : Lahirium\_2, Anamika\_2, Harambe\_2, Hail2Pitt\_2, Neoevie\_2
- Track 43 : GalacticEye\_2, Lidong\_2, Berries\_2
- Track 44 : Jams\_2
- Track 45 : Charianelly\_2, Nimi13\_2, Newt\_2, Teal\_2
- Track 46 : Shelley\_2, Kaseim\_2
- Track 47 : Jormungandr\_2
- Track 48 : Luker\_2
- Track 49 : Sticker17\_2
- Track 50 : Hello\_2
- Track 51 : ASerpRocky\_3
- Track 52 : Kvothe\_3
- Track 53 : Hollow\_3
- Track 54 : Teech\_3
- Track 55 : Philon9\_3
- Track 56 : Teatealatte\_3, Tredge\_3
- Track 57 : Niagara\_3
- Track 58 : Demosthenes\_3
- Track 59 : Benczkowski14\_3, Katyusha\_3
- Track 60 : Vitaenoi\_3

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

The start number called the most often in the published annotations is 3, it was called in 64 of the 76 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Adgers\_5, Amore2\_4, Anamika\_2, Austin\_4, Barbochs\_4, Beaver\_4, BenoitCattle\_4, Berries\_2, Bianmat\_2, BigShaq\_4, BillyBobJr\_5, BirksAndSocks\_4, Boneham\_4, Breezic\_4, Butterball\_4, CathyBurgh\_4, Charianelly\_2, Chelms\_4, CinnamonToast\_5, Crete\_5, Dakiti\_4, Damp\_2, Diabla\_4, Eggsie\_4, Ekhein\_4, Exiguo\_4, FelixAlejandro\_5, Flakey\_4, GMA7\_97, GTE7\_97, GalacticEye\_2, Gorko\_4, GourdThymes\_4, Guillaume\_2, Hail2Pitt\_2, Harambe\_2, HayZem\_4, Hello\_2, Hotorobo\_4, Jams\_2, Jellybones\_4, John316\_4, Jormungandr\_2, Kaseim\_2, Kelzog\_4, Lahirium\_2, Lidong\_2, Linetti\_5, Lizzo\_4, Luker\_2, Minos\_2, Monty\_4, MrWormie\_2, Msay19\_5, Neoevie\_2, Newt\_2, Nimi13\_2, PierreThree\_4, PokyPuppy\_4, Poland\_5, RemRem\_4, RoyalG\_5, Sam12\_4, Shelley\_2, Sombrero\_4, Squibbles\_4, SteveFrench\_4, Sticker17\_2, Teal\_2, Woes\_2, Worcestershire\_4,

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

- 

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

- ASerpRocky\_3, Benczkowski14\_3, Demosthenes\_3, Hollow\_3, Katyusha\_3, Kvothe\_3, Niagara\_3, Philon9\_3, Teatealatte\_3, Teech\_3, Tredge\_3, Vitaenoi\_3,

## Summary by start number:

### Start 2:

- Found in 12 of 83 ( 14.5% ) of genes in pham
- Manual Annotations of this start: 12 of 76
- Called 100.0% of time when present
- Phage (with cluster) where this start called: ASerpRocky\_3 (CS4), Benczkowski14\_3 (CS4), Demosthenes\_3 (CS4), Hollow\_3 (CS4), Katyusha\_3 (CS4), Kvothe\_3 (CS4), Niagara\_3 (CS4), Philon9\_3 (CS4), Teatealatte\_3 (CS4), Teech\_3 (CS4), Tredge\_3 (CS4), Vitaenoi\_3 (CS4),

### Start 3:

- Found in 71 of 83 ( 85.5% ) of genes in pham
- Manual Annotations of this start: 64 of 76
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Adgers\_5 (CS2), Amore2\_4 (CS1), Anamika\_2 (CS3), Austin\_4 (CS1), Barbochs\_4 (CS2), Beaver\_4 (CS2), BenoitCattle\_4 (CS2), Berries\_2 (CS3), Bianmat\_2 (CS3), BigShaq\_4 (CS2), BillyBobJr\_5 (CS2), BirksAndSocks\_4 (CS2), Boneham\_4 (CS2), Breezic\_4 (CS2), Butterball\_4 (CS2), CathyBurgh\_4 (CS2), Charianelly\_2 (CS3), Chelms\_4 (CS2), CinnamonToast\_5 (CS2), Crete\_5 (CS2), Dakiti\_4 (CS2), Damp\_2 (CS3), Diabla\_4 (CS2), Eggsie\_4 (CS2), Ekhein\_4 (CS2), Exiguo\_4 (CS2), FelixAlejandro\_5 (CS2), Flakey\_4 (CS2), GMA7\_97 (CS1), GTE7\_97 (CS1), GalacticEye\_2 (CS3), Gorko\_4 (CS2), GourdThymes\_4 (CS2), Guillaume\_2 (CS3), Hail2Pitt\_2 (CS3), Harambe\_2 (CS3), HayZem\_4 (CS1), Hello\_2 (CS3), Hotorobo\_4 (CS2), Jams\_2 (CS3), Jellybones\_4 (CS2), John316\_4 (CS2), Jormungandr\_2 (CS3), Kaseim\_2 (CS3), Kelzog\_4 (CS2), Lahirium\_2 (CS3), Lidong\_2 (CS3), Linetti\_5 (CS2), Lizzo\_4 (CS2), Luker\_2 (CS3), Minos\_2 (CS3), Monty\_4 (CS2), MrWormie\_2 (CS3), Msay19\_5 (CS2), Neevie\_2 (CS3), Newt\_2 (CS3), Nimi13\_2 (CS3), PierreThree\_4 (CS2), PokyPuppy\_4 (CS2), Poland\_5 (CS2), RemRem\_4 (CS2), RoyalG\_5 (CS2), Sam12\_4 (CS2), Shelley\_2 (CS3), Sombrero\_4 (CS2), Squibbles\_4 (CS2), SteveFrench\_4 (CS2), Sticker17\_2 (CS3), Teal\_2 (CS3), Woes\_2 (CS3), Worcestershire\_4 (CS2),

## Summary by clusters:

There are 4 clusters represented in this pham: CS4, CS1, CS3, CS2,

### Info for manual annotations of cluster CS1:

- Start number 3 was manually annotated 3 times for cluster CS1.

### Info for manual annotations of cluster CS2:

- Start number 3 was manually annotated 36 times for cluster CS2.

### Info for manual annotations of cluster CS3:

- Start number 3 was manually annotated 25 times for cluster CS3.

### Info for manual annotations of cluster CS4:

- Start number 2 was manually annotated 12 times for cluster CS4.

## Gene Information:

Gene: ASerpRocky\_3 Start: 5318, Stop: 3177, Start Num: 2

Candidate Starts for ASerpRocky\_3:

(Start: 2 @5318 has 12 MA's), (5, 5246), (9, 5204), (12, 5057), (13, 5048), (14, 5036), (17, 5009), (22, 4901), (24, 4871), (25, 4865), (27, 4844), (61, 4448), (62, 4445), (63, 4442), (64, 4436), (71, 4322), (75, 4295), (76, 4286), (77, 4268), (80, 4238), (83, 4205), (89, 4157), (91, 4148), (99, 4076), (101, 4064), (106, 4007), (116, 3899), (126, 3803), (132, 3758), (142, 3617), (146, 3593), (149, 3569), (150, 3557), (153, 3536), (154, 3527), (159, 3455), (175, 3278),

Gene: Adgers\_5 Start: 4241, Stop: 1974, Start Num: 3

Candidate Starts for Adgers\_5:

(Start: 3 @4241 has 64 MA's), (5, 4208), (7, 4193), (19, 3938), (25, 3821), (26, 3818), (28, 3734), (30, 3701), (36, 3608), (38, 3578), (41, 3545), (43, 3470), (50, 3329), (54, 3266), (62, 3206), (66, 3167), (68, 3140), (70, 3131), (72, 3074), (93, 2903), (96, 2870), (106, 2774), (107, 2768), (110, 2750), (114, 2708), (117, 2663), (127, 2567), (134, 2510), (138, 2456), (144, 2390), (149, 2354), (150, 2342), (153, 2321), (155, 2294), (156, 2276), (158, 2255), (165, 2138), (171, 2090), (178, 2042), (179, 2039), (183, 2015),

Gene: Amore2\_4 Start: 4012, Stop: 1769, Start Num: 3

Candidate Starts for Amore2\_4:

(Start: 3 @4012 has 64 MA's), (4, 3979), (15, 3745), (19, 3712), (21, 3688), (23, 3604), (25, 3595), (27, 3574), (31, 3463), (39, 3358), (54, 3070), (57, 3052), (65, 2983), (68, 2947), (71, 2890), (74, 2866), (91, 2716), (92, 2713), (96, 2677), (102, 2626), (109, 2566), (110, 2557), (113, 2527), (118, 2455), (122, 2407), (125, 2398), (130, 2362), (137, 2275), (139, 2254), (149, 2152), (151, 2128), (153, 2119), (158, 2053), (164, 1957), (168, 1918), (171, 1894), (184, 1807),

Gene: Anamika\_2 Start: 3416, Stop: 1128, Start Num: 3

Candidate Starts for Anamika\_2:

(1, 3518), (Start: 3 @3416 has 64 MA's), (6, 3374), (11, 3194), (16, 3143), (19, 3110), (23, 3002), (24, 2999), (25, 2993), (26, 2990), (32, 2846), (41, 2720), (51, 2471), (54, 2429), (55, 2423), (57, 2411), (71, 2249), (74, 2225), (81, 2159), (86, 2120), (91, 2075), (92, 2072), (96, 2036), (102, 1985), (109, 1925), (113, 1886), (119, 1781), (122, 1766), (136, 1637), (137, 1634), (140, 1601), (151, 1487), (152, 1481), (153, 1478), (155, 1451), (156, 1433), (161, 1379), (168, 1277),

Gene: Austin\_4 Start: 4012, Stop: 1769, Start Num: 3

Candidate Starts for Austin\_4:

(Start: 3 @4012 has 64 MA's), (4, 3979), (19, 3712), (21, 3688), (25, 3595), (26, 3592), (27, 3574), (31, 3463), (39, 3358), (54, 3070), (57, 3052), (65, 2983), (68, 2947), (71, 2890), (74, 2866), (91, 2716), (92, 2713), (96, 2677), (102, 2626), (109, 2566), (110, 2557), (113, 2527), (118, 2455), (122, 2407), (125, 2398), (130, 2362), (137, 2275), (139, 2254), (149, 2152), (151, 2128), (153, 2119), (158, 2053), (164, 1957), (168, 1918), (171, 1894), (184, 1807),

Gene: Barbochs\_4 Start: 4076, Stop: 1809, Start Num: 3

Candidate Starts for Barbochs\_4:

(Start: 3 @4076 has 64 MA's), (5, 4043), (7, 4028), (19, 3773), (25, 3656), (26, 3653), (28, 3569), (30, 3536), (36, 3443), (38, 3413), (41, 3380), (43, 3305), (44, 3263), (50, 3164), (54, 3101), (66, 3002), (68, 2975), (70, 2966), (72, 2909), (78, 2852), (79, 2837), (83, 2801), (85, 2792), (86, 2789), (93, 2738), (96, 2705), (106, 2609), (107, 2603), (110, 2585), (114, 2543), (117, 2498), (138, 2291), (149, 2189), (150, 2177), (153, 2156), (155, 2129), (156, 2111), (158, 2090), (163, 2009), (178, 1877), (179, 1874), (182, 1856), (183, 1850),

Gene: Beaver\_4 Start: 4087, Stop: 1820, Start Num: 3

Candidate Starts for Beaver\_4:

(Start: 3 @4087 has 64 MA's), (5, 4054), (7, 4039), (19, 3784), (25, 3667), (26, 3664), (28, 3580), (30, 3547), (41, 3391), (42, 3370), (54, 3130), (55, 3124), (57, 3112), (62, 3070), (71, 2950), (81, 2860), (83, 2833), (86, 2821), (90, 2782), (92, 2773), (94, 2749), (96, 2737), (102, 2686), (112, 2605), (113, 2587), (122, 2467), (131, 2413), (132, 2404), (135, 2359), (136, 2338), (137, 2335), (143, 2254), (149, 2212), (151, 2188), (153, 2179), (155, 2152), (172, 1951), (180, 1900), (181, 1891),

Gene: Benczkowski14\_3 Start: 5381, Stop: 3240, Start Num: 2

Candidate Starts for Benczkowski14\_3:

(Start: 2 @5381 has 12 MA's), (5, 5309), (12, 5120), (13, 5111), (14, 5099), (17, 5072), (22, 4964), (24, 4934), (25, 4928), (27, 4907), (61, 4511), (62, 4508), (63, 4505), (64, 4499), (71, 4385), (75, 4358), (76, 4349), (77, 4331), (91, 4211), (99, 4139), (101, 4127), (104, 4091), (106, 4070), (112, 4034), (121, 3890), (126, 3866), (132, 3821), (135, 3773), (142, 3680), (144, 3668), (146, 3656), (149, 3632), (150, 3620), (153, 3599), (154, 3590), (155, 3572), (159, 3518), (175, 3341), (176, 3338), (184, 3281),

Gene: BenoitCattle\_4 Start: 4065, Stop: 1801, Start Num: 3

Candidate Starts for BenoitCattle\_4:

(1, 4167), (Start: 3 @4065 has 64 MA's), (5, 4032), (7, 4017), (19, 3762), (23, 3654), (24, 3651), (25, 3645), (26, 3642), (28, 3558), (33, 3462), (35, 3444), (38, 3402), (41, 3369), (43, 3294), (47, 3207), (49, 3192), (50, 3156), (54, 3093), (66, 2994), (68, 2967), (70, 2958), (72, 2901), (78, 2844), (83, 2793), (85, 2784), (86, 2781), (93, 2730), (96, 2697), (106, 2601), (107, 2595), (110, 2577), (114, 2535), (117, 2490), (138, 2283), (149, 2181), (153, 2148), (155, 2121), (158, 2082), (163, 2001), (178, 1869), (179, 1866), (182, 1848), (183, 1842),

Gene: Berries\_2 Start: 3405, Stop: 1105, Start Num: 3

Candidate Starts for Berries\_2:

(1, 3507), (Start: 3 @3405 has 64 MA's), (6, 3363), (13, 3165), (19, 3099), (25, 2982), (26, 2979), (41, 2697), (51, 2448), (54, 2406), (55, 2400), (57, 2388), (71, 2226), (74, 2202), (91, 2052), (92, 2049), (96, 2013), (98, 1983), (102, 1962), (113, 1863), (116, 1809), (119, 1758), (122, 1743), (136, 1614), (137, 1611), (140, 1578), (151, 1464), (152, 1458), (153, 1455), (156, 1410), (168, 1254), (177, 1191), (178, 1182),

Gene: Bianmat\_2 Start: 3428, Stop: 1128, Start Num: 3

Candidate Starts for Bianmat\_2:

(1, 3530), (Start: 3 @3428 has 64 MA's), (6, 3386), (13, 3188), (19, 3122), (25, 3005), (26, 3002), (32, 2858), (41, 2720), (46, 2552), (51, 2471), (54, 2429), (55, 2423), (57, 2411), (71, 2249), (74, 2225), (91, 2075), (92, 2072), (96, 2036), (98, 2006), (102, 1985), (113, 1886), (116, 1832), (119, 1781), (122, 1766), (136, 1637), (137, 1634), (140, 1601), (151, 1487), (152, 1481), (153, 1478), (156, 1433), (168, 1277), (177, 1214), (178, 1205),

Gene: BigShaq\_4 Start: 4067, Stop: 1800, Start Num: 3

Candidate Starts for BigShaq\_4:

(1, 4169), (Start: 3 @4067 has 64 MA's), (5, 4034), (7, 4019), (19, 3764), (23, 3656), (24, 3653), (25, 3647), (26, 3644), (28, 3560), (42, 3350), (54, 3110), (57, 3092), (62, 3050), (67, 3011), (69, 2981), (71, 2930), (74, 2906), (81, 2840), (82, 2837), (90, 2762), (91, 2756), (92, 2753), (96, 2717), (102, 2666), (113, 2567), (118, 2495), (122, 2447), (131, 2393), (136, 2318), (137, 2315), (141, 2267), (143, 2234), (149, 2192), (151, 2168), (152, 2162), (153, 2159), (172, 1931), (181, 1871),

Gene: BillyBobJr\_5 Start: 4111, Stop: 1844, Start Num: 3

Candidate Starts for BillyBobJr\_5:

(Start: 3 @4111 has 64 MA's), (5, 4078), (7, 4063), (19, 3808), (25, 3691), (26, 3688), (28, 3604), (30, 3571), (41, 3415), (42, 3394), (54, 3154), (55, 3148), (57, 3136), (62, 3094), (71, 2974), (81, 2884), (83, 2857), (86, 2845), (90, 2806), (92, 2797), (94, 2773), (96, 2761), (102, 2710), (112, 2629), (113, 2611), (122, 2491), (131, 2437), (132, 2428), (135, 2383), (136, 2362), (137, 2359), (143, 2278), (149, 2236),

(151, 2212), (153, 2203), (155, 2176), (172, 1975), (180, 1924), (181, 1915),

Gene: BirksAndSocks\_4 Start: 4076, Stop: 1809, Start Num: 3

Candidate Starts for BirksAndSocks\_4:

(Start: 3 @4076 has 64 MA's), (5, 4043), (7, 4028), (19, 3773), (25, 3656), (26, 3653), (28, 3569), (30, 3536), (36, 3443), (38, 3413), (41, 3380), (43, 3305), (44, 3263), (50, 3164), (54, 3101), (59, 3062), (66, 3002), (68, 2975), (70, 2966), (72, 2909), (78, 2852), (83, 2801), (85, 2792), (86, 2789), (93, 2738), (96, 2705), (103, 2636), (106, 2609), (107, 2603), (110, 2585), (114, 2543), (117, 2498), (138, 2291), (149, 2189), (153, 2156), (155, 2129), (156, 2111), (158, 2090), (163, 2009), (167, 1955), (178, 1877), (179, 1874), (182, 1856), (183, 1850),

Gene: Boneham\_4 Start: 4075, Stop: 1808, Start Num: 3

Candidate Starts for Boneham\_4:

(Start: 3 @4075 has 64 MA's), (5, 4042), (7, 4027), (19, 3772), (25, 3655), (26, 3652), (28, 3568), (30, 3535), (36, 3442), (38, 3412), (41, 3379), (43, 3304), (44, 3262), (50, 3163), (54, 3100), (59, 3061), (66, 3001), (68, 2974), (70, 2965), (72, 2908), (78, 2851), (83, 2800), (85, 2791), (86, 2788), (93, 2737), (96, 2704), (103, 2635), (106, 2608), (107, 2602), (110, 2584), (114, 2542), (117, 2497), (138, 2290), (149, 2188), (153, 2155), (155, 2128), (156, 2110), (158, 2089), (163, 2008), (167, 1954), (178, 1876), (179, 1873), (182, 1855), (183, 1849),

Gene: Breezic\_4 Start: 4087, Stop: 1820, Start Num: 3

Candidate Starts for Breezic\_4:

(Start: 3 @4087 has 64 MA's), (5, 4054), (7, 4039), (19, 3784), (25, 3667), (26, 3664), (28, 3580), (30, 3547), (41, 3391), (42, 3370), (54, 3130), (55, 3124), (57, 3112), (62, 3070), (71, 2950), (81, 2860), (83, 2833), (86, 2821), (90, 2782), (92, 2773), (94, 2749), (96, 2737), (102, 2686), (112, 2605), (113, 2587), (122, 2467), (131, 2413), (132, 2404), (135, 2359), (136, 2338), (137, 2335), (143, 2254), (149, 2212), (151, 2188), (153, 2179), (155, 2152), (172, 1951), (180, 1900), (181, 1891),

Gene: Butterball\_4 Start: 4075, Stop: 1808, Start Num: 3

Candidate Starts for Butterball\_4:

(Start: 3 @4075 has 64 MA's), (5, 4042), (7, 4027), (19, 3772), (25, 3655), (26, 3652), (28, 3568), (30, 3535), (33, 3472), (35, 3454), (38, 3412), (41, 3379), (43, 3304), (49, 3202), (50, 3163), (54, 3100), (62, 3040), (66, 3001), (68, 2974), (70, 2965), (72, 2908), (83, 2800), (85, 2791), (93, 2737), (96, 2704), (106, 2608), (107, 2602), (110, 2584), (114, 2542), (117, 2497), (127, 2401), (134, 2344), (138, 2290), (149, 2188), (150, 2176), (153, 2155), (155, 2128), (156, 2110), (158, 2089), (163, 2008), (167, 1954), (178, 1876), (179, 1873), (183, 1849),

Gene: CathyBurgh\_4 Start: 4075, Stop: 1808, Start Num: 3

Candidate Starts for CathyBurgh\_4:

(Start: 3 @4075 has 64 MA's), (5, 4042), (7, 4027), (19, 3772), (25, 3655), (26, 3652), (28, 3568), (30, 3535), (36, 3442), (38, 3412), (41, 3379), (43, 3304), (44, 3262), (50, 3163), (54, 3100), (59, 3061), (66, 3001), (68, 2974), (70, 2965), (72, 2908), (78, 2851), (83, 2800), (85, 2791), (86, 2788), (93, 2737), (96, 2704), (103, 2635), (106, 2608), (107, 2602), (110, 2584), (114, 2542), (117, 2497), (138, 2290), (149, 2188), (153, 2155), (155, 2128), (156, 2110), (158, 2089), (159, 2074), (162, 2014), (163, 2008), (178, 1876), (179, 1873), (183, 1849),

Gene: Charianelly\_2 Start: 3416, Stop: 1128, Start Num: 3

Candidate Starts for Charianelly\_2:

(1, 3518), (Start: 3 @3416 has 64 MA's), (6, 3374), (13, 3176), (19, 3110), (25, 2993), (26, 2990), (32, 2846), (41, 2720), (51, 2471), (54, 2429), (55, 2423), (57, 2411), (71, 2249), (74, 2225), (91, 2075), (92, 2072), (96, 2036), (98, 2006), (102, 1985), (113, 1886), (116, 1832), (119, 1781), (122, 1766), (136, 1637), (137, 1634), (140, 1601), (151, 1487), (152, 1481), (153, 1478), (156, 1433), (168, 1277), (177, 1214), (178, 1205),

Gene: Chelms\_4 Start: 4067, Stop: 1800, Start Num: 3

Candidate Starts for Chelms\_4:

(1, 4169), (Start: 3 @4067 has 64 MA's), (5, 4034), (7, 4019), (19, 3764), (23, 3656), (24, 3653), (25, 3647), (26, 3644), (28, 3560), (42, 3350), (54, 3110), (57, 3092), (58, 3086), (62, 3050), (67, 3011), (69, 2981), (71, 2930), (74, 2906), (90, 2762), (92, 2753), (96, 2717), (102, 2666), (109, 2606), (113, 2567), (116, 2513), (118, 2495), (122, 2447), (131, 2393), (132, 2384), (134, 2354), (135, 2339), (136, 2318), (137, 2315), (138, 2297), (143, 2234), (149, 2192), (151, 2168), (152, 2162), (153, 2159), (157, 2105), (172, 1931), (181, 1871),

Gene: CinnamonToast\_5 Start: 4111, Stop: 1844, Start Num: 3

Candidate Starts for CinnamonToast\_5:

(Start: 3 @4111 has 64 MA's), (5, 4078), (7, 4063), (19, 3808), (25, 3691), (26, 3688), (28, 3604), (30, 3571), (41, 3415), (42, 3394), (54, 3154), (55, 3148), (57, 3136), (62, 3094), (71, 2974), (81, 2884), (83, 2857), (86, 2845), (90, 2806), (92, 2797), (94, 2773), (96, 2761), (102, 2710), (112, 2629), (113, 2611), (122, 2491), (131, 2437), (132, 2428), (135, 2383), (136, 2362), (137, 2359), (143, 2278), (149, 2236), (151, 2212), (153, 2203), (155, 2176), (172, 1975), (180, 1924), (181, 1915),

Gene: Crete\_5 Start: 4318, Stop: 2051, Start Num: 3

Candidate Starts for Crete\_5:

(1, 4420), (Start: 3 @4318 has 64 MA's), (5, 4285), (7, 4270), (19, 4015), (24, 3904), (25, 3898), (26, 3895), (28, 3811), (34, 3706), (42, 3601), (54, 3361), (57, 3343), (58, 3337), (62, 3301), (67, 3262), (69, 3232), (71, 3181), (74, 3157), (81, 3091), (90, 3013), (91, 3007), (92, 3004), (96, 2968), (102, 2917), (113, 2818), (116, 2764), (118, 2746), (122, 2698), (131, 2644), (136, 2569), (137, 2566), (141, 2518), (143, 2485), (148, 2446), (149, 2443), (151, 2419), (152, 2413), (153, 2410), (172, 2182), (181, 2122),

Gene: Dakiti\_4 Start: 4067, Stop: 1800, Start Num: 3

Candidate Starts for Dakiti\_4:

(1, 4169), (Start: 3 @4067 has 64 MA's), (5, 4034), (7, 4019), (19, 3764), (23, 3656), (24, 3653), (25, 3647), (26, 3644), (28, 3560), (42, 3350), (54, 3110), (57, 3092), (62, 3050), (67, 3011), (69, 2981), (71, 2930), (74, 2906), (81, 2840), (82, 2837), (90, 2762), (91, 2756), (92, 2753), (96, 2717), (102, 2666), (113, 2567), (118, 2495), (122, 2447), (131, 2393), (136, 2318), (137, 2315), (141, 2267), (143, 2234), (148, 2195), (149, 2192), (151, 2168), (152, 2162), (153, 2159), (157, 2105), (172, 1931), (181, 1871),

Gene: Damp\_2 Start: 3408, Stop: 1105, Start Num: 3

Candidate Starts for Damp\_2:

(Start: 3 @3408 has 64 MA's), (13, 3165), (19, 3099), (24, 2988), (25, 2982), (26, 2979), (41, 2697), (46, 2529), (54, 2406), (55, 2400), (57, 2388), (71, 2226), (72, 2217), (74, 2202), (83, 2109), (91, 2052), (92, 2049), (96, 2013), (97, 1998), (98, 1983), (99, 1980), (102, 1962), (113, 1863), (122, 1743), (132, 1680), (137, 1611), (146, 1512), (149, 1488), (151, 1464), (152, 1458), (153, 1455), (163, 1314), (168, 1254), (178, 1182),

Gene: Demosthenes\_3 Start: 5278, Stop: 3137, Start Num: 2

Candidate Starts for Demosthenes\_3:

(Start: 2 @5278 has 12 MA's), (5, 5206), (12, 5017), (13, 5008), (14, 4996), (17, 4969), (22, 4861), (24, 4831), (25, 4825), (27, 4804), (61, 4408), (63, 4402), (64, 4396), (70, 4330), (83, 4165), (84, 4162), (89, 4117), (91, 4108), (99, 4036), (101, 4024), (104, 3988), (106, 3967), (124, 3778), (132, 3718), (142, 3577), (146, 3553), (147, 3544), (149, 3529), (150, 3517), (153, 3496), (154, 3487), (155, 3469), (159, 3415), (174, 3241), (175, 3238), (184, 3178),

Gene: Diabla\_4 Start: 4098, Stop: 1813, Start Num: 3

Candidate Starts for Diabla\_4:

(Start: 3 @4098 has 64 MA's), (5, 4065), (7, 4050), (19, 3795), (23, 3687), (25, 3678), (28, 3591), (36, 3465), (38, 3435), (41, 3402), (47, 3222), (54, 3105), (56, 3093), (66, 3006), (68, 2979), (70, 2970), (72, 2913), (73, 2910), (78, 2856), (83, 2805), (86, 2793), (87, 2784), (88, 2766), (93, 2742), (94, 2721), (96, 2709), (106, 2613), (107, 2607), (110, 2589), (114, 2547), (117, 2502), (133, 2352), (138, 2295), (149, 2193), (153, 2160), (155, 2133), (156, 2115), (158, 2094), (160, 2076), (171, 1929), (178, 1881), (179, 1878), (182, 1860), (183, 1854),

Gene: Eggsie\_4 Start: 4087, Stop: 1802, Start Num: 3

Candidate Starts for Eggsie\_4:

(Start: 3 @4087 has 64 MA's), (5, 4054), (7, 4039), (19, 3784), (23, 3676), (25, 3667), (28, 3580), (30, 3547), (36, 3454), (38, 3424), (41, 3391), (47, 3211), (50, 3157), (54, 3094), (56, 3082), (59, 3055), (70, 2959), (72, 2902), (83, 2794), (84, 2791), (86, 2782), (87, 2773), (88, 2755), (93, 2731), (94, 2710), (96, 2698), (106, 2602), (107, 2596), (114, 2536), (117, 2491), (133, 2341), (138, 2284), (149, 2182), (153, 2149), (155, 2122), (156, 2104), (158, 2083), (163, 2002), (167, 1948), (170, 1936), (171, 1918), (178, 1870), (179, 1867), (183, 1843),

Gene: Ekhein\_4 Start: 4075, Stop: 1808, Start Num: 3

Candidate Starts for Ekhein\_4:

(Start: 3 @4075 has 64 MA's), (5, 4042), (7, 4027), (19, 3772), (25, 3655), (26, 3652), (28, 3568), (30, 3535), (36, 3442), (38, 3412), (41, 3379), (43, 3304), (44, 3262), (50, 3163), (54, 3100), (66, 3001), (68, 2974), (70, 2965), (72, 2908), (78, 2851), (79, 2836), (83, 2800), (85, 2791), (86, 2788), (93, 2737), (96, 2704), (103, 2635), (106, 2608), (107, 2602), (110, 2584), (114, 2542), (117, 2497), (138, 2290), (149, 2188), (153, 2155), (155, 2128), (156, 2110), (158, 2089), (159, 2074), (162, 2014), (163, 2008), (178, 1876), (179, 1873), (183, 1849),

Gene: Exiguo\_4 Start: 4087, Stop: 1820, Start Num: 3

Candidate Starts for Exiguo\_4:

(Start: 3 @4087 has 64 MA's), (5, 4054), (7, 4039), (19, 3784), (20, 3769), (25, 3667), (26, 3664), (28, 3580), (30, 3547), (41, 3391), (42, 3370), (54, 3130), (55, 3124), (57, 3112), (62, 3070), (71, 2950), (81, 2860), (83, 2833), (86, 2821), (90, 2782), (92, 2773), (94, 2749), (96, 2737), (102, 2686), (112, 2605), (113, 2587), (122, 2467), (131, 2413), (132, 2404), (135, 2359), (136, 2338), (137, 2335), (143, 2254), (149, 2212), (151, 2188), (153, 2179), (155, 2152), (172, 1951), (180, 1900), (181, 1891),

Gene: FelixAlejandro\_5 Start: 4273, Stop: 2006, Start Num: 3

Candidate Starts for FelixAlejandro\_5:

(Start: 3 @4273 has 64 MA's), (5, 4240), (7, 4225), (19, 3970), (25, 3853), (26, 3850), (28, 3766), (30, 3733), (33, 3670), (35, 3652), (38, 3610), (41, 3577), (43, 3502), (49, 3400), (50, 3361), (54, 3298), (62, 3238), (66, 3199), (68, 3172), (70, 3163), (72, 3106), (83, 2998), (85, 2989), (93, 2935), (96, 2902), (106, 2806), (107, 2800), (110, 2782), (114, 2740), (117, 2695), (127, 2599), (134, 2542), (138, 2488), (144, 2422), (149, 2386), (150, 2374), (153, 2353), (155, 2326), (156, 2308), (158, 2287), (163, 2206), (167, 2152), (178, 2074), (179, 2071), (182, 2053), (183, 2047),

Gene: Flakey\_4 Start: 4076, Stop: 1809, Start Num: 3

Candidate Starts for Flakey\_4:

(Start: 3 @4076 has 64 MA's), (5, 4043), (7, 4028), (19, 3773), (25, 3656), (26, 3653), (28, 3569), (30, 3536), (36, 3443), (38, 3413), (41, 3380), (43, 3305), (44, 3263), (50, 3164), (54, 3101), (66, 3002), (68, 2975), (70, 2966), (72, 2909), (78, 2852), (83, 2801), (85, 2792), (86, 2789), (93, 2738), (96, 2705), (106, 2609), (107, 2603), (110, 2585), (114, 2543), (117, 2498), (138, 2291), (149, 2189), (150, 2177), (153, 2156), (155, 2129), (156, 2111), (158, 2090), (178, 1877), (179, 1874), (183, 1850),

Gene: GMA7\_97 Start: 71620, Stop: 69377, Start Num: 3

Candidate Starts for GMA7\_97:

(Start: 3 @71620 has 64 MA's), (4, 71587), (15, 71353), (19, 71320), (21, 71296), (23, 71212), (25, 71203), (27, 71182), (31, 71071), (39, 70966), (54, 70678), (57, 70660), (60, 70624), (65, 70591), (68, 70555), (70, 70546), (71, 70498), (74, 70474), (91, 70324), (92, 70321), (96, 70285), (102, 70234), (109, 70174), (110, 70165), (118, 70063), (122, 70015), (125, 70006), (130, 69970), (137, 69883), (145, 69793), (149, 69760), (151, 69736), (153, 69727), (158, 69661), (164, 69565), (168, 69526), (171, 69502), (184, 69415),

Gene: GTE7\_97 Start: 72617, Stop: 70374, Start Num: 3

Candidate Starts for GTE7\_97:

(Start: 3 @72617 has 64 MA's), (4, 72584), (15, 72350), (19, 72317), (21, 72293), (23, 72209), (25, 72200), (27, 72179), (31, 72068), (39, 71963), (48, 71789), (54, 71675), (57, 71657), (60, 71621), (65, 71588), (68, 71552), (71, 71495), (74, 71471), (91, 71321), (92, 71318), (96, 71282), (102, 71231), (109, 71171), (110, 71162), (113, 71132), (118, 71060), (122, 71012), (125, 71003), (130, 70967), (137, 70880), (145, 70790), (149, 70757), (151, 70733), (153, 70724), (158, 70658), (164, 70562), (166, 70541), (168, 70523), (171, 70499), (184, 70412),

Gene: GalacticEye\_2 Start: 3405, Stop: 1105, Start Num: 3

Candidate Starts for GalacticEye\_2:

(1, 3507), (Start: 3 @3405 has 64 MA's), (6, 3363), (13, 3165), (19, 3099), (25, 2982), (26, 2979), (41, 2697), (51, 2448), (54, 2406), (55, 2400), (57, 2388), (71, 2226), (74, 2202), (91, 2052), (92, 2049), (96, 2013), (98, 1983), (102, 1962), (113, 1863), (116, 1809), (119, 1758), (122, 1743), (136, 1614), (137, 1611), (140, 1578), (151, 1464), (152, 1458), (153, 1455), (156, 1410), (168, 1254), (177, 1191), (178, 1182),

Gene: Gorko\_4 Start: 4076, Stop: 1809, Start Num: 3

Candidate Starts for Gorko\_4:

(Start: 3 @4076 has 64 MA's), (5, 4043), (7, 4028), (19, 3773), (25, 3656), (26, 3653), (28, 3569), (30, 3536), (36, 3443), (38, 3413), (41, 3380), (43, 3305), (44, 3263), (50, 3164), (54, 3101), (66, 3002), (68, 2975), (70, 2966), (72, 2909), (78, 2852), (83, 2801), (85, 2792), (86, 2789), (93, 2738), (96, 2705), (103, 2636), (106, 2609), (107, 2603), (110, 2585), (114, 2543), (117, 2498), (127, 2402), (138, 2291), (149, 2189), (150, 2177), (153, 2156), (155, 2129), (156, 2111), (158, 2090), (178, 1877), (179, 1874), (183, 1850),

Gene: GourdThymes\_4 Start: 4075, Stop: 1808, Start Num: 3

Candidate Starts for GourdThymes\_4:

(Start: 3 @4075 has 64 MA's), (5, 4042), (7, 4027), (19, 3772), (25, 3655), (26, 3652), (28, 3568), (30, 3535), (36, 3442), (38, 3412), (41, 3379), (43, 3304), (44, 3262), (50, 3163), (54, 3100), (66, 3001), (68, 2974), (70, 2965), (72, 2908), (78, 2851), (83, 2800), (85, 2791), (86, 2788), (93, 2737), (96, 2704), (103, 2635), (106, 2608), (107, 2602), (110, 2584), (114, 2542), (117, 2497), (125, 2425), (138, 2290), (149, 2188), (150, 2176), (153, 2155), (155, 2128), (156, 2110), (158, 2089), (159, 2074), (162, 2014), (163, 2008), (168, 1948), (169, 1945), (178, 1876), (179, 1873), (183, 1849),

Gene: Guillaume\_2 Start: 3416, Stop: 1128, Start Num: 3

Candidate Starts for Guillaume\_2:

(1, 3518), (Start: 3 @3416 has 64 MA's), (6, 3374), (13, 3176), (19, 3110), (25, 2993), (26, 2990), (32, 2846), (41, 2720), (51, 2471), (54, 2429), (55, 2423), (57, 2411), (71, 2249), (74, 2225), (91, 2075), (92, 2072), (96, 2036), (98, 2006), (102, 1985), (113, 1886), (119, 1781), (122, 1766), (136, 1637), (137, 1634), (140, 1601), (151, 1487), (152, 1481), (153, 1478), (156, 1433), (168, 1277), (177, 1214), (178, 1205),

Gene: Hail2Pitt\_2 Start: 3394, Stop: 1106, Start Num: 3

Candidate Starts for Hail2Pitt\_2:

(1, 3496), (Start: 3 @3394 has 64 MA's), (6, 3352), (11, 3172), (16, 3121), (19, 3088), (23, 2980), (24, 2977), (25, 2971), (26, 2968), (32, 2824), (41, 2698), (51, 2449), (54, 2407), (55, 2401), (57, 2389), (71, 2227), (74, 2203), (81, 2137), (86, 2098), (91, 2053), (92, 2050), (96, 2014), (102, 1963), (109, 1903), (113, 1864), (119, 1759), (122, 1744), (136, 1615), (137, 1612), (140, 1579), (151, 1465), (152, 1459), (153, 1456), (155, 1429), (156, 1411), (161, 1357), (168, 1255),

Gene: Harambe\_2 Start: 3415, Stop: 1127, Start Num: 3

Candidate Starts for Harambe\_2:

(1, 3517), (Start: 3 @3415 has 64 MA's), (6, 3373), (11, 3193), (16, 3142), (19, 3109), (23, 3001), (24, 2998), (25, 2992), (26, 2989), (32, 2845), (41, 2719), (51, 2470), (54, 2428), (55, 2422), (57, 2410), (71, 2248), (74, 2224), (81, 2158), (86, 2119), (91, 2074), (92, 2071), (96, 2035), (102, 1984), (109, 1924), (113, 1885), (119, 1780), (122, 1765), (136, 1636), (137, 1633), (140, 1600), (151, 1486), (152, 1480), (153, 1477), (155, 1450), (156, 1432), (161, 1378), (168, 1276),

Gene: HayZem\_4 Start: 4012, Stop: 1769, Start Num: 3

Candidate Starts for HayZem\_4:

(Start: 3 @4012 has 64 MA's), (4, 3979), (19, 3712), (21, 3688), (25, 3595), (26, 3592), (27, 3574), (31, 3463), (39, 3358), (48, 3184), (54, 3070), (57, 3052), (60, 3016), (65, 2983), (68, 2947), (70, 2938), (71, 2890), (74, 2866), (91, 2716), (92, 2713), (96, 2677), (102, 2626), (109, 2566), (110, 2557), (113, 2527), (118, 2455), (122, 2407), (125, 2398), (130, 2362), (137, 2275), (139, 2254), (149, 2152), (151, 2128), (153, 2119), (158, 2053), (164, 1957), (168, 1918), (171, 1894), (184, 1807),

Gene: Hello\_2 Start: 3405, Stop: 1105, Start Num: 3

Candidate Starts for Hello\_2:

(1, 3507), (Start: 3 @3405 has 64 MA's), (6, 3363), (19, 3099), (25, 2982), (26, 2979), (41, 2697), (46, 2529), (51, 2448), (54, 2406), (55, 2400), (57, 2388), (71, 2226), (74, 2202), (81, 2136), (86, 2097), (91, 2052), (92, 2049), (96, 2013), (102, 1962), (109, 1902), (113, 1863), (116, 1809), (119, 1758), (122, 1743), (136, 1614), (137, 1611), (140, 1578), (151, 1464), (152, 1458), (153, 1455), (155, 1428), (156, 1410), (161, 1356), (168, 1254),

Gene: Hollow\_3 Start: 5316, Stop: 3175, Start Num: 2

Candidate Starts for Hollow\_3:

(Start: 2 @5316 has 12 MA's), (5, 5244), (12, 5055), (13, 5046), (14, 5034), (17, 5007), (22, 4899), (24, 4869), (25, 4863), (27, 4842), (61, 4446), (62, 4443), (63, 4440), (64, 4434), (71, 4320), (75, 4293), (76, 4284), (77, 4266), (80, 4236), (83, 4203), (89, 4155), (91, 4146), (99, 4074), (101, 4062), (106, 4005), (116, 3897), (126, 3801), (132, 3756), (142, 3615), (146, 3591), (149, 3567), (150, 3555), (153, 3534), (154, 3525), (159, 3453), (175, 3276),

Gene: Hotorobo\_4 Start: 4086, Stop: 1819, Start Num: 3

Candidate Starts for Hotorobo\_4:

(Start: 3 @4086 has 64 MA's), (5, 4053), (7, 4038), (19, 3783), (25, 3666), (26, 3663), (28, 3579), (30, 3546), (41, 3390), (42, 3369), (54, 3129), (55, 3123), (57, 3111), (62, 3069), (71, 2949), (81, 2859), (83, 2832), (86, 2820), (90, 2781), (92, 2772), (94, 2748), (96, 2736), (102, 2685), (112, 2604), (113, 2586), (122, 2466), (131, 2412), (132, 2403), (135, 2358), (136, 2337), (137, 2334), (143, 2253), (149, 2211), (151, 2187), (153, 2178), (155, 2151), (172, 1950), (180, 1899), (181, 1890),

Gene: Jams\_2 Start: 3428, Stop: 1128, Start Num: 3

Candidate Starts for Jams\_2:

(1, 3530), (Start: 3 @3428 has 64 MA's), (6, 3386), (16, 3155), (19, 3122), (25, 3005), (26, 3002), (41, 2720), (46, 2552), (54, 2429), (55, 2423), (57, 2411), (71, 2249), (72, 2240), (74, 2225), (91, 2075), (92, 2072), (96, 2036), (97, 2021), (98, 2006), (99, 2003), (102, 1985), (113, 1886), (122, 1766), (132, 1703), (137, 1634), (146, 1535), (149, 1511), (151, 1487), (152, 1481), (153, 1478), (163, 1337), (168, 1277), (177, 1214), (178, 1205),

Gene: Jellybones\_4 Start: 4110, Stop: 1843, Start Num: 3

Candidate Starts for Jellybones\_4:

(Start: 3 @4110 has 64 MA's), (5, 4077), (7, 4062), (19, 3807), (25, 3690), (26, 3687), (28, 3603), (30, 3570), (42, 3393), (54, 3153), (55, 3147), (57, 3135), (62, 3093), (71, 2973), (81, 2883), (83, 2856), (86, 2844), (90, 2805), (92, 2796), (94, 2772), (96, 2760), (102, 2709), (112, 2628), (113, 2610), (118, 2538), (122, 2490), (131, 2436), (132, 2427), (135, 2382), (136, 2361), (137, 2358), (143, 2277), (149, 2235), (151, 2211), (153, 2202), (155, 2175), (172, 1974), (180, 1923), (181, 1914),

Gene: John316\_4 Start: 4075, Stop: 1808, Start Num: 3

Candidate Starts for John316\_4:

(Start: 3 @4075 has 64 MA's), (5, 4042), (7, 4027), (19, 3772), (25, 3655), (26, 3652), (28, 3568), (30, 3535), (36, 3442), (38, 3412), (41, 3379), (43, 3304), (44, 3262), (50, 3163), (54, 3100), (59, 3061), (66, 3001), (68, 2974), (70, 2965), (72, 2908), (78, 2851), (83, 2800), (85, 2791), (86, 2788), (93, 2737), (96, 2704), (106, 2608), (107, 2602), (110, 2584), (114, 2542), (117, 2497), (125, 2425), (138, 2290), (149, 2188), (150, 2176), (153, 2155), (155, 2128), (156, 2110), (158, 2089), (163, 2008), (178, 1876), (179, 1873), (182, 1855), (183, 1849),

Gene: Jormungandr\_2 Start: 3414, Stop: 1126, Start Num: 3

Candidate Starts for Jormungandr\_2:

(1, 3516), (Start: 3 @3414 has 64 MA's), (6, 3372), (19, 3108), (23, 3000), (24, 2997), (25, 2991), (26, 2988), (32, 2844), (41, 2718), (51, 2469), (54, 2427), (55, 2421), (57, 2409), (71, 2247), (74, 2223), (81, 2157), (86, 2118), (91, 2073), (92, 2070), (96, 2034), (102, 1983), (109, 1923), (113, 1884), (119, 1779), (122, 1764), (137, 1632), (140, 1599), (146, 1533), (151, 1485), (152, 1479), (153, 1476), (156, 1431), (161, 1377), (168, 1275),

Gene: Kaseim\_2 Start: 3416, Stop: 1128, Start Num: 3

Candidate Starts for Kaseim\_2:

(1, 3518), (Start: 3 @3416 has 64 MA's), (6, 3374), (16, 3143), (19, 3110), (25, 2993), (26, 2990), (32, 2846), (41, 2720), (51, 2471), (54, 2429), (55, 2423), (57, 2411), (71, 2249), (74, 2225), (91, 2075), (92, 2072), (96, 2036), (98, 2006), (102, 1985), (113, 1886), (116, 1832), (119, 1781), (122, 1766), (136, 1637), (137, 1634), (140, 1601), (151, 1487), (152, 1481), (153, 1478), (156, 1433), (168, 1277), (177, 1214), (178, 1205),

Gene: Katyusha\_3 Start: 5381, Stop: 3240, Start Num: 2

Candidate Starts for Katyusha\_3:

(Start: 2 @5381 has 12 MA's), (5, 5309), (12, 5120), (13, 5111), (14, 5099), (17, 5072), (22, 4964), (24, 4934), (25, 4928), (27, 4907), (61, 4511), (62, 4508), (63, 4505), (64, 4499), (71, 4385), (75, 4358), (76, 4349), (77, 4331), (91, 4211), (99, 4139), (101, 4127), (104, 4091), (106, 4070), (112, 4034), (121, 3890), (126, 3866), (132, 3821), (135, 3773), (142, 3680), (144, 3668), (146, 3656), (149, 3632), (150, 3620), (153, 3599), (154, 3590), (155, 3572), (159, 3518), (175, 3341), (176, 3338), (184, 3281),

Gene: Kelzog\_4 Start: 4087, Stop: 1820, Start Num: 3

Candidate Starts for Kelzog\_4:

(Start: 3 @4087 has 64 MA's), (5, 4054), (7, 4039), (19, 3784), (25, 3667), (26, 3664), (28, 3580), (30, 3547), (41, 3391), (42, 3370), (54, 3130), (55, 3124), (57, 3112), (62, 3070), (71, 2950), (81, 2860), (83, 2833), (86, 2821), (90, 2782), (92, 2773), (94, 2749), (96, 2737), (102, 2686), (112, 2605), (113, 2587), (122, 2467), (131, 2413), (132, 2404), (135, 2359), (136, 2338), (137, 2335), (143, 2254), (149, 2212), (151, 2188), (153, 2179), (155, 2152), (172, 1951), (180, 1900), (181, 1891),

Gene: Kvothe\_3 Start: 5336, Stop: 3195, Start Num: 2

Candidate Starts for Kvothe\_3:

(Start: 2 @5336 has 12 MA's), (12, 5075), (13, 5066), (14, 5054), (17, 5027), (18, 5003), (22, 4919), (24, 4889), (25, 4883), (27, 4862), (45, 4637), (61, 4466), (62, 4463), (63, 4460), (64, 4454), (71, 4340), (76, 4304), (77, 4286), (99, 4094), (101, 4082), (106, 4025), (112, 3989), (115, 3947), (116, 3917), (117, 3914), (126, 3821), (128, 3800), (129, 3797), (132, 3776), (142, 3635), (146, 3611), (149, 3587), (150, 3575), (153, 3554), (154, 3545), (155, 3527), (159, 3473), (173, 3311), (175, 3296), (176, 3293), (184, 3236),

Gene: Lahirium\_2 Start: 3415, Stop: 1127, Start Num: 3

Candidate Starts for Lahirium\_2:

(1, 3517), (Start: 3 @3415 has 64 MA's), (6, 3373), (11, 3193), (16, 3142), (19, 3109), (23, 3001), (24, 2998), (25, 2992), (26, 2989), (32, 2845), (41, 2719), (51, 2470), (54, 2428), (55, 2422), (57, 2410), (71, 2248), (74, 2224), (81, 2158), (86, 2119), (91, 2074), (92, 2071), (96, 2035), (102, 1984), (109, 1924), (113, 1885), (119, 1780), (122, 1765), (136, 1636), (137, 1633), (140, 1600), (151, 1486), (152, 1480), (153, 1477), (155, 1450), (156, 1432), (161, 1378), (168, 1276),

Gene: Lidong\_2 Start: 3405, Stop: 1105, Start Num: 3

Candidate Starts for Lidong\_2:

(1, 3507), (Start: 3 @3405 has 64 MA's), (6, 3363), (13, 3165), (19, 3099), (25, 2982), (26, 2979), (41, 2697), (51, 2448), (54, 2406), (55, 2400), (57, 2388), (71, 2226), (74, 2202), (91, 2052), (92, 2049), (96, 2013), (98, 1983), (102, 1962), (113, 1863), (116, 1809), (119, 1758), (122, 1743), (136, 1614), (137, 1611), (140, 1578), (151, 1464), (152, 1458), (153, 1455), (156, 1410), (168, 1254), (177, 1191), (178, 1182),

Gene: Linetti\_5 Start: 4220, Stop: 1965, Start Num: 3

Candidate Starts for Linetti\_5:

(1, 4322), (Start: 3 @4220 has 64 MA's), (5, 4187), (7, 4172), (19, 3917), (23, 3809), (24, 3806), (25, 3800), (26, 3797), (28, 3713), (38, 3569), (41, 3536), (43, 3461), (47, 3374), (49, 3359), (50, 3320), (54, 3257), (66, 3158), (68, 3131), (70, 3122), (72, 3065), (78, 3008), (83, 2957), (85, 2948), (86, 2945), (93, 2894), (96, 2861), (106, 2765), (107, 2759), (110, 2741), (117, 2654), (138, 2447), (149, 2345), (150, 2333), (153, 2312), (155, 2285), (156, 2267), (158, 2246), (163, 2165), (178, 2033), (179, 2030), (182, 2012), (183, 2006),

Gene: Lizzo\_4 Start: 4075, Stop: 1808, Start Num: 3

Candidate Starts for Lizzo\_4:

(Start: 3 @4075 has 64 MA's), (5, 4042), (7, 4027), (19, 3772), (25, 3655), (26, 3652), (28, 3568), (30, 3535), (36, 3442), (38, 3412), (41, 3379), (43, 3304), (44, 3262), (50, 3163), (54, 3100), (59, 3061), (66, 3001), (68, 2974), (70, 2965), (72, 2908), (78, 2851), (83, 2800), (85, 2791), (86, 2788), (93, 2737), (96, 2704), (103, 2635), (106, 2608), (107, 2602), (110, 2584), (114, 2542), (117, 2497), (138, 2290), (149, 2188), (153, 2155), (155, 2128), (156, 2110), (158, 2089), (159, 2074), (162, 2014), (163, 2008), (178, 1876), (179, 1873), (183, 1849),

Gene: Luker\_2 Start: 3394, Stop: 1106, Start Num: 3

Candidate Starts for Luker\_2:

(1, 3496), (Start: 3 @3394 has 64 MA's), (6, 3352), (11, 3172), (16, 3121), (19, 3088), (23, 2980), (24, 2977), (25, 2971), (26, 2968), (41, 2698), (51, 2449), (54, 2407), (55, 2401), (57, 2389), (71, 2227), (74, 2203), (81, 2137), (86, 2098), (91, 2053), (92, 2050), (96, 2014), (102, 1963), (109, 1903), (113, 1864), (119, 1759), (122, 1744), (136, 1615), (137, 1612), (140, 1579), (151, 1465), (152, 1459), (153, 1456), (155, 1429), (156, 1411), (161, 1357), (168, 1255),

Gene: Minos\_2 Start: 3408, Stop: 1105, Start Num: 3

Candidate Starts for Minos\_2:

(Start: 3 @3408 has 64 MA's), (13, 3165), (19, 3099), (25, 2982), (26, 2979), (41, 2697), (46, 2529), (54, 2406), (55, 2400), (57, 2388), (71, 2226), (72, 2217), (74, 2202), (83, 2109), (91, 2052), (92, 2049),

(96, 2013), (97, 1998), (98, 1983), (99, 1980), (102, 1962), (113, 1863), (122, 1743), (132, 1680), (137, 1611), (146, 1512), (149, 1488), (151, 1464), (152, 1458), (153, 1455), (163, 1314), (168, 1254), (178, 1182),

Gene: Monty\_4 Start: 4088, Stop: 1821, Start Num: 3

Candidate Starts for Monty\_4:

(Start: 3 @4088 has 64 MA's), (5, 4055), (7, 4040), (19, 3785), (25, 3668), (26, 3665), (28, 3581), (30, 3548), (41, 3392), (42, 3371), (54, 3131), (55, 3125), (57, 3113), (62, 3071), (71, 2951), (81, 2861), (83, 2834), (86, 2822), (90, 2783), (92, 2774), (94, 2750), (96, 2738), (102, 2687), (112, 2606), (113, 2588), (122, 2468), (131, 2414), (132, 2405), (135, 2360), (136, 2339), (137, 2336), (143, 2255), (149, 2213), (151, 2189), (153, 2180), (155, 2153), (172, 1952), (180, 1901), (181, 1892),

Gene: MrWormie\_2 Start: 3394, Stop: 1106, Start Num: 3

Candidate Starts for MrWormie\_2:

(1, 3496), (Start: 3 @3394 has 64 MA's), (6, 3352), (16, 3121), (19, 3088), (23, 2980), (24, 2977), (25, 2971), (26, 2968), (32, 2824), (41, 2698), (51, 2449), (54, 2407), (55, 2401), (57, 2389), (71, 2227), (74, 2203), (91, 2053), (92, 2050), (96, 2014), (98, 1984), (102, 1963), (113, 1864), (116, 1810), (119, 1759), (122, 1744), (136, 1615), (137, 1612), (140, 1579), (151, 1465), (152, 1459), (153, 1456), (156, 1411), (168, 1255), (177, 1192), (178, 1183),

Gene: Msay19\_5 Start: 4265, Stop: 1998, Start Num: 3

Candidate Starts for Msay19\_5:

(Start: 3 @4265 has 64 MA's), (5, 4232), (7, 4217), (19, 3962), (25, 3845), (26, 3842), (28, 3758), (30, 3725), (33, 3662), (35, 3644), (38, 3602), (41, 3569), (43, 3494), (50, 3353), (54, 3290), (66, 3191), (68, 3164), (70, 3155), (72, 3098), (83, 2990), (85, 2981), (93, 2927), (96, 2894), (106, 2798), (107, 2792), (110, 2774), (114, 2732), (117, 2687), (127, 2591), (134, 2534), (138, 2480), (144, 2414), (149, 2378), (150, 2366), (153, 2345), (155, 2318), (156, 2300), (158, 2279), (163, 2198), (169, 2135), (171, 2114), (178, 2066), (179, 2063), (183, 2039),

Gene: Neoevie\_2 Start: 3392, Stop: 1104, Start Num: 3

Candidate Starts for Neoevie\_2:

(1, 3494), (Start: 3 @3392 has 64 MA's), (6, 3350), (11, 3170), (16, 3119), (19, 3086), (23, 2978), (24, 2975), (25, 2969), (26, 2966), (32, 2822), (41, 2696), (51, 2447), (54, 2405), (55, 2399), (57, 2387), (71, 2225), (74, 2201), (81, 2135), (86, 2096), (91, 2051), (92, 2048), (96, 2012), (102, 1961), (109, 1901), (113, 1862), (119, 1757), (122, 1742), (136, 1613), (137, 1610), (140, 1577), (151, 1463), (152, 1457), (153, 1454), (155, 1427), (156, 1409), (161, 1355), (168, 1253),

Gene: Newt\_2 Start: 3416, Stop: 1128, Start Num: 3

Candidate Starts for Newt\_2:

(1, 3518), (Start: 3 @3416 has 64 MA's), (6, 3374), (13, 3176), (19, 3110), (25, 2993), (26, 2990), (32, 2846), (41, 2720), (51, 2471), (54, 2429), (55, 2423), (57, 2411), (71, 2249), (74, 2225), (91, 2075), (92, 2072), (96, 2036), (98, 2006), (102, 1985), (113, 1886), (116, 1832), (119, 1781), (122, 1766), (136, 1637), (137, 1634), (140, 1601), (151, 1487), (152, 1481), (153, 1478), (156, 1433), (168, 1277), (177, 1214), (178, 1205),

Gene: Niagara\_3 Start: 5338, Stop: 3197, Start Num: 2

Candidate Starts for Niagara\_3:

(Start: 2 @5338 has 12 MA's), (5, 5266), (9, 5224), (12, 5077), (13, 5068), (14, 5056), (17, 5029), (22, 4921), (24, 4891), (25, 4885), (27, 4864), (61, 4468), (62, 4465), (63, 4462), (64, 4456), (71, 4342), (75, 4315), (76, 4306), (77, 4288), (80, 4258), (83, 4225), (91, 4168), (99, 4096), (101, 4084), (104, 4048), (106, 4027), (116, 3919), (126, 3823), (132, 3778), (142, 3637), (146, 3613), (149, 3589), (153, 3556), (154, 3547), (155, 3529), (159, 3475), (174, 3301), (184, 3238),

Gene: Nimi13\_2 Start: 3417, Stop: 1129, Start Num: 3

Candidate Starts for Nimi13\_2:

(1, 3519), (Start: 3 @3417 has 64 MA's), (6, 3375), (13, 3177), (19, 3111), (25, 2994), (26, 2991), (32, 2847), (41, 2721), (51, 2472), (54, 2430), (55, 2424), (57, 2412), (71, 2250), (74, 2226), (91, 2076), (92, 2073), (96, 2037), (98, 2007), (102, 1986), (113, 1887), (116, 1833), (119, 1782), (122, 1767), (136, 1638), (137, 1635), (140, 1602), (151, 1488), (152, 1482), (153, 1479), (156, 1434), (168, 1278), (177, 1215), (178, 1206),

Gene: Philon9\_3 Start: 4857, Stop: 2704, Start Num: 2

Candidate Starts for Philon9\_3:

(Start: 2 @4857 has 12 MA's), (8, 4764), (9, 4743), (10, 4635), (12, 4596), (17, 4548), (22, 4440), (25, 4404), (27, 4383), (52, 4062), (53, 4044), (61, 3975), (62, 3972), (64, 3963), (70, 3897), (71, 3849), (77, 3795), (80, 3765), (83, 3732), (99, 3603), (100, 3597), (101, 3591), (104, 3555), (105, 3552), (108, 3525), (115, 3456), (120, 3363), (121, 3354), (129, 3306), (132, 3285), (142, 3144), (145, 3129), (146, 3120), (148, 3099), (149, 3096), (150, 3084), (152, 3066), (153, 3063), (158, 2997), (159, 2982), (174, 2808),

Gene: PierreThree\_4 Start: 4067, Stop: 1800, Start Num: 3

Candidate Starts for PierreThree\_4:

(1, 4169), (Start: 3 @4067 has 64 MA's), (5, 4034), (7, 4019), (19, 3764), (23, 3656), (24, 3653), (25, 3647), (26, 3644), (28, 3560), (42, 3350), (54, 3110), (57, 3092), (62, 3050), (67, 3011), (69, 2981), (71, 2930), (74, 2906), (81, 2840), (82, 2837), (90, 2762), (91, 2756), (92, 2753), (96, 2717), (102, 2666), (113, 2567), (118, 2495), (122, 2447), (131, 2393), (136, 2318), (137, 2315), (141, 2267), (143, 2234), (148, 2195), (149, 2192), (151, 2168), (152, 2162), (153, 2159), (157, 2105), (172, 1931), (181, 1871),

Gene: PokyPuppy\_4 Start: 4153, Stop: 1892, Start Num: 3

Candidate Starts for PokyPuppy\_4:

(Start: 3 @4153 has 64 MA's), (5, 4120), (7, 4105), (13, 3916), (19, 3850), (23, 3742), (25, 3733), (29, 3628), (35, 3532), (37, 3508), (38, 3490), (40, 3466), (41, 3457), (43, 3382), (47, 3295), (54, 3178), (68, 3052), (70, 3043), (72, 2986), (78, 2929), (83, 2878), (85, 2869), (88, 2839), (93, 2815), (96, 2782), (106, 2686), (107, 2680), (110, 2662), (114, 2620), (117, 2575), (123, 2509), (138, 2368), (148, 2269), (149, 2266), (153, 2233), (155, 2206), (156, 2188), (158, 2167), (163, 2086), (167, 2032), (170, 2020), (171, 2002), (178, 1954),

Gene: Poland\_5 Start: 4241, Stop: 1974, Start Num: 3

Candidate Starts for Poland\_5:

(Start: 3 @4241 has 64 MA's), (5, 4208), (7, 4193), (19, 3938), (25, 3821), (26, 3818), (28, 3734), (30, 3701), (33, 3638), (35, 3620), (38, 3578), (41, 3545), (43, 3470), (49, 3368), (50, 3329), (54, 3266), (66, 3167), (68, 3140), (70, 3131), (72, 3074), (85, 2957), (93, 2903), (96, 2870), (106, 2774), (107, 2768), (110, 2750), (114, 2708), (117, 2663), (127, 2567), (134, 2510), (138, 2456), (144, 2390), (149, 2354), (150, 2342), (153, 2321), (155, 2294), (156, 2276), (158, 2255), (165, 2138), (171, 2090), (178, 2042), (179, 2039), (183, 2015),

Gene: RemRem\_4 Start: 4087, Stop: 1820, Start Num: 3

Candidate Starts for RemRem\_4:

(Start: 3 @4087 has 64 MA's), (5, 4054), (7, 4039), (19, 3784), (25, 3667), (26, 3664), (28, 3580), (30, 3547), (41, 3391), (42, 3370), (54, 3130), (55, 3124), (57, 3112), (62, 3070), (71, 2950), (81, 2860), (83, 2833), (86, 2821), (90, 2782), (92, 2773), (94, 2749), (96, 2737), (102, 2686), (112, 2605), (113, 2587), (122, 2467), (131, 2413), (132, 2404), (135, 2359), (136, 2338), (137, 2335), (143, 2254), (149, 2212), (151, 2188), (153, 2179), (155, 2152), (172, 1951), (180, 1900), (181, 1891),

Gene: RoyalG\_5 Start: 4282, Stop: 1997, Start Num: 3

Candidate Starts for RoyalG\_5:

(Start: 3 @4282 has 64 MA's), (5, 4249), (7, 4234), (19, 3979), (23, 3871), (25, 3862), (28, 3775), (36, 3649), (38, 3619), (41, 3586), (50, 3352), (54, 3289), (56, 3277), (66, 3190), (68, 3163), (70, 3154), (72, 3097), (83, 2989), (93, 2926), (94, 2905), (96, 2893), (106, 2797), (107, 2791), (114, 2731), (117, 2686), (133, 2536), (138, 2479), (143, 2419), (149, 2377), (153, 2344), (155, 2317), (156, 2299), (158, 2278), (163, 2197), (171, 2113), (178, 2065), (179, 2062), (182, 2044), (183, 2038),

Gene: Sam12\_4 Start: 4087, Stop: 1820, Start Num: 3

Candidate Starts for Sam12\_4:

(Start: 3 @4087 has 64 MA's), (5, 4054), (7, 4039), (19, 3784), (20, 3769), (25, 3667), (26, 3664), (28, 3580), (30, 3547), (41, 3391), (42, 3370), (54, 3130), (55, 3124), (57, 3112), (62, 3070), (71, 2950), (81, 2860), (83, 2833), (86, 2821), (90, 2782), (92, 2773), (94, 2749), (96, 2737), (102, 2686), (112, 2605), (113, 2587), (122, 2467), (131, 2413), (132, 2404), (135, 2359), (136, 2338), (137, 2335), (143, 2254), (149, 2212), (151, 2188), (153, 2179), (155, 2152), (172, 1951), (180, 1900), (181, 1891),

Gene: Shelley\_2 Start: 3439, Stop: 1151, Start Num: 3

Candidate Starts for Shelley\_2:

(1, 3541), (Start: 3 @3439 has 64 MA's), (6, 3397), (16, 3166), (19, 3133), (25, 3016), (26, 3013), (32, 2869), (41, 2743), (51, 2494), (54, 2452), (55, 2446), (57, 2434), (71, 2272), (74, 2248), (91, 2098), (92, 2095), (96, 2059), (98, 2029), (102, 2008), (113, 1909), (116, 1855), (119, 1804), (122, 1789), (136, 1660), (137, 1657), (140, 1624), (151, 1510), (152, 1504), (153, 1501), (156, 1456), (168, 1300), (177, 1237), (178, 1228),

Gene: Sombrero\_4 Start: 4121, Stop: 1854, Start Num: 3

Candidate Starts for Sombrero\_4:

(Start: 3 @4121 has 64 MA's), (5, 4088), (7, 4073), (19, 3818), (25, 3701), (26, 3698), (28, 3614), (30, 3581), (41, 3425), (42, 3404), (54, 3164), (55, 3158), (57, 3146), (62, 3104), (71, 2984), (81, 2894), (83, 2867), (86, 2855), (90, 2816), (92, 2807), (94, 2783), (96, 2771), (102, 2720), (112, 2639), (113, 2621), (122, 2501), (131, 2447), (132, 2438), (135, 2393), (136, 2372), (137, 2369), (143, 2288), (149, 2246), (151, 2222), (153, 2213), (155, 2186), (172, 1985), (180, 1934), (181, 1925),

Gene: Squibbles\_4 Start: 4075, Stop: 1808, Start Num: 3

Candidate Starts for Squibbles\_4:

(Start: 3 @4075 has 64 MA's), (5, 4042), (7, 4027), (25, 3655), (26, 3652), (28, 3568), (30, 3535), (36, 3442), (38, 3412), (41, 3379), (43, 3304), (44, 3262), (50, 3163), (54, 3100), (66, 3001), (68, 2974), (70, 2965), (72, 2908), (78, 2851), (79, 2836), (83, 2800), (85, 2791), (86, 2788), (93, 2737), (96, 2704), (106, 2608), (107, 2602), (110, 2584), (114, 2542), (117, 2497), (138, 2290), (149, 2188), (150, 2176), (153, 2155), (155, 2128), (156, 2110), (158, 2089), (159, 2074), (162, 2014), (163, 2008), (168, 1948), (169, 1945), (178, 1876), (179, 1873), (183, 1849),

Gene: SteveFrench\_4 Start: 4087, Stop: 1820, Start Num: 3

Candidate Starts for SteveFrench\_4:

(Start: 3 @4087 has 64 MA's), (5, 4054), (19, 3784), (20, 3769), (25, 3667), (26, 3664), (28, 3580), (30, 3547), (41, 3391), (54, 3130), (55, 3124), (57, 3112), (62, 3070), (71, 2950), (81, 2860), (83, 2833), (86, 2821), (90, 2782), (92, 2773), (94, 2749), (96, 2737), (102, 2686), (112, 2605), (113, 2587), (122, 2467), (131, 2413), (132, 2404), (135, 2359), (136, 2338), (137, 2335), (143, 2254), (149, 2212), (151, 2188), (153, 2179), (155, 2152), (172, 1951), (180, 1900), (181, 1891),

Gene: Sticker17\_2 Start: 3416, Stop: 1128, Start Num: 3

Candidate Starts for Sticker17\_2:

(1, 3518), (Start: 3 @3416 has 64 MA's), (6, 3374), (13, 3176), (19, 3110), (23, 3002), (24, 2999), (25, 2993), (26, 2990), (41, 2720), (51, 2471), (54, 2429), (55, 2423), (57, 2411), (71, 2249), (74, 2225), (91, 2075), (92, 2072), (96, 2036), (98, 2006), (102, 1985), (113, 1886), (116, 1832), (119, 1781), (122, 1766), (136, 1637), (137, 1634), (140, 1601), (151, 1487), (152, 1481), (153, 1478), (156, 1433), (168,

1277), (177, 1214), (178, 1205),

Gene: Teal\_2 Start: 3393, Stop: 1105, Start Num: 3

Candidate Starts for Teal\_2:

(1, 3495), (Start: 3 @3393 has 64 MA's), (6, 3351), (13, 3153), (19, 3087), (25, 2970), (26, 2967), (32, 2823), (41, 2697), (51, 2448), (54, 2406), (55, 2400), (57, 2388), (71, 2226), (74, 2202), (91, 2052), (92, 2049), (96, 2013), (98, 1983), (102, 1962), (113, 1863), (116, 1809), (119, 1758), (122, 1743), (136, 1614), (137, 1611), (140, 1578), (151, 1464), (152, 1458), (153, 1455), (156, 1410), (168, 1254), (177, 1191), (178, 1182),

Gene: Teatealatte\_3 Start: 5301, Stop: 3160, Start Num: 2

Candidate Starts for Teatealatte\_3:

(Start: 2 @5301 has 12 MA's), (5, 5229), (12, 5040), (13, 5031), (14, 5019), (17, 4992), (22, 4884), (24, 4854), (25, 4848), (27, 4827), (61, 4431), (62, 4428), (63, 4425), (64, 4419), (71, 4305), (75, 4278), (76, 4269), (77, 4251), (91, 4131), (99, 4059), (101, 4047), (104, 4011), (106, 3990), (112, 3954), (121, 3810), (126, 3786), (132, 3741), (135, 3693), (142, 3600), (144, 3588), (146, 3576), (149, 3552), (150, 3540), (153, 3519), (154, 3510), (155, 3492), (174, 3264), (175, 3261), (176, 3258), (184, 3201),

Gene: Teech\_3 Start: 5373, Stop: 3232, Start Num: 2

Candidate Starts for Teech\_3:

(Start: 2 @5373 has 12 MA's), (5, 5301), (12, 5112), (13, 5103), (14, 5091), (17, 5064), (22, 4956), (24, 4926), (25, 4920), (27, 4899), (61, 4503), (62, 4500), (63, 4497), (64, 4491), (71, 4377), (75, 4350), (76, 4341), (77, 4323), (80, 4293), (83, 4260), (89, 4212), (91, 4203), (99, 4131), (101, 4119), (106, 4062), (116, 3954), (126, 3858), (132, 3813), (142, 3672), (145, 3657), (146, 3648), (149, 3624), (150, 3612), (153, 3591), (154, 3582), (159, 3510), (175, 3333),

Gene: Tredge\_3 Start: 5301, Stop: 3160, Start Num: 2

Candidate Starts for Tredge\_3:

(Start: 2 @5301 has 12 MA's), (5, 5229), (12, 5040), (13, 5031), (14, 5019), (17, 4992), (22, 4884), (24, 4854), (25, 4848), (27, 4827), (61, 4431), (62, 4428), (63, 4425), (64, 4419), (71, 4305), (75, 4278), (76, 4269), (77, 4251), (91, 4131), (99, 4059), (101, 4047), (104, 4011), (106, 3990), (112, 3954), (121, 3810), (126, 3786), (132, 3741), (135, 3693), (142, 3600), (144, 3588), (146, 3576), (149, 3552), (150, 3540), (153, 3519), (154, 3510), (155, 3492), (174, 3264), (175, 3261), (176, 3258), (184, 3201),

Gene: Vitaenoi\_3 Start: 4857, Stop: 2704, Start Num: 2

Candidate Starts for Vitaenoi\_3:

(Start: 2 @4857 has 12 MA's), (8, 4764), (9, 4743), (10, 4635), (12, 4596), (17, 4548), (22, 4440), (25, 4404), (27, 4383), (52, 4062), (53, 4044), (61, 3975), (62, 3972), (64, 3963), (70, 3897), (71, 3849), (77, 3795), (80, 3765), (95, 3639), (99, 3603), (100, 3597), (101, 3591), (104, 3555), (108, 3525), (111, 3501), (112, 3498), (115, 3456), (121, 3354), (126, 3330), (132, 3285), (146, 3120), (148, 3099), (149, 3096), (150, 3084), (152, 3066), (153, 3063), (158, 2997), (159, 2982), (174, 2808),

Gene: Woes\_2 Start: 3432, Stop: 1129, Start Num: 3

Candidate Starts for Woes\_2:

(Start: 3 @3432 has 64 MA's), (13, 3189), (19, 3123), (25, 3006), (26, 3003), (41, 2721), (46, 2553), (54, 2430), (55, 2424), (57, 2412), (71, 2250), (72, 2241), (74, 2226), (83, 2133), (91, 2076), (92, 2073), (96, 2037), (97, 2022), (98, 2007), (102, 1986), (113, 1887), (122, 1767), (132, 1704), (137, 1635), (146, 1536), (149, 1512), (151, 1488), (152, 1482), (153, 1479), (163, 1338), (168, 1278), (178, 1206),

Gene: Worcestershire\_4 Start: 4086, Stop: 1819, Start Num: 3

Candidate Starts for Worcestershire\_4:

(Start: 3 @4086 has 64 MA's), (5, 4053), (7, 4038), (19, 3783), (20, 3768), (25, 3666), (26, 3663), (28, 3579), (30, 3546), (41, 3390), (42, 3369), (54, 3129), (55, 3123), (57, 3111), (62, 3069), (71, 2949), (81,

2859), (83, 2832), (86, 2820), (90, 2781), (92, 2772), (94, 2748), (96, 2736), (102, 2685), (112, 2604),  
(113, 2586), (122, 2466), (131, 2412), (132, 2403), (135, 2358), (136, 2337), (137, 2334), (143, 2253),  
(149, 2211), (151, 2187), (153, 2178), (155, 2151), (172, 1950), (180, 1899), (181, 1890),