



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 202871 Report

This analysis was run 01/18/25 on database version 583.

Pham number 202871 has 83 members, 6 are drafts.

Phages represented in each track:

- Track 1 : Mao1\_26, Sejanus\_27, Mask\_27
- Track 2 : JustASigh\_21
- Track 3 : Blocker23\_32, Lars\_32, Faze9\_32, Ares\_32, Opia\_32, Hedgerow\_32, FrenchFry\_32, Tinciduntolum\_33, Coffee\_32, Phantasmagoria\_32, Brownie5\_32, Boyle\_32, West99\_32, Arbiter\_32, Kheth\_32, Rhinoforte\_32, Rosebush\_32
- Track 4 : Kaleb\_32, Kolhan\_32, Lephleur\_32
- Track 5 : Qyrzula\_30
- Track 6 : Tres\_32
- Track 7 : MasterPo\_32
- Track 8 : Godines\_32
- Track 9 : Bananafish\_32
- Track 10 : Eaglehorse\_32
- Track 11 : Glass\_32, Allegro\_32, LizLemon\_32
- Track 12 : Vic9\_33
- Track 13 : Holeinone\_32
- Track 14 : LilSmirk\_32, Calamitous\_32
- Track 15 : ItsyBitsy1\_32
- Track 16 : TA17A\_32
- Track 17 : Sabella\_32
- Track 18 : BigPhil\_19, Velveteen\_19, Cerasum\_19, Sarma624\_19
- Track 19 : Pippy\_18
- Track 20 : Crumble\_18, Clifton\_18, LastJedi\_18, Koella\_18
- Track 21 : SamScheppers\_26
- Track 22 : Eponine\_28
- Track 23 : Taquito\_26
- Track 24 : AvadaKedavra\_20
- Track 25 : JoeDirt\_20, DirkDirk\_20, Enceladus\_20, Appletree2\_20
- Track 26 : Poochiewood\_20, Wyatt2\_20, Rose5\_20, Acquire49\_20, MAckerman\_20
- Track 27 : Zaria\_20, Calm\_20
- Track 28 : CicholasNage\_20, Halena\_20
- Track 29 : LeBron\_20
- Track 30 : Wamburgrxpress\_20, Tyson\_20
- Track 31 : OhShagHennessy\_20
- Track 32 : Silverleaf\_20
- Track 33 : UPIE\_20
- Track 34 : Raymond7\_20
- Track 35 : Phrann\_20

- Track 36 : Atcoo\_21
- Track 37 : Xavia\_21
- Track 38 : Patience\_37
- Track 39 : Madruga\_35
- Track 40 : Labelle\_36
- Track 41 : Jeon\_24
- Track 42 : GodPhather\_25
- Track 43 : PR\_24, D12\_24

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

The start number called the most often in the published annotations is 25, it was called in 31 of the 77 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Allegro\_32, Arbiter\_32, Ares\_32, Bananafish\_32, Blocker23\_32, Boyle\_32, Brownie5\_32, Calamitous\_32, Coffee\_32, Eaglehorse\_32, Faze9\_32, FrenchFry\_32, Glass\_32, Godines\_32, Hedgerow\_32, Holeinone\_32, ItsyBitsy1\_32, Kaleb\_32, Kheth\_32, Kolhan\_32, Lars\_32, Lephleur\_32, LilSmirk\_32, LizLemon\_32, MasterPo\_32, Opia\_32, Phantasmagoria\_32, Qyrzula\_30, Rhinoforte\_32, Rosebush\_32, Sabella\_32, TA17A\_32, Tinciduntsolum\_33, Tres\_32, Vic9\_33, West99\_32,

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

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

- Acquire49\_20, Appletree2\_20, Atcoo\_21, AvadaKedavra\_20, BigPhil\_19, Calm\_20, Cerasum\_19, CicholasNage\_20, Clifton\_18, Crumble\_18, D12\_24, DirkDirk\_20, Enceladus\_20, Eponine\_28, GodPhather\_25, Halena\_20, Jeon\_24, JoeDirt\_20, JustASigh\_21, Koella\_18, Labelle\_36, LastJedi\_18, LeBron\_20, MAckerman\_20, Madruga\_35, Mao1\_26, Mask\_27, OhShagHennessy\_20, PR\_24, Patience\_37, Phrann\_20, Pippy\_18, Poochiewood\_20, Raymond7\_20, Rose5\_20, SamScheppers\_26, Sarma624\_19, Sejanus\_27, Silverleaf\_20, Taquito\_26, Tyson\_20, UPIE\_20, Velveteen\_19, Wamburggrxpress\_20, Wyatt2\_20, Xavia\_21, Zaria\_20,

**Summary by start number:**

Start 1:

- Found in 3 of 83 ( 3.6% ) of genes in pham
- Manual Annotations of this start: 3 of 77
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Labelle\_36 (U), Madruga\_35 (U), Patience\_37 (U),

Start 7:

- Found in 4 of 83 ( 4.8% ) of genes in pham
- Manual Annotations of this start: 2 of 77
- Called 50.0% of time when present

- Phage (with cluster) where this start called: Atcoo\_21 (P1), Xavia\_21 (P3),

#### Start 8:

- Found in 9 of 83 ( 10.8% ) of genes in pham
- Manual Annotations of this start: 9 of 77
- Called 100.0% of time when present
- Phage (with cluster) where this start called: BigPhil\_19 (F1), Cerasum\_19 (F1), Clifton\_18 (F1), Crumble\_18 (F1), Koella\_18 (F1), LastJedi\_18 (F1), Pippy\_18 (F1), Sarma624\_19 (F1), Velveteen\_19 (F1),

#### Start 9:

- Found in 2 of 83 ( 2.4% ) of genes in pham
- Manual Annotations of this start: 2 of 77
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Phrann\_20 (N), Raymond7\_20 (N),

#### Start 11:

- Found in 1 of 83 ( 1.2% ) of genes in pham
- Manual Annotations of this start: 1 of 77
- Called 100.0% of time when present
- Phage (with cluster) where this start called: JustASigh\_21 (AH),

#### Start 18:

- Found in 3 of 83 ( 3.6% ) of genes in pham
- Manual Annotations of this start: 3 of 77
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Eponine\_28 (K4), SamScheppers\_26 (K4), Taquito\_26 (K4),

#### Start 24:

- Found in 5 of 83 ( 6.0% ) of genes in pham
- Manual Annotations of this start: 3 of 77
- Called 60.0% of time when present
- Phage (with cluster) where this start called: Mao1\_26 (AD), Mask\_27 (AD), Sejanus\_27 (AD),

#### Start 25:

- Found in 36 of 83 ( 43.4% ) of genes in pham
- Manual Annotations of this start: 31 of 77
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Allegro\_32 (B2), Arbiter\_32 (B2), Ares\_32 (B2), Bananafish\_32 (B2), Blocker23\_32 (B2), Boyle\_32 (B2), Brownie5\_32 (B2), Calamitous\_32 (B2), Coffee\_32 (B2), Eaglehorse\_32 (B2), Faze9\_32 (B2), FrenchFry\_32 (B2), Glass\_32 (B2), Godines\_32 (B2), Hedgerow\_32 (B2), Holeinone\_32 (B2), ItsyBitsy1\_32 (B2), Kaleb\_32 (B2), Kheth\_32 (B2), Kolhan\_32 (B2), Lars\_32 (B2), Lephleur\_32 (B2), LilSmirk\_32 (B2), LizLemon\_32 (B2), MasterPo\_32 (B2), Opia\_32 (B2), Phantasmagoria\_32 (B2), Qyrzula\_30 (B2), Rhinoforte\_32 (B2), Rosebush\_32 (B2), Sabella\_32 (B2), TA17A\_32 (B2), Tinciduntolum\_33 (B2), Tres\_32 (B2), Vic9\_33 (B2), West99\_32 (B2),

#### Start 27:

- Found in 4 of 83 ( 4.8% ) of genes in pham
- Manual Annotations of this start: 4 of 77

- Called 100.0% of time when present
- Phage (with cluster) where this start called: D12\_24 (W), GodPhather\_25 (W), Jeon\_24 (W), PR\_24 (W),

Start 28:

- Found in 20 of 83 ( 24.1% ) of genes in pham
- Manual Annotations of this start: 19 of 77
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Acquire49\_20 (L1), Appletree2\_20 (L1), AvadaKedavra\_20 (L1), Calm\_20 (L1), CicholasNage\_20 (L1), DirkDirk\_20 (L1), Enceladus\_20 (L1), Halena\_20 (L1), JoeDirt\_20 (L1), LeBron\_20 (L1), MAckerman\_20 (L1), OhShagHennessy\_20 (L1), Poochiewood\_20 (L1), Rose5\_20 (L1), Silverleaf\_20 (L1), Tyson\_20 (L1), UPIE\_20 (L1), Wamburggrxpress\_20 (L1), Wyatt2\_20 (L1), Zaria\_20 (L1),

### Summary by clusters:

There are 11 clusters represented in this pham: F1, P1, AD, P3, AH, K4, N, W, U, B2, L1,

Info for manual annotations of cluster AD:

- Start number 24 was manually annotated 3 times for cluster AD.

Info for manual annotations of cluster AH:

- Start number 11 was manually annotated 1 time for cluster AH.

Info for manual annotations of cluster B2:

- Start number 25 was manually annotated 31 times for cluster B2.

Info for manual annotations of cluster F1:

- Start number 8 was manually annotated 9 times for cluster F1.

Info for manual annotations of cluster K4:

- Start number 18 was manually annotated 3 times for cluster K4.

Info for manual annotations of cluster L1:

- Start number 28 was manually annotated 19 times for cluster L1.

Info for manual annotations of cluster N:

- Start number 9 was manually annotated 2 times for cluster N.

Info for manual annotations of cluster P1:

- Start number 7 was manually annotated 1 time for cluster P1.

Info for manual annotations of cluster P3:

- Start number 7 was manually annotated 1 time for cluster P3.

Info for manual annotations of cluster U:

- Start number 1 was manually annotated 3 times for cluster U.

Info for manual annotations of cluster W:

- Start number 27 was manually annotated 4 times for cluster W.

**Gene Information:**

Gene: Acquire49\_20 Start: 18997, Stop: 21678, Start Num: 28

Candidate Starts for Acquire49\_20:

(Start: 28 @18997 has 19 MA's), (29, 19003), (52, 19180), (55, 19210), (59, 19273), (68, 19348), (73, 19402), (80, 19462), (82, 19468), (91, 19534), (99, 19597), (102, 19630), (103, 19633), (107, 19657), (110, 19687), (111, 19693), (116, 19741), (121, 19762), (126, 19777), (131, 19798), (134, 19837), (136, 19849), (140, 19867), (146, 19924), (149, 19942), (154, 19972), (155, 19996), (156, 19999), (160, 20044), (163, 20095), (166, 20113), (170, 20167), (174, 20239), (176, 20251), (178, 20260), (181, 20302), (182, 20332), (184, 20368), (185, 20386), (189, 20401), (190, 20407), (192, 20440), (204, 20569), (205, 20578), (210, 20659), (211, 20695), (212, 20701), (218, 20806), (219, 20815), (220, 20830), (221, 20848), (224, 20890), (229, 20986), (230, 20992), (234, 21046), (235, 21052), (236, 21064), (240, 21175), (242, 21205), (243, 21211), (249, 21307), (250, 21313), (251, 21337), (252, 21343), (253, 21349), (257, 21394), (258, 21403), (259, 21412), (262, 21451), (263, 21487), (264, 21496), (265, 21511), (269, 21607), (271, 21658), (272, 21664),

Gene: Allegro\_32 Start: 29960, Stop: 32680, Start Num: 25

Candidate Starts for Allegro\_32:

(Start: 25 @29960 has 31 MA's), (32, 30014), (38, 30053), (44, 30098), (47, 30122), (48, 30125), (52, 30158), (62, 30266), (64, 30287), (65, 30290), (70, 30344), (75, 30404), (77, 30428), (84, 30464), (90, 30512), (93, 30533), (98, 30572), (101, 30611), (104, 30626), (111, 30680), (113, 30692), (115, 30716), (119, 30740), (124, 30752), (127, 30767), (130, 30782), (135, 30824), (137, 30842), (141, 30881), (144, 30905), (162, 31076), (169, 31154), (173, 31214), (176, 31250), (177, 31253), (182, 31331), (184, 31367), (187, 31391), (195, 31490), (200, 31529), (205, 31583), (211, 31700), (213, 31727), (216, 31790), (217, 31796), (218, 31811), (221, 31853), (226, 31940), (230, 31997), (231, 32015), (232, 32036), (233, 32045), (234, 32051), (235, 32057), (236, 32069), (238, 32174), (241, 32192), (244, 32225), (249, 32312), (251, 32342), (252, 32348), (258, 32408), (264, 32501), (265, 32516), (268, 32558), (273, 32672),

Gene: Appletree2\_20 Start: 18940, Stop: 21621, Start Num: 28

Candidate Starts for Appletree2\_20:

(Start: 28 @18940 has 19 MA's), (29, 18946), (52, 19123), (55, 19153), (59, 19216), (68, 19291), (80, 19405), (82, 19411), (91, 19477), (99, 19540), (102, 19573), (103, 19576), (107, 19600), (109, 19624), (110, 19630), (111, 19636), (116, 19684), (121, 19705), (126, 19720), (131, 19741), (134, 19780), (136, 19792), (140, 19810), (149, 19885), (154, 19915), (155, 19939), (156, 19942), (160, 19987), (163, 20038), (166, 20056), (170, 20110), (174, 20182), (176, 20194), (178, 20203), (180, 20221), (181, 20245), (182, 20275), (184, 20311), (189, 20344), (190, 20350), (193, 20416), (201, 20482), (205, 20521), (210, 20602), (211, 20638), (212, 20644), (218, 20749), (219, 20758), (220, 20773), (221, 20791), (224, 20833), (229, 20929), (230, 20935), (234, 20989), (235, 20995), (236, 21007), (240, 21118), (242, 21148), (243, 21154), (249, 21250), (250, 21256), (251, 21280), (252, 21286), (253, 21292), (257, 21337), (258, 21346), (259, 21355), (262, 21394), (263, 21430), (264, 21439), (265, 21454), (269, 21550), (271, 21601), (272, 21607),

Gene: Arbiter\_32 Start: 30049, Stop: 32769, Start Num: 25

Candidate Starts for Arbiter\_32:

(Start: 25 @30049 has 31 MA's), (32, 30103), (38, 30142), (44, 30187), (47, 30211), (48, 30214), (52, 30247), (62, 30355), (64, 30376), (65, 30379), (70, 30433), (75, 30493), (77, 30517), (84, 30553), (90, 30601), (93, 30622), (98, 30661), (101, 30700), (104, 30715), (111, 30769), (113, 30781), (115, 30805), (119, 30829), (124, 30841), (127, 30856), (130, 30871), (135, 30913), (137, 30931), (141, 30970), (144, 30994), (162, 31165), (169, 31243), (173, 31303), (176, 31339), (177, 31342), (182, 31420), (184, 31456), (187, 31480), (191, 31501), (205, 31672), (206, 31678), (211, 31789), (213,

31816), (216, 31879), (217, 31885), (218, 31900), (221, 31942), (226, 32029), (227, 32056), (230, 32086), (231, 32104), (232, 32125), (233, 32134), (234, 32140), (235, 32146), (236, 32158), (238, 32263), (241, 32281), (244, 32314), (249, 32401), (251, 32431), (252, 32437), (258, 32497), (264, 32590), (265, 32605), (268, 32647), (273, 32761),

Gene: Ares\_32 Start: 29971, Stop: 32691, Start Num: 25

Candidate Starts for Ares\_32:

(Start: 25 @29971 has 31 MA's), (32, 30025), (38, 30064), (44, 30109), (47, 30133), (48, 30136), (52, 30169), (62, 30277), (64, 30298), (65, 30301), (70, 30355), (75, 30415), (77, 30439), (84, 30475), (90, 30523), (93, 30544), (98, 30583), (101, 30622), (104, 30637), (111, 30691), (113, 30703), (115, 30727), (119, 30751), (124, 30763), (127, 30778), (130, 30793), (135, 30835), (137, 30853), (141, 30892), (144, 30916), (162, 31087), (169, 31165), (173, 31225), (176, 31261), (177, 31264), (182, 31342), (184, 31378), (187, 31402), (191, 31423), (205, 31594), (206, 31600), (211, 31711), (213, 31738), (216, 31801), (217, 31807), (218, 31822), (221, 31864), (226, 31951), (227, 31978), (230, 32008), (231, 32026), (232, 32047), (233, 32056), (234, 32062), (235, 32068), (236, 32080), (238, 32185), (241, 32203), (244, 32236), (249, 32323), (251, 32353), (252, 32359), (258, 32419), (264, 32512), (265, 32527), (268, 32569), (273, 32683),

Gene: Atcoo\_21 Start: 18913, Stop: 21759, Start Num: 7

Candidate Starts for Atcoo\_21:

(Start: 7 @18913 has 2 MA's), (23, 19066), (59, 19339), (61, 19351), (63, 19372), (66, 19396), (74, 19471), (81, 19543), (86, 19573), (91, 19609), (99, 19672), (100, 19687), (105, 19714), (106, 19720), (115, 19795), (118, 19819), (120, 19825), (125, 19837), (132, 19879), (133, 19885), (143, 19972), (145, 19993), (149, 20017), (157, 20083), (158, 20104), (161, 20122), (162, 20155), (164, 20179), (165, 20182), (169, 20233), (173, 20293), (176, 20329), (177, 20332), (178, 20338), (182, 20410), (184, 20446), (187, 20470), (195, 20569), (200, 20608), (205, 20662), (209, 20737), (211, 20779), (213, 20806), (216, 20869), (217, 20875), (218, 20890), (221, 20932), (223, 20971), (226, 21019), (227, 21046), (228, 21049), (230, 21076), (231, 21094), (233, 21124), (235, 21136), (236, 21148), (238, 21253), (241, 21271), (244, 21304), (245, 21319), (251, 21421), (252, 21427), (258, 21487), (260, 21505), (264, 21580), (265, 21595), (266, 21601), (268, 21637), (273, 21751),

Gene: AvadaKedavra\_20 Start: 19007, Stop: 21688, Start Num: 28

Candidate Starts for AvadaKedavra\_20:

(Start: 28 @19007 has 19 MA's), (29, 19013), (52, 19190), (55, 19220), (59, 19283), (68, 19358), (80, 19472), (82, 19478), (91, 19544), (99, 19607), (102, 19640), (103, 19643), (107, 19667), (109, 19691), (110, 19697), (111, 19703), (116, 19751), (121, 19772), (126, 19787), (131, 19808), (134, 19847), (136, 19859), (140, 19877), (146, 19934), (149, 19952), (154, 19982), (155, 20006), (156, 20009), (160, 20054), (163, 20105), (166, 20123), (170, 20177), (174, 20249), (176, 20261), (178, 20270), (181, 20312), (182, 20342), (184, 20378), (185, 20396), (189, 20411), (190, 20417), (192, 20450), (204, 20579), (205, 20588), (210, 20669), (211, 20705), (212, 20711), (218, 20816), (219, 20825), (220, 20840), (221, 20858), (224, 20900), (229, 20996), (230, 21002), (234, 21056), (235, 21062), (236, 21074), (240, 21185), (242, 21215), (243, 21221), (249, 21317), (250, 21323), (251, 21347), (252, 21353), (253, 21359), (257, 21404), (258, 21413), (259, 21422), (262, 21461), (263, 21497), (264, 21506), (265, 21521), (269, 21617), (271, 21668), (272, 21674),

Gene: Bananafish\_32 Start: 29969, Stop: 32689, Start Num: 25

Candidate Starts for Bananafish\_32:

(Start: 25 @29969 has 31 MA's), (32, 30023), (38, 30062), (44, 30107), (47, 30131), (48, 30134), (52, 30167), (62, 30275), (64, 30296), (65, 30299), (70, 30353), (75, 30413), (77, 30437), (84, 30473), (90, 30521), (93, 30542), (98, 30581), (101, 30620), (104, 30635), (111, 30689), (113, 30701), (115, 30725), (119, 30749), (124, 30761), (127, 30776), (130, 30791), (135, 30833), (137, 30851), (141, 30890), (144, 30914), (162, 31085), (169, 31163), (173, 31223), (176, 31259), (177, 31262), (182, 31340), (184, 31376), (187, 31400), (195, 31499), (200, 31538), (205, 31592), (211, 31709), (213,

31736), (216, 31799), (217, 31805), (218, 31820), (221, 31862), (226, 31949), (227, 31976), (230, 32006), (231, 32024), (232, 32045), (233, 32054), (234, 32060), (235, 32066), (236, 32078), (238, 32183), (241, 32201), (244, 32234), (249, 32321), (251, 32351), (252, 32357), (258, 32417), (264, 32510), (265, 32525), (268, 32567), (273, 32681),

Gene: BigPhil\_19 Start: 17226, Stop: 20090, Start Num: 8

Candidate Starts for BigPhil\_19:

(Start: 8 @17226 has 9 MA's), (10, 17247), (13, 17268), (15, 17307), (21, 17376), (22, 17385), (23, 17388), (31, 17439), (45, 17529), (53, 17580), (59, 17664), (61, 17676), (63, 17697), (67, 17730), (83, 17877), (91, 17940), (95, 17979), (99, 18003), (100, 18018), (101, 18027), (106, 18054), (108, 18060), (115, 18129), (118, 18150), (120, 18156), (129, 18192), (132, 18210), (143, 18303), (145, 18324), (149, 18348), (157, 18414), (158, 18435), (161, 18453), (162, 18486), (165, 18513), (169, 18564), (172, 18600), (173, 18624), (176, 18660), (178, 18669), (179, 18684), (181, 18711), (182, 18741), (184, 18777), (187, 18801), (195, 18900), (200, 18939), (203, 18978), (206, 18999), (211, 19110), (213, 19137), (214, 19167), (215, 19188), (216, 19200), (217, 19206), (221, 19263), (230, 19407), (231, 19425), (235, 19467), (236, 19479), (244, 19635), (249, 19722), (251, 19752), (252, 19758), (258, 19818), (260, 19836), (264, 19911), (266, 19932), (268, 19968), (273, 20082),

Gene: Blocker23\_32 Start: 30090, Stop: 32807, Start Num: 25

Candidate Starts for Blocker23\_32:

(Start: 25 @30090 has 31 MA's), (32, 30144), (38, 30183), (44, 30228), (47, 30252), (48, 30255), (52, 30288), (62, 30396), (64, 30417), (65, 30420), (70, 30474), (75, 30534), (77, 30558), (84, 30594), (90, 30642), (93, 30663), (98, 30702), (101, 30741), (104, 30756), (111, 30810), (113, 30822), (115, 30846), (119, 30870), (124, 30882), (127, 30897), (130, 30912), (135, 30954), (137, 30972), (141, 31011), (144, 31035), (162, 31206), (169, 31284), (173, 31344), (176, 31380), (177, 31383), (182, 31461), (184, 31497), (187, 31521), (191, 31542), (205, 31710), (206, 31716), (211, 31827), (213, 31854), (216, 31917), (217, 31923), (218, 31938), (221, 31980), (226, 32067), (227, 32094), (230, 32124), (231, 32142), (232, 32163), (233, 32172), (234, 32178), (235, 32184), (236, 32196), (238, 32301), (241, 32319), (244, 32352), (249, 32439), (251, 32469), (252, 32475), (258, 32535), (264, 32628), (265, 32643), (268, 32685), (273, 32799),

Gene: Boyle\_32 Start: 30088, Stop: 32808, Start Num: 25

Candidate Starts for Boyle\_32:

(Start: 25 @30088 has 31 MA's), (32, 30142), (38, 30181), (44, 30226), (47, 30250), (48, 30253), (52, 30286), (62, 30394), (64, 30415), (65, 30418), (70, 30472), (75, 30532), (77, 30556), (84, 30592), (90, 30640), (93, 30661), (98, 30700), (101, 30739), (104, 30754), (111, 30808), (113, 30820), (115, 30844), (119, 30868), (124, 30880), (127, 30895), (130, 30910), (135, 30952), (137, 30970), (141, 31009), (144, 31033), (162, 31204), (169, 31282), (173, 31342), (176, 31378), (177, 31381), (182, 31459), (184, 31495), (187, 31519), (191, 31540), (205, 31711), (206, 31717), (211, 31828), (213, 31855), (216, 31918), (217, 31924), (218, 31939), (221, 31981), (226, 32068), (227, 32095), (230, 32125), (231, 32143), (232, 32164), (233, 32173), (234, 32179), (235, 32185), (236, 32197), (238, 32302), (241, 32320), (244, 32353), (249, 32440), (251, 32470), (252, 32476), (258, 32536), (264, 32629), (265, 32644), (268, 32686), (273, 32800),

Gene: Brownie5\_32 Start: 30094, Stop: 32814, Start Num: 25

Candidate Starts for Brownie5\_32:

(Start: 25 @30094 has 31 MA's), (32, 30148), (38, 30187), (44, 30232), (47, 30256), (48, 30259), (52, 30292), (62, 30400), (64, 30421), (65, 30424), (70, 30478), (75, 30538), (77, 30562), (84, 30598), (90, 30646), (93, 30667), (98, 30706), (101, 30745), (104, 30760), (111, 30814), (113, 30826), (115, 30850), (119, 30874), (124, 30886), (127, 30901), (130, 30916), (135, 30958), (137, 30976), (141, 31015), (144, 31039), (162, 31210), (169, 31288), (173, 31348), (176, 31384), (177, 31387), (182, 31465), (184, 31501), (187, 31525), (191, 31546), (205, 31717), (206, 31723), (211, 31834), (213, 31861), (216, 31924), (217, 31930), (218, 31945), (221, 31987), (226, 32074), (227, 32101), (230,



32131), (231, 32149), (232, 32170), (233, 32179), (234, 32185), (235, 32191), (236, 32203), (238, 32308), (241, 32326), (244, 32359), (249, 32446), (251, 32476), (252, 32482), (258, 32542), (264, 32635), (265, 32650), (268, 32692), (273, 32806),

Gene: Calamitous\_32 Start: 29974, Stop: 32694, Start Num: 25

Candidate Starts for Calamitous\_32:

(Start: 25 @29974 has 31 MA's), (32, 30028), (38, 30067), (44, 30112), (47, 30136), (48, 30139), (52, 30172), (62, 30280), (64, 30301), (65, 30304), (70, 30358), (75, 30418), (77, 30442), (84, 30478), (90, 30526), (93, 30547), (98, 30586), (101, 30625), (104, 30640), (111, 30694), (113, 30706), (115, 30730), (119, 30754), (124, 30766), (127, 30781), (130, 30796), (135, 30838), (137, 30856), (141, 30895), (144, 30919), (162, 31090), (169, 31168), (173, 31228), (176, 31264), (177, 31267), (182, 31345), (184, 31381), (187, 31405), (191, 31426), (205, 31597), (211, 31714), (213, 31741), (216, 31804), (217, 31810), (218, 31825), (221, 31867), (226, 31954), (230, 32011), (231, 32029), (232, 32050), (233, 32059), (234, 32065), (235, 32071), (236, 32083), (238, 32188), (241, 32206), (244, 32239), (249, 32326), (251, 32356), (252, 32362), (258, 32422), (264, 32515), (265, 32530), (268, 32572), (273, 32686),

Gene: Calm\_20 Start: 19011, Stop: 21692, Start Num: 28

Candidate Starts for Calm\_20:

(Start: 28 @19011 has 19 MA's), (29, 19017), (52, 19194), (55, 19224), (59, 19287), (68, 19362), (73, 19416), (80, 19476), (82, 19482), (91, 19548), (99, 19611), (102, 19644), (103, 19647), (107, 19671), (109, 19695), (110, 19701), (111, 19707), (116, 19755), (121, 19776), (126, 19791), (131, 19812), (134, 19851), (136, 19863), (140, 19881), (149, 19956), (154, 19986), (155, 20010), (156, 20013), (160, 20058), (163, 20109), (166, 20127), (170, 20181), (174, 20253), (176, 20265), (178, 20274), (181, 20316), (182, 20346), (184, 20382), (185, 20400), (189, 20415), (190, 20421), (192, 20454), (204, 20583), (205, 20592), (210, 20673), (211, 20709), (212, 20715), (218, 20820), (219, 20829), (220, 20844), (221, 20862), (224, 20904), (229, 21000), (230, 21006), (234, 21060), (235, 21066), (236, 21078), (240, 21189), (242, 21219), (243, 21225), (249, 21321), (250, 21327), (251, 21351), (252, 21357), (253, 21363), (257, 21408), (258, 21417), (259, 21426), (262, 21465), (263, 21501), (264, 21510), (265, 21525), (269, 21621), (271, 21672), (272, 21678),

Gene: Cerasum\_19 Start: 17226, Stop: 20090, Start Num: 8

Candidate Starts for Cerasum\_19:

(Start: 8 @17226 has 9 MA's), (10, 17247), (13, 17268), (15, 17307), (21, 17376), (22, 17385), (23, 17388), (31, 17439), (45, 17529), (53, 17580), (59, 17664), (61, 17676), (63, 17697), (67, 17730), (83, 17877), (91, 17940), (95, 17979), (99, 18003), (100, 18018), (101, 18027), (106, 18054), (108, 18060), (115, 18129), (118, 18150), (120, 18156), (129, 18192), (132, 18210), (143, 18303), (145, 18324), (149, 18348), (157, 18414), (158, 18435), (161, 18453), (162, 18486), (165, 18513), (169, 18564), (172, 18600), (173, 18624), (176, 18660), (178, 18669), (179, 18684), (181, 18711), (182, 18741), (184, 18777), (187, 18801), (195, 18900), (200, 18939), (203, 18978), (206, 18999), (211, 19110), (213, 19137), (214, 19167), (215, 19188), (216, 19200), (217, 19206), (221, 19263), (230, 19407), (231, 19425), (235, 19467), (236, 19479), (244, 19635), (249, 19722), (251, 19752), (252, 19758), (258, 19818), (260, 19836), (264, 19911), (266, 19932), (268, 19968), (273, 20082),

Gene: CicholasNage\_20 Start: 18999, Stop: 21680, Start Num: 28

Candidate Starts for CicholasNage\_20:

(Start: 28 @18999 has 19 MA's), (29, 19005), (52, 19182), (55, 19212), (59, 19275), (68, 19350), (73, 19404), (80, 19464), (82, 19470), (91, 19536), (99, 19599), (102, 19632), (103, 19635), (107, 19659), (109, 19683), (110, 19689), (111, 19695), (116, 19743), (121, 19764), (126, 19779), (131, 19800), (134, 19839), (136, 19851), (140, 19869), (149, 19944), (154, 19974), (155, 19998), (156, 20001), (160, 20046), (163, 20097), (166, 20115), (170, 20169), (174, 20241), (176, 20253), (178, 20262), (181, 20304), (182, 20334), (184, 20370), (185, 20388), (189, 20403), (190, 20409), (192, 20442), (204, 20571), (205, 20580), (210, 20661), (211, 20697), (212, 20703), (218, 20808), (219, 20817),

(220, 20832), (221, 20850), (224, 20892), (229, 20988), (230, 20994), (234, 21048), (235, 21054), (236, 21066), (240, 21177), (242, 21207), (243, 21213), (247, 21243), (249, 21309), (250, 21315), (251, 21339), (252, 21345), (253, 21351), (257, 21396), (258, 21405), (259, 21414), (262, 21453), (263, 21489), (264, 21498), (265, 21513), (269, 21609), (271, 21660), (272, 21666),

Gene: Clifton\_18 Start: 17353, Stop: 20217, Start Num: 8

Candidate Starts for Clifton\_18:

(6, 17341), (Start: 8 @17353 has 9 MA's), (10, 17374), (13, 17395), (15, 17434), (21, 17503), (22, 17512), (23, 17515), (31, 17566), (45, 17656), (52, 17701), (59, 17791), (60, 17800), (61, 17803), (63, 17824), (65, 17836), (69, 17869), (83, 18004), (89, 18052), (91, 18067), (94, 18088), (99, 18130), (100, 18145), (101, 18154), (106, 18181), (108, 18187), (113, 18232), (114, 18241), (115, 18256), (117, 18268), (118, 18277), (120, 18283), (124, 18292), (129, 18319), (132, 18337), (143, 18430), (145, 18451), (149, 18475), (157, 18541), (158, 18562), (161, 18580), (162, 18613), (164, 18637), (165, 18640), (169, 18691), (172, 18727), (173, 18751), (176, 18787), (178, 18796), (179, 18811), (181, 18838), (182, 18868), (184, 18904), (187, 18928), (195, 19027), (200, 19066), (205, 19120), (211, 19237), (213, 19264), (216, 19327), (217, 19333), (218, 19348), (221, 19390), (226, 19477), (227, 19504), (230, 19534), (231, 19552), (233, 19582), (235, 19594), (236, 19606), (238, 19711), (241, 19729), (244, 19762), (249, 19849), (251, 19879), (252, 19885), (258, 19945), (259, 19954), (260, 19963), (264, 20038), (266, 20059), (268, 20095), (273, 20209),

Gene: Coffee\_32 Start: 30077, Stop: 32797, Start Num: 25

Candidate Starts for Coffee\_32:

(Start: 25 @30077 has 31 MA's), (32, 30131), (38, 30170), (44, 30215), (47, 30239), (48, 30242), (52, 30275), (62, 30383), (64, 30404), (65, 30407), (70, 30461), (75, 30521), (77, 30545), (84, 30581), (90, 30629), (93, 30650), (98, 30689), (101, 30728), (104, 30743), (111, 30797), (113, 30809), (115, 30833), (119, 30857), (124, 30869), (127, 30884), (130, 30899), (135, 30941), (137, 30959), (141, 30998), (144, 31022), (162, 31193), (169, 31271), (173, 31331), (176, 31367), (177, 31370), (182, 31448), (184, 31484), (187, 31508), (191, 31529), (205, 31700), (206, 31706), (211, 31817), (213, 31844), (216, 31907), (217, 31913), (218, 31928), (221, 31970), (226, 32057), (227, 32084), (230, 32114), (231, 32132), (232, 32153), (233, 32162), (234, 32168), (235, 32174), (236, 32186), (238, 32291), (241, 32309), (244, 32342), (249, 32429), (251, 32459), (252, 32465), (258, 32525), (264, 32618), (265, 32633), (268, 32675), (273, 32789),

Gene: Crumble\_18 Start: 17400, Stop: 20264, Start Num: 8

Candidate Starts for Crumble\_18:

(6, 17388), (Start: 8 @17400 has 9 MA's), (10, 17421), (13, 17442), (15, 17481), (21, 17550), (22, 17559), (23, 17562), (31, 17613), (45, 17703), (52, 17748), (59, 17838), (60, 17847), (61, 17850), (63, 17871), (65, 17883), (69, 17916), (83, 18051), (89, 18099), (91, 18114), (94, 18135), (99, 18177), (100, 18192), (101, 18201), (106, 18228), (108, 18234), (113, 18279), (114, 18288), (115, 18303), (117, 18315), (118, 18324), (120, 18330), (124, 18339), (129, 18366), (132, 18384), (143, 18477), (145, 18498), (149, 18522), (157, 18588), (158, 18609), (161, 18627), (162, 18660), (164, 18684), (165, 18687), (169, 18738), (172, 18774), (173, 18798), (176, 18834), (178, 18843), (179, 18858), (181, 18885), (182, 18915), (184, 18951), (187, 18975), (195, 19074), (200, 19113), (205, 19167), (211, 19284), (213, 19311), (216, 19374), (217, 19380), (218, 19395), (221, 19437), (226, 19524), (227, 19551), (230, 19581), (231, 19599), (233, 19629), (235, 19641), (236, 19653), (238, 19758), (241, 19776), (244, 19809), (249, 19896), (251, 19926), (252, 19932), (258, 19992), (259, 20001), (260, 20010), (264, 20085), (266, 20106), (268, 20142), (273, 20256),

Gene: D12\_24 Start: 27231, Stop: 29945, Start Num: 27

Candidate Starts for D12\_24:

(Start: 27 @27231 has 4 MA's), (35, 27300), (40, 27333), (43, 27354), (50, 27411), (54, 27441), (57, 27459), (64, 27552), (65, 27555), (70, 27609), (71, 27615), (77, 27693), (84, 27729), (86, 27750), (93, 27798), (98, 27837), (104, 27891), (111, 27945), (113, 27957), (115, 27981), (119, 28005), (120,

28008), (130, 28047), (135, 28089), (144, 28170), (146, 28185), (151, 28215), (161, 28308), (162, 28341), (167, 28398), (168, 28410), (169, 28419), (173, 28479), (176, 28515), (177, 28518), (182, 28596), (184, 28632), (188, 28662), (191, 28677), (197, 28785), (203, 28833), (204, 28839), (205, 28848), (206, 28854), (211, 28965), (213, 28992), (216, 29055), (217, 29061), (218, 29076), (221, 29118), (230, 29262), (231, 29280), (235, 29322), (236, 29334), (238, 29439), (241, 29457), (244, 29490), (249, 29577), (251, 29607), (252, 29613), (254, 29634), (258, 29673), (260, 29691), (264, 29766), (266, 29787), (268, 29823), (273, 29937),

Gene: DirkDirk\_20 Start: 18980, Stop: 21661, Start Num: 28

Candidate Starts for DirkDirk\_20:

(Start: 28 @18980 has 19 MA's), (29, 18986), (52, 19163), (55, 19193), (59, 19256), (68, 19331), (80, 19445), (82, 19451), (91, 19517), (99, 19580), (102, 19613), (103, 19616), (107, 19640), (109, 19664), (110, 19670), (111, 19676), (116, 19724), (121, 19745), (126, 19760), (131, 19781), (134, 19820), (136, 19832), (140, 19850), (149, 19925), (154, 19955), (155, 19979), (156, 19982), (160, 20027), (163, 20078), (166, 20096), (170, 20150), (174, 20222), (176, 20234), (178, 20243), (180, 20261), (181, 20285), (182, 20315), (184, 20351), (189, 20384), (190, 20390), (193, 20456), (201, 20522), (205, 20561), (210, 20642), (211, 20678), (212, 20684), (218, 20789), (219, 20798), (220, 20813), (221, 20831), (224, 20873), (229, 20969), (230, 20975), (234, 21029), (235, 21035), (236, 21047), (240, 21158), (242, 21188), (243, 21194), (249, 21290), (250, 21296), (251, 21320), (252, 21326), (253, 21332), (257, 21377), (258, 21386), (259, 21395), (262, 21434), (263, 21470), (264, 21479), (265, 21494), (269, 21590), (271, 21641), (272, 21647),

Gene: Eaglehorse\_32 Start: 30001, Stop: 32721, Start Num: 25

Candidate Starts for Eaglehorse\_32:

(Start: 25 @30001 has 31 MA's), (32, 30055), (38, 30094), (44, 30139), (47, 30163), (48, 30166), (52, 30199), (62, 30307), (64, 30328), (65, 30331), (70, 30385), (75, 30445), (77, 30469), (84, 30505), (90, 30553), (93, 30574), (98, 30613), (101, 30652), (104, 30667), (111, 30721), (113, 30733), (115, 30757), (119, 30781), (124, 30793), (127, 30808), (130, 30823), (135, 30865), (137, 30883), (141, 30922), (144, 30946), (162, 31117), (169, 31195), (173, 31255), (176, 31291), (177, 31294), (182, 31372), (184, 31408), (187, 31432), (191, 31453), (205, 31624), (211, 31741), (213, 31768), (216, 31831), (217, 31837), (218, 31852), (221, 31894), (226, 31981), (227, 32008), (230, 32038), (231, 32056), (232, 32077), (233, 32086), (234, 32092), (235, 32098), (236, 32110), (238, 32215), (241, 32233), (244, 32266), (249, 32353), (251, 32383), (252, 32389), (258, 32449), (264, 32542), (265, 32557), (268, 32599), (273, 32713),

Gene: Enceladus\_20 Start: 18981, Stop: 21662, Start Num: 28

Candidate Starts for Enceladus\_20:

(Start: 28 @18981 has 19 MA's), (29, 18987), (52, 19164), (55, 19194), (59, 19257), (68, 19332), (80, 19446), (82, 19452), (91, 19518), (99, 19581), (102, 19614), (103, 19617), (107, 19641), (109, 19665), (110, 19671), (111, 19677), (116, 19725), (121, 19746), (126, 19761), (131, 19782), (134, 19821), (136, 19833), (140, 19851), (149, 19926), (154, 19956), (155, 19980), (156, 19983), (160, 20028), (163, 20079), (166, 20097), (170, 20151), (174, 20223), (176, 20235), (178, 20244), (180, 20262), (181, 20286), (182, 20316), (184, 20352), (189, 20385), (190, 20391), (193, 20457), (201, 20523), (205, 20562), (210, 20643), (211, 20679), (212, 20685), (218, 20790), (219, 20799), (220, 20814), (221, 20832), (224, 20874), (229, 20970), (230, 20976), (234, 21030), (235, 21036), (236, 21048), (240, 21159), (242, 21189), (243, 21195), (249, 21291), (250, 21297), (251, 21321), (252, 21327), (253, 21333), (257, 21378), (258, 21387), (259, 21396), (262, 21435), (263, 21471), (264, 21480), (265, 21495), (269, 21591), (271, 21642), (272, 21648),

Gene: Eponine\_28 Start: 22173, Stop: 24917, Start Num: 18

Candidate Starts for Eponine\_28:

(17, 22164), (Start: 18 @22173 has 3 MA's), (30, 22263), (38, 22308), (41, 22332), (59, 22488), (61, 22500), (63, 22521), (69, 22566), (83, 22701), (89, 22749), (91, 22764), (94, 22785), (95, 22803), (99,

22827), (100, 22842), (101, 22851), (106, 22878), (108, 22884), (113, 22929), (115, 22953), (117, 22965), (118, 22974), (120, 22980), (124, 22989), (129, 23016), (132, 23034), (143, 23127), (144, 23139), (145, 23148), (157, 23238), (158, 23259), (161, 23277), (162, 23310), (165, 23337), (169, 23388), (172, 23424), (173, 23448), (176, 23484), (178, 23493), (179, 23508), (181, 23535), (182, 23565), (184, 23601), (185, 23619), (186, 23622), (188, 23631), (202, 23781), (205, 23820), (211, 23937), (213, 23964), (216, 24027), (217, 24033), (218, 24048), (221, 24090), (226, 24177), (227, 24204), (230, 24234), (231, 24252), (233, 24282), (235, 24294), (236, 24306), (239, 24414), (241, 24429), (244, 24462), (247, 24483), (249, 24549), (251, 24579), (252, 24585), (258, 24645), (260, 24663), (264, 24738), (266, 24759), (268, 24795), (273, 24909),

Gene: Faze9\_32 Start: 30097, Stop: 32817, Start Num: 25

Candidate Starts for Faze9\_32:

(Start: 25 @30097 has 31 MA's), (32, 30151), (38, 30190), (44, 30235), (47, 30259), (48, 30262), (52, 30295), (62, 30403), (64, 30424), (65, 30427), (70, 30481), (75, 30541), (77, 30565), (84, 30601), (90, 30649), (93, 30670), (98, 30709), (101, 30748), (104, 30763), (111, 30817), (113, 30829), (115, 30853), (119, 30877), (124, 30889), (127, 30904), (130, 30919), (135, 30961), (137, 30979), (141, 31018), (144, 31042), (162, 31213), (169, 31291), (173, 31351), (176, 31387), (177, 31390), (182, 31468), (184, 31504), (187, 31528), (191, 31549), (205, 31720), (206, 31726), (211, 31837), (213, 31864), (216, 31927), (217, 31933), (218, 31948), (221, 31990), (226, 32077), (227, 32104), (230, 32134), (231, 32152), (232, 32173), (233, 32182), (234, 32188), (235, 32194), (236, 32206), (238, 32311), (241, 32329), (244, 32362), (249, 32449), (251, 32479), (252, 32485), (258, 32545), (264, 32638), (265, 32653), (268, 32695), (273, 32809),

Gene: FrenchFry\_32 Start: 30091, Stop: 32811, Start Num: 25

Candidate Starts for FrenchFry\_32:

(Start: 25 @30091 has 31 MA's), (32, 30145), (38, 30184), (44, 30229), (47, 30253), (48, 30256), (52, 30289), (62, 30397), (64, 30418), (65, 30421), (70, 30475), (75, 30535), (77, 30559), (84, 30595), (90, 30643), (93, 30664), (98, 30703), (101, 30742), (104, 30757), (111, 30811), (113, 30823), (115, 30847), (119, 30871), (124, 30883), (127, 30898), (130, 30913), (135, 30955), (137, 30973), (141, 31012), (144, 31036), (162, 31207), (169, 31285), (173, 31345), (176, 31381), (177, 31384), (182, 31462), (184, 31498), (187, 31522), (191, 31543), (205, 31714), (206, 31720), (211, 31831), (213, 31858), (216, 31921), (217, 31927), (218, 31942), (221, 31984), (226, 32071), (227, 32098), (230, 32128), (231, 32146), (232, 32167), (233, 32176), (234, 32182), (235, 32188), (236, 32200), (238, 32305), (241, 32323), (244, 32356), (249, 32443), (251, 32473), (252, 32479), (258, 32539), (264, 32632), (265, 32647), (268, 32689), (273, 32803),

Gene: Glass\_32 Start: 30091, Stop: 32811, Start Num: 25

Candidate Starts for Glass\_32:

(Start: 25 @30091 has 31 MA's), (32, 30145), (38, 30184), (44, 30229), (47, 30253), (48, 30256), (52, 30289), (62, 30397), (64, 30418), (65, 30421), (70, 30475), (75, 30535), (77, 30559), (84, 30595), (90, 30643), (93, 30664), (98, 30703), (101, 30742), (104, 30757), (111, 30811), (113, 30823), (115, 30847), (119, 30871), (124, 30883), (127, 30898), (130, 30913), (135, 30955), (137, 30973), (141, 31012), (144, 31036), (162, 31207), (169, 31285), (173, 31345), (176, 31381), (177, 31384), (182, 31462), (184, 31498), (187, 31522), (195, 31621), (200, 31660), (205, 31714), (211, 31831), (213, 31858), (216, 31921), (217, 31927), (218, 31942), (221, 31984), (226, 32071), (230, 32128), (231, 32146), (232, 32167), (233, 32176), (234, 32182), (235, 32188), (236, 32200), (238, 32305), (241, 32323), (244, 32356), (249, 32443), (251, 32473), (252, 32479), (258, 32539), (264, 32632), (265, 32647), (268, 32689), (273, 32803),

Gene: GodPhather\_25 Start: 27493, Stop: 30207, Start Num: 27

Candidate Starts for GodPhather\_25:

(Start: 27 @27493 has 4 MA's), (35, 27562), (40, 27595), (43, 27616), (50, 27673), (54, 27703), (57, 27721), (64, 27814), (65, 27817), (70, 27871), (77, 27955), (84, 27991), (85, 28009), (86, 28012), (93,

28060), (98, 28099), (104, 28153), (111, 28207), (113, 28219), (115, 28243), (119, 28267), (124, 28279), (127, 28294), (135, 28351), (138, 28375), (144, 28432), (151, 28477), (158, 28552), (162, 28603), (167, 28660), (169, 28681), (173, 28741), (176, 28777), (177, 28780), (182, 28858), (184, 28894), (188, 28924), (191, 28939), (197, 29047), (203, 29095), (204, 29101), (205, 29110), (206, 29116), (209, 29185), (211, 29227), (213, 29254), (216, 29317), (217, 29323), (218, 29338), (219, 29347), (221, 29380), (227, 29494), (230, 29524), (231, 29542), (232, 29563), (233, 29572), (234, 29578), (235, 29584), (236, 29596), (238, 29701), (241, 29719), (244, 29752), (247, 29773), (249, 29839), (251, 29869), (252, 29875), (258, 29935), (260, 29953), (264, 30028), (266, 30049), (268, 30085), (273, 30199),

Gene: Godines\_32 Start: 29971, Stop: 32691, Start Num: 25

Candidate Starts for Godines\_32:

(Start: 25 @29971 has 31 MA's), (32, 30025), (38, 30064), (40, 30082), (44, 30109), (47, 30133), (48, 30136), (52, 30169), (62, 30277), (64, 30298), (65, 30301), (70, 30355), (75, 30415), (77, 30439), (84, 30475), (90, 30523), (93, 30544), (98, 30583), (101, 30622), (104, 30637), (111, 30691), (113, 30703), (115, 30727), (119, 30751), (124, 30763), (127, 30778), (130, 30793), (135, 30835), (137, 30853), (141, 30892), (144, 30916), (162, 31087), (169, 31165), (173, 31225), (176, 31261), (177, 31264), (182, 31342), (184, 31378), (187, 31402), (191, 31423), (205, 31594), (206, 31600), (211, 31711), (213, 31738), (216, 31801), (217, 31807), (218, 31822), (221, 31864), (226, 31951), (227, 31978), (230, 32008), (231, 32026), (232, 32047), (233, 32056), (234, 32062), (235, 32068), (236, 32080), (238, 32185), (241, 32203), (244, 32236), (249, 32323), (251, 32353), (252, 32359), (258, 32419), (264, 32512), (265, 32527), (268, 32569), (273, 32683),

Gene: Halena\_20 Start: 19008, Stop: 21689, Start Num: 28

Candidate Starts for Halena\_20:

(Start: 28 @19008 has 19 MA's), (29, 19014), (52, 19191), (55, 19221), (59, 19284), (68, 19359), (73, 19413), (80, 19473), (82, 19479), (91, 19545), (99, 19608), (102, 19641), (103, 19644), (107, 19668), (109, 19692), (110, 19698), (111, 19704), (116, 19752), (121, 19773), (126, 19788), (131, 19809), (134, 19848), (136, 19860), (140, 19878), (149, 19953), (154, 19983), (155, 20007), (156, 20010), (160, 20055), (163, 20106), (166, 20124), (170, 20178), (174, 20250), (176, 20262), (178, 20271), (181, 20313), (182, 20343), (184, 20379), (185, 20397), (189, 20412), (190, 20418), (192, 20451), (204, 20580), (205, 20589), (210, 20670), (211, 20706), (212, 20712), (218, 20817), (219, 20826), (220, 20841), (221, 20859), (224, 20901), (229, 20997), (230, 21003), (234, 21057), (235, 21063), (236, 21075), (240, 21186), (242, 21216), (243, 21222), (247, 21252), (249, 21318), (250, 21324), (251, 21348), (252, 21354), (253, 21360), (257, 21405), (258, 21414), (259, 21423), (262, 21462), (263, 21498), (264, 21507), (265, 21522), (269, 21618), (271, 21669), (272, 21675),

Gene: Hedgerow\_32 Start: 30073, Stop: 32793, Start Num: 25

Candidate Starts for Hedgerow\_32:

(Start: 25 @30073 has 31 MA's), (32, 30127), (38, 30166), (44, 30211), (47, 30235), (48, 30238), (52, 30271), (62, 30379), (64, 30400), (65, 30403), (70, 30457), (75, 30517), (77, 30541), (84, 30577), (90, 30625), (93, 30646), (98, 30685), (101, 30724), (104, 30739), (111, 30793), (113, 30805), (115, 30829), (119, 30853), (124, 30865), (127, 30880), (130, 30895), (135, 30937), (137, 30955), (141, 30994), (144, 31018), (162, 31189), (169, 31267), (173, 31327), (176, 31363), (177, 31366), (182, 31444), (184, 31480), (187, 31504), (191, 31525), (205, 31696), (206, 31702), (211, 31813), (213, 31840), (216, 31903), (217, 31909), (218, 31924), (221, 31966), (226, 32053), (227, 32080), (230, 32110), (231, 32128), (232, 32149), (233, 32158), (234, 32164), (235, 32170), (236, 32182), (238, 32287), (241, 32305), (244, 32338), (249, 32425), (251, 32455), (252, 32461), (258, 32521), (264, 32614), (265, 32629), (268, 32671), (273, 32785),

Gene: Holeinone\_32 Start: 29953, Stop: 32673, Start Num: 25

Candidate Starts for Holeinone\_32:

(Start: 25 @29953 has 31 MA's), (32, 30007), (38, 30046), (44, 30091), (47, 30115), (48, 30118), (52, 30151), (62, 30259), (64, 30280), (65, 30283), (70, 30337), (75, 30397), (77, 30421), (84, 30457), (90, 30505), (93, 30526), (98, 30565), (101, 30604), (104, 30619), (111, 30673), (113, 30685), (115, 30709), (119, 30733), (124, 30745), (127, 30760), (130, 30775), (135, 30817), (137, 30835), (141, 30874), (144, 30898), (162, 31069), (169, 31147), (173, 31207), (176, 31243), (177, 31246), (182, 31324), (184, 31360), (187, 31384), (191, 31405), (205, 31576), (206, 31582), (211, 31693), (213, 31720), (216, 31783), (217, 31789), (218, 31804), (221, 31846), (230, 31990), (231, 32008), (232, 32029), (233, 32038), (234, 32044), (235, 32050), (236, 32062), (238, 32167), (241, 32185), (244, 32218), (245, 32233), (249, 32305), (251, 32335), (252, 32341), (258, 32401), (264, 32494), (265, 32509), (268, 32551), (270, 32653), (273, 32665),

Gene: ItsyBitsy1\_32 Start: 29955, Stop: 32675, Start Num: 25

Candidate Starts for ItsyBitsy1\_32:

(Start: 25 @29955 has 31 MA's), (32, 30009), (38, 30048), (44, 30093), (47, 30117), (48, 30120), (52, 30153), (62, 30261), (64, 30282), (65, 30285), (70, 30339), (75, 30399), (77, 30423), (84, 30459), (90, 30507), (93, 30528), (98, 30567), (104, 30621), (111, 30675), (113, 30687), (115, 30711), (119, 30735), (124, 30747), (127, 30762), (130, 30777), (135, 30819), (137, 30837), (141, 30876), (144, 30900), (162, 31071), (169, 31149), (173, 31209), (176, 31245), (177, 31248), (182, 31326), (184, 31362), (187, 31386), (191, 31407), (205, 31578), (211, 31695), (213, 31722), (216, 31785), (217, 31791), (218, 31806), (221, 31848), (226, 31935), (227, 31962), (230, 31992), (231, 32010), (232, 32031), (233, 32040), (234, 32046), (235, 32052), (236, 32064), (238, 32169), (241, 32187), (244, 32220), (249, 32307), (251, 32337), (252, 32343), (258, 32403), (264, 32496), (265, 32511), (268, 32553), (273, 32667),

Gene: Jeon\_24 Start: 27235, Stop: 29949, Start Num: 27

Candidate Starts for Jeon\_24:

(Start: 27 @27235 has 4 MA's), (35, 27304), (40, 27337), (43, 27358), (50, 27415), (54, 27445), (57, 27463), (64, 27556), (65, 27559), (70, 27613), (77, 27697), (84, 27733), (85, 27751), (86, 27754), (93, 27802), (98, 27841), (104, 27895), (111, 27949), (113, 27961), (115, 27985), (119, 28009), (124, 28021), (127, 28036), (135, 28093), (138, 28117), (144, 28174), (146, 28189), (151, 28219), (158, 28294), (162, 28345), (167, 28402), (169, 28423), (173, 28483), (176, 28519), (177, 28522), (182, 28600), (184, 28636), (188, 28666), (191, 28681), (197, 28789), (203, 28837), (204, 28843), (205, 28852), (206, 28858), (209, 28927), (211, 28969), (213, 28996), (216, 29059), (217, 29065), (218, 29080), (219, 29089), (221, 29122), (227, 29236), (230, 29266), (231, 29284), (233, 29314), (234, 29320), (235, 29326), (236, 29338), (238, 29443), (241, 29461), (244, 29494), (247, 29515), (249, 29581), (251, 29611), (252, 29617), (258, 29677), (260, 29695), (264, 29770), (268, 29827), (273, 29941),

Gene: JoeDirt\_20 Start: 18979, Stop: 21660, Start Num: 28

Candidate Starts for JoeDirt\_20:

(Start: 28 @18979 has 19 MA's), (29, 18985), (52, 19162), (55, 19192), (59, 19255), (68, 19330), (80, 19444), (82, 19450), (91, 19516), (99, 19579), (102, 19612), (103, 19615), (107, 19639), (109, 19663), (110, 19669), (111, 19675), (116, 19723), (121, 19744), (126, 19759), (131, 19780), (134, 19819), (136, 19831), (140, 19849), (149, 19924), (154, 19954), (155, 19978), (156, 19981), (160, 20026), (163, 20077), (166, 20095), (170, 20149), (174, 20221), (176, 20233), (178, 20242), (180, 20260), (181, 20284), (182, 20314), (184, 20350), (189, 20383), (190, 20389), (193, 20455), (201, 20521), (205, 20560), (210, 20641), (211, 20677), (212, 20683), (218, 20788), (219, 20797), (220, 20812), (221, 20830), (224, 20872), (229, 20968), (230, 20974), (234, 21028), (235, 21034), (236, 21046), (240, 21157), (242, 21187), (243, 21193), (249, 21289), (250, 21295), (251, 21319), (252, 21325), (253, 21331), (257, 21376), (258, 21385), (259, 21394), (262, 21433), (263, 21469), (264, 21478), (265, 21493), (269, 21589), (271, 21640), (272, 21646),

Gene: JustASigh\_21 Start: 19828, Stop: 22794, Start Num: 11

Candidate Starts for JustASigh\_21:

(Start: 11 @19828 has 1 MA's), (12, 19837), (26, 19999), (34, 20059), (43, 20134), (58, 20269), (63, 20326), (79, 20494), (86, 20542), (87, 20548), (88, 20551), (97, 20638), (102, 20686), (109, 20746), (115, 20794), (123, 20827), (130, 20860), (159, 21124), (162, 21172), (169, 21259), (170, 21271), (171, 21292), (173, 21319), (175, 21352), (176, 21355), (182, 21436), (183, 21448), (184, 21472), (198, 21637), (199, 21640), (203, 21682), (206, 21703), (207, 21718), (208, 21727), (210, 21778), (211, 21814), (216, 21904), (218, 21925), (221, 21967), (222, 21976), (224, 22009), (227, 22081), (231, 22129), (235, 22171), (236, 22183), (237, 22252), (244, 22339), (246, 22357), (249, 22426), (255, 22489), (256, 22495), (260, 22537), (262, 22570), (267, 22648), (268, 22672),

Gene: Kaleb\_32 Start: 30088, Stop: 32808, Start Num: 25

Candidate Starts for Kaleb\_32:

(Start: 25 @30088 has 31 MA's), (32, 30142), (38, 30181), (44, 30226), (47, 30250), (48, 30253), (52, 30286), (62, 30394), (64, 30415), (65, 30418), (70, 30472), (75, 30532), (77, 30556), (84, 30592), (90, 30640), (93, 30661), (98, 30700), (101, 30739), (104, 30754), (111, 30808), (113, 30820), (115, 30844), (119, 30868), (124, 30880), (127, 30895), (130, 30910), (135, 30952), (137, 30970), (141, 31009), (144, 31033), (162, 31204), (169, 31282), (173, 31342), (176, 31378), (177, 31381), (182, 31459), (184, 31495), (187, 31519), (191, 31540), (205, 31711), (206, 31717), (211, 31828), (213, 31855), (216, 31918), (217, 31924), (218, 31939), (221, 31981), (226, 32068), (230, 32125), (231, 32143), (232, 32164), (233, 32173), (234, 32179), (235, 32185), (236, 32197), (238, 32302), (241, 32320), (244, 32353), (249, 32440), (251, 32470), (252, 32476), (258, 32536), (264, 32629), (265, 32644), (268, 32686), (273, 32800),

Gene: Kheth\_32 Start: 29973, Stop: 32693, Start Num: 25

Candidate Starts for Kheth\_32:

(Start: 25 @29973 has 31 MA's), (32, 30027), (38, 30066), (44, 30111), (47, 30135), (48, 30138), (52, 30171), (62, 30279), (64, 30300), (65, 30303), (70, 30357), (75, 30417), (77, 30441), (84, 30477), (90, 30525), (93, 30546), (98, 30585), (101, 30624), (104, 30639), (111, 30693), (113, 30705), (115, 30729), (119, 30753), (124, 30765), (127, 30780), (130, 30795), (135, 30837), (137, 30855), (141, 30894), (144, 30918), (162, 31089), (169, 31167), (173, 31227), (176, 31263), (177, 31266), (182, 31344), (184, 31380), (187, 31404), (191, 31425), (205, 31596), (206, 31602), (211, 31713), (213, 31740), (216, 31803), (217, 31809), (218, 31824), (221, 31866), (226, 31953), (227, 31980), (230, 32010), (231, 32028), (232, 32049), (233, 32058), (234, 32064), (235, 32070), (236, 32082), (238, 32187), (241, 32205), (244, 32238), (249, 32325), (251, 32355), (252, 32361), (258, 32421), (264, 32514), (265, 32529), (268, 32571), (273, 32685),

Gene: Koella\_18 Start: 17365, Stop: 20229, Start Num: 8

Candidate Starts for Koella\_18:

(6, 17353), (Start: 8 @17365 has 9 MA's), (10, 17386), (13, 17407), (15, 17446), (21, 17515), (22, 17524), (23, 17527), (31, 17578), (45, 17668), (52, 17713), (59, 17803), (60, 17812), (61, 17815), (63, 17836), (65, 17848), (69, 17881), (83, 18016), (89, 18064), (91, 18079), (94, 18100), (99, 18142), (100, 18157), (101, 18166), (106, 18193), (108, 18199), (113, 18244), (114, 18253), (115, 18268), (117, 18280), (118, 18289), (120, 18295), (124, 18304), (129, 18331), (132, 18349), (143, 18442), (145, 18463), (149, 18487), (157, 18553), (158, 18574), (161, 18592), (162, 18625), (164, 18649), (165, 18652), (169, 18703), (172, 18739), (173, 18763), (176, 18799), (178, 18808), (179, 18823), (181, 18850), (182, 18880), (184, 18916), (187, 18940), (195, 19039), (200, 19078), (205, 19132), (211, 19249), (213, 19276), (216, 19339), (217, 19345), (218, 19360), (221, 19402), (226, 19489), (227, 19516), (230, 19546), (231, 19564), (233, 19594), (235, 19606), (236, 19618), (238, 19723), (241, 19741), (244, 19774), (249, 19861), (251, 19891), (252, 19897), (258, 19957), (259, 19966), (260, 19975), (264, 20050), (266, 20071), (268, 20107), (273, 20221),

Gene: Kolhan\_32 Start: 29967, Stop: 32687, Start Num: 25

Candidate Starts for Kolhan\_32:

(Start: 25 @29967 has 31 MA's), (32, 30021), (38, 30060), (44, 30105), (47, 30129), (48, 30132), (52, 30165), (62, 30273), (64, 30294), (65, 30297), (70, 30351), (75, 30411), (77, 30435), (84, 30471), (90, 30519), (93, 30540), (98, 30579), (101, 30618), (104, 30633), (111, 30687), (113, 30699), (115, 30723), (119, 30747), (124, 30759), (127, 30774), (130, 30789), (135, 30831), (137, 30849), (141, 30888), (144, 30912), (162, 31083), (169, 31161), (173, 31221), (176, 31257), (177, 31260), (182, 31338), (184, 31374), (187, 31398), (191, 31419), (205, 31590), (206, 31596), (211, 31707), (213, 31734), (216, 31797), (217, 31803), (218, 31818), (221, 31860), (226, 31947), (230, 32004), (231, 32022), (232, 32043), (233, 32052), (234, 32058), (235, 32064), (236, 32076), (238, 32181), (241, 32199), (244, 32232), (249, 32319), (251, 32349), (252, 32355), (258, 32415), (264, 32508), (265, 32523), (268, 32565), (273, 32679),

Gene: Labelle\_36 Start: 28741, Stop: 32043, Start Num: 1

Candidate Starts for Labelle\_36:

(Start: 1 @28741 has 3 MA's), (2, 28753), (3, 28882), (4, 28891), (5, 28903), (13, 29071), (14, 29077), (19, 29161), (37, 29314), (42, 29356), (46, 29389), (49, 29416), (52, 29428), (72, 29644), (76, 29701), (78, 29722), (93, 29827), (96, 29863), (112, 30001), (122, 30070), (128, 30094), (142, 30220), (144, 30235), (147, 30262), (150, 30283), (152, 30298), (153, 30307), (176, 30613), (177, 30616), (179, 30637), (182, 30694), (184, 30730), (185, 30748), (186, 30751), (188, 30760), (191, 30775), (197, 30883), (205, 30946), (209, 31021), (211, 31063), (221, 31216), (223, 31255), (230, 31360), (231, 31378), (233, 31408), (235, 31420), (236, 31432), (248, 31621), (252, 31711), (258, 31771), (260, 31789), (264, 31864), (266, 31885), (268, 31921), (271, 32026), (272, 32032), (273, 32035),

Gene: Lars\_32 Start: 30078, Stop: 32798, Start Num: 25

Candidate Starts for Lars\_32:

(Start: 25 @30078 has 31 MA's), (32, 30132), (38, 30171), (44, 30216), (47, 30240), (48, 30243), (52, 30276), (62, 30384), (64, 30405), (65, 30408), (70, 30462), (75, 30522), (77, 30546), (84, 30582), (90, 30630), (93, 30651), (98, 30690), (101, 30729), (104, 30744), (111, 30798), (113, 30810), (115, 30834), (119, 30858), (124, 30870), (127, 30885), (130, 30900), (135, 30942), (137, 30960), (141, 30999), (144, 31023), (162, 31194), (169, 31272), (173, 31332), (176, 31368), (177, 31371), (182, 31449), (184, 31485), (187, 31509), (191, 31530), (205, 31701), (206, 31707), (211, 31818), (213, 31845), (216, 31908), (217, 31914), (218, 31929), (221, 31971), (226, 32058), (227, 32085), (230, 32115), (231, 32133), (232, 32154), (233, 32163), (234, 32169), (235, 32175), (236, 32187), (238, 32292), (241, 32310), (244, 32343), (249, 32430), (251, 32460), (252, 32466), (258, 32526), (264, 32619), (265, 32634), (268, 32676), (273, 32790),

Gene: LastJedi\_18 Start: 17396, Stop: 20260, Start Num: 8

Candidate Starts for LastJedi\_18:

(6, 17384), (Start: 8 @17396 has 9 MA's), (10, 17417), (13, 17438), (15, 17477), (21, 17546), (22, 17555), (23, 17558), (31, 17609), (45, 17699), (52, 17744), (59, 17834), (60, 17843), (61, 17846), (63, 17867), (65, 17879), (69, 17912), (83, 18047), (89, 18095), (91, 18110), (94, 18131), (99, 18173), (100, 18188), (101, 18197), (106, 18224), (108, 18230), (113, 18275), (114, 18284), (115, 18299), (117, 18311), (118, 18320), (120, 18326), (124, 18335), (129, 18362), (132, 18380), (143, 18473), (145, 18494), (149, 18518), (157, 18584), (158, 18605), (161, 18623), (162, 18656), (164, 18680), (165, 18683), (169, 18734), (172, 18770), (173, 18794), (176, 18830), (178, 18839), (179, 18854), (181, 18881), (182, 18911), (184, 18947), (187, 18971), (195, 19070), (200, 19109), (205, 19163), (211, 19280), (213, 19307), (216, 19370), (217, 19376), (218, 19391), (221, 19433), (226, 19520), (227, 19547), (230, 19577), (231, 19595), (233, 19625), (235, 19637), (236, 19649), (238, 19754), (241, 19772), (244, 19805), (249, 19892), (251, 19922), (252, 19928), (258, 19988), (259, 19997), (260, 20006), (264, 20081), (266, 20102), (268, 20138), (273, 20252),

Gene: LeBron\_20 Start: 19023, Stop: 21704, Start Num: 28

Candidate Starts for LeBron\_20:



(Start: 28 @19023 has 19 MA's), (29, 19029), (52, 19206), (55, 19236), (59, 19299), (68, 19374), (73, 19428), (80, 19488), (82, 19494), (91, 19560), (99, 19623), (102, 19656), (103, 19659), (107, 19683), (109, 19707), (110, 19713), (111, 19719), (116, 19767), (121, 19788), (126, 19803), (131, 19824), (134, 19863), (136, 19875), (140, 19893), (149, 19968), (154, 19998), (155, 20022), (156, 20025), (160, 20070), (163, 20121), (166, 20139), (170, 20193), (174, 20265), (176, 20277), (178, 20286), (180, 20304), (181, 20328), (182, 20358), (184, 20394), (189, 20427), (190, 20433), (193, 20499), (201, 20565), (205, 20604), (210, 20685), (211, 20721), (212, 20727), (218, 20832), (219, 20841), (220, 20856), (221, 20874), (224, 20916), (229, 21012), (230, 21018), (234, 21072), (235, 21078), (236, 21090), (240, 21201), (242, 21231), (243, 21237), (249, 21333), (250, 21339), (251, 21363), (252, 21369), (253, 21375), (257, 21420), (258, 21429), (259, 21438), (262, 21477), (263, 21513), (264, 21522), (265, 21537), (269, 21633), (271, 21684), (272, 21690),

Gene: Lephleur\_32 Start: 29971, Stop: 32691, Start Num: 25

Candidate Starts for Lephleur\_32:

(Start: 25 @29971 has 31 MA's), (32, 30025), (38, 30064), (44, 30109), (47, 30133), (48, 30136), (52, 30169), (62, 30277), (64, 30298), (65, 30301), (70, 30355), (75, 30415), (77, 30439), (84, 30475), (90, 30523), (93, 30544), (98, 30583), (101, 30622), (104, 30637), (111, 30691), (113, 30703), (115, 30727), (119, 30751), (124, 30763), (127, 30778), (130, 30793), (135, 30835), (137, 30853), (141, 30892), (144, 30916), (162, 31087), (169, 31165), (173, 31225), (176, 31261), (177, 31264), (182, 31342), (184, 31378), (187, 31402), (191, 31423), (205, 31594), (206, 31600), (211, 31711), (213, 31738), (216, 31801), (217, 31807), (218, 31822), (221, 31864), (226, 31951), (230, 32008), (231, 32026), (232, 32047), (233, 32056), (234, 32062), (235, 32068), (236, 32080), (238, 32185), (241, 32203), (244, 32236), (249, 32323), (251, 32353), (252, 32359), (258, 32419), (264, 32512), (265, 32527), (268, 32569), (273, 32683),

Gene: LilSmirk\_32 Start: 29965, Stop: 32685, Start Num: 25

Candidate Starts for LilSmirk\_32:

(Start: 25 @29965 has 31 MA's), (32, 30019), (38, 30058), (44, 30103), (47, 30127), (48, 30130), (52, 30163), (62, 30271), (64, 30292), (65, 30295), (70, 30349), (75, 30409), (77, 30433), (84, 30469), (90, 30517), (93, 30538), (98, 30577), (101, 30616), (104, 30631), (111, 30685), (113, 30697), (115, 30721), (119, 30745), (124, 30757), (127, 30772), (130, 30787), (135, 30829), (137, 30847), (141, 30886), (144, 30910), (162, 31081), (169, 31159), (173, 31219), (176, 31255), (177, 31258), (182, 31336), (184, 31372), (187, 31396), (191, 31417), (205, 31588), (211, 31705), (213, 31732), (216, 31795), (217, 31801), (218, 31816), (221, 31858), (226, 31945), (230, 32002), (231, 32020), (232, 32041), (233, 32050), (234, 32056), (235, 32062), (236, 32074), (238, 32179), (241, 32197), (244, 32230), (249, 32317), (251, 32347), (252, 32353), (258, 32413), (264, 32506), (265, 32521), (268, 32563), (273, 32677),

Gene: LizLemon\_32 Start: 30087, Stop: 32807, Start Num: 25

Candidate Starts for LizLemon\_32:

(Start: 25 @30087 has 31 MA's), (32, 30141), (38, 30180), (44, 30225), (47, 30249), (48, 30252), (52, 30285), (62, 30393), (64, 30414), (65, 30417), (70, 30471), (75, 30531), (77, 30555), (84, 30591), (90, 30639), (93, 30660), (98, 30699), (101, 30738), (104, 30753), (111, 30807), (113, 30819), (115, 30843), (119, 30867), (124, 30879), (127, 30894), (130, 30909), (135, 30951), (137, 30969), (141, 31008), (144, 31032), (162, 31203), (169, 31281), (173, 31341), (176, 31377), (177, 31380), (182, 31458), (184, 31494), (187, 31518), (195, 31617), (200, 31656), (205, 31710), (211, 31827), (213, 31854), (216, 31917), (217, 31923), (218, 31938), (221, 31980), (226, 32067), (230, 32124), (231, 32142), (232, 32163), (233, 32172), (234, 32178), (235, 32184), (236, 32196), (238, 32301), (241, 32319), (244, 32352), (249, 32439), (251, 32469), (252, 32475), (258, 32535), (264, 32628), (265, 32643), (268, 32685), (273, 32799),

Gene: MAckerman\_20 Start: 18997, Stop: 21678, Start Num: 28

Candidate Starts for MAckerman\_20:

(Start: 28 @18997 has 19 MA's), (29, 19003), (52, 19180), (55, 19210), (59, 19273), (68, 19348), (73, 19402), (80, 19462), (82, 19468), (91, 19534), (99, 19597), (102, 19630), (103, 19633), (107, 19657), (110, 19687), (111, 19693), (116, 19741), (121, 19762), (126, 19777), (131, 19798), (134, 19837), (136, 19849), (140, 19867), (146, 19924), (149, 19942), (154, 19972), (155, 19996), (156, 19999), (160, 20044), (163, 20095), (166, 20113), (170, 20167), (174, 20239), (176, 20251), (178, 20260), (181, 20302), (182, 20332), (184, 20368), (185, 20386), (189, 20401), (190, 20407), (192, 20440), (204, 20569), (205, 20578), (210, 20659), (211, 20695), (212, 20701), (218, 20806), (219, 20815), (220, 20830), (221, 20848), (224, 20890), (229, 20986), (230, 20992), (234, 21046), (235, 21052), (236, 21064), (240, 21175), (242, 21205), (243, 21211), (249, 21307), (250, 21313), (251, 21337), (252, 21343), (253, 21349), (257, 21394), (258, 21403), (259, 21412), (262, 21451), (263, 21487), (264, 21496), (265, 21511), (269, 21607), (271, 21658), (272, 21664),

Gene: Madrug\_a\_35 Start: 28410, Stop: 31712, Start Num: 1

Candidate Starts for Madrug\_a\_35:

(Start: 1 @28410 has 3 MA's), (2, 28422), (3, 28551), (4, 28560), (5, 28572), (14, 28746), (19, 28830), (36, 28974), (37, 28983), (42, 29025), (46, 29058), (52, 29097), (72, 29313), (76, 29370), (78, 29391), (93, 29496), (96, 29532), (112, 29670), (122, 29739), (128, 29763), (142, 29889), (144, 29904), (147, 29931), (150, 29952), (152, 29967), (153, 29976), (176, 30282), (177, 30285), (179, 30306), (182, 30363), (184, 30399), (187, 30423), (188, 30429), (191, 30444), (196, 30546), (197, 30552), (205, 30615), (209, 30690), (211, 30732), (221, 30885), (223, 30924), (225, 30951), (230, 31029), (231, 31047), (233, 31077), (235, 31089), (236, 31101), (248, 31290), (252, 31380), (258, 31440), (259, 31449), (265, 31548), (271, 31695), (272, 31701), (273, 31704),

Gene: Mao1\_26 Start: 25993, Stop: 28746, Start Num: 24

Candidate Starts for Mao1\_26:

(16, 25900), (Start: 24 @25993 has 3 MA's), (36, 26071), (40, 26107), (44, 26134), (47, 26158), (56, 26227), (60, 26296), (63, 26320), (65, 26332), (90, 26566), (92, 26578), (94, 26593), (98, 26629), (102, 26671), (109, 26725), (115, 26773), (119, 26803), (120, 26806), (139, 26914), (144, 26968), (146, 26983), (148, 26998), (157, 27067), (158, 27088), (161, 27106), (162, 27139), (164, 27163), (165, 27166), (169, 27217), (172, 27253), (173, 27277), (176, 27313), (178, 27322), (179, 27337), (181, 27364), (182, 27394), (184, 27430), (185, 27448), (186, 27451), (188, 27460), (197, 27586), (203, 27634), (211, 27766), (213, 27793), (215, 27844), (216, 27856), (217, 27862), (221, 27919), (223, 27958), (226, 28006), (227, 28033), (230, 28063), (231, 28081), (233, 28111), (235, 28123), (236, 28135), (239, 28243), (241, 28258), (244, 28291), (247, 28312), (249, 28378), (251, 28408), (252, 28414), (258, 28474), (259, 28483), (260, 28492), (264, 28567), (265, 28582), (266, 28588), (268, 28624), (273, 28738),

Gene: Mask\_27 Start: 25986, Stop: 28739, Start Num: 24

Candidate Starts for Mask\_27:

(16, 25893), (Start: 24 @25986 has 3 MA's), (36, 26064), (40, 26100), (44, 26127), (47, 26151), (56, 26220), (60, 26289), (63, 26313), (65, 26325), (90, 26559), (92, 26571), (94, 26586), (98, 26622), (102, 26664), (109, 26718), (115, 26766), (119, 26796), (120, 26799), (139, 26907), (144, 26961), (146, 26976), (148, 26991), (157, 27060), (158, 27081), (161, 27099), (162, 27132), (164, 27156), (165, 27159), (169, 27210), (172, 27246), (173, 27270), (176, 27306), (178, 27315), (179, 27330), (181, 27357), (182, 27387), (184, 27423), (185, 27441), (186, 27444), (188, 27453), (197, 27579), (203, 27627), (211, 27759), (213, 27786), (215, 27837), (216, 27849), (217, 27855), (221, 27912), (223, 27951), (226, 27999), (227, 28026), (230, 28056), (231, 28074), (233, 28104), (235, 28116), (236, 28128), (239, 28236), (241, 28251), (244, 28284), (247, 28305), (249, 28371), (251, 28401), (252, 28407), (258, 28467), (259, 28476), (260, 28485), (264, 28560), (265, 28575), (266, 28581), (268, 28617), (273, 28731),

Gene: MasterPo\_32 Start: 29974, Stop: 32694, Start Num: 25

Candidate Starts for MasterPo\_32:

(Start: 25 @29974 has 31 MA's), (32, 30028), (38, 30067), (44, 30112), (47, 30136), (48, 30139), (52, 30172), (62, 30280), (64, 30301), (65, 30304), (70, 30358), (75, 30418), (77, 30442), (84, 30478), (90, 30526), (93, 30547), (98, 30586), (101, 30625), (104, 30640), (111, 30694), (113, 30706), (115, 30730), (119, 30754), (124, 30766), (127, 30781), (130, 30796), (135, 30838), (137, 30856), (141, 30895), (144, 30919), (162, 31090), (169, 31168), (173, 31228), (176, 31264), (177, 31267), (182, 31345), (184, 31381), (187, 31405), (191, 31426), (205, 31597), (206, 31603), (211, 31714), (213, 31741), (216, 31804), (217, 31810), (218, 31825), (221, 31867), (226, 31954), (227, 31981), (230, 32011), (231, 32029), (232, 32050), (233, 32059), (234, 32065), (235, 32071), (236, 32083), (238, 32188), (241, 32206), (244, 32239), (249, 32326), (251, 32356), (252, 32362), (258, 32422), (264, 32515), (265, 32530), (266, 32536), (268, 32572), (273, 32686),

Gene: OhShagHennessey\_20 Start: 18962, Stop: 21643, Start Num: 28

Candidate Starts for OhShagHennessey\_20:

(Start: 28 @18962 has 19 MA's), (29, 18968), (52, 19145), (55, 19175), (59, 19238), (68, 19313), (80, 19427), (82, 19433), (91, 19499), (99, 19562), (102, 19595), (103, 19598), (107, 19622), (109, 19646), (110, 19652), (111, 19658), (116, 19706), (121, 19727), (126, 19742), (131, 19763), (134, 19802), (136, 19814), (140, 19832), (149, 19907), (154, 19937), (155, 19961), (156, 19964), (160, 20009), (163, 20060), (166, 20078), (170, 20132), (174, 20204), (176, 20216), (178, 20225), (180, 20243), (181, 20267), (182, 20297), (184, 20333), (189, 20366), (190, 20372), (193, 20438), (201, 20504), (205, 20543), (210, 20624), (211, 20660), (212, 20666), (218, 20771), (219, 20780), (220, 20795), (221, 20813), (224, 20855), (229, 20951), (234, 21011), (235, 21017), (236, 21029), (240, 21140), (242, 21170), (243, 21176), (249, 21272), (250, 21278), (251, 21302), (252, 21308), (253, 21314), (257, 21359), (258, 21368), (259, 21377), (262, 21416), (263, 21452), (264, 21461), (265, 21476), (269, 21572), (271, 21623), (272, 21629),

Gene: Opia\_32 Start: 29961, Stop: 32681, Start Num: 25

Candidate Starts for Opia\_32:

(Start: 25 @29961 has 31 MA's), (32, 30015), (38, 30054), (44, 30099), (47, 30123), (48, 30126), (52, 30159), (62, 30267), (64, 30288), (65, 30291), (70, 30345), (75, 30405), (77, 30429), (84, 30465), (90, 30513), (93, 30534), (98, 30573), (101, 30612), (104, 30627), (111, 30681), (113, 30693), (115, 30717), (119, 30741), (124, 30753), (127, 30768), (130, 30783), (135, 30825), (137, 30843), (141, 30882), (144, 30906), (162, 31077), (169, 31155), (173, 31215), (176, 31251), (177, 31254), (182, 31332), (184, 31368), (187, 31392), (191, 31413), (205, 31584), (206, 31590), (211, 31701), (213, 31728), (216, 31791), (217, 31797), (218, 31812), (221, 31854), (226, 31941), (227, 31968), (230, 31998), (231, 32016), (232, 32037), (233, 32046), (234, 32052), (235, 32058), (236, 32070), (238, 32175), (241, 32193), (244, 32226), (249, 32313), (251, 32343), (252, 32349), (258, 32409), (264, 32502), (265, 32517), (268, 32559), (273, 32673),

Gene: PR\_24 Start: 27208, Stop: 29922, Start Num: 27

Candidate Starts for PR\_24:

(Start: 27 @27208 has 4 MA's), (35, 27277), (40, 27310), (43, 27331), (50, 27388), (54, 27418), (57, 27436), (64, 27529), (65, 27532), (70, 27586), (71, 27592), (77, 27670), (84, 27706), (86, 27727), (93, 27775), (98, 27814), (104, 27868), (111, 27922), (113, 27934), (115, 27958), (119, 27982), (120, 27985), (130, 28024), (135, 28066), (144, 28147), (146, 28162), (151, 28192), (161, 28285), (162, 28318), (167, 28375), (168, 28387), (169, 28396), (173, 28456), (176, 28492), (177, 28495), (182, 28573), (184, 28609), (188, 28639), (191, 28654), (197, 28762), (203, 28810), (204, 28816), (205, 28825), (206, 28831), (211, 28942), (213, 28969), (216, 29032), (217, 29038), (218, 29053), (221, 29095), (230, 29239), (231, 29257), (235, 29299), (236, 29311), (238, 29416), (241, 29434), (244, 29467), (249, 29554), (251, 29584), (252, 29590), (254, 29611), (258, 29650), (260, 29668), (264, 29743), (266, 29764), (268, 29800), (273, 29914),

Gene: Patience\_37 Start: 29291, Stop: 32593, Start Num: 1

Candidate Starts for Patience\_37:

(Start: 1 @29291 has 3 MA's), (2, 29303), (3, 29432), (4, 29441), (5, 29453), (14, 29627), (19, 29711), (36, 29855), (37, 29864), (42, 29906), (46, 29939), (49, 29966), (52, 29978), (72, 30194), (76, 30251), (78, 30272), (93, 30377), (96, 30413), (112, 30551), (122, 30620), (128, 30644), (142, 30770), (144, 30785), (147, 30812), (150, 30833), (152, 30848), (153, 30857), (176, 31163), (177, 31166), (179, 31187), (182, 31244), (184, 31280), (187, 31304), (188, 31310), (197, 31433), (205, 31496), (209, 31571), (211, 31613), (221, 31766), (223, 31805), (230, 31910), (231, 31928), (233, 31958), (235, 31970), (236, 31982), (248, 32171), (252, 32261), (258, 32321), (259, 32330), (265, 32429), (271, 32576), (272, 32582), (273, 32585),

Gene: Phantasmagoria\_32 Start: 29972, Stop: 32692, Start Num: 25

Candidate Starts for Phantasmagoria\_32:

(Start: 25 @29972 has 31 MA's), (32, 30026), (38, 30065), (44, 30110), (47, 30134), (48, 30137), (52, 30170), (62, 30278), (64, 30299), (65, 30302), (70, 30356), (75, 30416), (77, 30440), (84, 30476), (90, 30524), (93, 30545), (98, 30584), (101, 30623), (104, 30638), (111, 30692), (113, 30704), (115, 30728), (119, 30752), (124, 30764), (127, 30779), (130, 30794), (135, 30836), (137, 30854), (141, 30893), (144, 30917), (162, 31088), (169, 31166), (173, 31226), (176, 31262), (177, 31265), (182, 31343), (184, 31379), (187, 31403), (191, 31424), (205, 31595), (206, 31601), (211, 31712), (213, 31739), (216, 31802), (217, 31808), (218, 31823), (221, 31865), (226, 31952), (227, 31979), (230, 32009), (231, 32027), (232, 32048), (233, 32057), (234, 32063), (235, 32069), (236, 32081), (238, 32186), (241, 32204), (244, 32237), (249, 32324), (251, 32354), (252, 32360), (258, 32420), (264, 32513), (265, 32528), (268, 32570), (273, 32684),

Gene: Phrann\_20 Start: 17560, Stop: 20412, Start Num: 9

Candidate Starts for Phrann\_20:

(Start: 7 @17548 has 2 MA's), (Start: 9 @17560 has 2 MA's), (10, 17572), (20, 17683), (22, 17707), (23, 17710), (Start: 24 @17719 has 3 MA's), (45, 17857), (51, 17899), (52, 17902), (59, 17992), (61, 18004), (63, 18025), (66, 18049), (74, 18124), (81, 18196), (86, 18226), (91, 18262), (99, 18325), (100, 18340), (106, 18373), (115, 18448), (118, 18472), (120, 18478), (132, 18532), (133, 18538), (143, 18625), (145, 18646), (149, 18670), (157, 18736), (158, 18757), (161, 18775), (162, 18808), (165, 18835), (169, 18886), (172, 18922), (173, 18946), (176, 18982), (178, 18991), (179, 19006), (181, 19033), (182, 19063), (184, 19099), (187, 19123), (195, 19222), (200, 19261), (203, 19300), (206, 19321), (211, 19432), (213, 19459), (214, 19489), (215, 19510), (216, 19522), (217, 19528), (221, 19585), (223, 19624), (230, 19729), (231, 19747), (235, 19789), (236, 19801), (244, 19957), (249, 20044), (251, 20074), (252, 20080), (258, 20140), (260, 20158), (264, 20233), (266, 20254), (268, 20290), (273, 20404),

Gene: Pippy\_18 Start: 17389, Stop: 20253, Start Num: 8

Candidate Starts for Pippy\_18:

(6, 17377), (Start: 8 @17389 has 9 MA's), (10, 17410), (13, 17431), (15, 17470), (21, 17539), (22, 17548), (23, 17551), (31, 17602), (45, 17692), (52, 17737), (59, 17827), (60, 17836), (61, 17839), (63, 17860), (65, 17872), (69, 17905), (83, 18040), (89, 18088), (91, 18103), (94, 18124), (99, 18166), (100, 18181), (101, 18190), (106, 18217), (108, 18223), (113, 18268), (114, 18277), (115, 18292), (118, 18313), (120, 18319), (124, 18328), (129, 18355), (132, 18373), (143, 18466), (145, 18487), (149, 18511), (157, 18577), (158, 18598), (161, 18616), (162, 18649), (164, 18673), (165, 18676), (169, 18727), (172, 18763), (173, 18787), (176, 18823), (178, 18832), (179, 18847), (181, 18874), (182, 18904), (184, 18940), (187, 18964), (195, 19063), (200, 19102), (205, 19156), (211, 19273), (213, 19300), (216, 19363), (217, 19369), (218, 19384), (221, 19426), (226, 19513), (227, 19540), (230, 19570), (231, 19588), (233, 19618), (235, 19630), (236, 19642), (238, 19747), (241, 19765), (244, 19798), (249, 19885), (251, 19915), (252, 19921), (258, 19981), (259, 19990), (260, 19999), (264, 20074), (266, 20095), (268, 20131), (273, 20245),

Gene: Pochiewood\_20 Start: 18997, Stop: 21678, Start Num: 28

Candidate Starts for Pochiewood\_20:

(Start: 28 @18997 has 19 MA's), (29, 19003), (52, 19180), (55, 19210), (59, 19273), (68, 19348), (73, 19402), (80, 19462), (82, 19468), (91, 19534), (99, 19597), (102, 19630), (103, 19633), (107, 19657), (110, 19687), (111, 19693), (116, 19741), (121, 19762), (126, 19777), (131, 19798), (134, 19837), (136, 19849), (140, 19867), (146, 19924), (149, 19942), (154, 19972), (155, 19996), (156, 19999), (160, 20044), (163, 20095), (166, 20113), (170, 20167), (174, 20239), (176, 20251), (178, 20260), (181, 20302), (182, 20332), (184, 20368), (185, 20386), (189, 20401), (190, 20407), (192, 20440), (204, 20569), (205, 20578), (210, 20659), (211, 20695), (212, 20701), (218, 20806), (219, 20815), (220, 20830), (221, 20848), (224, 20890), (229, 20986), (230, 20992), (234, 21046), (235, 21052), (236, 21064), (240, 21175), (242, 21205), (243, 21211), (249, 21307), (250, 21313), (251, 21337), (252, 21343), (253, 21349), (257, 21394), (258, 21403), (259, 21412), (262, 21451), (263, 21487), (264, 21496), (265, 21511), (269, 21607), (271, 21658), (272, 21664),

Gene: Qyrzula\_30 Start: 30056, Stop: 32776, Start Num: 25

Candidate Starts for Qyrzula\_30:

(Start: 25 @30056 has 31 MA's), (32, 30110), (38, 30149), (44, 30194), (47, 30218), (48, 30221), (52, 30254), (62, 30362), (64, 30383), (65, 30386), (70, 30440), (75, 30500), (77, 30524), (84, 30560), (85, 30578), (86, 30581), (90, 30608), (93, 30629), (98, 30668), (101, 30707), (104, 30722), (111, 30776), (113, 30788), (115, 30812), (119, 30836), (124, 30848), (127, 30863), (130, 30878), (135, 30920), (137, 30938), (141, 30977), (144, 31001), (162, 31172), (169, 31250), (173, 31310), (176, 31346), (177, 31349), (182, 31427), (184, 31463), (187, 31487), (195, 31586), (200, 31625), (205, 31679), (211, 31796), (213, 31823), (216, 31886), (217, 31892), (218, 31907), (221, 31949), (226, 32036), (227, 32063), (230, 32093), (231, 32111), (232, 32132), (233, 32141), (234, 32147), (235, 32153), (236, 32165), (238, 32270), (241, 32288), (244, 32321), (249, 32408), (251, 32438), (252, 32444), (258, 32504), (264, 32597), (268, 32654), (273, 32768),

Gene: Raymond7\_20 Start: 17560, Stop: 20415, Start Num: 9

Candidate Starts for Raymond7\_20:

(Start: 7 @17548 has 2 MA's), (Start: 9 @17560 has 2 MA's), (10, 17572), (20, 17683), (22, 17707), (23, 17710), (Start: 24 @17719 has 3 MA's), (59, 17992), (61, 18004), (63, 18025), (66, 18049), (74, 18124), (81, 18196), (86, 18226), (91, 18262), (99, 18325), (100, 18340), (106, 18373), (115, 18448), (118, 18472), (120, 18478), (125, 18490), (132, 18532), (133, 18538), (143, 18625), (145, 18646), (149, 18670), (157, 18736), (158, 18757), (161, 18775), (162, 18808), (164, 18832), (165, 18835), (169, 18886), (172, 18922), (173, 18946), (176, 18982), (184, 19099), (185, 19117), (186, 19120), (194, 19219), (205, 19318), (206, 19324), (211, 19435), (213, 19462), (216, 19525), (217, 19531), (218, 19546), (221, 19588), (223, 19627), (226, 19675), (227, 19702), (230, 19732), (231, 19750), (233, 19780), (234, 19786), (235, 19792), (236, 19804), (238, 19909), (241, 19927), (244, 19960), (245, 19975), (251, 20077), (252, 20083), (258, 20143), (259, 20152), (260, 20161), (261, 20188), (264, 20236), (265, 20251), (266, 20257), (268, 20293), (273, 20407),

Gene: Rhinoforte\_32 Start: 30081, Stop: 32801, Start Num: 25

Candidate Starts for Rhinoforte\_32:

(Start: 25 @30081 has 31 MA's), (32, 30135), (38, 30174), (44, 30219), (47, 30243), (48, 30246), (52, 30279), (62, 30387), (64, 30408), (65, 30411), (70, 30465), (75, 30525), (77, 30549), (84, 30585), (90, 30633), (93, 30654), (98, 30693), (101, 30732), (104, 30747), (111, 30801), (113, 30813), (115, 30837), (119, 30861), (124, 30873), (127, 30888), (130, 30903), (135, 30945), (137, 30963), (141, 31002), (144, 31026), (162, 31197), (169, 31275), (173, 31335), (176, 31371), (177, 31374), (182, 31452), (184, 31488), (187, 31512), (191, 31533), (205, 31704), (206, 31710), (211, 31821), (213, 31848), (216, 31911), (217, 31917), (218, 31932), (221, 31974), (226, 32061), (227, 32088), (230, 32118), (231, 32136), (232, 32157), (233, 32166), (234, 32172), (235, 32178), (236, 32190), (238, 32295), (241, 32313), (244, 32346), (249, 32433), (251, 32463), (252, 32469), (258, 32529), (264, 32622), (265, 32637), (268, 32679), (273, 32793),

Gene: Rose5\_20 Start: 18997, Stop: 21678, Start Num: 28

Candidate Starts for Rose5\_20:

(Start: 28 @18997 has 19 MA's), (29, 19003), (52, 19180), (55, 19210), (59, 19273), (68, 19348), (73, 19402), (80, 19462), (82, 19468), (91, 19534), (99, 19597), (102, 19630), (103, 19633), (107, 19657), (110, 19687), (111, 19693), (116, 19741), (121, 19762), (126, 19777), (131, 19798), (134, 19837), (136, 19849), (140, 19867), (146, 19924), (149, 19942), (154, 19972), (155, 19996), (156, 19999), (160, 20044), (163, 20095), (166, 20113), (170, 20167), (174, 20239), (176, 20251), (178, 20260), (181, 20302), (182, 20332), (184, 20368), (185, 20386), (189, 20401), (190, 20407), (192, 20440), (204, 20569), (205, 20578), (210, 20659), (211, 20695), (212, 20701), (218, 20806), (219, 20815), (220, 20830), (221, 20848), (224, 20890), (229, 20986), (230, 20992), (234, 21046), (235, 21052), (236, 21064), (240, 21175), (242, 21205), (243, 21211), (249, 21307), (250, 21313), (251, 21337), (252, 21343), (253, 21349), (257, 21394), (258, 21403), (259, 21412), (262, 21451), (263, 21487), (264, 21496), (265, 21511), (269, 21607), (271, 21658), (272, 21664),

Gene: Rosebush\_32 Start: 30088, Stop: 32808, Start Num: 25

Candidate Starts for Rosebush\_32:

(Start: 25 @30088 has 31 MA's), (32, 30142), (38, 30181), (44, 30226), (47, 30250), (48, 30253), (52, 30286), (62, 30394), (64, 30415), (65, 30418), (70, 30472), (75, 30532), (77, 30556), (84, 30592), (90, 30640), (93, 30661), (98, 30700), (101, 30739), (104, 30754), (111, 30808), (113, 30820), (115, 30844), (119, 30868), (124, 30880), (127, 30895), (130, 30910), (135, 30952), (137, 30970), (141, 31009), (144, 31033), (162, 31204), (169, 31282), (173, 31342), (176, 31378), (177, 31381), (182, 31459), (184, 31495), (187, 31519), (191, 31540), (205, 31711), (206, 31717), (211, 31828), (213, 31855), (216, 31918), (217, 31924), (218, 31939), (221, 31981), (226, 32068), (227, 32095), (230, 32125), (231, 32143), (232, 32164), (233, 32173), (234, 32179), (235, 32185), (236, 32197), (238, 32302), (241, 32320), (244, 32353), (249, 32440), (251, 32470), (252, 32476), (258, 32536), (264, 32629), (265, 32644), (268, 32686), (273, 32800),

Gene: Sabella\_32 Start: 29965, Stop: 32685, Start Num: 25

Candidate Starts for Sabella\_32:

(Start: 25 @29965 has 31 MA's), (32, 30019), (38, 30058), (44, 30103), (47, 30127), (48, 30130), (52, 30163), (62, 30271), (64, 30292), (65, 30295), (70, 30349), (75, 30409), (77, 30433), (84, 30469), (85, 30487), (86, 30490), (90, 30517), (93, 30538), (98, 30577), (104, 30631), (111, 30685), (113, 30697), (115, 30721), (119, 30745), (124, 30757), (127, 30772), (130, 30787), (135, 30829), (137, 30847), (141, 30886), (144, 30910), (162, 31081), (169, 31159), (173, 31219), (176, 31255), (177, 31258), (182, 31336), (184, 31372), (187, 31396), (191, 31417), (205, 31588), (206, 31594), (211, 31705), (213, 31732), (216, 31795), (217, 31801), (218, 31816), (221, 31858), (226, 31945), (227, 31972), (230, 32002), (231, 32020), (232, 32041), (233, 32050), (234, 32056), (235, 32062), (236, 32074), (238, 32179), (241, 32197), (244, 32230), (249, 32317), (251, 32347), (252, 32353), (258, 32413), (264, 32506), (265, 32521), (268, 32563), (273, 32677),

Gene: SamScheppers\_26 Start: 21811, Stop: 24555, Start Num: 18

Candidate Starts for SamScheppers\_26:

(Start: 18 @21811 has 3 MA's), (30, 21901), (33, 21922), (38, 21946), (39, 21952), (41, 21970), (52, 22036), (59, 22126), (60, 22135), (61, 22138), (63, 22159), (65, 22171), (69, 22204), (83, 22339), (89, 22387), (91, 22402), (94, 22423), (95, 22441), (99, 22465), (100, 22480), (101, 22489), (106, 22516), (108, 22522), (113, 22567), (115, 22591), (117, 22603), (118, 22612), (120, 22618), (124, 22627), (129, 22654), (132, 22672), (143, 22765), (144, 22777), (145, 22786), (157, 22876), (158, 22897), (161, 22915), (162, 22948), (165, 22975), (169, 23026), (172, 23062), (173, 23086), (176, 23122), (178, 23131), (179, 23146), (181, 23173), (182, 23203), (184, 23239), (185, 23257), (186, 23260), (188, 23269), (202, 23419), (205, 23458), (211, 23575), (213, 23602), (216, 23665), (217, 23671), (218, 23686), (221, 23728), (226, 23815), (227, 23842), (230, 23872), (231, 23890), (233, 23920), (235, 23932), (236, 23944), (239, 24052), (241, 24067), (244, 24100), (247, 24121), (249, 24187), (251, 24217), (252, 24223), (258, 24283), (260, 24301), (264, 24376), (266, 24397), (268, 24433), (273, 24547),

Gene: Sarma624\_19 Start: 17226, Stop: 20090, Start Num: 8

Candidate Starts for Sarma624\_19:

(Start: 8 @17226 has 9 MA's), (10, 17247), (13, 17268), (15, 17307), (21, 17376), (22, 17385), (23, 17388), (31, 17439), (45, 17529), (53, 17580), (59, 17664), (61, 17676), (63, 17697), (67, 17730), (83, 17877), (91, 17940), (95, 17979), (99, 18003), (100, 18018), (101, 18027), (106, 18054), (108, 18060), (115, 18129), (118, 18150), (120, 18156), (129, 18192), (132, 18210), (143, 18303), (145, 18324), (149, 18348), (157, 18414), (158, 18435), (161, 18453), (162, 18486), (165, 18513), (169, 18564), (172, 18600), (173, 18624), (176, 18660), (178, 18669), (179, 18684), (181, 18711), (182, 18741), (184, 18777), (187, 18801), (195, 18900), (200, 18939), (203, 18978), (206, 18999), (211, 19110), (213, 19137), (214, 19167), (215, 19188), (216, 19200), (217, 19206), (221, 19263), (230, 19407), (231, 19425), (235, 19467), (236, 19479), (244, 19635), (249, 19722), (251, 19752), (252, 19758), (258, 19818), (260, 19836), (264, 19911), (266, 19932), (268, 19968), (273, 20082),

Gene: Sejanus\_27 Start: 26927, Stop: 29680, Start Num: 24

Candidate Starts for Sejanus\_27:

(16, 26834), (Start: 24 @26927 has 3 MA's), (36, 27005), (40, 27041), (44, 27068), (47, 27092), (56, 27161), (60, 27230), (63, 27254), (65, 27266), (90, 27500), (92, 27512), (94, 27527), (98, 27563), (102, 27605), (109, 27659), (115, 27707), (119, 27737), (120, 27740), (139, 27848), (144, 27902), (146, 27917), (148, 27932), (157, 28001), (158, 28022), (161, 28040), (162, 28073), (164, 28097), (165, 28100), (169, 28151), (172, 28187), (173, 28211), (176, 28247), (178, 28256), (179, 28271), (181, 28298), (182, 28328), (184, 28364), (185, 28382), (186, 28385), (188, 28394), (197, 28520), (203, 28568), (211, 28700), (213, 28727), (215, 28778), (216, 28790), (217, 28796), (221, 28853), (223, 28892), (226, 28940), (227, 28967), (230, 28997), (231, 29015), (233, 29045), (235, 29057), (236, 29069), (239, 29177), (241, 29192), (244, 29225), (247, 29246), (249, 29312), (251, 29342), (252, 29348), (258, 29408), (259, 29417), (260, 29426), (264, 29501), (265, 29516), (266, 29522), (268, 29558), (273, 29672),

Gene: Silverleaf\_20 Start: 18997, Stop: 21678, Start Num: 28

Candidate Starts for Silverleaf\_20:

(Start: 28 @18997 has 19 MA's), (29, 19003), (52, 19180), (55, 19210), (59, 19273), (68, 19348), (73, 19402), (80, 19462), (82, 19468), (91, 19534), (99, 19597), (102, 19630), (103, 19633), (107, 19657), (109, 19681), (110, 19687), (111, 19693), (116, 19741), (121, 19762), (126, 19777), (131, 19798), (134, 19837), (136, 19849), (140, 19867), (146, 19924), (149, 19942), (154, 19972), (155, 19996), (156, 19999), (160, 20044), (163, 20095), (166, 20113), (170, 20167), (174, 20239), (176, 20251), (178, 20260), (181, 20302), (182, 20332), (184, 20368), (185, 20386), (189, 20401), (190, 20407), (192, 20440), (204, 20569), (205, 20578), (210, 20659), (211, 20695), (212, 20701), (218, 20806), (219, 20815), (220, 20830), (221, 20848), (224, 20890), (229, 20986), (230, 20992), (234, 21046), (235, 21052), (236, 21064), (240, 21175), (242, 21205), (243, 21211), (247, 21241), (249, 21307), (250, 21313), (251, 21337), (252, 21343), (253, 21349), (257, 21394), (258, 21403), (259, 21412), (262, 21451), (263, 21487), (264, 21496), (265, 21511), (269, 21607), (271, 21658), (272, 21664),

Gene: TA17A\_32 Start: 29955, Stop: 32675, Start Num: 25

Candidate Starts for TA17A\_32:

(Start: 25 @29955 has 31 MA's), (32, 30009), (38, 30048), (40, 30066), (44, 30093), (47, 30117), (48, 30120), (52, 30153), (62, 30261), (64, 30282), (65, 30285), (70, 30339), (75, 30399), (77, 30423), (84, 30459), (90, 30507), (93, 30528), (98, 30567), (104, 30621), (111, 30675), (113, 30687), (115, 30711), (119, 30735), (124, 30747), (127, 30762), (130, 30777), (135, 30819), (137, 30837), (141, 30876), (144, 30900), (162, 31071), (169, 31149), (173, 31209), (176, 31245), (177, 31248), (182, 31326), (184, 31362), (187, 31386), (195, 31485), (200, 31524), (205, 31578), (211, 31695), (213, 31722), (216, 31785), (217, 31791), (221, 31848), (226, 31935), (227, 31962), (230, 31992), (231, 32010), (232, 32031), (233, 32040), (234, 32046), (235, 32052), (236, 32064), (238, 32169), (241, 32187), (244, 32220), (249, 32307), (251, 32337), (252, 32343), (258, 32403), (264, 32496), (265, 32511),

(268, 32553), (273, 32667),

Gene: Taquito\_26 Start: 21892, Stop: 24636, Start Num: 18

Candidate Starts for Taquito\_26:

(Start: 18 @21892 has 3 MA's), (30, 21982), (33, 22003), (38, 22027), (41, 22051), (52, 22117), (59, 22207), (60, 22216), (61, 22219), (63, 22240), (65, 22252), (69, 22285), (83, 22420), (89, 22468), (91, 22483), (94, 22504), (95, 22522), (99, 22546), (100, 22561), (101, 22570), (106, 22597), (108, 22603), (113, 22648), (115, 22672), (117, 22684), (118, 22693), (120, 22699), (124, 22708), (129, 22735), (132, 22753), (143, 22846), (144, 22858), (145, 22867), (157, 22957), (158, 22978), (161, 22996), (162, 23029), (165, 23056), (169, 23107), (172, 23143), (173, 23167), (176, 23203), (178, 23212), (179, 23227), (181, 23254), (182, 23284), (184, 23320), (185, 23338), (186, 23341), (188, 23350), (202, 23500), (205, 23539), (211, 23656), (213, 23683), (216, 23746), (217, 23752), (218, 23767), (221, 23809), (226, 23896), (227, 23923), (230, 23953), (231, 23971), (235, 24013), (236, 24025), (239, 24133), (241, 24148), (244, 24181), (247, 24202), (249, 24268), (251, 24298), (252, 24304), (258, 24364), (260, 24382), (264, 24457), (266, 24478), (268, 24514), (273, 24628),

Gene: Tinciduntolum\_33 Start: 30093, Stop: 32813, Start Num: 25

Candidate Starts for Tinciduntolum\_33:

(Start: 25 @30093 has 31 MA's), (32, 30147), (38, 30186), (44, 30231), (47, 30255), (48, 30258), (52, 30291), (62, 30399), (64, 30420), (65, 30423), (70, 30477), (75, 30537), (77, 30561), (84, 30597), (90, 30645), (93, 30666), (98, 30705), (101, 30744), (104, 30759), (111, 30813), (113, 30825), (115, 30849), (119, 30873), (124, 30885), (127, 30900), (130, 30915), (135, 30957), (137, 30975), (141, 31014), (144, 31038), (162, 31209), (169, 31287), (173, 31347), (176, 31383), (177, 31386), (182, 31464), (184, 31500), (187, 31524), (191, 31545), (205, 31716), (206, 31722), (211, 31833), (213, 31860), (216, 31923), (217, 31929), (218, 31944), (221, 31986), (226, 32073), (227, 32100), (230, 32130), (231, 32148), (232, 32169), (233, 32178), (234, 32184), (235, 32190), (236, 32202), (238, 32307), (241, 32325), (244, 32358), (249, 32445), (251, 32475), (252, 32481), (258, 32541), (264, 32634), (265, 32649), (268, 32691), (273, 32805),

Gene: Tres\_32 Start: 29968, Stop: 32688, Start Num: 25

Candidate Starts for Tres\_32:

(Start: 25 @29968 has 31 MA's), (32, 30022), (38, 30061), (44, 30106), (47, 30130), (48, 30133), (52, 30166), (62, 30274), (64, 30295), (65, 30298), (70, 30352), (75, 30412), (77, 30436), (84, 30472), (90, 30520), (93, 30541), (98, 30580), (101, 30619), (104, 30634), (111, 30688), (115, 30724), (119, 30748), (124, 30760), (127, 30775), (130, 30790), (135, 30832), (137, 30850), (141, 30889), (144, 30913), (162, 31084), (169, 31162), (173, 31222), (176, 31258), (177, 31261), (182, 31339), (184, 31375), (187, 31399), (191, 31420), (205, 31591), (206, 31597), (211, 31708), (213, 31735), (216, 31798), (217, 31804), (218, 31819), (221, 31861), (226, 31948), (227, 31975), (230, 32005), (231, 32023), (232, 32044), (233, 32053), (234, 32059), (235, 32065), (236, 32077), (238, 32182), (241, 32200), (244, 32233), (249, 32320), (251, 32350), (252, 32356), (258, 32416), (264, 32509), (265, 32524), (268, 32566), (273, 32680),

Gene: Tyson\_20 Start: 18997, Stop: 21678, Start Num: 28

Candidate Starts for Tyson\_20:

(Start: 28 @18997 has 19 MA's), (29, 19003), (52, 19180), (55, 19210), (59, 19273), (68, 19348), (80, 19462), (82, 19468), (91, 19534), (99, 19597), (102, 19630), (103, 19633), (107, 19657), (109, 19681), (110, 19687), (111, 19693), (116, 19741), (121, 19762), (126, 19777), (131, 19798), (134, 19837), (136, 19849), (140, 19867), (149, 19942), (154, 19972), (155, 19996), (156, 19999), (160, 20044), (163, 20095), (166, 20113), (170, 20167), (174, 20239), (176, 20251), (178, 20260), (181, 20302), (182, 20332), (184, 20368), (185, 20386), (189, 20401), (190, 20407), (192, 20440), (204, 20569), (205, 20578), (210, 20659), (211, 20695), (212, 20701), (218, 20806), (219, 20815), (220, 20830), (221, 20848), (224, 20890), (229, 20986), (230, 20992), (234, 21046), (235, 21052), (236, 21064), (240, 21175), (242, 21205), (243, 21211), (247, 21241), (249, 21307), (250, 21313), (251, 21337),



(252, 21343), (253, 21349), (257, 21394), (258, 21403), (259, 21412), (262, 21451), (263, 21487),  
(264, 21496), (265, 21511), (269, 21607), (271, 21658), (272, 21664),

Gene: UPIE\_20 Start: 18995, Stop: 21676, Start Num: 28

Candidate Starts for UPIE\_20:

(Start: 28 @18995 has 19 MA's), (29, 19001), (52, 19178), (55, 19208), (59, 19271), (68, 19346), (73, 19400), (80, 19460), (82, 19466), (91, 19532), (99, 19595), (102, 19628), (103, 19631), (107, 19655), (110, 19685), (111, 19691), (116, 19739), (121, 19760), (126, 19775), (131, 19796), (134, 19835), (136, 19847), (140, 19865), (146, 19922), (149, 19940), (154, 19970), (155, 19994), (156, 19997), (160, 20042), (163, 20093), (166, 20111), (170, 20165), (174, 20237), (176, 20249), (178, 20258), (181, 20300), (182, 20330), (184, 20366), (185, 20384), (189, 20399), (190, 20405), (192, 20438), (204, 20567), (205, 20576), (210, 20657), (211, 20693), (212, 20699), (218, 20804), (219, 20813), (220, 20828), (221, 20846), (224, 20888), (229, 20984), (230, 20990), (234, 21044), (235, 21050), (236, 21062), (240, 21173), (242, 21203), (243, 21209), (247, 21239), (249, 21305), (250, 21311), (251, 21335), (252, 21341), (253, 21347), (257, 21392), (258, 21401), (259, 21410), (262, 21449), (263, 21485), (264, 21494), (265, 21509), (269, 21605), (271, 21656), (272, 21662),

Gene: Velveteen\_19 Start: 17226, Stop: 20090, Start Num: 8

Candidate Starts for Velveteen\_19:

(Start: 8 @17226 has 9 MA's), (10, 17247), (13, 17268), (15, 17307), (21, 17376), (22, 17385), (23, 17388), (31, 17439), (45, 17529), (53, 17580), (59, 17664), (61, 17676), (63, 17697), (67, 17730), (83, 17877), (91, 17940), (95, 17979), (99, 18003), (100, 18018), (101, 18027), (106, 18054), (108, 18060), (115, 18129), (118, 18150), (120, 18156), (129, 18192), (132, 18210), (143, 18303), (145, 18324), (149, 18348), (157, 18414), (158, 18435), (161, 18453), (162, 18486), (165, 18513), (169, 18564), (172, 18600), (173, 18624), (176, 18660), (178, 18669), (179, 18684), (181, 18711), (182, 18741), (184, 18777), (187, 18801), (195, 18900), (200, 18939), (203, 18978), (206, 18999), (211, 19110), (213, 19137), (214, 19167), (215, 19188), (216, 19200), (217, 19206), (221, 19263), (230, 19407), (231, 19425), (235, 19467), (236, 19479), (244, 19635), (249, 19722), (251, 19752), (252, 19758), (258, 19818), (260, 19836), (264, 19911), (266, 19932), (268, 19968), (273, 20082),

Gene: Vic9\_33 Start: 30412, Stop: 33132, Start Num: 25

Candidate Starts for Vic9\_33:

(Start: 25 @30412 has 31 MA's), (32, 30466), (38, 30505), (40, 30523), (44, 30550), (47, 30574), (48, 30577), (52, 30610), (62, 30718), (64, 30739), (65, 30742), (70, 30796), (75, 30856), (77, 30880), (84, 30916), (90, 30964), (93, 30985), (98, 31024), (101, 31063), (104, 31078), (111, 31132), (113, 31144), (115, 31168), (119, 31192), (124, 31204), (127, 31219), (130, 31234), (135, 31276), (137, 31294), (141, 31333), (144, 31357), (162, 31528), (169, 31606), (173, 31666), (176, 31702), (177, 31705), (182, 31783), (184, 31819), (187, 31843), (195, 31942), (200, 31981), (205, 32035), (211, 32152), (213, 32179), (216, 32242), (217, 32248), (218, 32263), (221, 32305), (226, 32392), (230, 32449), (231, 32467), (235, 32509), (236, 32521), (238, 32626), (241, 32644), (242, 32662), (244, 32677), (249, 32764), (251, 32794), (252, 32800), (258, 32860), (264, 32953), (265, 32968), (268, 33010), (273, 33124),

Gene: Wamburgxpress\_20 Start: 19010, Stop: 21691, Start Num: 28

Candidate Starts for Wamburgxpress\_20:

(Start: 28 @19010 has 19 MA's), (29, 19016), (52, 19193), (55, 19223), (59, 19286), (68, 19361), (80, 19475), (82, 19481), (91, 19547), (99, 19610), (102, 19643), (103, 19646), (107, 19670), (109, 19694), (110, 19700), (111, 19706), (116, 19754), (121, 19775), (126, 19790), (131, 19811), (134, 19850), (136, 19862), (140, 19880), (149, 19955), (154, 19985), (155, 20009), (156, 20012), (160, 20057), (163, 20108), (166, 20126), (170, 20180), (174, 20252), (176, 20264), (178, 20273), (181, 20315), (182, 20345), (184, 20381), (185, 20399), (189, 20414), (190, 20420), (192, 20453), (204, 20582), (205, 20591), (210, 20672), (211, 20708), (212, 20714), (218, 20819), (219, 20828), (220, 20843), (221, 20861), (224, 20903), (229, 20999), (230, 21005), (234, 21059), (235, 21065), (236, 21077),

(240, 21188), (242, 21218), (243, 21224), (247, 21254), (249, 21320), (250, 21326), (251, 21350), (252, 21356), (253, 21362), (257, 21407), (258, 21416), (259, 21425), (262, 21464), (263, 21500), (264, 21509), (265, 21524), (269, 21620), (271, 21671), (272, 21677),

Gene: West99\_32 Start: 30088, Stop: 32808, Start Num: 25

Candidate Starts for West99\_32:

(Start: 25 @30088 has 31 MA's), (32, 30142), (38, 30181), (44, 30226), (47, 30250), (48, 30253), (52, 30286), (62, 30394), (64, 30415), (65, 30418), (70, 30472), (75, 30532), (77, 30556), (84, 30592), (90, 30640), (93, 30661), (98, 30700), (101, 30739), (104, 30754), (111, 30808), (113, 30820), (115, 30844), (119, 30868), (124, 30880), (127, 30895), (130, 30910), (135, 30952), (137, 30970), (141, 31009), (144, 31033), (162, 31204), (169, 31282), (173, 31342), (176, 31378), (177, 31381), (182, 31459), (184, 31495), (187, 31519), (191, 31540), (205, 31711), (206, 31717), (211, 31828), (213, 31855), (216, 31918), (217, 31924), (218, 31939), (221, 31981), (226, 32068), (227, 32095), (230, 32125), (231, 32143), (232, 32164), (233, 32173), (234, 32179), (235, 32185), (236, 32197), (238, 32302), (241, 32320), (244, 32353), (249, 32440), (251, 32470), (252, 32476), (258, 32536), (264, 32629), (265, 32644), (268, 32686), (273, 32800),

Gene: Wyatt2\_20 Start: 18997, Stop: 21678, Start Num: 28

Candidate Starts for Wyatt2\_20:

(Start: 28 @18997 has 19 MA's), (29, 19003), (52, 19180), (55, 19210), (59, 19273), (68, 19348), (73, 19402), (80, 19462), (82, 19468), (91, 19534), (99, 19597), (102, 19630), (103, 19633), (107, 19657), (110, 19687), (111, 19693), (116, 19741), (121, 19762), (126, 19777), (131, 19798), (134, 19837), (136, 19849), (140, 19867), (146, 19924), (149, 19942), (154, 19972), (155, 19996), (156, 19999), (160, 20044), (163, 20095), (166, 20113), (170, 20167), (174, 20239), (176, 20251), (178, 20260), (181, 20302), (182, 20332), (184, 20368), (185, 20386), (189, 20401), (190, 20407), (192, 20440), (204, 20569), (205, 20578), (210, 20659), (211, 20695), (212, 20701), (218, 20806), (219, 20815), (220, 20830), (221, 20848), (224, 20890), (229, 20986), (230, 20992), (234, 21046), (235, 21052), (236, 21064), (240, 21175), (242, 21205), (243, 21211), (249, 21307), (250, 21313), (251, 21337), (252, 21343), (253, 21349), (257, 21394), (258, 21403), (259, 21412), (262, 21451), (263, 21487), (264, 21496), (265, 21511), (269, 21607), (271, 21658), (272, 21664),

Gene: Xavia\_21 Start: 19042, Stop: 21888, Start Num: 7

Candidate Starts for Xavia\_21:

(Start: 7 @19042 has 2 MA's), (23, 19195), (59, 19468), (61, 19480), (63, 19501), (66, 19525), (74, 19600), (81, 19672), (86, 19702), (91, 19738), (99, 19801), (100, 19816), (106, 19849), (115, 19924), (118, 19948), (120, 19954), (125, 19966), (132, 20008), (133, 20014), (143, 20101), (145, 20122), (149, 20146), (157, 20212), (158, 20233), (161, 20251), (162, 20284), (164, 20308), (165, 20311), (167, 20341), (169, 20362), (173, 20422), (176, 20458), (177, 20461), (178, 20467), (182, 20539), (184, 20575), (185, 20593), (186, 20596), (188, 20605), (191, 20620), (197, 20728), (205, 20791), (209, 20866), (211, 20908), (213, 20935), (216, 20998), (217, 21004), (218, 21019), (221, 21061), (223, 21100), (226, 21148), (227, 21175), (228, 21178), (230, 21205), (231, 21223), (233, 21253), (235, 21265), (236, 21277), (238, 21382), (241, 21400), (244, 21433), (249, 21520), (251, 21550), (252, 21556), (258, 21616), (259, 21625), (260, 21634), (261, 21661), (264, 21709), (265, 21724), (266, 21730), (268, 21766), (273, 21880),

Gene: Zaria\_20 Start: 19011, Stop: 21692, Start Num: 28

Candidate Starts for Zaria\_20:

(Start: 28 @19011 has 19 MA's), (29, 19017), (52, 19194), (55, 19224), (59, 19287), (68, 19362), (73, 19416), (80, 19476), (82, 19482), (91, 19548), (99, 19611), (102, 19644), (103, 19647), (107, 19671), (109, 19695), (110, 19701), (111, 19707), (116, 19755), (121, 19776), (126, 19791), (131, 19812), (134, 19851), (136, 19863), (140, 19881), (149, 19956), (154, 19986), (155, 20010), (156, 20013), (160, 20058), (163, 20109), (166, 20127), (170, 20181), (174, 20253), (176, 20265), (178, 20274), (181, 20316), (182, 20346), (184, 20382), (185, 20400), (189, 20415), (190, 20421), (192, 20454),

(204, 20583), (205, 20592), (210, 20673), (211, 20709), (212, 20715), (218, 20820), (219, 20829),  
(220, 20844), (221, 20862), (224, 20904), (229, 21000), (230, 21006), (234, 21060), (235, 21066),  
(236, 21078), (240, 21189), (242, 21219), (243, 21225), (249, 21321), (250, 21327), (251, 21351),  
(252, 21357), (253, 21363), (257, 21408), (258, 21417), (259, 21426), (262, 21465), (263, 21501),  
(264, 21510), (265, 21525), (269, 21621), (271, 21672), (272, 21678),