





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 292636 Report

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

WARNING: Pham size does not match number of genes in report. Either unphamerated genes have been added (by you) or starterator has removed genes due to invalid start codon.

Pham number 292636 has 117 members, 7 are drafts.

Phages represented in each track:

- Track 1 : Bovely\_18, Esperer\_18, SunsetPointe\_18, Leviticus\_18, Indigo\_18, Nerdos\_18, Ozzie\_18, Caliburn\_18, Unstoppable\_18, Hydra\_20, BeardedLady\_19, Legacy\_18, Phettuccine\_18
- Track 2 : Yasdnil\_18, TuanPN\_18, Ejemplo\_18
- Track 3 : Danzina\_19, Brataylor\_19, Zemlya\_19
- Track 4 : Whatever\_18
- Track 5 : Lannister\_19
- Track 6 : Werner\_18, Snorlax\_18, SarahRose\_18, BarryBee\_20, Asten\_18, Emaanora\_20
- Track 7 : Chucky\_18
- Track 8 : Dattran\_19, Celeste\_18
- Track 9 : OzzyJ\_19
- Track 10 : Oliyinyk\_19, BryanRecycles\_19, Rusticus\_19, Eddasa\_19, Izzy\_19, Jash\_19
- Track 11 : Goby\_18, Sujidade\_19
- Track 12 : Hippo\_18
- Track 13 : Godpower\_19
- Track 14 : Nabi\_18
- Track 15 : RedBear\_20, Katalie\_19, South40\_19
- Track 16 : TagePhighter\_19
- Track 17 : Lorelei\_18, Rana\_18
- Track 18 : Nanodon\_20
- Track 19 : Aaronocolus\_18
- Track 20 : EnochSoames\_20
- Track 21 : Lika\_18
- Track 22 : Dwayne\_18
- Track 23 : Toma\_18
- Track 24 : Maneekul\_18
- Track 25 : Triste\_18
- Track 26 : TrvxScott\_17
- Track 27 : Amethyst\_18
- Track 28 : Janus\_19
- Track 29 : Hank144\_19

- Track 30 : GirlDinner\_18
- Track 31 : Puginator\_20
- Track 32 : Paolo\_20
- Track 33 : Omar\_19
- Track 34 : Superstar\_21
- Track 35 : Daudau\_18
- Track 36 : Caelum\_19
- Track 37 : Animus\_19
- Track 38 : Axiom\_19
- Track 39 : ELB20\_17, R4\_18
- Track 40 : Marav\_21
- Track 41 : Alvy\_20, BartholomewSD\_20
- Track 42 : Zainub\_20
- Track 43 : Paedore\_18
- Track 44 : Jevington\_20
- Track 45 : Haizum\_18, Tefunt\_18
- Track 46 : Triumph\_20
- Track 47 : Issmi\_19
- Track 48 : Thestral\_19
- Track 49 : Bowden\_19, TinaBelcher\_18
- Track 50 : Nishikigoi\_18
- Track 51 : Pablito\_18
- Track 52 : Diane\_18
- Track 53 : Andris\_18
- Track 54 : Loofah\_19
- Track 55 : SqueakyClean\_19
- Track 56 : Vanseggelen\_23
- Track 57 : Pavo\_19
- Track 58 : Conan\_19
- Track 59 : Verse\_18
- Track 60 : Celery\_21
- Track 61 : Yosif\_19
- Track 62 : ElGato\_19
- Track 63 : Verabelle\_19
- Track 64 : Provolone\_19
- Track 65 : Alsaber\_19, Sudan\_18, Kaine\_18
- Track 66 : phiCAM\_19
- Track 67 : Speedwell\_23
- Track 68 : Jhitchelle\_17
- Track 69 : Saftant\_18
- Track 70 : ZamZam\_18
- Track 71 : SunkenRoot\_20
- Track 72 : Dexers\_17
- Track 73 : Amela\_18
- Track 74 : BroPlease\_19, GreenWeasel\_20
- Track 75 : phiHau3\_20
- Track 76 : VieEnRose\_18
- Track 77 : Itza\_18, Celia\_18, Urza\_18

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

The start number called the most often in the published annotations is 12, it was called in 61 of the 110 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Aaronocolus\_18, Alsaber\_19, Amela\_18, Asten\_18, BarryBee\_20, BeardedLady\_19, Bovely\_18, Brataylor\_19, BryanRecycles\_19, Caliburn\_18, Celery\_21, Chucky\_18, Conan\_19, Danzina\_19, Dexers\_17, Dwayne\_18, Eddasa\_19, Ejemplo\_18, ElGato\_19, Emaanora\_20, EnochSoames\_20, Esperer\_18, Goby\_18, Godpower\_19, Hippo\_18, Hydra\_20, Indigo\_18, Izzy\_19, Jash\_19, Jhitchelle\_17, Kaine\_18, Katalie\_19, Lannister\_19, Legacy\_18, Leviticus\_18, Lika\_18, Maneekul\_18, Nabi\_18, Nanodon\_20, Nerdos\_18, Oliynyk\_19, Ozzie\_18, OzzyJ\_19, Pavo\_19, Phettuccine\_18, RedBear\_20, Rusticus\_19, SarahRose\_18, Snorlax\_18, South40\_19, Sudan\_18, Sujidade\_19, SunkenRoot\_20, SunsetPointe\_18, TagePhighter\_19, Toma\_18, Triste\_18, TuanPN\_18, Unstoppable\_18, Vanseggelen\_23, Verabelle\_19, Verse\_18, Werner\_18, Whatever\_18, Yasdnii\_18, Zemlya\_19,

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

- Celeste\_18, Dattran\_19, Lorelei\_18, Provolone\_19, Rana\_18, phiCAM\_19,

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

- Alvy\_20, Amethyst\_18, Andris\_18, Animus\_19, Axiom\_19, BartholomewSD\_20, Bowden\_19, BroPlease\_19, Caelum\_19, Celia\_18, Daudau\_18, Diane\_18, ELB20\_17, GirlDinner\_18, GreenWeasel\_20, Haizum\_18, Hank144\_19, Issmi\_19, Itza\_18, Janus\_19, Jevington\_20, Loofah\_19, Marav\_21, Nishikigoi\_18, Omar\_19, Pablito\_18, Paedore\_18, Paolo\_20, Puginator\_20, R4\_18, Saftant\_18, Speedwell\_23, SqueakyClean\_19, Superstar\_21, Tefunt\_18, Thestral\_19, TinaBelcher\_18, Triumph\_20, TrvxScott\_17, Urza\_18, VieEnRose\_18, Yosif\_19, Zainub\_20, ZamZam\_18, phiHau3\_20,

### Summary by start number:

Start 1:

- Found in 3 of 117 ( 2.6% ) of genes in pham
- Manual Annotations of this start: 3 of 110
- Called 100.0% of time when present
- Phage (with cluster) where this start called: BroPlease\_19 (BD4), GreenWeasel\_20 (BD4), phiHau3\_20 (BD4),

Start 3:

- Found in 3 of 117 ( 2.6% ) of genes in pham
- Manual Annotations of this start: 3 of 110
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Saftant\_18 (BD3), Speedwell\_23 (BD3), ZamZam\_18 (BD3),

Start 12:

- Found in 72 of 117 ( 61.5% ) of genes in pham
- Manual Annotations of this start: 61 of 110
- Called 91.7% of time when present
- Phage (with cluster) where this start called: Aaronocolus\_18 (BD1), Alsaber\_19 (BD3), Amela\_18 (BD3), Asten\_18 (BD1), BarryBee\_20 (BD1), BeardedLady\_19

(BD1), Bovely\_18 (BD1), Brataylor\_19 (BD1), BryanRecycles\_19 (BD1), Caliburn\_18 (BD1), Celery\_21 (BD3), Chucky\_18 (BD1), Conan\_19 (BD3), Danzina\_19 (BD1), Dexters\_17 (BD3), Dwayne\_18 (BD1), Eddasa\_19 (BD1), Ejemplo\_18 (BD1), ElGato\_19 (BD3), Emaanora\_20 (BD1), EnochSoames\_20 (BD1), Esperer\_18 (BD1), Goby\_18 (BD1), Godpower\_19 (BD1), Hippo\_18 (BD1), Hydra\_20 (BD1), Indigo\_18 (BD1), Izzy\_19 (BD1), Jash\_19 (BD1), Jhitchelle\_17 (BD3), Kaine\_18 (BD3), Katalie\_19 (BD1), Lannister\_19 (BD1), Legacy\_18 (BD1), Leviticus\_18 (BD1), Lika\_18 (BD1), Maneekul\_18 (BD1), Nabi\_18 (BD1), Nanodon\_20 (BD1), Nerdos\_18 (BD1), Oliynyk\_19 (BD1), Ozzie\_18 (BD1), OzzyJ\_19 (BD1), Pavo\_19 (BD3), Phettuccine\_18 (BD1), RedBear\_20 (BD1), Rusticus\_19 (BD1), SarahRose\_18 (BD1), Snorlax\_18 (BD1), South40\_19 (BD1), Sudan\_18 (BD3), Sujidade\_19 (BD1), SunkenRoot\_20 (BD3), SunsetPointe\_18 (BD1), TagePhighter\_19 (BD1), Toma\_18 (BD1), Triste\_18 (BD1), TuanPN\_18 (BD1), Unstoppable\_18 (BD1), Vanseggelen\_23 (BD3), Verabelle\_19 (BD3), Verse\_18 (BD3), Werner\_18 (BD1), Whatever\_18 (BD1), Yasdnil\_18 (BD1), Zemlya\_19 (BD1),

#### Start 14:

- Found in 5 of 117 ( 4.3% ) of genes in pham
- Manual Annotations of this start: 5 of 110
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Celia\_18 (BD6), Itza\_18 (BD6), Urza\_18 (BD6), VieEnRose\_18 (BD6), Yosif\_19 (BD3),

#### Start 15:

- Found in 34 of 117 ( 29.1% ) of genes in pham
- Manual Annotations of this start: 29 of 110
- Called 88.2% of time when present
- Phage (with cluster) where this start called: Alvy\_20 (BD2), Amethyst\_18 (BD2), Andris\_18 (BD2), Axiom\_19 (BD2), BartholomewSD\_20 (BD2), Caelum\_19 (BD2), Daudau\_18 (BD2), Diane\_18 (BD2), ELB20\_17 (BD2), GirlDinner\_18 (BD2), Haizum\_18 (BD2), Hank144\_19 (BD2), Issmi\_19 (BD2), Janus\_19 (BD2), Jevington\_20 (BD2), Loofah\_19 (BD2), Marav\_21 (BD2), Nishikigoi\_18 (BD2), Omar\_19 (BD2), Pablito\_18 (BD2), Paolo\_20 (BD2), Puginator\_20 (BD2), R4\_18 (BD2), SqueakyClean\_19 (BD2), Superstar\_21 (BD2), Tefunt\_18 (BD2), Thestral\_19 (BD2), Triumph\_20 (BD2), TrvxScott\_17 (BD2), Zainub\_20 (BD2),

#### Start 17:

- Found in 24 of 117 ( 20.5% ) of genes in pham
- Manual Annotations of this start: 1 of 110
- Called 4.2% of time when present
- Phage (with cluster) where this start called: Provolone\_19 (BD3),

#### Start 19:

- Found in 15 of 117 ( 12.8% ) of genes in pham
- Manual Annotations of this start: 4 of 110
- Called 26.7% of time when present
- Phage (with cluster) where this start called: Celeste\_18 (BD1), Dattran\_19 (BD1), Lorelei\_18 (BD1), Rana\_18 (BD1),

#### Start 20:

- Found in 23 of 117 ( 19.7% ) of genes in pham
- Manual Annotations of this start: 3 of 110
- Called 13.0% of time when present

- Phage (with cluster) where this start called: Animus\_19 (BD2), Bowden\_19 (BD2), TinaBelcher\_18 (BD2),

Start 26:

- Found in 4 of 117 ( 3.4% ) of genes in pham
- Manual Annotations of this start: 1 of 110
- Called 25.0% of time when present
- Phage (with cluster) where this start called: Paedore\_18 (BD2),

Start 30:

- Found in 114 of 117 ( 97.4% ) of genes in pham
- No Manual Annotations of this start.
- Called 0.9% of time when present
- Phage (with cluster) where this start called: phiCAM\_19 (BD3),

### **Summary by clusters:**

There are 5 clusters represented in this pham: BD4, BD6, BD1, BD3, BD2,

Info for manual annotations of cluster BD1:

- Start number 12 was manually annotated 51 times for cluster BD1.
- Start number 19 was manually annotated 4 times for cluster BD1.

Info for manual annotations of cluster BD2:

- Start number 15 was manually annotated 29 times for cluster BD2.
- Start number 20 was manually annotated 3 times for cluster BD2.
- Start number 26 was manually annotated 1 time for cluster BD2.

Info for manual annotations of cluster BD3:

- Start number 3 was manually annotated 3 times for cluster BD3.
- Start number 12 was manually annotated 10 times for cluster BD3.
- Start number 14 was manually annotated 1 time for cluster BD3.
- Start number 17 was manually annotated 1 time for cluster BD3.

Info for manual annotations of cluster BD4:

- Start number 1 was manually annotated 3 times for cluster BD4.

Info for manual annotations of cluster BD6:

- Start number 14 was manually annotated 4 times for cluster BD6.

### **Gene Information:**

Gene: Aaronocolus\_18 Start: 11669, Stop: 14989, Start Num: 12

Candidate Starts for Aaronocolus\_18:

(Start: 12 @11669 has 61 MA's), (30, 11813), (41, 11924), (44, 11936), (49, 12005), (51, 12011), (56, 12032), (69, 12167), (77, 12230), (81, 12266), (82, 12269), (98, 12434), (104, 12473), (110, 12530), (121, 12734), (135, 13037), (136, 13070), (142, 13133), (145, 13166), (151, 13244), (155, 13280), (156, 13283), (158, 13301), (160, 13325), (162, 13346), (165, 13379), (170, 13397), (175, 13433), (185, 13487), (191, 13526), (196, 13550), (206, 13616), (216, 13652), (227, 13724), (241, 13748), (242, 13754), (246, 13778), (248, 13799), (260, 13889), (263, 13901), (264, 13913), (269, 13949), (275, 13988), (281, 14021), (298, 14192), (302, 14231), (315, 14333), (317, 14354), (322, 14366),

(345, 14543), (349, 14594), (350, 14606), (360, 14780), (369, 14849), (372, 14888), (377, 14975), (379, 14978),

Gene: Alsaber\_19 Start: 11562, Stop: 15674, Start Num: 12

Candidate Starts for Alsaber\_19:

(Start: 12 @11562 has 61 MA's), (Start: 17 @11586 has 1 MA's), (30, 11706), (32, 11739), (41, 11817), (42, 11820), (69, 12060), (71, 12081), (77, 12123), (81, 12159), (83, 12171), (96, 12297), (109, 12393), (110, 12423), (112, 12444), (116, 12516), (120, 12615), (121, 12624), (135, 12930), (137, 12966), (142, 13026), (151, 13137), (155, 13173), (158, 13194), (162, 13239), (165, 13272), (170, 13290), (174, 13323), (196, 13443), (197, 13446), (207, 13512), (209, 13521), (224, 13605), (226, 13614), (228, 13629), (238, 13704), (243, 13740), (248, 13779), (264, 13893), (266, 13905), (267, 13911), (271, 13950), (277, 13977), (286, 14031), (290, 14085), (303, 14214), (307, 14259), (322, 14346), (347, 14544), (349, 14574), (351, 14616), (361, 14775), (363, 14787), (371, 14850), (378, 14964), (383, 15003), (385, 15075), (386, 15114), (387, 15156), (391, 15231), (392, 15252), (394, 15309), (395, 15330), (398, 15378), (399, 15381), (400, 15396), (403, 15459), (404, 15468), (407, 15510), (415, 15660), (416, 15663),

Gene: Alvy\_20 Start: 11699, Stop: 14998, Start Num: 15

Candidate Starts for Alvy\_20:

(Start: 15 @11699 has 29 MA's), (30, 11834), (31, 11855), (36, 11897), (59, 12074), (77, 12245), (81, 12281), (96, 12419), (104, 12488), (112, 12566), (121, 12749), (135, 13052), (142, 13148), (145, 13181), (150, 13253), (151, 13259), (160, 13340), (161, 13358), (162, 13361), (165, 13394), (170, 13412), (200, 13586), (211, 13649), (213, 13655), (240, 13760), (248, 13814), (250, 13826), (255, 13871), (264, 13928), (275, 14003), (287, 14075), (334, 14468), (339, 14492), (349, 14609), (350, 14621), (353, 14690), (354, 14699), (357, 14762), (365, 14840), (366, 14852), (369, 14864),

Gene: Amela\_18 Start: 11854, Stop: 15966, Start Num: 12

Candidate Starts for Amela\_18:

(Start: 12 @11854 has 61 MA's), (Start: 17 @11878 has 1 MA's), (30, 11998), (32, 12031), (36, 12061), (41, 12109), (42, 12112), (65, 12328), (73, 12388), (83, 12463), (88, 12526), (96, 12589), (105, 12664), (112, 12736), (120, 12907), (121, 12916), (135, 13222), (137, 13258), (142, 13318), (145, 13351), (151, 13429), (155, 13465), (158, 13486), (159, 13504), (162, 13531), (165, 13564), (170, 13582), (174, 13615), (185, 13672), (192, 13717), (196, 13735), (207, 13804), (226, 13906), (230, 13933), (238, 13996), (248, 14071), (258, 14149), (264, 14185), (266, 14197), (267, 14203), (271, 14242), (275, 14260), (290, 14377), (300, 14476), (301, 14482), (302, 14503), (303, 14506), (322, 14638), (332, 14716), (349, 14866), (351, 14908), (378, 15256), (383, 15295), (385, 15367), (386, 15406), (391, 15523), (392, 15544), (394, 15601), (395, 15622), (398, 15670), (399, 15673), (403, 15751), (404, 15760), (407, 15802), (415, 15952), (416, 15955),

Gene: Amethyst\_18 Start: 11541, Stop: 15449, Start Num: 15

Candidate Starts for Amethyst\_18:

(Start: 15 @11541 has 29 MA's), (30, 11676), (41, 11787), (47, 11850), (59, 11919), (76, 12081), (77, 12090), (81, 12126), (90, 12213), (119, 12582), (121, 12591), (142, 12990), (145, 13023), (155, 13137), (162, 13203), (165, 13236), (170, 13254), (173, 13278), (182, 13329), (206, 13428), (207, 13431), (208, 13437), (224, 13482), (248, 13569), (255, 13626), (264, 13683), (275, 13758), (287, 13830), (317, 14124), (334, 14223), (341, 14256), (349, 14364), (355, 14469), (378, 14754), (386, 14904), (387, 14946), (391, 15021), (392, 15042), (394, 15099), (395, 15120), (396, 15123),

Gene: Andris\_18 Start: 11508, Stop: 14702, Start Num: 15

Candidate Starts for Andris\_18:

(Start: 15 @11508 has 29 MA's), (Start: 20 @11547 has 3 MA's), (30, 11643), (41, 11754), (54, 11850), (59, 11886), (76, 12048), (77, 12057), (80, 12087), (81, 12093), (86, 12150), (96, 12231), (110, 12357), (115, 12447), (121, 12561), (134, 12795), (135, 12864), (138, 12927), (142, 12960), (145, 12993),

(158, 13128), (160, 13152), (162, 13173), (165, 13206), (170, 13224), (178, 13281), (179, 13284), (205, 13371), (234, 13476), (235, 13479), (246, 13518), (264, 13653), (272, 13713), (283, 13749), (284, 13758), (285, 13764), (306, 13995), (338, 14193), (341, 14205), (349, 14313), (353, 14394), (370, 14580), (377, 14691),

Gene: Animus\_19 Start: 11880, Stop: 15038, Start Num: 20

Candidate Starts for Animus\_19:

(Start: 15 @11841 has 29 MA's), (Start: 20 @11880 has 3 MA's), (30, 11979), (31, 12000), (40, 12072), (41, 12090), (59, 12222), (60, 12234), (76, 12384), (80, 12423), (81, 12429), (82, 12432), (86, 12486), (102, 12621), (110, 12693), (121, 12897), (129, 13005), (135, 13200), (142, 13296), (145, 13329), (151, 13407), (155, 13443), (158, 13464), (160, 13488), (162, 13509), (163, 13512), (165, 13542), (170, 13560), (176, 13599), (179, 13620), (180, 13626), (183, 13638), (205, 13707), (220, 13770), (233, 13803), (235, 13815), (264, 13989), (272, 14049), (284, 14094), (285, 14100), (304, 14298), (325, 14430), (337, 14520), (341, 14541), (349, 14649), (365, 14880), (370, 14916),

Gene: Asten\_18 Start: 11636, Stop: 14959, Start Num: 12

Candidate Starts for Asten\_18:

(Start: 12 @11636 has 61 MA's), (30, 11783), (41, 11894), (44, 11906), (45, 11918), (54, 11993), (59, 12029), (71, 12158), (77, 12200), (80, 12230), (81, 12236), (86, 12293), (112, 12521), (114, 12581), (121, 12704), (135, 13007), (142, 13103), (145, 13136), (156, 13253), (158, 13271), (162, 13316), (165, 13349), (170, 13367), (182, 13442), (196, 13520), (200, 13541), (211, 13604), (216, 13622), (248, 13769), (258, 13847), (263, 13871), (264, 13883), (266, 13895), (267, 13901), (271, 13940), (275, 13958), (302, 14201), (315, 14303), (325, 14345), (345, 14513), (349, 14564), (350, 14576), (360, 14750), (369, 14819), (377, 14945), (379, 14948),

Gene: Axiom\_19 Start: 11546, Stop: 14851, Start Num: 15

Candidate Starts for Axiom\_19:

(Start: 15 @11546 has 29 MA's), (Start: 20 @11585 has 3 MA's), (30, 11684), (31, 11705), (40, 11777), (41, 11795), (59, 11927), (76, 12089), (80, 12128), (81, 12134), (82, 12137), (86, 12191), (121, 12602), (135, 12905), (138, 12968), (142, 13001), (145, 13034), (158, 13169), (162, 13214), (163, 13217), (165, 13247), (170, 13265), (175, 13301), (196, 13418), (199, 13430), (206, 13484), (216, 13520), (246, 13646), (248, 13667), (258, 13745), (263, 13769), (264, 13781), (271, 13838), (280, 13886), (287, 13928), (293, 14018), (322, 14234), (345, 14411), (349, 14462), (350, 14474), (357, 14615), (360, 14648), (365, 14693), (370, 14729),

Gene: BarryBee\_20 Start: 11646, Stop: 14969, Start Num: 12

Candidate Starts for BarryBee\_20:

(Start: 12 @11646 has 61 MA's), (30, 11793), (41, 11904), (44, 11916), (45, 11928), (54, 12003), (59, 12039), (71, 12168), (77, 12210), (80, 12240), (81, 12246), (86, 12303), (112, 12531), (114, 12591), (121, 12714), (135, 13017), (142, 13113), (145, 13146), (156, 13263), (158, 13281), (162, 13326), (165, 13359), (170, 13377), (182, 13452), (196, 13530), (200, 13551), (211, 13614), (216, 13632), (248, 13779), (258, 13857), (263, 13881), (264, 13893), (266, 13905), (267, 13911), (271, 13950), (275, 13968), (302, 14211), (315, 14313), (325, 14355), (345, 14523), (349, 14574), (350, 14586), (360, 14760), (369, 14829), (377, 14955), (379, 14958),

Gene: BartholomewSD\_20 Start: 11699, Stop: 14998, Start Num: 15

Candidate Starts for BartholomewSD\_20:

(Start: 15 @11699 has 29 MA's), (30, 11834), (31, 11855), (36, 11897), (59, 12074), (77, 12245), (81, 12281), (96, 12419), (104, 12488), (112, 12566), (121, 12749), (135, 13052), (142, 13148), (145, 13181), (150, 13253), (151, 13259), (160, 13340), (161, 13358), (162, 13361), (165, 13394), (170, 13412), (200, 13586), (211, 13649), (213, 13655), (240, 13760), (248, 13814), (250, 13826), (255, 13871), (264, 13928), (275, 14003), (287, 14075), (334, 14468), (339, 14492), (349, 14609), (350, 14621), (353, 14690), (354, 14699), (357, 14762), (365, 14840), (366, 14852), (369, 14864),

Gene: BeardedLady\_19 Start: 11916, Stop: 15236, Start Num: 12

Candidate Starts for BeardedLady\_19:

(Start: 12 @11916 has 61 MA's), (30, 12060), (41, 12171), (44, 12183), (49, 12252), (51, 12258), (56, 12279), (69, 12414), (77, 12477), (81, 12513), (82, 12516), (98, 12681), (104, 12720), (110, 12777), (121, 12981), (135, 13284), (136, 13317), (142, 13380), (145, 13413), (151, 13491), (155, 13527), (156, 13530), (158, 13548), (160, 13572), (162, 13593), (165, 13626), (170, 13644), (175, 13680), (185, 13734), (191, 13773), (196, 13797), (206, 13863), (216, 13899), (227, 13971), (241, 13995), (242, 14001), (246, 14025), (248, 14046), (263, 14148), (264, 14160), (269, 14196), (275, 14235), (281, 14268), (298, 14439), (302, 14478), (315, 14580), (317, 14601), (322, 14613), (345, 14790), (349, 14841), (350, 14853), (360, 15027), (369, 15096), (372, 15135), (377, 15222), (379, 15225),

Gene: Bovely\_18 Start: 11675, Stop: 14995, Start Num: 12

Candidate Starts for Bovely\_18:

(Start: 12 @11675 has 61 MA's), (30, 11819), (41, 11930), (44, 11942), (49, 12011), (51, 12017), (56, 12038), (69, 12173), (77, 12236), (81, 12272), (82, 12275), (98, 12440), (104, 12479), (110, 12536), (121, 12740), (135, 13043), (136, 13076), (142, 13139), (145, 13172), (151, 13250), (155, 13286), (156, 13289), (158, 13307), (160, 13331), (162, 13352), (165, 13385), (170, 13403), (175, 13439), (185, 13493), (191, 13532), (196, 13556), (206, 13622), (216, 13658), (227, 13730), (241, 13754), (242, 13760), (246, 13784), (248, 13805), (263, 13907), (264, 13919), (269, 13955), (275, 13994), (281, 14027), (298, 14198), (302, 14237), (315, 14339), (317, 14360), (322, 14372), (345, 14549), (349, 14600), (350, 14612), (360, 14786), (369, 14855), (372, 14894), (377, 14981), (379, 14984),

Gene: Bowden\_19 Start: 11670, Stop: 14930, Start Num: 20

Candidate Starts for Bowden\_19:

(Start: 15 @11631 has 29 MA's), (Start: 20 @11670 has 3 MA's), (30, 11766), (31, 11787), (36, 11829), (39, 11844), (59, 12006), (77, 12177), (81, 12213), (106, 12432), (108, 12438), (112, 12498), (121, 12681), (135, 12984), (142, 13080), (145, 13113), (150, 13185), (151, 13191), (157, 13239), (160, 13272), (161, 13290), (162, 13293), (165, 13326), (170, 13344), (191, 13473), (200, 13518), (211, 13581), (213, 13587), (248, 13746), (250, 13758), (264, 13860), (270, 13914), (275, 13935), (287, 14007), (314, 14274), (334, 14400), (339, 14424), (349, 14541), (350, 14553), (353, 14622), (354, 14631), (357, 14694), (365, 14772), (366, 14784), (369, 14796),

Gene: Brataylor\_19 Start: 11658, Stop: 14981, Start Num: 12

Candidate Starts for Brataylor\_19:

(Start: 12 @11658 has 61 MA's), (Start: 19 @11694 has 4 MA's), (30, 11805), (41, 11916), (44, 11928), (45, 11940), (54, 12015), (59, 12051), (71, 12180), (77, 12222), (80, 12252), (81, 12258), (83, 12270), (86, 12315), (108, 12483), (112, 12543), (120, 12717), (121, 12726), (135, 13029), (137, 13065), (141, 13101), (142, 13125), (145, 13158), (156, 13275), (158, 13293), (162, 13338), (165, 13371), (170, 13389), (182, 13464), (196, 13542), (200, 13563), (203, 13584), (211, 13626), (216, 13644), (248, 13791), (258, 13869), (263, 13893), (264, 13905), (266, 13917), (267, 13923), (271, 13962), (275, 13980), (302, 14223), (315, 14325), (349, 14586), (350, 14598), (354, 14676), (356, 14694), (360, 14772), (369, 14841), (377, 14967), (379, 14970),

Gene: BroPlease\_19 Start: 11860, Stop: 15681, Start Num: 1

Candidate Starts for BroPlease\_19:

(Start: 1 @11860 has 3 MA's), (8, 12196), (10, 12241), (11, 12334), (16, 12358), (Start: 17 @12367 has 1 MA's), (30, 12493), (38, 12577), (43, 12616), (52, 12703), (59, 12760), (66, 12853), (68, 12862), (71, 12889), (74, 12907), (78, 12940), (81, 12967), (86, 13024), (87, 13033), (105, 13180), (106, 13186), (107, 13189), (118, 13408), (119, 13423), (121, 13435), (126, 13516), (133, 13654), (135, 13738), (142, 13834), (143, 13843), (154, 13978), (155, 13981), (157, 13993), (165, 14080), (166, 14083), (168, 14089), (197, 14254), (201, 14281), (235, 14440), (241, 14449), (248, 14500), (249, 14503), (252, 14524), (257, 14572), (262, 14599), (264, 14614), (265, 14620), (275, 14689), (284,

14740), (319, 15058), (329, 15112), (331, 15142), (349, 15295), (353, 15376), (356, 15403), (377, 15670),

Gene: BryanRecycles\_19 Start: 11832, Stop: 15152, Start Num: 12

Candidate Starts for BryanRecycles\_19:

(Start: 12 @11832 has 61 MA's), (30, 11976), (41, 12087), (44, 12099), (49, 12168), (51, 12174), (56, 12195), (69, 12330), (77, 12393), (81, 12429), (82, 12432), (98, 12597), (104, 12636), (110, 12693), (120, 12888), (121, 12897), (135, 13200), (136, 13233), (142, 13296), (145, 13329), (151, 13407), (158, 13464), (160, 13488), (162, 13509), (165, 13542), (170, 13560), (175, 13596), (185, 13650), (191, 13689), (196, 13713), (206, 13779), (216, 13815), (227, 13887), (241, 13911), (242, 13917), (246, 13941), (248, 13962), (263, 14064), (264, 14076), (269, 14112), (275, 14151), (281, 14184), (298, 14355), (302, 14394), (303, 14397), (315, 14496), (317, 14517), (322, 14529), (349, 14757), (350, 14769), (360, 14943), (369, 15012), (372, 15051), (377, 15138), (379, 15141),

Gene: Caelum\_19 Start: 11485, Stop: 15480, Start Num: 15

Candidate Starts for Caelum\_19:

(Start: 15 @11485 has 29 MA's), (28, 11611), (30, 11620), (31, 11641), (39, 11698), (41, 11731), (59, 11863), (76, 12025), (81, 12070), (93, 12175), (109, 12304), (113, 12412), (121, 12535), (142, 12934), (155, 13081), (158, 13102), (160, 13126), (162, 13147), (165, 13180), (170, 13198), (173, 13222), (193, 13339), (215, 13450), (216, 13453), (219, 13474), (240, 13546), (248, 13600), (255, 13657), (264, 13714), (266, 13726), (267, 13732), (275, 13789), (287, 13861), (293, 13951), (339, 14278), (345, 14344), (349, 14395), (355, 14500), (357, 14548), (363, 14608), (374, 14719), (378, 14785), (384, 14857), (385, 14896), (386, 14935), (389, 14995), (390, 15049), (391, 15052), (392, 15073), (393, 15085), (394, 15130), (395, 15151), (398, 15199), (401, 15247), (415, 15469),

Gene: Caliburn\_18 Start: 11649, Stop: 14969, Start Num: 12

Candidate Starts for Caliburn\_18:

(Start: 12 @11649 has 61 MA's), (30, 11793), (41, 11904), (44, 11916), (49, 11985), (51, 11991), (56, 12012), (69, 12147), (77, 12210), (81, 12246), (82, 12249), (98, 12414), (104, 12453), (110, 12510), (121, 12714), (135, 13017), (136, 13050), (142, 13113), (145, 13146), (151, 13224), (155, 13260), (156, 13263), (158, 13281), (160, 13305), (162, 13326), (165, 13359), (170, 13377), (175, 13413), (185, 13467), (191, 13506), (196, 13530), (206, 13596), (216, 13632), (227, 13704), (241, 13728), (242, 13734), (246, 13758), (248, 13779), (263, 13881), (264, 13893), (269, 13929), (275, 13968), (281, 14001), (298, 14172), (302, 14211), (315, 14313), (317, 14334), (322, 14346), (345, 14523), (349, 14574), (350, 14586), (360, 14760), (369, 14829), (372, 14868), (377, 14955), (379, 14958),

Gene: Celery\_21 Start: 11512, Stop: 15627, Start Num: 12

Candidate Starts for Celery\_21:

(9, 11401), (Start: 12 @11512 has 61 MA's), (Start: 17 @11536 has 1 MA's), (30, 11656), (32, 11689), (36, 11719), (41, 11767), (42, 11770), (71, 12031), (81, 12109), (82, 12112), (83, 12121), (88, 12184), (93, 12214), (95, 12238), (96, 12247), (101, 12298), (105, 12322), (112, 12394), (120, 12565), (121, 12574), (135, 12880), (138, 12943), (142, 12976), (147, 13051), (151, 13087), (155, 13123), (162, 13189), (165, 13222), (170, 13240), (174, 13273), (182, 13315), (185, 13330), (190, 13363), (191, 13369), (195, 13387), (198, 13402), (207, 13462), (209, 13471), (212, 13480), (218, 13510), (226, 13564), (228, 13579), (238, 13654), (248, 13729), (263, 13831), (264, 13843), (266, 13855), (267, 13861), (271, 13900), (275, 13918), (290, 14035), (302, 14161), (307, 14209), (321, 14293), (322, 14296), (349, 14524), (351, 14566), (378, 14914), (383, 14953), (385, 15025), (386, 15064), (387, 15106), (390, 15178), (391, 15181), (392, 15202), (394, 15259), (395, 15280), (398, 15328), (399, 15331), (400, 15346), (403, 15409), (404, 15418), (407, 15460), (415, 15613), (416, 15616),

Gene: Celeste\_18 Start: 11686, Stop: 14973, Start Num: 19

Candidate Starts for Celeste\_18:

(Start: 12 @11650 has 61 MA's), (Start: 19 @11686 has 4 MA's), (30, 11797), (41, 11908), (44, 11920), (45, 11932), (54, 12007), (59, 12043), (71, 12172), (77, 12214), (80, 12244), (81, 12250), (83, 12262), (86, 12307), (112, 12535), (121, 12718), (137, 13057), (142, 13117), (145, 13150), (156, 13267), (158, 13285), (162, 13330), (165, 13363), (170, 13381), (182, 13456), (196, 13534), (200, 13555), (203, 13576), (211, 13618), (216, 13636), (248, 13783), (258, 13861), (263, 13885), (264, 13897), (266, 13909), (267, 13915), (271, 13954), (275, 13972), (302, 14215), (315, 14317), (349, 14578), (350, 14590), (354, 14668), (356, 14686), (360, 14764), (369, 14833), (377, 14959), (379, 14962),

Gene: Celia\_18 Start: 12007, Stop: 15408, Start Num: 14

Candidate Starts for Celia\_18:

(Start: 14 @12007 has 5 MA's), (Start: 17 @12022 has 1 MA's), (30, 12142), (40, 12235), (41, 12253), (45, 12277), (61, 12433), (83, 12610), (86, 12655), (96, 12736), (103, 12799), (106, 12817), (113, 12940), (121, 13063), (124, 13135), (127, 13147), (132, 13276), (135, 13369), (141, 13441), (142, 13465), (147, 13540), (157, 13624), (162, 13678), (165, 13711), (167, 13717), (171, 13738), (172, 13750), (179, 13789), (183, 13807), (213, 13972), (223, 14041), (227, 14056), (229, 14071), (233, 14092), (239, 14146), (246, 14197), (248, 14218), (264, 14332), (275, 14407), (277, 14416), (292, 14530), (302, 14650), (320, 14782), (322, 14785), (330, 14836), (340, 14902), (341, 14905), (349, 15013), (353, 15094), (356, 15121), (364, 15238), (373, 15310), (380, 15397),

Gene: Chucky\_18 Start: 11647, Stop: 14970, Start Num: 12

Candidate Starts for Chucky\_18:

(Start: 12 @11647 has 61 MA's), (30, 11794), (41, 11905), (44, 11917), (45, 11929), (54, 12004), (59, 12040), (71, 12169), (77, 12211), (80, 12241), (81, 12247), (86, 12304), (112, 12532), (114, 12592), (121, 12715), (135, 13018), (142, 13114), (145, 13147), (156, 13264), (158, 13282), (162, 13327), (165, 13360), (170, 13378), (182, 13453), (196, 13531), (200, 13552), (211, 13615), (216, 13633), (248, 13780), (258, 13858), (263, 13882), (264, 13894), (266, 13906), (267, 13912), (271, 13951), (275, 13969), (302, 14212), (315, 14314), (325, 14356), (345, 14524), (349, 14575), (350, 14587), (369, 14830), (377, 14956), (379, 14959),

Gene: Conan\_19 Start: 11284, Stop: 15396, Start Num: 12

Candidate Starts for Conan\_19:

(Start: 12 @11284 has 61 MA's), (Start: 17 @11308 has 1 MA's), (30, 11428), (32, 11461), (36, 11491), (41, 11539), (71, 11803), (77, 11845), (83, 11893), (96, 12019), (109, 12115), (110, 12145), (112, 12166), (113, 12223), (116, 12238), (120, 12337), (121, 12346), (135, 12652), (137, 12688), (142, 12748), (152, 12868), (155, 12895), (156, 12898), (160, 12940), (162, 12961), (191, 13141), (207, 13234), (209, 13243), (216, 13267), (222, 13321), (224, 13327), (226, 13336), (228, 13351), (231, 13366), (234, 13384), (238, 13426), (248, 13501), (264, 13615), (266, 13627), (267, 13633), (275, 13690), (281, 13723), (284, 13741), (288, 13780), (290, 13807), (303, 13936), (307, 13981), (322, 14068), (332, 14146), (347, 14266), (349, 14296), (351, 14338), (361, 14497), (363, 14509), (367, 14542), (375, 14662), (378, 14686), (382, 14719), (383, 14725), (384, 14758), (385, 14797), (386, 14836), (388, 14887), (391, 14953), (392, 14974), (394, 15031), (395, 15052), (398, 15100), (399, 15103), (400, 15118), (403, 15181), (404, 15190), (407, 15232), (409, 15247), (415, 15382), (416, 15385),

Gene: Danzina\_19 Start: 11860, Stop: 15183, Start Num: 12

Candidate Starts for Danzina\_19:

(Start: 12 @11860 has 61 MA's), (Start: 19 @11896 has 4 MA's), (30, 12007), (41, 12118), (44, 12130), (45, 12142), (54, 12217), (59, 12253), (71, 12382), (77, 12424), (80, 12454), (81, 12460), (83, 12472), (86, 12517), (108, 12685), (112, 12745), (120, 12919), (121, 12928), (135, 13231), (137, 13267), (141, 13303), (142, 13327), (145, 13360), (156, 13477), (158, 13495), (162, 13540), (165, 13573), (170, 13591), (182, 13666), (196, 13744), (200, 13765), (203, 13786), (211, 13828), (216, 13846), (248, 13993), (258, 14071), (263, 14095), (264, 14107), (266, 14119), (267, 14125), (271, 14164), (275, 14182), (302, 14425), (315, 14527), (349, 14788), (350, 14800), (354, 14878), (356, 14896), (360,

14974), (369, 15043), (377, 15169), (379, 15172),

Gene: Dattran\_19 Start: 11685, Stop: 14972, Start Num: 19

Candidate Starts for Dattran\_19:

(Start: 12 @11649 has 61 MA's), (Start: 19 @11685 has 4 MA's), (30, 11796), (41, 11907), (44, 11919), (45, 11931), (54, 12006), (59, 12042), (71, 12171), (77, 12213), (80, 12243), (81, 12249), (83, 12261), (86, 12306), (112, 12534), (121, 12717), (137, 13056), (142, 13116), (145, 13149), (156, 13266), (158, 13284), (162, 13329), (165, 13362), (170, 13380), (182, 13455), (196, 13533), (200, 13554), (203, 13575), (211, 13617), (216, 13635), (248, 13782), (258, 13860), (263, 13884), (264, 13896), (266, 13908), (267, 13914), (271, 13953), (275, 13971), (302, 14214), (315, 14316), (349, 14577), (350, 14589), (354, 14667), (356, 14685), (360, 14763), (369, 14832), (377, 14958), (379, 14961),

Gene: Daudau\_18 Start: 11605, Stop: 14904, Start Num: 15

Candidate Starts for Daudau\_18:

(Start: 15 @11605 has 29 MA's), (Start: 20 @11644 has 3 MA's), (Start: 26 @11722 has 1 MA's), (30, 11740), (31, 11761), (41, 11851), (59, 11983), (79, 12172), (81, 12190), (85, 12229), (113, 12532), (121, 12655), (125, 12730), (138, 13021), (142, 13054), (155, 13201), (199, 13483), (216, 13573), (218, 13588), (248, 13720), (255, 13777), (263, 13822), (264, 13834), (271, 13891), (275, 13909), (317, 14275), (334, 14374), (339, 14398), (349, 14515), (350, 14527), (353, 14596), (354, 14605), (362, 14722),

Gene: Dexers\_17 Start: 11265, Stop: 15377, Start Num: 12

Candidate Starts for Dexers\_17:

(Start: 12 @11265 has 61 MA's), (Start: 17 @11289 has 1 MA's), (30, 11409), (32, 11442), (41, 11520), (42, 11523), (69, 11763), (71, 11784), (77, 11826), (83, 11874), (96, 12000), (109, 12096), (110, 12126), (112, 12147), (116, 12219), (120, 12318), (121, 12327), (122, 12339), (135, 12633), (137, 12669), (142, 12729), (151, 12840), (155, 12876), (158, 12897), (162, 12942), (165, 12975), (170, 12993), (174, 13026), (196, 13146), (197, 13149), (207, 13215), (209, 13224), (224, 13308), (226, 13317), (228, 13332), (238, 13407), (243, 13443), (248, 13482), (264, 13596), (266, 13608), (267, 13614), (271, 13653), (277, 13680), (286, 13734), (290, 13788), (303, 13917), (307, 13962), (322, 14049), (347, 14247), (349, 14277), (351, 14319), (361, 14478), (363, 14490), (371, 14553), (378, 14667), (383, 14706), (385, 14778), (386, 14817), (387, 14859), (391, 14934), (392, 14955), (394, 15012), (395, 15033), (398, 15081), (399, 15084), (400, 15099), (403, 15162), (404, 15171), (407, 15213), (415, 15363), (416, 15366),

Gene: Diane\_18 Start: 11534, Stop: 15442, Start Num: 15

Candidate Starts for Diane\_18:

(Start: 15 @11534 has 29 MA's), (30, 11669), (41, 11780), (47, 11843), (54, 11876), (59, 11912), (77, 12083), (80, 12113), (81, 12119), (90, 12206), (113, 12461), (114, 12464), (121, 12584), (142, 12983), (145, 13016), (155, 13130), (157, 13142), (162, 13196), (165, 13229), (170, 13247), (185, 13337), (206, 13421), (208, 13430), (248, 13562), (250, 13574), (255, 13619), (264, 13676), (275, 13751), (287, 13823), (317, 14117), (334, 14216), (341, 14249), (349, 14357), (363, 14570), (378, 14747), (386, 14897), (387, 14939), (391, 15014), (392, 15035), (394, 15092), (395, 15113), (396, 15116), (398, 15161), (405, 15254),

Gene: Dwayne\_18 Start: 11643, Stop: 14966, Start Num: 12

Candidate Starts for Dwayne\_18:

(Start: 12 @11643 has 61 MA's), (30, 11790), (41, 11901), (44, 11913), (45, 11925), (54, 12000), (59, 12036), (71, 12165), (77, 12207), (80, 12237), (81, 12243), (86, 12300), (112, 12528), (114, 12588), (121, 12711), (135, 13014), (142, 13110), (145, 13143), (156, 13260), (158, 13278), (162, 13323), (165, 13356), (170, 13374), (182, 13449), (196, 13527), (200, 13548), (211, 13611), (216, 13629), (227, 13701), (248, 13776), (258, 13854), (263, 13878), (264, 13890), (266, 13902), (267, 13908), (271, 13947), (275, 13965), (302, 14208), (315, 14310), (325, 14352), (345, 14520), (349, 14571),

(350, 14583), (360, 14757), (369, 14826), (377, 14952), (379, 14955),

Gene: ELB20\_17 Start: 11627, Stop: 15028, Start Num: 15

Candidate Starts for ELB20\_17:

(Start: 15 @11627 has 29 MA's), (Start: 20 @11666 has 3 MA's), (28, 11753), (30, 11762), (31, 11783), (39, 11840), (41, 11873), (47, 11936), (49, 11954), (55, 11975), (59, 12005), (77, 12176), (81, 12212), (86, 12269), (90, 12299), (93, 12317), (98, 12380), (112, 12497), (121, 12680), (135, 12983), (138, 13046), (142, 13079), (145, 13112), (150, 13184), (151, 13190), (158, 13247), (160, 13271), (162, 13292), (165, 13325), (170, 13343), (182, 13418), (191, 13472), (193, 13484), (197, 13499), (200, 13517), (211, 13580), (264, 13859), (275, 13934), (287, 14006), (289, 14030), (314, 14273), (318, 14303), (323, 14390), (324, 14399), (339, 14522), (346, 14600), (349, 14639), (350, 14651), (354, 14729), (369, 14894),

Gene: Eddasa\_19 Start: 11832, Stop: 15152, Start Num: 12

Candidate Starts for Eddasa\_19:

(Start: 12 @11832 has 61 MA's), (30, 11976), (41, 12087), (44, 12099), (49, 12168), (51, 12174), (56, 12195), (69, 12330), (77, 12393), (81, 12429), (82, 12432), (98, 12597), (104, 12636), (110, 12693), (120, 12888), (121, 12897), (135, 13200), (136, 13233), (142, 13296), (145, 13329), (151, 13407), (158, 13464), (160, 13488), (162, 13509), (165, 13542), (170, 13560), (175, 13596), (185, 13650), (191, 13689), (196, 13713), (206, 13779), (216, 13815), (227, 13887), (241, 13911), (242, 13917), (246, 13941), (248, 13962), (263, 14064), (264, 14076), (269, 14112), (275, 14151), (281, 14184), (298, 14355), (302, 14394), (303, 14397), (315, 14496), (317, 14517), (322, 14529), (349, 14757), (350, 14769), (360, 14943), (369, 15012), (372, 15051), (377, 15138), (379, 15141),

Gene: Ejemplo\_18 Start: 11643, Stop: 14966, Start Num: 12

Candidate Starts for Ejemplo\_18:

(Start: 12 @11643 has 61 MA's), (30, 11790), (41, 11901), (44, 11913), (45, 11925), (54, 12000), (59, 12036), (77, 12207), (80, 12237), (81, 12243), (83, 12255), (86, 12300), (94, 12354), (108, 12468), (112, 12528), (120, 12702), (121, 12711), (135, 13014), (137, 13050), (142, 13110), (145, 13143), (151, 13221), (156, 13260), (158, 13278), (162, 13323), (165, 13356), (170, 13374), (182, 13449), (196, 13527), (200, 13548), (203, 13569), (211, 13611), (216, 13629), (227, 13701), (248, 13776), (258, 13854), (263, 13878), (264, 13890), (266, 13902), (267, 13908), (271, 13947), (275, 13965), (302, 14208), (306, 14253), (315, 14310), (345, 14520), (349, 14571), (369, 14826), (377, 14952), (379, 14955),

Gene: ElGato\_19 Start: 11287, Stop: 15399, Start Num: 12

Candidate Starts for ElGato\_19:

(Start: 12 @11287 has 61 MA's), (Start: 17 @11311 has 1 MA's), (30, 11431), (32, 11464), (36, 11494), (41, 11542), (71, 11806), (77, 11848), (83, 11896), (96, 12022), (109, 12118), (110, 12148), (112, 12169), (116, 12241), (120, 12340), (121, 12349), (135, 12655), (137, 12691), (142, 12751), (152, 12871), (155, 12898), (156, 12901), (160, 12943), (162, 12964), (191, 13144), (204, 13222), (207, 13237), (209, 13246), (216, 13270), (222, 13324), (224, 13330), (226, 13339), (228, 13354), (231, 13369), (234, 13387), (238, 13429), (248, 13504), (264, 13618), (266, 13630), (267, 13636), (271, 13675), (274, 13684), (275, 13693), (303, 13939), (307, 13984), (322, 14071), (332, 14149), (347, 14269), (349, 14299), (351, 14341), (361, 14500), (363, 14512), (367, 14545), (375, 14665), (378, 14689), (383, 14728), (384, 14761), (385, 14800), (386, 14839), (388, 14890), (391, 14956), (392, 14977), (394, 15034), (395, 15055), (398, 15103), (399, 15106), (400, 15121), (403, 15184), (404, 15193), (407, 15235), (409, 15250), (415, 15385), (416, 15388),

Gene: Emaanora\_20 Start: 11646, Stop: 14969, Start Num: 12

Candidate Starts for Emaanora\_20:

(Start: 12 @11646 has 61 MA's), (30, 11793), (41, 11904), (44, 11916), (45, 11928), (54, 12003), (59, 12039), (71, 12168), (77, 12210), (80, 12240), (81, 12246), (86, 12303), (112, 12531), (114, 12591),

(121, 12714), (135, 13017), (142, 13113), (145, 13146), (156, 13263), (158, 13281), (162, 13326), (165, 13359), (170, 13377), (182, 13452), (196, 13530), (200, 13551), (211, 13614), (216, 13632), (248, 13779), (258, 13857), (263, 13881), (264, 13893), (266, 13905), (267, 13911), (271, 13950), (275, 13968), (302, 14211), (315, 14313), (325, 14355), (345, 14523), (349, 14574), (350, 14586), (360, 14760), (369, 14829), (377, 14955), (379, 14958),

Gene: EnochSoames\_20 Start: 11828, Stop: 15148, Start Num: 12

Candidate Starts for EnochSoames\_20:

(Start: 12 @11828 has 61 MA's), (30, 11972), (41, 12083), (44, 12095), (45, 12107), (51, 12170), (54, 12182), (69, 12326), (77, 12389), (81, 12425), (82, 12428), (98, 12593), (104, 12632), (110, 12689), (120, 12884), (121, 12893), (135, 13196), (136, 13229), (142, 13292), (145, 13325), (151, 13403), (158, 13460), (160, 13484), (162, 13505), (165, 13538), (170, 13556), (175, 13592), (185, 13646), (191, 13685), (196, 13709), (206, 13775), (216, 13811), (227, 13883), (241, 13907), (242, 13913), (246, 13937), (248, 13958), (263, 14060), (264, 14072), (269, 14108), (275, 14147), (281, 14180), (298, 14351), (302, 14390), (303, 14393), (315, 14492), (317, 14513), (322, 14525), (349, 14753), (350, 14765), (360, 14939), (369, 15008), (372, 15047), (377, 15134), (379, 15137),

Gene: Esperer\_18 Start: 11669, Stop: 14989, Start Num: 12

Candidate Starts for Esperer\_18:

(Start: 12 @11669 has 61 MA's), (30, 11813), (41, 11924), (44, 11936), (49, 12005), (51, 12011), (56, 12032), (69, 12167), (77, 12230), (81, 12266), (82, 12269), (98, 12434), (104, 12473), (110, 12530), (121, 12734), (135, 13037), (136, 13070), (142, 13133), (145, 13166), (151, 13244), (155, 13280), (156, 13283), (158, 13301), (160, 13325), (162, 13346), (165, 13379), (170, 13397), (175, 13433), (185, 13487), (191, 13526), (196, 13550), (206, 13616), (216, 13652), (227, 13724), (241, 13748), (242, 13754), (246, 13778), (248, 13799), (263, 13901), (264, 13913), (269, 13949), (275, 13988), (281, 14021), (298, 14192), (302, 14231), (315, 14333), (317, 14354), (322, 14366), (345, 14543), (349, 14594), (350, 14606), (360, 14780), (369, 14849), (372, 14888), (377, 14975), (379, 14978),

Gene: GirlDinner\_18 Start: 11503, Stop: 14700, Start Num: 15

Candidate Starts for GirlDinner\_18:

(Start: 15 @11503 has 29 MA's), (Start: 20 @11542 has 3 MA's), (30, 11641), (31, 11662), (40, 11734), (41, 11752), (59, 11884), (60, 11896), (76, 12046), (80, 12085), (81, 12091), (82, 12094), (86, 12148), (102, 12283), (110, 12355), (121, 12559), (129, 12667), (135, 12862), (142, 12958), (145, 12991), (151, 13069), (155, 13105), (158, 13126), (160, 13150), (162, 13171), (163, 13174), (165, 13204), (170, 13222), (176, 13261), (179, 13282), (180, 13288), (183, 13300), (205, 13369), (220, 13432), (233, 13465), (235, 13477), (246, 13516), (264, 13651), (272, 13711), (284, 13756), (285, 13762), (295, 13879), (309, 14005), (325, 14092), (346, 14272), (349, 14311), (365, 14542), (370, 14578),

Gene: Goby\_18 Start: 11655, Stop: 14978, Start Num: 12

Candidate Starts for Goby\_18:

(Start: 12 @11655 has 61 MA's), (Start: 19 @11691 has 4 MA's), (30, 11802), (41, 11913), (44, 11925), (45, 11937), (54, 12012), (59, 12048), (71, 12177), (77, 12219), (80, 12249), (81, 12255), (83, 12267), (86, 12312), (112, 12540), (121, 12723), (137, 13062), (142, 13122), (145, 13155), (146, 13188), (155, 13269), (158, 13290), (162, 13335), (165, 13368), (170, 13386), (171, 13395), (182, 13461), (196, 13539), (200, 13560), (203, 13581), (211, 13623), (216, 13641), (248, 13788), (258, 13866), (263, 13890), (264, 13902), (266, 13914), (267, 13920), (271, 13959), (275, 13977), (302, 14220), (315, 14322), (346, 14544), (349, 14583), (350, 14595), (360, 14769), (369, 14838), (377, 14964), (379, 14967),

Gene: Godpower\_19 Start: 11667, Stop: 14990, Start Num: 12

Candidate Starts for Godpower\_19:

(Start: 12 @11667 has 61 MA's), (Start: 19 @11703 has 4 MA's), (30, 11814), (41, 11925), (44, 11937), (45, 11949), (54, 12024), (59, 12060), (63, 12114), (71, 12189), (77, 12231), (80, 12261), (81, 12267),

(83, 12279), (86, 12324), (112, 12552), (120, 12726), (121, 12735), (137, 13074), (142, 13134), (145, 13167), (146, 13200), (155, 13281), (158, 13302), (162, 13347), (165, 13380), (170, 13398), (171, 13407), (182, 13473), (196, 13551), (200, 13572), (203, 13593), (211, 13635), (216, 13653), (248, 13800), (258, 13878), (263, 13902), (264, 13914), (266, 13926), (267, 13932), (271, 13971), (275, 13989), (302, 14232), (315, 14334), (346, 14556), (349, 14595), (350, 14607), (360, 14781), (369, 14850), (377, 14976), (379, 14979),

Gene: GreenWeasel\_20 Start: 11869, Stop: 15690, Start Num: 1

Candidate Starts for GreenWeasel\_20:

(Start: 1 @11869 has 3 MA's), (8, 12205), (10, 12250), (11, 12343), (16, 12367), (Start: 17 @12376 has 1 MA's), (30, 12502), (38, 12586), (43, 12625), (52, 12712), (59, 12769), (66, 12862), (68, 12871), (71, 12898), (74, 12916), (78, 12949), (81, 12976), (86, 13033), (87, 13042), (105, 13189), (106, 13195), (107, 13198), (118, 13417), (119, 13432), (121, 13444), (126, 13525), (133, 13663), (135, 13747), (142, 13843), (143, 13852), (154, 13987), (155, 13990), (157, 14002), (165, 14089), (166, 14092), (168, 14098), (197, 14263), (201, 14290), (235, 14449), (241, 14458), (248, 14509), (249, 14512), (252, 14533), (257, 14581), (262, 14608), (264, 14623), (265, 14629), (275, 14698), (284, 14749), (319, 15067), (329, 15121), (331, 15151), (349, 15304), (353, 15385), (356, 15412), (377, 15679),

Gene: Haizum\_18 Start: 11570, Stop: 15475, Start Num: 15

Candidate Starts for Haizum\_18:

(Start: 15 @11570 has 29 MA's), (30, 11705), (41, 11816), (47, 11879), (54, 11912), (59, 11948), (76, 12110), (77, 12119), (81, 12155), (90, 12242), (119, 12611), (121, 12620), (142, 13019), (145, 13052), (155, 13166), (162, 13232), (165, 13265), (170, 13283), (173, 13307), (175, 13319), (185, 13373), (206, 13457), (208, 13466), (224, 13511), (248, 13598), (255, 13655), (264, 13712), (275, 13787), (287, 13859), (317, 14153), (334, 14252), (341, 14285), (349, 14393), (352, 14438), (355, 14498), (363, 14606), (386, 14933), (387, 14975), (391, 15050), (392, 15071), (394, 15128), (395, 15149), (396, 15152), (398, 15197), (415, 15464),

Gene: Hank144\_19 Start: 11796, Stop: 15098, Start Num: 15

Candidate Starts for Hank144\_19:

(Start: 15 @11796 has 29 MA's), (Start: 26 @11913 has 1 MA's), (30, 11931), (31, 11952), (41, 12042), (59, 12174), (71, 12303), (77, 12345), (81, 12381), (86, 12438), (121, 12849), (131, 13002), (135, 13152), (142, 13248), (145, 13281), (158, 13416), (160, 13440), (162, 13461), (165, 13494), (170, 13512), (196, 13665), (203, 13707), (210, 13746), (211, 13749), (246, 13893), (248, 13914), (258, 13992), (264, 14028), (266, 14040), (269, 14064), (271, 14085), (275, 14103), (287, 14175), (294, 14268), (296, 14286), (302, 14346), (306, 14391), (321, 14478), (322, 14481), (349, 14709), (353, 14790), (354, 14799), (370, 14976), (377, 15087),

Gene: Hippo\_18 Start: 11646, Stop: 14969, Start Num: 12

Candidate Starts for Hippo\_18:

(Start: 12 @11646 has 61 MA's), (30, 11793), (41, 11904), (44, 11916), (45, 11928), (54, 12003), (59, 12039), (71, 12168), (77, 12210), (80, 12240), (81, 12246), (86, 12303), (112, 12531), (114, 12591), (121, 12714), (135, 13017), (142, 13113), (145, 13146), (156, 13263), (158, 13281), (162, 13326), (165, 13359), (170, 13377), (182, 13452), (196, 13530), (200, 13551), (211, 13614), (216, 13632), (248, 13779), (258, 13857), (263, 13881), (264, 13893), (266, 13905), (267, 13911), (271, 13950), (275, 13968), (302, 14211), (306, 14256), (315, 14313), (345, 14523), (349, 14574), (350, 14586), (360, 14760), (369, 14829), (377, 14955), (379, 14958),

Gene: Hydra\_20 Start: 12197, Stop: 15517, Start Num: 12

Candidate Starts for Hydra\_20:

(Start: 12 @12197 has 61 MA's), (30, 12341), (41, 12452), (44, 12464), (49, 12533), (51, 12539), (56, 12560), (69, 12695), (77, 12758), (81, 12794), (82, 12797), (98, 12962), (104, 13001), (110, 13058),

(121, 13262), (135, 13565), (136, 13598), (142, 13661), (145, 13694), (151, 13772), (155, 13808), (156, 13811), (158, 13829), (160, 13853), (162, 13874), (165, 13907), (170, 13925), (175, 13961), (185, 14015), (191, 14054), (196, 14078), (206, 14144), (216, 14180), (227, 14252), (241, 14276), (242, 14282), (246, 14306), (248, 14327), (263, 14429), (264, 14441), (269, 14477), (275, 14516), (281, 14549), (298, 14720), (302, 14759), (315, 14861), (317, 14882), (322, 14894), (345, 15071), (349, 15122), (350, 15134), (360, 15308), (369, 15377), (372, 15416), (377, 15503), (379, 15506),

Gene: Indigo\_18 Start: 11669, Stop: 14989, Start Num: 12

Candidate Starts for Indigo\_18:

(Start: 12 @11669 has 61 MA's), (30, 11813), (41, 11924), (44, 11936), (49, 12005), (51, 12011), (56, 12032), (69, 12167), (77, 12230), (81, 12266), (82, 12269), (98, 12434), (104, 12473), (110, 12530), (121, 12734), (135, 13037), (136, 13070), (142, 13133), (145, 13166), (151, 13244), (155, 13280), (156, 13283), (158, 13301), (160, 13325), (162, 13346), (165, 13379), (170, 13397), (175, 13433), (185, 13487), (191, 13526), (196, 13550), (206, 13616), (216, 13652), (227, 13724), (241, 13748), (242, 13754), (246, 13778), (248, 13799), (263, 13901), (264, 13913), (269, 13949), (275, 13988), (281, 14021), (298, 14192), (302, 14231), (315, 14333), (317, 14354), (322, 14366), (345, 14543), (349, 14594), (350, 14606), (360, 14780), (369, 14849), (372, 14888), (377, 14975), (379, 14978),

Gene: Issmi\_19 Start: 11823, Stop: 15905, Start Num: 15

Candidate Starts for Issmi\_19:

(Start: 15 @11823 has 29 MA's), (Start: 19 @11850 has 4 MA's), (30, 11958), (31, 11979), (41, 12069), (59, 12201), (71, 12330), (81, 12408), (84, 12441), (86, 12465), (113, 12750), (119, 12864), (121, 12873), (142, 13272), (155, 13419), (160, 13464), (164, 13494), (167, 13524), (199, 13701), (215, 13788), (216, 13791), (219, 13812), (247, 13932), (248, 13938), (263, 14040), (264, 14052), (275, 14127), (283, 14169), (293, 14277), (314, 14454), (318, 14484), (324, 14580), (325, 14601), (339, 14703), (349, 14820), (355, 14925), (378, 15210), (383, 15249), (384, 15282), (385, 15321), (386, 15360), (390, 15474), (391, 15477), (392, 15498), (394, 15555), (395, 15576), (396, 15579), (397, 15600), (398, 15624), (408, 15768), (415, 15894),

Gene: Itza\_18 Start: 11930, Stop: 15331, Start Num: 14

Candidate Starts for Itza\_18:

(Start: 14 @11930 has 5 MA's), (Start: 17 @11945 has 1 MA's), (30, 12065), (40, 12158), (41, 12176), (45, 12200), (61, 12356), (83, 12533), (86, 12578), (96, 12659), (103, 12722), (106, 12740), (113, 12863), (121, 12986), (124, 13058), (127, 13070), (132, 13199), (135, 13292), (141, 13364), (142, 13388), (147, 13463), (157, 13547), (162, 13601), (165, 13634), (167, 13640), (171, 13661), (172, 13673), (179, 13712), (183, 13730), (213, 13895), (223, 13964), (227, 13979), (229, 13994), (233, 14015), (239, 14069), (246, 14120), (248, 14141), (264, 14255), (275, 14330), (277, 14339), (292, 14453), (302, 14573), (320, 14705), (322, 14708), (330, 14759), (340, 14825), (341, 14828), (349, 14936), (353, 15017), (356, 15044), (364, 15161), (373, 15233), (380, 15320),

Gene: Izzy\_19 Start: 11879, Stop: 15199, Start Num: 12

Candidate Starts for Izzy\_19:

(Start: 12 @11879 has 61 MA's), (30, 12023), (41, 12134), (44, 12146), (49, 12215), (51, 12221), (56, 12242), (69, 12377), (77, 12440), (81, 12476), (82, 12479), (98, 12644), (104, 12683), (110, 12740), (120, 12935), (121, 12944), (135, 13247), (136, 13280), (142, 13343), (145, 13376), (151, 13454), (158, 13511), (160, 13535), (162, 13556), (165, 13589), (170, 13607), (175, 13643), (185, 13697), (191, 13736), (196, 13760), (206, 13826), (216, 13862), (227, 13934), (241, 13958), (242, 13964), (246, 13988), (248, 14009), (263, 14111), (264, 14123), (269, 14159), (275, 14198), (281, 14231), (298, 14402), (302, 14441), (303, 14444), (315, 14543), (317, 14564), (322, 14576), (349, 14804), (350, 14816), (360, 14990), (369, 15059), (372, 15098), (377, 15185), (379, 15188),

Gene: Janus\_19 Start: 11841, Stop: 15038, Start Num: 15

Candidate Starts for Janus\_19:

(Start: 15 @11841 has 29 MA's), (Start: 20 @11880 has 3 MA's), (30, 11979), (31, 12000), (40, 12072), (41, 12090), (59, 12222), (60, 12234), (76, 12384), (80, 12423), (81, 12429), (82, 12432), (86, 12486), (102, 12621), (110, 12693), (121, 12897), (129, 13005), (135, 13200), (142, 13296), (145, 13329), (151, 13407), (155, 13443), (158, 13464), (160, 13488), (162, 13509), (163, 13512), (165, 13542), (170, 13560), (176, 13599), (179, 13620), (180, 13626), (183, 13638), (205, 13707), (220, 13770), (233, 13803), (235, 13815), (246, 13854), (264, 13989), (272, 14049), (284, 14094), (285, 14100), (295, 14217), (325, 14430), (346, 14610), (349, 14649), (365, 14880), (370, 14916),

Gene: Jash\_19 Start: 11832, Stop: 15152, Start Num: 12

Candidate Starts for Jash\_19:

(Start: 12 @11832 has 61 MA's), (30, 11976), (41, 12087), (44, 12099), (49, 12168), (51, 12174), (56, 12195), (69, 12330), (77, 12393), (81, 12429), (82, 12432), (98, 12597), (104, 12636), (110, 12693), (120, 12888), (121, 12897), (135, 13200), (136, 13233), (142, 13296), (145, 13329), (151, 13407), (158, 13464), (160, 13488), (162, 13509), (165, 13542), (170, 13560), (175, 13596), (185, 13650), (191, 13689), (196, 13713), (206, 13779), (216, 13815), (227, 13887), (241, 13911), (242, 13917), (246, 13941), (248, 13962), (263, 14064), (264, 14076), (269, 14112), (275, 14151), (281, 14184), (298, 14355), (302, 14394), (303, 14397), (315, 14496), (317, 14517), (322, 14529), (349, 14757), (350, 14769), (360, 14943), (369, 15012), (372, 15051), (377, 15138), (379, 15141),

Gene: Jevington\_20 Start: 12149, Stop: 15340, Start Num: 15

Candidate Starts for Jevington\_20:

(Start: 15 @12149 has 29 MA's), (Start: 20 @12188 has 3 MA's), (28, 12275), (30, 12284), (31, 12305), (36, 12347), (59, 12524), (72, 12662), (76, 12686), (81, 12731), (82, 12734), (86, 12788), (98, 12899), (121, 13199), (130, 13322), (133, 13418), (135, 13502), (138, 13565), (140, 13571), (142, 13598), (155, 13745), (158, 13766), (160, 13790), (162, 13811), (163, 13814), (165, 13844), (170, 13862), (178, 13919), (205, 14009), (240, 14123), (241, 14126), (253, 14204), (255, 14234), (263, 14279), (264, 14291), (271, 14348), (272, 14351), (284, 14396), (285, 14402), (291, 14465), (299, 14558), (306, 14633), (325, 14732), (349, 14951), (360, 15137), (362, 15158), (365, 15182),

Gene: Jhitchelle\_17 Start: 11193, Stop: 15305, Start Num: 12

Candidate Starts for Jhitchelle\_17:

(Start: 12 @11193 has 61 MA's), (Start: 17 @11217 has 1 MA's), (29, 11331), (30, 11337), (32, 11370), (36, 11400), (40, 11430), (41, 11448), (45, 11472), (57, 11553), (69, 11691), (77, 11754), (81, 11790), (83, 11802), (86, 11847), (90, 11877), (96, 11928), (101, 11979), (112, 12075), (113, 12132), (117, 12168), (120, 12246), (121, 12255), (135, 12561), (139, 12627), (141, 12633), (142, 12657), (147, 12732), (155, 12804), (162, 12870), (164, 12879), (176, 12960), (186, 13014), (191, 13050), (207, 13143), (209, 13152), (212, 13161), (216, 13176), (230, 13272), (238, 13335), (244, 13380), (248, 13410), (255, 13467), (258, 13488), (264, 13524), (271, 13581), (275, 13599), (277, 13608), (311, 13908), (322, 13977), (326, 13995), (333, 14064), (341, 14097), (343, 14139), (344, 14148), (349, 14205), (353, 14286), (355, 14310), (359, 14388), (378, 14595), (383, 14634), (385, 14706), (386, 14745), (391, 14862), (392, 14883), (394, 14940), (395, 14961), (398, 15009), (399, 15012), (400, 15027), (403, 15090), (404, 15099), (407, 15141), (415, 15291), (416, 15294),

Gene: Kaine\_18 Start: 11265, Stop: 15377, Start Num: 12

Candidate Starts for Kaine\_18:

(Start: 12 @11265 has 61 MA's), (Start: 17 @11289 has 1 MA's), (30, 11409), (32, 11442), (41, 11520), (42, 11523), (69, 11763), (71, 11784), (77, 11826), (81, 11862), (83, 11874), (96, 12000), (109, 12096), (110, 12126), (112, 12147), (116, 12219), (120, 12318), (121, 12327), (135, 12633), (137, 12669), (142, 12729), (151, 12840), (155, 12876), (158, 12897), (162, 12942), (165, 12975), (170, 12993), (174, 13026), (196, 13146), (197, 13149), (207, 13215), (209, 13224), (224, 13308), (226, 13317), (228, 13332), (238, 13407), (243, 13443), (248, 13482), (264, 13596), (266, 13608), (267, 13614), (271, 13653), (277, 13680), (286, 13734), (290, 13788), (303, 13917), (307, 13962), (322, 14049), (347, 14247), (349, 14277), (351, 14319), (361, 14478), (363, 14490), (371, 14553), (378, 14667),

(383, 14706), (385, 14778), (386, 14817), (387, 14859), (391, 14934), (392, 14955), (394, 15012), (395, 15033), (398, 15081), (399, 15084), (400, 15099), (403, 15162), (404, 15171), (407, 15213), (415, 15363), (416, 15366),

Gene: Katalie\_19 Start: 11907, Stop: 15230, Start Num: 12

Candidate Starts for Katalie\_19:

(Start: 12 @11907 has 61 MA's), (30, 12054), (41, 12165), (44, 12177), (45, 12189), (54, 12264), (59, 12300), (77, 12471), (80, 12501), (81, 12507), (83, 12519), (120, 12966), (121, 12975), (135, 13278), (137, 13314), (142, 13374), (145, 13407), (146, 13440), (155, 13521), (158, 13542), (160, 13566), (162, 13587), (165, 13620), (170, 13638), (179, 13698), (196, 13791), (200, 13812), (211, 13875), (216, 13893), (246, 14019), (248, 14040), (258, 14118), (264, 14154), (266, 14166), (267, 14172), (271, 14211), (275, 14229), (296, 14412), (302, 14472), (306, 14517), (349, 14835), (350, 14847), (360, 15021), (369, 15090), (377, 15216), (379, 15219),

Gene: Lannister\_19 Start: 11670, Stop: 14996, Start Num: 12

Candidate Starts for Lannister\_19:

(Start: 12 @11670 has 61 MA's), (30, 11817), (41, 11928), (44, 11940), (45, 11952), (51, 12015), (59, 12063), (72, 12201), (77, 12234), (80, 12264), (81, 12270), (120, 12729), (121, 12738), (134, 12972), (135, 13041), (137, 13077), (142, 13137), (145, 13170), (151, 13248), (155, 13284), (156, 13287), (158, 13305), (160, 13329), (162, 13350), (165, 13383), (170, 13401), (182, 13476), (184, 13488), (196, 13554), (200, 13575), (203, 13596), (211, 13638), (216, 13656), (248, 13803), (258, 13881), (264, 13917), (266, 13929), (267, 13935), (271, 13974), (275, 13992), (302, 14235), (315, 14337), (345, 14547), (349, 14598), (350, 14610), (369, 14853), (377, 14982), (379, 14985),

Gene: Legacy\_18 Start: 11640, Stop: 14960, Start Num: 12

Candidate Starts for Legacy\_18:

(Start: 12 @11640 has 61 MA's), (30, 11784), (41, 11895), (44, 11907), (49, 11976), (51, 11982), (56, 12003), (69, 12138), (77, 12201), (81, 12237), (82, 12240), (98, 12405), (104, 12444), (110, 12501), (121, 12705), (135, 13008), (136, 13041), (142, 13104), (145, 13137), (151, 13215), (155, 13251), (156, 13254), (158, 13272), (160, 13296), (162, 13317), (165, 13350), (170, 13368), (175, 13404), (185, 13458), (191, 13497), (196, 13521), (206, 13587), (216, 13623), (227, 13695), (241, 13719), (242, 13725), (246, 13749), (248, 13770), (263, 13872), (264, 13884), (269, 13920), (275, 13959), (281, 13992), (298, 14163), (302, 14202), (315, 14304), (317, 14325), (322, 14337), (345, 14514), (349, 14565), (350, 14577), (360, 14751), (369, 14820), (372, 14859), (377, 14946), (379, 14949),

Gene: Leviticus\_18 Start: 11669, Stop: 14989, Start Num: 12

Candidate Starts for Leviticus\_18:

(Start: 12 @11669 has 61 MA's), (30, 11813), (41, 11924), (44, 11936), (49, 12005), (51, 12011), (56, 12032), (69, 12167), (77, 12230), (81, 12266), (82, 12269), (98, 12434), (104, 12473), (110, 12530), (121, 12734), (135, 13037), (136, 13070), (142, 13133), (145, 13166), (151, 13244), (155, 13280), (156, 13283), (158, 13301), (160, 13325), (162, 13346), (165, 13379), (170, 13397), (175, 13433), (185, 13487), (191, 13526), (196, 13550), (206, 13616), (216, 13652), (227, 13724), (241, 13748), (242, 13754), (246, 13778), (248, 13799), (263, 13901), (264, 13913), (269, 13949), (275, 13988), (281, 14021), (298, 14192), (302, 14231), (315, 14333), (317, 14354), (322, 14366), (345, 14543), (349, 14594), (350, 14606), (360, 14780), (369, 14849), (372, 14888), (377, 14975), (379, 14978),

Gene: Lika\_18 Start: 11671, Stop: 14994, Start Num: 12

Candidate Starts for Lika\_18:

(Start: 12 @11671 has 61 MA's), (Start: 19 @11707 has 4 MA's), (30, 11818), (41, 11929), (44, 11941), (45, 11953), (51, 12016), (54, 12028), (59, 12064), (71, 12193), (77, 12235), (80, 12265), (81, 12271), (83, 12283), (86, 12328), (112, 12556), (121, 12739), (134, 12973), (137, 13078), (142, 13138), (145, 13171), (146, 13204), (155, 13285), (158, 13306), (162, 13351), (165, 13384), (170, 13402), (171, 13411), (182, 13477), (196, 13555), (200, 13576), (203, 13597), (211, 13639), (216, 13657), (248,

13804), (258, 13882), (263, 13906), (264, 13918), (266, 13930), (267, 13936), (271, 13975), (275, 13993), (278, 14014), (302, 14236), (315, 14338), (346, 14560), (349, 14599), (350, 14611), (360, 14785), (369, 14854), (377, 14980), (379, 14983),

Gene: Loofah\_19 Start: 11655, Stop: 14957, Start Num: 15

Candidate Starts for Loofah\_19:

(Start: 15 @11655 has 29 MA's), (Start: 20 @11694 has 3 MA's), (Start: 26 @11772 has 1 MA's), (28, 11781), (30, 11790), (31, 11811), (39, 11868), (41, 11901), (49, 11982), (55, 12003), (59, 12033), (77, 12204), (81, 12240), (86, 12297), (90, 12327), (93, 12345), (98, 12408), (100, 12420), (112, 12525), (113, 12582), (121, 12708), (135, 13011), (138, 13074), (142, 13107), (145, 13140), (151, 13218), (158, 13275), (160, 13299), (162, 13320), (165, 13353), (170, 13371), (182, 13446), (191, 13500), (193, 13512), (200, 13545), (211, 13608), (264, 13887), (275, 13962), (287, 14034), (334, 14427), (346, 14529), (349, 14568), (353, 14649), (357, 14721), (369, 14823),

Gene: Lorelei\_18 Start: 11676, Stop: 14963, Start Num: 19

Candidate Starts for Lorelei\_18:

(Start: 12 @11640 has 61 MA's), (Start: 19 @11676 has 4 MA's), (30, 11787), (41, 11898), (44, 11910), (45, 11922), (54, 11997), (59, 12033), (71, 12162), (77, 12204), (80, 12234), (81, 12240), (83, 12252), (108, 12465), (112, 12525), (120, 12699), (121, 12708), (135, 13011), (137, 13047), (142, 13107), (145, 13140), (150, 13212), (156, 13257), (158, 13275), (162, 13320), (165, 13353), (170, 13371), (182, 13446), (196, 13524), (200, 13545), (203, 13566), (211, 13608), (216, 13626), (248, 13773), (258, 13851), (263, 13875), (264, 13887), (266, 13899), (267, 13905), (271, 13944), (275, 13962), (302, 14205), (307, 14253), (315, 14307), (345, 14517), (349, 14568), (350, 14580), (360, 14754), (369, 14823), (377, 14949), (379, 14952),

Gene: Maneekul\_18 Start: 11642, Stop: 14965, Start Num: 12

Candidate Starts for Maneekul\_18:

(Start: 12 @11642 has 61 MA's), (30, 11789), (41, 11900), (44, 11912), (45, 11924), (54, 11999), (59, 12035), (77, 12206), (80, 12236), (81, 12242), (83, 12254), (86, 12299), (94, 12353), (108, 12467), (112, 12527), (120, 12701), (121, 12710), (135, 13013), (137, 13049), (142, 13109), (145, 13142), (151, 13220), (156, 13259), (158, 13277), (162, 13322), (165, 13355), (170, 13373), (182, 13448), (196, 13526), (200, 13547), (203, 13568), (211, 13610), (216, 13628), (227, 13700), (248, 13775), (258, 13853), (263, 13877), (264, 13889), (266, 13901), (267, 13907), (271, 13946), (275, 13964), (302, 14207), (306, 14252), (315, 14309), (341, 14462), (345, 14519), (349, 14570), (369, 14825), (377, 14951), (379, 14954),

Gene: Marav\_21 Start: 12499, Stop: 15690, Start Num: 15

Candidate Starts for Marav\_21:

(Start: 15 @12499 has 29 MA's), (Start: 20 @12538 has 3 MA's), (28, 12625), (30, 12634), (31, 12655), (36, 12697), (59, 12874), (76, 13036), (81, 13081), (82, 13084), (86, 13138), (121, 13549), (127, 13633), (133, 13768), (135, 13852), (142, 13948), (155, 14095), (158, 14116), (160, 14140), (162, 14161), (163, 14164), (165, 14194), (170, 14212), (178, 14269), (205, 14359), (217, 14389), (240, 14473), (241, 14476), (253, 14554), (255, 14584), (263, 14629), (264, 14641), (271, 14698), (272, 14701), (284, 14746), (285, 14752), (291, 14815), (299, 14908), (306, 14983), (331, 15148), (337, 15172), (338, 15181), (349, 15301), (357, 15454), (360, 15487), (362, 15508), (365, 15532), (366, 15544),

Gene: Nabi\_18 Start: 11640, Stop: 14963, Start Num: 12

Candidate Starts for Nabi\_18:

(Start: 12 @11640 has 61 MA's), (Start: 19 @11676 has 4 MA's), (30, 11787), (41, 11898), (44, 11910), (45, 11922), (54, 11997), (59, 12033), (71, 12162), (77, 12204), (80, 12234), (81, 12240), (83, 12252), (108, 12465), (112, 12525), (120, 12699), (121, 12708), (135, 13011), (137, 13047), (142, 13107), (145, 13140), (150, 13212), (156, 13257), (158, 13275), (162, 13320), (165, 13353), (170, 13371),

(182, 13446), (196, 13524), (200, 13545), (203, 13566), (211, 13608), (216, 13626), (248, 13773), (258, 13851), (263, 13875), (264, 13887), (266, 13899), (267, 13905), (271, 13944), (275, 13962), (302, 14205), (307, 14253), (315, 14307), (345, 14517), (349, 14568), (350, 14580), (360, 14754), (369, 14823), (377, 14949), (379, 14952),

Gene: Nanodon\_20 Start: 11848, Stop: 15171, Start Num: 12

Candidate Starts for Nanodon\_20:

(Start: 12 @11848 has 61 MA's), (Start: 19 @11884 has 4 MA's), (Start: 20 @11896 has 3 MA's), (30, 11995), (41, 12106), (44, 12118), (45, 12130), (51, 12193), (54, 12205), (59, 12241), (77, 12412), (80, 12442), (81, 12448), (83, 12460), (86, 12505), (92, 12544), (111, 12724), (112, 12733), (114, 12793), (120, 12907), (121, 12916), (128, 13015), (137, 13255), (142, 13315), (145, 13348), (155, 13462), (158, 13483), (160, 13507), (162, 13528), (165, 13561), (169, 13576), (170, 13579), (182, 13654), (196, 13732), (200, 13753), (203, 13774), (211, 13816), (216, 13834), (227, 13906), (248, 13981), (258, 14059), (264, 14095), (266, 14107), (267, 14113), (271, 14152), (275, 14170), (302, 14413), (315, 14515), (345, 14725), (349, 14776), (350, 14788), (360, 14962), (369, 15031), (377, 15157), (379, 15160),

Gene: Nerdos\_18 Start: 11669, Stop: 14989, Start Num: 12

Candidate Starts for Nerdos\_18:

(Start: 12 @11669 has 61 MA's), (30, 11813), (41, 11924), (44, 11936), (49, 12005), (51, 12011), (56, 12032), (69, 12167), (77, 12230), (81, 12266), (82, 12269), (98, 12434), (104, 12473), (110, 12530), (121, 12734), (135, 13037), (136, 13070), (142, 13133), (145, 13166), (151, 13244), (155, 13280), (156, 13283), (158, 13301), (160, 13325), (162, 13346), (165, 13379), (170, 13397), (175, 13433), (185, 13487), (191, 13526), (196, 13550), (206, 13616), (216, 13652), (227, 13724), (241, 13748), (242, 13754), (246, 13778), (248, 13799), (263, 13901), (264, 13913), (269, 13949), (275, 13988), (281, 14021), (298, 14192), (302, 14231), (315, 14333), (317, 14354), (322, 14366), (345, 14543), (349, 14594), (350, 14606), (360, 14780), (369, 14849), (372, 14888), (377, 14975), (379, 14978),

Gene: Nishikigoi\_18 Start: 11570, Stop: 15475, Start Num: 15

Candidate Starts for Nishikigoi\_18:

(Start: 15 @11570 has 29 MA's), (30, 11705), (41, 11816), (47, 11879), (54, 11912), (59, 11948), (76, 12110), (77, 12119), (81, 12155), (90, 12242), (119, 12611), (121, 12620), (142, 13019), (145, 13052), (155, 13166), (162, 13232), (165, 13265), (170, 13283), (173, 13307), (175, 13319), (185, 13373), (206, 13457), (208, 13466), (248, 13598), (255, 13655), (264, 13712), (275, 13787), (287, 13859), (317, 14153), (334, 14252), (341, 14285), (349, 14393), (352, 14438), (355, 14498), (363, 14606), (386, 14933), (387, 14975), (391, 15050), (392, 15071), (394, 15128), (395, 15149), (396, 15152), (398, 15197), (415, 15464),

Gene: Oliynyk\_19 Start: 11832, Stop: 15152, Start Num: 12

Candidate Starts for Oliynyk\_19:

(Start: 12 @11832 has 61 MA's), (30, 11976), (41, 12087), (44, 12099), (49, 12168), (51, 12174), (56, 12195), (69, 12330), (77, 12393), (81, 12429), (82, 12432), (98, 12597), (104, 12636), (110, 12693), (120, 12888), (121, 12897), (135, 13200), (136, 13233), (142, 13296), (145, 13329), (151, 13407), (158, 13464), (160, 13488), (162, 13509), (165, 13542), (170, 13560), (175, 13596), (185, 13650), (191, 13689), (196, 13713), (206, 13779), (216, 13815), (227, 13887), (241, 13911), (242, 13917), (246, 13941), (248, 13962), (263, 14064), (264, 14076), (269, 14112), (275, 14151), (281, 14184), (298, 14355), (302, 14394), (303, 14397), (315, 14496), (317, 14517), (322, 14529), (349, 14757), (350, 14769), (360, 14943), (369, 15012), (372, 15051), (377, 15138), (379, 15141),

Gene: Omar\_19 Start: 11800, Stop: 15807, Start Num: 15

Candidate Starts for Omar\_19:

(Start: 15 @11800 has 29 MA's), (28, 11926), (30, 11935), (41, 12046), (47, 12109), (59, 12178), (69, 12286), (77, 12349), (81, 12385), (89, 12466), (99, 12556), (113, 12727), (114, 12730), (121, 12850),

(124, 12922), (142, 13249), (150, 13354), (155, 13396), (157, 13408), (158, 13417), (160, 13441), (162, 13462), (165, 13495), (170, 13513), (187, 13609), (207, 13690), (208, 13696), (227, 13753), (251, 13843), (254, 13873), (256, 13897), (261, 13921), (264, 13942), (275, 14017), (282, 14053), (287, 14089), (317, 14383), (341, 14614), (348, 14701), (349, 14722), (357, 14875), (361, 14923), (378, 15112), (386, 15262), (387, 15304), (391, 15379), (392, 15400), (394, 15457), (395, 15478), (398, 15526), (414, 15721),

Gene: Ozzie\_18 Start: 11649, Stop: 14969, Start Num: 12

Candidate Starts for Ozzie\_18:

(Start: 12 @11649 has 61 MA's), (30, 11793), (41, 11904), (44, 11916), (49, 11985), (51, 11991), (56, 12012), (69, 12147), (77, 12210), (81, 12246), (82, 12249), (98, 12414), (104, 12453), (110, 12510), (121, 12714), (135, 13017), (136, 13050), (142, 13113), (145, 13146), (151, 13224), (155, 13260), (156, 13263), (158, 13281), (160, 13305), (162, 13326), (165, 13359), (170, 13377), (175, 13413), (185, 13467), (191, 13506), (196, 13530), (206, 13596), (216, 13632), (227, 13704), (241, 13728), (242, 13734), (246, 13758), (248, 13779), (263, 13881), (264, 13893), (269, 13929), (275, 13968), (281, 14001), (298, 14172), (302, 14211), (315, 14313), (317, 14334), (322, 14346), (345, 14523), (349, 14574), (350, 14586), (360, 14760), (369, 14829), (372, 14868), (377, 14955), (379, 14958),

Gene: OzzyJ\_19 Start: 11637, Stop: 14960, Start Num: 12

Candidate Starts for OzzyJ\_19:

(Start: 12 @11637 has 61 MA's), (30, 11784), (41, 11895), (44, 11907), (45, 11919), (54, 11994), (59, 12030), (71, 12159), (77, 12201), (80, 12231), (81, 12237), (86, 12294), (112, 12522), (114, 12582), (121, 12705), (135, 13008), (142, 13104), (145, 13137), (150, 13209), (156, 13254), (158, 13272), (162, 13317), (165, 13350), (170, 13368), (182, 13443), (196, 13521), (200, 13542), (211, 13605), (216, 13623), (227, 13695), (248, 13770), (258, 13848), (264, 13884), (266, 13896), (267, 13902), (271, 13941), (275, 13959), (302, 14202), (306, 14247), (315, 14304), (345, 14514), (349, 14565), (350, 14577), (360, 14751), (369, 14820), (377, 14946), (379, 14949),

Gene: Pablito\_18 Start: 11494, Stop: 14799, Start Num: 15

Candidate Starts for Pablito\_18:

(Start: 15 @11494 has 29 MA's), (Start: 20 @11533 has 3 MA's), (30, 11632), (31, 11653), (40, 11725), (41, 11743), (59, 11875), (60, 11887), (71, 12004), (72, 12013), (77, 12046), (81, 12082), (86, 12139), (90, 12169), (93, 12187), (100, 12262), (110, 12346), (112, 12367), (113, 12424), (121, 12550), (135, 12853), (138, 12916), (142, 12949), (145, 12982), (151, 13060), (153, 13081), (155, 13096), (157, 13108), (158, 13117), (160, 13141), (162, 13162), (165, 13195), (170, 13213), (175, 13249), (196, 13366), (216, 13468), (241, 13564), (248, 13615), (258, 13693), (263, 13717), (264, 13729), (266, 13741), (267, 13747), (271, 13786), (275, 13804), (294, 13969), (302, 14047), (332, 14260), (339, 14293), (349, 14410), (350, 14422), (365, 14641), (370, 14677),

Gene: Paedore\_18 Start: 11772, Stop: 14957, Start Num: 26

Candidate Starts for Paedore\_18:

(Start: 15 @11655 has 29 MA's), (Start: 20 @11694 has 3 MA's), (Start: 26 @11772 has 1 MA's), (28, 11781), (30, 11790), (31, 11811), (39, 11868), (41, 11901), (49, 11982), (55, 12003), (59, 12033), (77, 12204), (81, 12240), (86, 12297), (90, 12327), (93, 12345), (98, 12408), (100, 12420), (112, 12525), (113, 12582), (121, 12708), (135, 13011), (138, 13074), (142, 13107), (145, 13140), (151, 13218), (158, 13275), (160, 13299), (162, 13320), (165, 13353), (170, 13371), (182, 13446), (191, 13500), (193, 13512), (200, 13545), (211, 13608), (264, 13887), (275, 13962), (287, 14034), (334, 14427), (346, 14529), (349, 14568), (353, 14649), (357, 14721), (369, 14823),

Gene: Paolo\_20 Start: 12162, Stop: 15353, Start Num: 15

Candidate Starts for Paolo\_20:

(Start: 15 @12162 has 29 MA's), (Start: 20 @12201 has 3 MA's), (28, 12288), (30, 12297), (31, 12318), (36, 12360), (59, 12537), (69, 12645), (72, 12675), (76, 12699), (81, 12744), (82, 12747), (86, 12801),

(121, 13212), (130, 13335), (133, 13431), (135, 13515), (142, 13611), (155, 13758), (158, 13779), (160, 13803), (162, 13824), (163, 13827), (165, 13857), (170, 13875), (205, 14022), (240, 14136), (241, 14139), (253, 14217), (255, 14247), (263, 14292), (264, 14304), (271, 14361), (272, 14364), (284, 14409), (285, 14415), (291, 14478), (297, 14559), (299, 14571), (306, 14646), (325, 14745), (331, 14811), (342, 14865), (349, 14964), (360, 15150), (362, 15171), (365, 15195), (366, 15207),

Gene: Pavo\_19 Start: 11557, Stop: 15669, Start Num: 12

Candidate Starts for Pavo\_19:

(Start: 12 @11557 has 61 MA's), (Start: 17 @11581 has 1 MA's), (30, 11701), (32, 11734), (36, 11764), (41, 11812), (69, 12055), (71, 12076), (77, 12118), (83, 12166), (96, 12292), (109, 12388), (110, 12418), (112, 12439), (116, 12511), (120, 12610), (121, 12619), (135, 12925), (137, 12961), (142, 13021), (148, 13099), (151, 13132), (155, 13168), (158, 13189), (162, 13234), (165, 13267), (170, 13285), (174, 13318), (182, 13360), (191, 13414), (195, 13432), (196, 13438), (197, 13441), (207, 13507), (209, 13516), (218, 13555), (226, 13609), (228, 13624), (236, 13675), (238, 13699), (248, 13774), (264, 13888), (266, 13900), (267, 13906), (275, 13963), (281, 13996), (284, 14014), (288, 14053), (290, 14080), (303, 14209), (307, 14254), (322, 14341), (332, 14419), (347, 14539), (349, 14569), (351, 14611), (361, 14770), (363, 14782), (367, 14815), (375, 14935), (378, 14959), (383, 14998), (384, 15031), (385, 15070), (386, 15109), (388, 15160), (391, 15226), (392, 15247), (394, 15304), (395, 15325), (398, 15373), (399, 15376), (400, 15391), (403, 15454), (404, 15463), (407, 15505), (409, 15520), (415, 15655), (416, 15658),

Gene: Phettuccine\_18 Start: 11669, Stop: 14989, Start Num: 12

Candidate Starts for Phettuccine\_18:

(Start: 12 @11669 has 61 MA's), (30, 11813), (41, 11924), (44, 11936), (49, 12005), (51, 12011), (56, 12032), (69, 12167), (77, 12230), (81, 12266), (82, 12269), (98, 12434), (104, 12473), (110, 12530), (121, 12734), (135, 13037), (136, 13070), (142, 13133), (145, 13166), (151, 13244), (155, 13280), (156, 13283), (158, 13301), (160, 13325), (162, 13346), (165, 13379), (170, 13397), (175, 13433), (185, 13487), (191, 13526), (196, 13550), (206, 13616), (216, 13652), (227, 13724), (241, 13748), (242, 13754), (246, 13778), (248, 13799), (263, 13901), (264, 13913), (269, 13949), (275, 13988), (281, 14021), (298, 14192), (302, 14231), (315, 14333), (317, 14354), (322, 14366), (345, 14543), (349, 14594), (350, 14606), (360, 14780), (369, 14849), (372, 14888), (377, 14975), (379, 14978),

Gene: Provolone\_19 Start: 11311, Stop: 15399, Start Num: 17

Candidate Starts for Provolone\_19:

(Start: 12 @11287 has 61 MA's), (Start: 17 @11311 has 1 MA's), (30, 11431), (32, 11464), (36, 11494), (41, 11542), (71, 11806), (77, 11848), (83, 11896), (96, 12022), (109, 12118), (110, 12148), (112, 12169), (116, 12241), (120, 12340), (121, 12349), (135, 12655), (137, 12691), (142, 12751), (152, 12871), (155, 12898), (156, 12901), (160, 12943), (162, 12964), (191, 13144), (207, 13237), (209, 13246), (216, 13270), (222, 13324), (224, 13330), (226, 13339), (228, 13354), (231, 13369), (234, 13387), (238, 13429), (248, 13504), (264, 13618), (266, 13630), (267, 13636), (275, 13693), (281, 13726), (284, 13744), (288, 13783), (290, 13810), (303, 13939), (307, 13984), (322, 14071), (332, 14149), (347, 14269), (349, 14299), (351, 14341), (361, 14500), (363, 14512), (367, 14545), (375, 14665), (378, 14689), (383, 14728), (384, 14761), (385, 14800), (386, 14839), (388, 14890), (391, 14956), (392, 14977), (394, 15034), (395, 15055), (398, 15103), (399, 15106), (400, 15121), (403, 15184), (404, 15193), (407, 15235), (409, 15250), (415, 15385), (416, 15388),

Gene: Puginator\_20 Start: 12120, Stop: 15398, Start Num: 15

Candidate Starts for Puginator\_20:

(Start: 15 @12120 has 29 MA's), (Start: 20 @12159 has 3 MA's), (28, 12246), (30, 12255), (31, 12276), (36, 12318), (59, 12495), (69, 12603), (72, 12633), (76, 12657), (81, 12702), (82, 12705), (86, 12759), (121, 13170), (130, 13293), (135, 13473), (138, 13536), (140, 13542), (142, 13569), (155, 13716), (158, 13737), (160, 13761), (162, 13782), (163, 13785), (165, 13815), (170, 13833), (188, 13932), (206, 14052), (211, 14070), (214, 14082), (221, 14139), (233, 14163), (234, 14172), (235, 14175),

(241, 14184), (245, 14208), (246, 14214), (247, 14229), (255, 14292), (263, 14337), (264, 14349), (271, 14406), (272, 14409), (279, 14427), (284, 14454), (285, 14460), (291, 14523), (297, 14604), (299, 14616), (313, 14727), (316, 14757), (325, 14790), (334, 14868), (341, 14901), (349, 15009), (360, 15195), (362, 15216), (365, 15240), (366, 15252),

Gene: R4\_18 Start: 11638, Stop: 15039, Start Num: 15

Candidate Starts for R4\_18:

(Start: 15 @11638 has 29 MA's), (Start: 20 @11677 has 3 MA's), (28, 11764), (30, 11773), (31, 11794), (39, 11851), (41, 11884), (47, 11947), (49, 11965), (55, 11986), (59, 12016), (77, 12187), (81, 12223), (86, 12280), (90, 12310), (93, 12328), (98, 12391), (112, 12508), (121, 12691), (135, 12994), (138, 13057), (142, 13090), (145, 13123), (150, 13195), (151, 13201), (158, 13258), (160, 13282), (162, 13303), (165, 13336), (170, 13354), (182, 13429), (191, 13483), (193, 13495), (197, 13510), (200, 13528), (211, 13591), (264, 13870), (275, 13945), (287, 14017), (289, 14041), (314, 14284), (318, 14314), (323, 14401), (324, 14410), (339, 14533), (346, 14611), (349, 14650), (350, 14662), (354, 14740), (369, 14905),

Gene: Rana\_18 Start: 11676, Stop: 14963, Start Num: 19

Candidate Starts for Rana\_18:

(Start: 12 @11640 has 61 MA's), (Start: 19 @11676 has 4 MA's), (30, 11787), (41, 11898), (44, 11910), (45, 11922), (54, 11997), (59, 12033), (71, 12162), (77, 12204), (80, 12234), (81, 12240), (83, 12252), (108, 12465), (112, 12525), (120, 12699), (121, 12708), (135, 13011), (137, 13047), (142, 13107), (145, 13140), (150, 13212), (156, 13257), (158, 13275), (162, 13320), (165, 13353), (170, 13371), (182, 13446), (196, 13524), (200, 13545), (203, 13566), (211, 13608), (216, 13626), (248, 13773), (258, 13851), (263, 13875), (264, 13887), (266, 13899), (267, 13905), (271, 13944), (275, 13962), (302, 14205), (307, 14253), (315, 14307), (345, 14517), (349, 14568), (350, 14580), (360, 14754), (369, 14823), (377, 14949), (379, 14952),

Gene: RedBear\_20 Start: 11907, Stop: 15230, Start Num: 12

Candidate Starts for RedBear\_20:

(Start: 12 @11907 has 61 MA's), (30, 12054), (41, 12165), (44, 12177), (45, 12189), (54, 12264), (59, 12300), (77, 12471), (80, 12501), (81, 12507), (83, 12519), (120, 12966), (121, 12975), (135, 13278), (137, 13314), (142, 13374), (145, 13407), (146, 13440), (155, 13521), (158, 13542), (160, 13566), (162, 13587), (165, 13620), (170, 13638), (179, 13698), (196, 13791), (200, 13812), (211, 13875), (216, 13893), (246, 14019), (248, 14040), (258, 14118), (264, 14154), (266, 14166), (267, 14172), (271, 14211), (275, 14229), (296, 14412), (302, 14472), (306, 14517), (349, 14835), (350, 14847), (360, 15021), (369, 15090), (377, 15216), (379, 15219),

Gene: Rusticus\_19 Start: 11832, Stop: 15152, Start Num: 12

Candidate Starts for Rusticus\_19:

(Start: 12 @11832 has 61 MA's), (30, 11976), (41, 12087), (44, 12099), (49, 12168), (51, 12174), (56, 12195), (69, 12330), (77, 12393), (81, 12429), (82, 12432), (98, 12597), (104, 12636), (110, 12693), (120, 12888), (121, 12897), (135, 13200), (136, 13233), (142, 13296), (145, 13329), (151, 13407), (158, 13464), (160, 13488), (162, 13509), (165, 13542), (170, 13560), (175, 13596), (185, 13650), (191, 13689), (196, 13713), (206, 13779), (216, 13815), (227, 13887), (241, 13911), (242, 13917), (246, 13941), (248, 13962), (263, 14064), (264, 14076), (269, 14112), (275, 14151), (281, 14184), (298, 14355), (302, 14394), (303, 14397), (315, 14496), (317, 14517), (322, 14529), (349, 14757), (350, 14769), (360, 14943), (369, 15012), (372, 15051), (377, 15138), (379, 15141),

Gene: Saftant\_18 Start: 11565, Stop: 15947, Start Num: 3

Candidate Starts for Saftant\_18:

(2, 11433), (Start: 3 @11565 has 3 MA's), (6, 11694), (13, 11901), (18, 11931), (21, 11952), (23, 11967), (24, 11976), (25, 12018), (27, 12033), (36, 12111), (37, 12117), (50, 12249), (56, 12270), (58, 12288), (70, 12423), (72, 12450), (75, 12465), (81, 12519), (83, 12531), (88, 12594), (90, 12606), (95,

12648), (96, 12657), (112, 12804), (121, 12984), (123, 13038), (135, 13290), (142, 13386), (144, 13404), (152, 13506), (155, 13533), (157, 13545), (162, 13599), (170, 13650), (181, 13719), (195, 13797), (199, 13815), (200, 13824), (203, 13845), (213, 13893), (219, 13926), (243, 14013), (248, 14052), (251, 14067), (259, 14139), (262, 14151), (264, 14166), (268, 14199), (273, 14229), (275, 14241), (278, 14262), (282, 14277), (291, 14349), (335, 14697), (336, 14706), (340, 14724), (349, 14835), (351, 14877), (358, 14997), (368, 15090), (371, 15111), (375, 15201), (378, 15225), (381, 15249), (383, 15264), (384, 15297), (385, 15336), (386, 15375), (390, 15489), (391, 15492), (392, 15513), (394, 15570), (395, 15591), (398, 15639), (399, 15642), (401, 15687), (407, 15771), (413, 15846), (415, 15933), (416, 15936),

Gene: SarahRose\_18 Start: 11643, Stop: 14966, Start Num: 12

Candidate Starts for SarahRose\_18:

(Start: 12 @11643 has 61 MA's), (30, 11790), (41, 11901), (44, 11913), (45, 11925), (54, 12000), (59, 12036), (71, 12165), (77, 12207), (80, 12237), (81, 12243), (86, 12300), (112, 12528), (114, 12588), (121, 12711), (135, 13014), (142, 13110), (145, 13143), (156, 13260), (158, 13278), (162, 13323), (165, 13356), (170, 13374), (182, 13449), (196, 13527), (200, 13548), (211, 13611), (216, 13629), (248, 13776), (258, 13854), (263, 13878), (264, 13890), (266, 13902), (267, 13908), (271, 13947), (275, 13965), (302, 14208), (315, 14310), (325, 14352), (345, 14520), (349, 14571), (350, 14583), (360, 14757), (369, 14826), (377, 14952), (379, 14955),

Gene: Snorlax\_18 Start: 11646, Stop: 14969, Start Num: 12

Candidate Starts for Snorlax\_18:

(Start: 12 @11646 has 61 MA's), (30, 11793), (41, 11904), (44, 11916), (45, 11928), (54, 12003), (59, 12039), (71, 12168), (77, 12210), (80, 12240), (81, 12246), (86, 12303), (112, 12531), (114, 12591), (121, 12714), (135, 13017), (142, 13113), (145, 13146), (156, 13263), (158, 13281), (162, 13326), (165, 13359), (170, 13377), (182, 13452), (196, 13530), (200, 13551), (211, 13614), (216, 13632), (248, 13779), (258, 13857), (263, 13881), (264, 13893), (266, 13905), (267, 13911), (271, 13950), (275, 13968), (302, 14211), (315, 14313), (325, 14355), (345, 14523), (349, 14574), (350, 14586), (360, 14760), (369, 14829), (377, 14955), (379, 14958),

Gene: South40\_19 Start: 11907, Stop: 15230, Start Num: 12

Candidate Starts for South40\_19:

(Start: 12 @11907 has 61 MA's), (30, 12054), (41, 12165), (44, 12177), (45, 12189), (54, 12264), (59, 12300), (77, 12471), (80, 12501), (81, 12507), (83, 12519), (120, 12966), (121, 12975), (135, 13278), (137, 13314), (142, 13374), (145, 13407), (146, 13440), (155, 13521), (158, 13542), (160, 13566), (162, 13587), (165, 13620), (170, 13638), (179, 13698), (196, 13791), (200, 13812), (211, 13875), (216, 13893), (246, 14019), (248, 14040), (258, 14118), (264, 14154), (266, 14166), (267, 14172), (271, 14211), (275, 14229), (296, 14412), (302, 14472), (306, 14517), (349, 14835), (350, 14847), (360, 15021), (369, 15090), (377, 15216), (379, 15219),

Gene: Speedwell\_23 Start: 13301, Stop: 17692, Start Num: 3

Candidate Starts for Speedwell\_23:

(Start: 3 @13301 has 3 MA's), (4, 13346), (5, 13376), (21, 13688), (23, 13703), (24, 13712), (25, 13754), (33, 13820), (34, 13826), (35, 13829), (46, 13949), (49, 13982), (58, 14024), (67, 14141), (75, 14201), (83, 14267), (96, 14393), (111, 14531), (112, 14540), (121, 14720), (123, 14774), (127, 14804), (135, 15026), (137, 15062), (142, 15122), (152, 15242), (155, 15269), (162, 15335), (170, 15386), (181, 15455), (195, 15533), (199, 15551), (200, 15560), (203, 15581), (217, 15650), (249, 15791), (262, 15887), (264, 15902), (268, 15935), (275, 15977), (284, 16028), (287, 16049), (288, 16067), (296, 16160), (308, 16271), (310, 16283), (312, 16295), (322, 16355), (338, 16463), (349, 16583), (351, 16625), (381, 16997), (383, 17012), (384, 17045), (385, 17084), (386, 17123), (387, 17165), (391, 17240), (392, 17261), (394, 17318), (395, 17339), (398, 17387), (399, 17390), (407, 17519), (413, 17591), (415, 17678), (416, 17681),

Gene: SqueakyClean\_19 Start: 11767, Stop: 14964, Start Num: 15

Candidate Starts for SqueakyClean\_19:

(Start: 15 @11767 has 29 MA's), (Start: 20 @11806 has 3 MA's), (30, 11905), (31, 11926), (40, 11998), (41, 12016), (59, 12148), (60, 12160), (76, 12310), (80, 12349), (81, 12355), (82, 12358), (86, 12412), (102, 12547), (110, 12619), (121, 12823), (129, 12931), (135, 13126), (142, 13222), (145, 13255), (151, 13333), (155, 13369), (158, 13390), (160, 13414), (162, 13435), (163, 13438), (165, 13468), (170, 13486), (176, 13525), (179, 13546), (180, 13552), (183, 13564), (205, 13633), (220, 13696), (233, 13729), (235, 13741), (264, 13915), (272, 13975), (284, 14020), (285, 14026), (304, 14224), (325, 14356), (337, 14446), (341, 14467), (349, 14575), (365, 14806), (370, 14842),

Gene: Sudan\_18 Start: 11552, Stop: 15664, Start Num: 12

Candidate Starts for Sudan\_18:

(Start: 12 @11552 has 61 MA's), (Start: 17 @11576 has 1 MA's), (30, 11696), (32, 11729), (41, 11807), (42, 11810), (69, 12050), (71, 12071), (77, 12113), (81, 12149), (83, 12161), (96, 12287), (109, 12383), (110, 12413), (112, 12434), (116, 12506), (120, 12605), (121, 12614), (135, 12920), (137, 12956), (142, 13016), (151, 13127), (155, 13163), (158, 13184), (162, 13229), (165, 13262), (170, 13280), (174, 13313), (196, 13433), (197, 13436), (207, 13502), (209, 13511), (224, 13595), (226, 13604), (228, 13619), (238, 13694), (243, 13730), (248, 13769), (264, 13883), (266, 13895), (267, 13901), (271, 13940), (277, 13967), (286, 14021), (290, 14075), (303, 14204), (307, 14249), (322, 14336), (347, 14534), (349, 14564), (351, 14606), (361, 14765), (363, 14777), (371, 14840), (378, 14954), (383, 14993), (385, 15065), (386, 15104), (387, 15146), (391, 15221), (392, 15242), (394, 15299), (395, 15320), (398, 15368), (399, 15371), (400, 15386), (403, 15449), (404, 15458), (407, 15500), (415, 15650), (416, 15653),

Gene: Sujidade\_19 Start: 11947, Stop: 15270, Start Num: 12

Candidate Starts for Sujidade\_19:

(Start: 12 @11947 has 61 MA's), (Start: 19 @11983 has 4 MA's), (30, 12094), (41, 12205), (44, 12217), (45, 12229), (54, 12304), (59, 12340), (71, 12469), (77, 12511), (80, 12541), (81, 12547), (83, 12559), (86, 12604), (112, 12832), (121, 13015), (137, 13354), (142, 13414), (145, 13447), (146, 13480), (155, 13561), (158, 13582), (162, 13627), (165, 13660), (170, 13678), (171, 13687), (182, 13753), (196, 13831), (200, 13852), (203, 13873), (211, 13915), (216, 13933), (248, 14080), (258, 14158), (263, 14182), (264, 14194), (266, 14206), (267, 14212), (271, 14251), (275, 14269), (302, 14512), (315, 14614), (346, 14836), (349, 14875), (350, 14887), (360, 15061), (369, 15130), (377, 15256), (379, 15259),

Gene: SunkenRoot\_20 Start: 11847, Stop: 15959, Start Num: 12

Candidate Starts for SunkenRoot\_20:

(Start: 12 @11847 has 61 MA's), (Start: 17 @11871 has 1 MA's), (30, 11991), (32, 12024), (36, 12054), (41, 12102), (42, 12105), (65, 12321), (69, 12345), (71, 12366), (77, 12408), (81, 12444), (82, 12447), (83, 12456), (88, 12519), (93, 12549), (95, 12573), (96, 12582), (97, 12594), (101, 12633), (105, 12657), (112, 12729), (120, 12900), (121, 12909), (135, 13215), (138, 13278), (142, 13311), (151, 13422), (155, 13458), (158, 13479), (162, 13524), (165, 13557), (170, 13575), (174, 13608), (182, 13650), (185, 13665), (190, 13698), (191, 13704), (195, 13722), (198, 13737), (207, 13797), (209, 13806), (212, 13815), (216, 13830), (218, 13845), (224, 13890), (226, 13899), (230, 13926), (237, 13986), (248, 14064), (258, 14142), (264, 14178), (266, 14190), (267, 14196), (271, 14235), (275, 14253), (277, 14262), (290, 14370), (300, 14469), (301, 14475), (302, 14496), (303, 14499), (322, 14631), (332, 14709), (349, 14859), (351, 14901), (378, 15249), (383, 15288), (385, 15360), (386, 15399), (391, 15516), (392, 15537), (394, 15594), (395, 15615), (398, 15663), (399, 15666), (403, 15744), (404, 15753), (407, 15795), (415, 15945), (416, 15948),

Gene: SunsetPointe\_18 Start: 11659, Stop: 14979, Start Num: 12

Candidate Starts for SunsetPointe\_18:

(Start: 12 @11659 has 61 MA's), (30, 11803), (41, 11914), (44, 11926), (49, 11995), (51, 12001), (56, 12022), (69, 12157), (77, 12220), (81, 12256), (82, 12259), (98, 12424), (104, 12463), (110, 12520), (121, 12724), (135, 13027), (136, 13060), (142, 13123), (145, 13156), (151, 13234), (155, 13270), (156, 13273), (158, 13291), (160, 13315), (162, 13336), (165, 13369), (170, 13387), (175, 13423), (185, 13477), (191, 13516), (196, 13540), (206, 13606), (216, 13642), (227, 13714), (241, 13738), (242, 13744), (246, 13768), (248, 13789), (263, 13891), (264, 13903), (269, 13939), (275, 13978), (281, 14011), (298, 14182), (302, 14221), (315, 14323), (317, 14344), (322, 14356), (345, 14533), (349, 14584), (350, 14596), (360, 14770), (369, 14839), (372, 14878), (377, 14965), (379, 14968),

Gene: Superstar\_21 Start: 12671, Stop: 16678, Start Num: 15

Candidate Starts for Superstar\_21:

(Start: 15 @12671 has 29 MA's), (28, 12797), (30, 12806), (39, 12884), (41, 12917), (59, 13049), (64, 13115), (71, 13178), (77, 13220), (81, 13256), (86, 13313), (90, 13343), (100, 13436), (102, 13448), (113, 13598), (119, 13712), (121, 13721), (142, 14120), (151, 14231), (158, 14288), (160, 14312), (162, 14333), (165, 14366), (170, 14384), (185, 14474), (206, 14558), (207, 14561), (208, 14567), (224, 14612), (225, 14615), (248, 14699), (255, 14756), (264, 14813), (266, 14825), (267, 14831), (275, 14888), (287, 14960), (317, 15254), (318, 15257), (322, 15266), (349, 15593), (355, 15698), (357, 15746), (363, 15806), (378, 15983), (384, 16055), (385, 16094), (386, 16133), (390, 16247), (391, 16250), (392, 16271), (394, 16328), (395, 16349), (396, 16352), (401, 16445), (402, 16469), (406, 16493), (415, 16667),

Gene: TagePighther\_19 Start: 11646, Stop: 14969, Start Num: 12

Candidate Starts for TagePighther\_19:

(Start: 12 @11646 has 61 MA's), (30, 11793), (41, 11904), (44, 11916), (45, 11928), (54, 12003), (71, 12168), (77, 12210), (80, 12240), (81, 12246), (86, 12303), (112, 12531), (114, 12591), (121, 12714), (135, 13017), (142, 13113), (145, 13146), (156, 13263), (158, 13281), (162, 13326), (165, 13359), (170, 13377), (182, 13452), (196, 13530), (200, 13551), (211, 13614), (216, 13632), (248, 13779), (258, 13857), (263, 13881), (264, 13893), (266, 13905), (267, 13911), (271, 13950), (275, 13968), (302, 14211), (315, 14313), (325, 14355), (345, 14523), (349, 14574), (350, 14586), (369, 14829), (377, 14955), (379, 14958),

Gene: Tefunt\_18 Start: 11570, Stop: 15475, Start Num: 15

Candidate Starts for Tefunt\_18:

(Start: 15 @11570 has 29 MA's), (30, 11705), (41, 11816), (47, 11879), (54, 11912), (59, 11948), (76, 12110), (77, 12119), (81, 12155), (90, 12242), (119, 12611), (121, 12620), (142, 13019), (145, 13052), (155, 13166), (162, 13232), (165, 13265), (170, 13283), (173, 13307), (175, 13319), (185, 13373), (206, 13457), (208, 13466), (224, 13511), (248, 13598), (255, 13655), (264, 13712), (275, 13787), (287, 13859), (317, 14153), (334, 14252), (341, 14285), (349, 14393), (352, 14438), (355, 14498), (363, 14606), (386, 14933), (387, 14975), (391, 15050), (392, 15071), (394, 15128), (395, 15149), (396, 15152), (398, 15197), (415, 15464),

Gene: Thestral\_19 Start: 11634, Stop: 14933, Start Num: 15

Candidate Starts for Thestral\_19:

(Start: 15 @11634 has 29 MA's), (Start: 20 @11673 has 3 MA's), (30, 11769), (31, 11790), (36, 11832), (39, 11847), (59, 12009), (77, 12180), (81, 12216), (96, 12354), (104, 12423), (119, 12672), (121, 12684), (135, 12987), (142, 13083), (145, 13116), (150, 13188), (151, 13194), (155, 13230), (158, 13251), (160, 13275), (161, 13293), (162, 13296), (165, 13329), (170, 13347), (191, 13476), (200, 13521), (211, 13584), (213, 13590), (248, 13749), (250, 13761), (264, 13863), (275, 13938), (287, 14010), (314, 14277), (334, 14403), (339, 14427), (349, 14544), (350, 14556), (353, 14625), (354, 14634), (357, 14697), (365, 14775), (366, 14787), (369, 14799),

Gene: TinaBelcher\_18 Start: 11621, Stop: 14881, Start Num: 20

Candidate Starts for TinaBelcher\_18:

(Start: 15 @11582 has 29 MA's), (Start: 20 @11621 has 3 MA's), (30, 11717), (31, 11738), (36, 11780), (39, 11795), (59, 11957), (77, 12128), (81, 12164), (106, 12383), (108, 12389), (112, 12449), (121, 12632), (135, 12935), (142, 13031), (145, 13064), (150, 13136), (151, 13142), (157, 13190), (160, 13223), (161, 13241), (162, 13244), (165, 13277), (170, 13295), (191, 13424), (200, 13469), (211, 13532), (213, 13538), (248, 13697), (250, 13709), (264, 13811), (270, 13865), (275, 13886), (287, 13958), (314, 14225), (334, 14351), (339, 14375), (349, 14492), (350, 14504), (353, 14573), (354, 14582), (357, 14645), (365, 14723), (366, 14735), (369, 14747),

Gene: Toma\_18 Start: 11655, Stop: 14978, Start Num: 12

Candidate Starts for Toma\_18:

(Start: 12 @11655 has 61 MA's), (Start: 19 @11691 has 4 MA's), (30, 11802), (41, 11913), (44, 11925), (45, 11937), (54, 12012), (59, 12048), (71, 12177), (77, 12219), (80, 12249), (81, 12255), (83, 12267), (86, 12312), (112, 12540), (121, 12723), (137, 13062), (142, 13122), (145, 13155), (156, 13272), (158, 13290), (162, 13335), (165, 13368), (170, 13386), (182, 13461), (196, 13539), (200, 13560), (203, 13581), (211, 13623), (216, 13641), (248, 13788), (258, 13866), (263, 13890), (264, 13902), (266, 13914), (267, 13920), (271, 13959), (275, 13977), (302, 14220), (315, 14322), (346, 14544), (349, 14583), (350, 14595), (360, 14769), (369, 14838), (377, 14964), (379, 14967),

Gene: Triste\_18 Start: 11637, Stop: 14960, Start Num: 12

Candidate Starts for Triste\_18:

(Start: 12 @11637 has 61 MA's), (30, 11784), (41, 11895), (44, 11907), (45, 11919), (54, 11994), (59, 12030), (77, 12201), (80, 12231), (81, 12237), (86, 12294), (112, 12522), (114, 12582), (121, 12705), (135, 13008), (142, 13104), (145, 13137), (156, 13254), (158, 13272), (162, 13317), (165, 13350), (170, 13368), (182, 13443), (196, 13521), (200, 13542), (211, 13605), (216, 13623), (248, 13770), (258, 13848), (263, 13872), (264, 13884), (266, 13896), (267, 13902), (271, 13941), (275, 13959), (302, 14202), (315, 14304), (325, 14346), (345, 14514), (349, 14565), (350, 14577), (360, 14751), (369, 14820), (377, 14946), (379, 14949),

Gene: Triumph\_20 Start: 11576, Stop: 14881, Start Num: 15

Candidate Starts for Triumph\_20:

(Start: 15 @11576 has 29 MA's), (Start: 20 @11615 has 3 MA's), (30, 11714), (31, 11735), (40, 11807), (41, 11825), (59, 11957), (60, 11969), (76, 12119), (80, 12158), (81, 12164), (82, 12167), (86, 12221), (121, 12632), (135, 12935), (142, 13031), (145, 13064), (158, 13199), (160, 13223), (162, 13244), (163, 13247), (165, 13277), (170, 13295), (175, 13331), (196, 13448), (199, 13460), (206, 13514), (216, 13550), (248, 13697), (258, 13775), (263, 13799), (264, 13811), (271, 13868), (280, 13916), (287, 13958), (293, 14048), (322, 14264), (345, 14441), (349, 14492), (350, 14504), (357, 14645), (360, 14678), (365, 14723), (370, 14759),

Gene: TrvxScott\_17 Start: 11584, Stop: 14883, Start Num: 15

Candidate Starts for TrvxScott\_17:

(Start: 15 @11584 has 29 MA's), (Start: 20 @11623 has 3 MA's), (30, 11719), (31, 11740), (36, 11782), (39, 11797), (59, 11959), (77, 12130), (81, 12166), (121, 12634), (135, 12937), (142, 13033), (145, 13066), (150, 13138), (151, 13144), (160, 13225), (161, 13243), (162, 13246), (165, 13279), (170, 13297), (191, 13426), (200, 13471), (211, 13534), (213, 13540), (248, 13699), (250, 13711), (255, 13756), (264, 13813), (275, 13888), (276, 13894), (287, 13960), (314, 14227), (334, 14353), (339, 14377), (349, 14494), (350, 14506), (353, 14575), (354, 14584), (357, 14647), (362, 14701), (365, 14725), (369, 14749),

Gene: TuanPN\_18 Start: 11643, Stop: 14966, Start Num: 12

Candidate Starts for TuanPN\_18:

(Start: 12 @11643 has 61 MA's), (30, 11790), (41, 11901), (44, 11913), (45, 11925), (54, 12000), (59, 12036), (77, 12207), (80, 12237), (81, 12243), (83, 12255), (86, 12300), (94, 12354), (108, 12468), (112, 12528), (120, 12702), (121, 12711), (135, 13014), (137, 13050), (142, 13110), (145, 13143),

(151, 13221), (156, 13260), (158, 13278), (162, 13323), (165, 13356), (170, 13374), (182, 13449), (196, 13527), (200, 13548), (203, 13569), (211, 13611), (216, 13629), (227, 13701), (248, 13776), (258, 13854), (263, 13878), (264, 13890), (266, 13902), (267, 13908), (271, 13947), (275, 13965), (302, 14208), (306, 14253), (315, 14310), (345, 14520), (349, 14571), (369, 14826), (377, 14952), (379, 14955),

Gene: Unstoppable\_18 Start: 11660, Stop: 14980, Start Num: 12

Candidate Starts for Unstoppable\_18:

(Start: 12 @11660 has 61 MA's), (30, 11804), (41, 11915), (44, 11927), (49, 11996), (51, 12002), (56, 12023), (69, 12158), (77, 12221), (81, 12257), (82, 12260), (98, 12425), (104, 12464), (110, 12521), (121, 12725), (135, 13028), (136, 13061), (142, 13124), (145, 13157), (151, 13235), (155, 13271), (156, 13274), (158, 13292), (160, 13316), (162, 13337), (165, 13370), (170, 13388), (175, 13424), (185, 13478), (191, 13517), (196, 13541), (206, 13607), (216, 13643), (227, 13715), (241, 13739), (242, 13745), (246, 13769), (248, 13790), (263, 13892), (264, 13904), (269, 13940), (275, 13979), (281, 14012), (298, 14183), (302, 14222), (315, 14324), (317, 14345), (322, 14357), (345, 14534), (349, 14585), (350, 14597), (360, 14771), (369, 14840), (372, 14879), (377, 14966), (379, 14969),

Gene: Urza\_18 Start: 11942, Stop: 15343, Start Num: 14

Candidate Starts for Urza\_18:

(Start: 14 @11942 has 5 MA's), (Start: 17 @11957 has 1 MA's), (30, 12077), (40, 12170), (41, 12188), (45, 12212), (61, 12368), (83, 12545), (86, 12590), (96, 12671), (103, 12734), (106, 12752), (113, 12875), (121, 12998), (124, 13070), (127, 13082), (132, 13211), (135, 13304), (141, 13376), (142, 13400), (147, 13475), (157, 13559), (162, 13613), (165, 13646), (167, 13652), (171, 13673), (172, 13685), (179, 13724), (183, 13742), (213, 13907), (223, 13976), (227, 13991), (229, 14006), (233, 14027), (239, 14081), (246, 14132), (248, 14153), (264, 14267), (275, 14342), (277, 14351), (292, 14465), (302, 14585), (320, 14717), (322, 14720), (330, 14771), (340, 14837), (341, 14840), (349, 14948), (353, 15029), (356, 15056), (364, 15173), (373, 15245), (380, 15332),

Gene: Vanseggelen\_23 Start: 11218, Stop: 15330, Start Num: 12

Candidate Starts for Vanseggelen\_23:

(Start: 12 @11218 has 61 MA's), (Start: 17 @11242 has 1 MA's), (22, 11269), (30, 11362), (32, 11395), (36, 11425), (41, 11473), (48, 11545), (69, 11716), (71, 11737), (77, 11779), (83, 11827), (88, 11890), (96, 11953), (109, 12049), (110, 12079), (112, 12100), (116, 12172), (120, 12271), (121, 12280), (135, 12586), (142, 12682), (145, 12715), (151, 12793), (155, 12829), (162, 12895), (189, 13054), (191, 13075), (207, 13168), (209, 13177), (212, 13186), (231, 13300), (238, 13360), (244, 13405), (248, 13435), (255, 13492), (258, 13513), (264, 13549), (271, 13606), (275, 13624), (277, 13633), (322, 14002), (333, 14089), (341, 14122), (343, 14164), (349, 14230), (353, 14311), (355, 14335), (361, 14431), (363, 14443), (375, 14596), (378, 14620), (383, 14659), (385, 14731), (386, 14770), (387, 14812), (391, 14887), (392, 14908), (394, 14965), (395, 14986), (398, 15034), (399, 15037), (400, 15052), (403, 15115), (404, 15124), (407, 15166), (409, 15181), (415, 15316), (416, 15319),

Gene: Verabelle\_19 Start: 11549, Stop: 15661, Start Num: 12

Candidate Starts for Verabelle\_19:

(Start: 12 @11549 has 61 MA's), (Start: 17 @11573 has 1 MA's), (22, 11600), (29, 11687), (30, 11693), (32, 11726), (36, 11756), (41, 11804), (62, 11987), (64, 12005), (71, 12068), (77, 12110), (81, 12146), (83, 12158), (86, 12203), (90, 12233), (96, 12284), (101, 12335), (110, 12410), (112, 12431), (113, 12488), (117, 12524), (120, 12602), (121, 12611), (132, 12824), (135, 12917), (139, 12983), (141, 12989), (142, 13013), (149, 13100), (162, 13226), (164, 13235), (168, 13268), (170, 13277), (174, 13310), (182, 13352), (187, 13373), (191, 13406), (193, 13418), (195, 13424), (198, 13439), (207, 13499), (209, 13508), (212, 13517), (215, 13529), (216, 13532), (230, 13628), (232, 13637), (238, 13691), (244, 13736), (248, 13766), (255, 13823), (258, 13844), (264, 13880), (271, 13937), (275, 13955), (277, 13964), (290, 14072), (305, 14240), (322, 14333), (333, 14420), (341, 14453), (343, 14495), (349, 14561), (353, 14642), (355, 14666), (359, 14744), (375, 14927), (378, 14951), (383,

14990), (384, 15023), (385, 15062), (386, 15101), (391, 15218), (392, 15239), (394, 15296), (395, 15317), (399, 15368), (403, 15446), (404, 15455), (407, 15497), (415, 15647), (416, 15650),

Gene: Verse\_18 Start: 11848, Stop: 15960, Start Num: 12

Candidate Starts for Verse\_18:

(Start: 12 @11848 has 61 MA's), (Start: 17 @11872 has 1 MA's), (30, 11992), (32, 12025), (36, 12055), (41, 12103), (42, 12106), (65, 12322), (73, 12382), (83, 12457), (88, 12520), (96, 12583), (105, 12658), (112, 12730), (120, 12901), (121, 12910), (135, 13216), (137, 13252), (142, 13312), (145, 13345), (151, 13423), (153, 13444), (155, 13459), (158, 13480), (159, 13498), (162, 13525), (165, 13558), (170, 13576), (174, 13609), (185, 13666), (192, 13711), (196, 13729), (207, 13798), (226, 13900), (230, 13927), (238, 13990), (248, 14065), (258, 14143), (262, 14164), (264, 14179), (266, 14191), (267, 14197), (271, 14236), (275, 14254), (290, 14371), (300, 14470), (301, 14476), (302, 14497), (303, 14500), (322, 14632), (332, 14710), (349, 14860), (351, 14902), (378, 15250), (383, 15289), (385, 15361), (386, 15400), (391, 15517), (392, 15538), (394, 15595), (395, 15616), (398, 15664), (399, 15667), (403, 15745), (404, 15754), (407, 15796), (415, 15946), (416, 15949),

Gene: VieEnRose\_18 Start: 12008, Stop: 15409, Start Num: 14

Candidate Starts for VieEnRose\_18:

(Start: 14 @12008 has 5 MA's), (Start: 17 @12023 has 1 MA's), (30, 12143), (40, 12236), (41, 12254), (45, 12278), (61, 12434), (77, 12563), (83, 12611), (86, 12656), (96, 12737), (103, 12800), (106, 12818), (113, 12941), (121, 13064), (124, 13136), (127, 13148), (132, 13277), (135, 13370), (141, 13442), (142, 13466), (157, 13625), (162, 13679), (165, 13712), (167, 13718), (171, 13739), (177, 13784), (183, 13808), (194, 13874), (202, 13919), (217, 13994), (223, 14042), (227, 14057), (229, 14072), (230, 14081), (239, 14147), (246, 14198), (248, 14219), (264, 14333), (275, 14408), (277, 14417), (287, 14480), (302, 14651), (320, 14783), (322, 14786), (327, 14807), (328, 14828), (349, 15014), (350, 15026), (353, 15095), (354, 15104), (356, 15122), (364, 15239), (373, 15311), (380, 15398),

Gene: Werner\_18 Start: 11647, Stop: 14970, Start Num: 12

Candidate Starts for Werner\_18:

(Start: 12 @11647 has 61 MA's), (30, 11794), (41, 11905), (44, 11917), (45, 11929), (54, 12004), (59, 12040), (71, 12169), (77, 12211), (80, 12241), (81, 12247), (86, 12304), (112, 12532), (114, 12592), (121, 12715), (135, 13018), (142, 13114), (145, 13147), (156, 13264), (158, 13282), (162, 13327), (165, 13360), (170, 13378), (182, 13453), (196, 13531), (200, 13552), (211, 13615), (216, 13633), (248, 13780), (258, 13858), (263, 13882), (264, 13894), (266, 13906), (267, 13912), (271, 13951), (275, 13969), (302, 14212), (315, 14314), (325, 14356), (345, 14524), (349, 14575), (350, 14587), (360, 14761), (369, 14830), (377, 14956), (379, 14959),

Gene: Whatever\_18 Start: 11647, Stop: 14970, Start Num: 12

Candidate Starts for Whatever\_18:

(Start: 12 @11647 has 61 MA's), (30, 11794), (31, 11815), (41, 11905), (44, 11917), (45, 11929), (54, 12004), (59, 12040), (71, 12169), (77, 12211), (80, 12241), (81, 12247), (86, 12304), (112, 12532), (114, 12592), (121, 12715), (135, 13018), (142, 13114), (145, 13147), (156, 13264), (158, 13282), (162, 13327), (165, 13360), (170, 13378), (182, 13453), (196, 13531), (200, 13552), (211, 13615), (216, 13633), (248, 13780), (258, 13858), (263, 13882), (264, 13894), (266, 13906), (267, 13912), (271, 13951), (275, 13969), (302, 14212), (315, 14314), (325, 14356), (345, 14524), (349, 14575), (350, 14587), (360, 14761), (369, 14830), (377, 14956), (379, 14959),

Gene: Yasdniil\_18 Start: 11639, Stop: 14962, Start Num: 12

Candidate Starts for Yasdniil\_18:

(Start: 12 @11639 has 61 MA's), (30, 11786), (41, 11897), (44, 11909), (45, 11921), (54, 11996), (59, 12032), (77, 12203), (80, 12233), (81, 12239), (83, 12251), (86, 12296), (94, 12350), (108, 12464), (112, 12524), (120, 12698), (121, 12707), (135, 13010), (137, 13046), (142, 13106), (145, 13139),

(151, 13217), (156, 13256), (158, 13274), (162, 13319), (165, 13352), (170, 13370), (182, 13445), (196, 13523), (200, 13544), (203, 13565), (211, 13607), (216, 13625), (227, 13697), (248, 13772), (258, 13850), (263, 13874), (264, 13886), (266, 13898), (267, 13904), (271, 13943), (275, 13961), (302, 14204), (306, 14249), (315, 14306), (345, 14516), (349, 14567), (369, 14822), (377, 14948), (379, 14951),

Gene: Yosif\_19 Start: 11936, Stop: 15949, Start Num: 14

Candidate Starts for Yosif\_19:

(Start: 14 @11936 has 5 MA's), (Start: 17 @11951 has 1 MA's), (30, 12071), (34, 12113), (36, 12134), (41, 12182), (55, 12281), (69, 12425), (72, 12455), (83, 12536), (91, 12614), (121, 12992), (127, 13076), (130, 13115), (135, 13295), (136, 13328), (142, 13391), (155, 13538), (162, 13604), (165, 13637), (167, 13643), (170, 13655), (193, 13796), (195, 13802), (200, 13829), (213, 13898), (227, 13982), (233, 13985), (235, 13997), (248, 14057), (264, 14171), (266, 14183), (277, 14255), (300, 14450), (302, 14477), (321, 14609), (322, 14612), (327, 14633), (328, 14654), (349, 14840), (376, 15218), (378, 15227), (383, 15266), (384, 15299), (386, 15377), (387, 15419), (388, 15428), (390, 15491), (391, 15494), (392, 15515), (394, 15572), (395, 15593), (398, 15641), (399, 15644), (400, 15659), (403, 15722), (404, 15731), (407, 15773), (410, 15794), (412, 15806), (413, 15848), (415, 15935), (416, 15938),

Gene: Zainub\_20 Start: 12120, Stop: 15311, Start Num: 15

Candidate Starts for Zainub\_20:

(Start: 15 @12120 has 29 MA's), (Start: 20 @12159 has 3 MA's), (28, 12246), (30, 12255), (31, 12276), (36, 12318), (59, 12495), (69, 12603), (72, 12633), (76, 12657), (81, 12702), (82, 12705), (86, 12759), (121, 13170), (130, 13293), (135, 13473), (138, 13536), (140, 13542), (142, 13569), (155, 13716), (158, 13737), (160, 13761), (162, 13782), (163, 13785), (165, 13815), (170, 13833), (205, 13980), (240, 14094), (241, 14097), (253, 14175), (255, 14205), (263, 14250), (264, 14262), (271, 14319), (272, 14322), (284, 14367), (285, 14373), (299, 14529), (306, 14604), (325, 14703), (331, 14769), (342, 14823), (349, 14922), (360, 15108), (362, 15129), (365, 15153), (366, 15165),

Gene: ZamZam\_18 Start: 11560, Stop: 15954, Start Num: 3

Candidate Starts for ZamZam\_18:

(2, 11434), (Start: 3 @11560 has 3 MA's), (6, 11689), (7, 11710), (13, 11896), (18, 11926), (21, 11947), (23, 11962), (24, 11971), (25, 12013), (27, 12028), (33, 12079), (50, 12244), (53, 12250), (58, 12283), (70, 12418), (72, 12445), (75, 12460), (81, 12514), (83, 12526), (88, 12589), (90, 12601), (95, 12643), (96, 12652), (112, 12799), (121, 12979), (123, 13033), (135, 13285), (139, 13351), (142, 13381), (152, 13501), (155, 13528), (157, 13540), (162, 13594), (170, 13645), (174, 13678), (181, 13714), (195, 13792), (199, 13810), (200, 13819), (203, 13840), (213, 13888), (219, 13921), (248, 14047), (251, 14062), (259, 14134), (262, 14146), (264, 14161), (268, 14194), (273, 14224), (275, 14236), (287, 14308), (293, 14398), (298, 14440), (340, 14731), (349, 14842), (353, 14923), (355, 14947), (378, 15232), (383, 15271), (385, 15343), (386, 15382), (387, 15424), (391, 15499), (392, 15520), (394, 15577), (395, 15598), (398, 15646), (399, 15649), (401, 15694), (407, 15778), (411, 15805), (413, 15853), (415, 15940), (416, 15943),

Gene: Zemlya\_19 Start: 11666, Stop: 14989, Start Num: 12

Candidate Starts for Zemlya\_19:

(Start: 12 @11666 has 61 MA's), (Start: 19 @11702 has 4 MA's), (30, 11813), (41, 11924), (44, 11936), (45, 11948), (54, 12023), (59, 12059), (71, 12188), (77, 12230), (80, 12260), (81, 12266), (83, 12278), (86, 12323), (108, 12491), (112, 12551), (120, 12725), (121, 12734), (135, 13037), (137, 13073), (141, 13109), (142, 13133), (145, 13166), (156, 13283), (158, 13301), (162, 13346), (165, 13379), (170, 13397), (182, 13472), (196, 13550), (200, 13571), (203, 13592), (211, 13634), (216, 13652), (248, 13799), (258, 13877), (263, 13901), (264, 13913), (266, 13925), (267, 13931), (271, 13970), (275, 13988), (302, 14231), (315, 14333), (349, 14594), (350, 14606), (354, 14684), (356, 14702), (360, 14780), (369, 14849), (377, 14975), (379, 14978),

Gene: phiCAM\_19 Start: 13655, Stop: 17626, Start Num: 30

Candidate Starts for phiCAM\_19:

(Start: 12 @13511 has 61 MA's), (Start: 17 @13535 has 1 MA's), (30, 13655), (32, 13688), (36, 13718), (41, 13766), (42, 13769), (65, 13985), (71, 14030), (81, 14108), (82, 14111), (83, 14120), (88, 14183), (93, 14213), (95, 14237), (96, 14246), (101, 14297), (105, 14321), (112, 14393), (120, 14564), (121, 14573), (135, 14879), (138, 14942), (142, 14975), (151, 15086), (155, 15122), (158, 15143), (162, 15188), (165, 15221), (170, 15239), (174, 15272), (182, 15314), (185, 15329), (190, 15362), (191, 15368), (195, 15386), (196, 15392), (197, 15395), (207, 15461), (209, 15470), (212, 15479), (216, 15494), (226, 15563), (228, 15578), (238, 15653), (248, 15728), (262, 15827), (264, 15842), (266, 15854), (267, 15860), (271, 15899), (275, 15917), (288, 16007), (290, 16034), (302, 16160), (315, 16262), (322, 16295), (349, 16523), (351, 16565), (361, 16724), (363, 16736), (378, 16913), (383, 16952), (385, 17024), (386, 17063), (391, 17180), (392, 17201), (394, 17258), (395, 17279), (398, 17327), (399, 17330), (400, 17345), (403, 17408), (404, 17417), (407, 17459), (415, 17612), (416, 17615),

Gene: phiHau3\_20 Start: 11837, Stop: 15658, Start Num: 1

Candidate Starts for phiHau3\_20:

(Start: 1 @11837 has 3 MA's), (8, 12173), (10, 12218), (11, 12311), (16, 12335), (Start: 17 @12344 has 1 MA's), (30, 12470), (38, 12554), (43, 12593), (52, 12680), (59, 12737), (66, 12830), (68, 12839), (71, 12866), (74, 12884), (78, 12917), (81, 12944), (86, 13001), (87, 13010), (105, 13157), (106, 13163), (107, 13166), (118, 13385), (121, 13412), (126, 13493), (133, 13631), (135, 13715), (142, 13811), (143, 13820), (154, 13955), (155, 13958), (157, 13970), (165, 14057), (166, 14060), (168, 14066), (197, 14231), (201, 14258), (235, 14417), (241, 14426), (248, 14477), (252, 14501), (257, 14549), (262, 14576), (264, 14591), (275, 14666), (284, 14717), (319, 15035), (329, 15089), (331, 15119), (349, 15272), (353, 15353), (354, 15362), (356, 15380), (377, 15647),