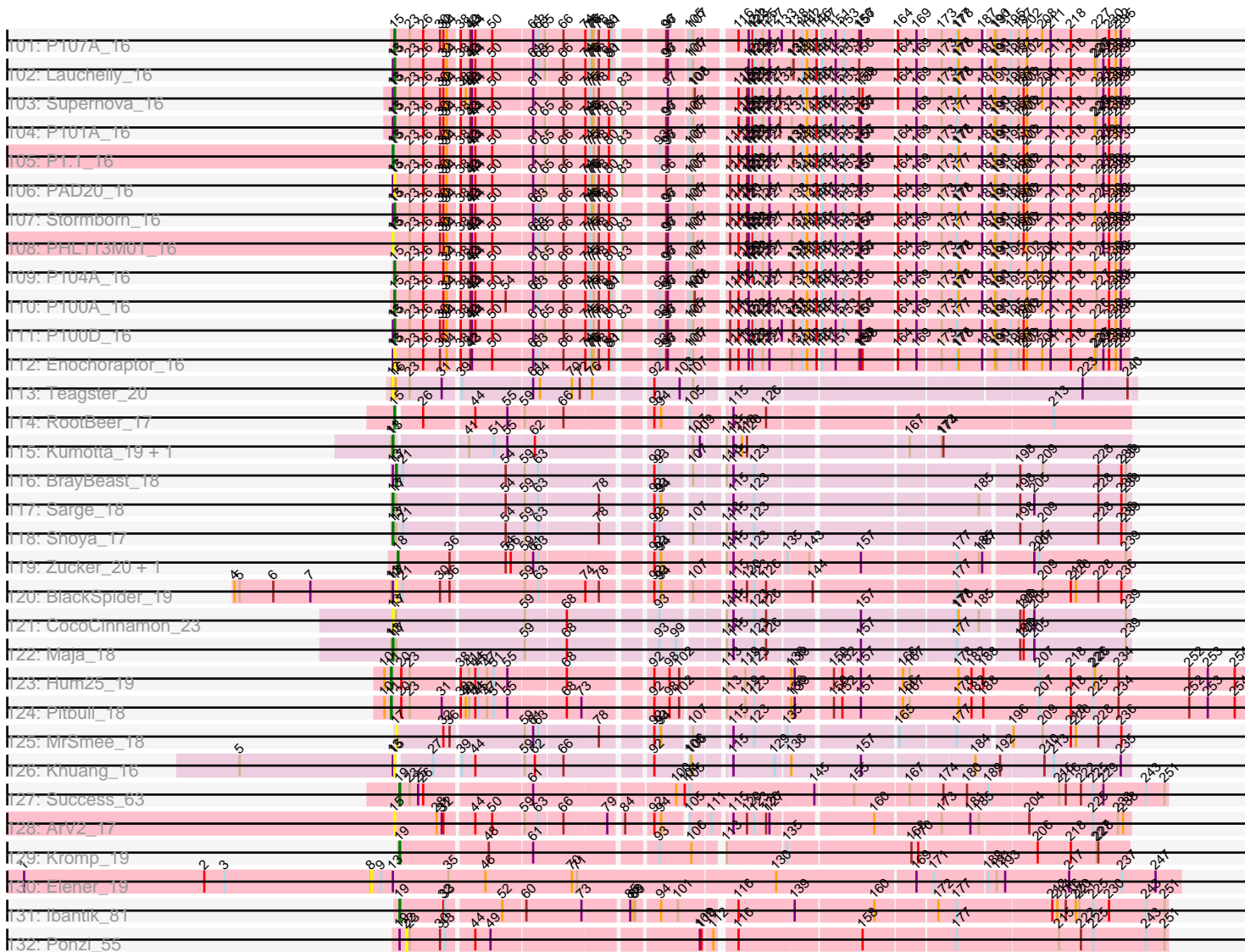




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|                        |    |    |  |    |    |    |  |    |     |     |     |     |     |     |     |  |     |     |     |     |     |     |
|------------------------|----|----|--|----|----|----|--|----|-----|-----|-----|-----|-----|-----|-----|--|-----|-----|-----|-----|-----|-----|
| 51: phiCAM_21          | 15 | 20 |  | 30 | 86 | 75 |  |    | 107 | 112 | 124 | 128 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 52: ElGato_21          | 15 | 20 |  | 30 | 86 | 75 |  |    | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 53: Speedwell_27       | 15 | 20 |  | 30 | 86 | 75 |  | 87 | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 54: Verabelle_21       | 15 | 20 |  | 30 | 86 | 75 |  |    | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 55: Provotone_21       | 15 | 20 |  | 30 | 86 | 75 |  | 87 | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 56: Dexers_19          | 15 | 20 |  | 30 | 86 | 70 |  | 87 | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 57: phiHau3_22         | 15 | 20 |  | 30 | 86 | 70 |  | 87 | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 58: BroPtease_21 + 1   | 15 | 20 |  | 30 | 86 | 70 |  | 87 | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 59: Itza_20 + 2        | 15 | 20 |  | 30 | 86 |    |  | 87 | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 60: VieEnRose_20       | 15 | 20 |  | 30 | 86 |    |  | 87 | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 61: Keiki_16 + 1       | 15 | 20 |  | 30 | 86 |    |  | 87 | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 62: Kubed_16           | 15 | 20 |  | 30 | 86 |    |  | 87 | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 63: Attache_16         | 15 | 20 |  | 30 | 86 |    |  | 87 | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 64: P9.1_16            | 15 | 20 |  | 30 | 86 |    |  | 87 | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 65: PHL010M04_16       | 15 | 20 |  | 30 | 86 |    |  | 87 | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 66: PHL071N05_16       | 15 | 20 |  | 30 | 86 |    |  | 87 | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 67: MEAK_16            | 15 | 20 |  | 30 | 86 |    |  | 87 | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 68: LinBandit_16       | 15 | 20 |  | 30 | 86 |    |  | 87 | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 69: PHL067M10_16       | 15 | 20 |  | 30 | 86 |    |  | 87 | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 70: P106A_16           | 15 | 20 |  | 30 | 86 |    |  | 87 | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 71: Solid_16           | 15 | 20 |  | 30 | 86 |    |  | 87 | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 72: P106M_16 + 3       | 15 | 20 |  | 30 | 86 |    |  | 87 | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 73: Ouroboros_16       | 15 | 20 |  | 30 | 86 |    |  | 87 | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 74: Cota_16            | 15 | 20 |  | 30 | 86 |    |  | 87 | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 75: P14.4_16           | 15 | 20 |  | 30 | 86 |    |  | 87 | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 76: MiAK_16            | 15 | 20 |  | 30 | 86 |    |  | 87 | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 77: Procrasti_16       | 15 | 20 |  | 30 | 86 |    |  | 87 | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 78: PAS50_16           | 15 | 20 |  | 30 | 86 |    |  | 87 | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 79: SKKY_16            | 15 | 20 |  | 30 | 86 |    |  | 87 | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 80: PHL114L00_16       | 15 | 20 |  | 30 | 86 |    |  | 87 | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 81: ATCC29399B1_16     | 15 | 20 |  | 30 | 86 |    |  | 87 | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 82: PA6_16             | 15 | 20 |  | 30 | 86 |    |  | 87 | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 83: Enoki_16           | 15 | 20 |  | 30 | 86 |    |  | 87 | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 84: Levisosa_16        | 15 | 20 |  | 30 | 86 |    |  | 87 | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 85: ATCC29399BC_16 + 1 | 15 | 20 |  | 30 | 86 |    |  | 87 | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 86: P104B_16           | 15 | 20 |  | 30 | 86 |    |  | 87 | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 87: Rileysaurus_16     | 15 | 20 |  | 30 | 86 |    |  | 87 | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 88: BruceLethal_16     | 15 | 20 |  | 30 | 86 |    |  | 87 | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 89: PHL037M02_16       | 15 | 20 |  | 30 | 86 |    |  | 87 | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 90: PHL060L00_16       | 15 | 20 |  | 30 | 86 |    |  | 87 | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 91: PHL111M01_16       | 15 | 20 |  | 30 | 86 |    |  | 87 | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 92: P100.1_16          | 15 | 20 |  | 30 | 86 |    |  | 87 | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 93: Wizzo_16           | 15 | 20 |  | 30 | 86 |    |  | 87 | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 94: Moyashi_16         | 15 | 20 |  | 30 | 86 |    |  | 87 | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 95: P108C_16           | 15 | 20 |  | 30 | 86 |    |  | 87 | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 96: QueenBey_16        | 15 | 20 |  | 30 | 86 |    |  | 87 | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 97: Aquanus_16         | 15 | 20 |  | 30 | 86 |    |  | 87 | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 98: PHL112N00_16       | 15 | 20 |  | 30 | 86 |    |  | 87 | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 99: P105_16            | 15 | 20 |  | 30 | 86 |    |  | 87 | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |
| 100: DParker_16        | 15 | 20 |  | 30 | 86 |    |  | 87 | 107 | 112 | 116 | 124 | 140 | 152 | 158 |  | 189 | 201 | 211 | 229 | 235 | 238 |

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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 193747 Report

This analysis was run 11/02/24 on database version 579.

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 193747 has 193 members, 32 are drafts.

Phages represented in each track:

- Track 1 : AbbyDaisy\_19
- Track 2 : Raqqa\_19
- Track 3 : Caliburn\_20, Legacy\_20, BeardedLady\_21, Nerdos\_20, Leviticus\_20, Unstoppable\_20, Aaronocolus\_20, Phettuccine\_20, Hydra\_22, Indigo\_20, SunsetPointe\_20, Esperer\_20, Bovely\_20, Ozzie\_20
- Track 4 : Asten\_20, Dwayne\_20, Werner\_20, Chucky\_20, OzzyJ\_21, Emaanora\_22, TagePhighter\_21, Whatever\_20, BarryBee\_22, Snorlax\_20, Triste\_20
- Track 5 : Lorelei\_20, Rana\_20, Nabi\_20
- Track 6 : BryanRecycles\_21, Oliynk\_21, Eddasa\_21, Izzy\_21, Jash\_21, Rusticus\_21
- Track 7 : Lika\_20, Godpower\_21, Sujidade\_21
- Track 8 : TuanPN\_20, YasdniI\_20, Maneekul\_20, Ejemplo\_20
- Track 9 : Danzina\_21
- Track 10 : Dattran\_21, Celeste\_20, Goby\_20, Toma\_20
- Track 11 : Brataylor\_21
- Track 12 : RedBear\_22, South40\_21, Katalie\_21
- Track 13 : EnochSoames\_22
- Track 14 : Hippo\_20
- Track 15 : Nanodon\_22
- Track 16 : SarahRose\_20
- Track 17 : Lannister\_21
- Track 18 : Zemlya\_21
- Track 19 : Amethyst\_20
- Track 20 : Loofah\_21, Paedore\_20
- Track 21 : TrvxScott\_19
- Track 22 : Issmi\_21
- Track 23 : Paolo\_22, Zainub\_22, Jevington\_22
- Track 24 : Thestral\_21
- Track 25 : Bowden\_21, TinaBelcher\_20
- Track 26 : Diane\_20
- Track 27 : Superstar\_23
- Track 28 : Haizum\_20, Tefunt\_20
- Track 29 : Animus\_21, SqueakyClean\_21

- Track 30 : Hank144\_21
- Track 31 : ELB20\_19, R4\_20
- Track 32 : Marav\_23
- Track 33 : Puginator\_22
- Track 34 : Omar\_21
- Track 35 : Daudau\_20
- Track 36 : BartholomewSD\_22, Alvy\_22
- Track 37 : Triumph\_22
- Track 38 : GirlDinner\_20
- Track 39 : Andris\_20
- Track 40 : Caelum\_21
- Track 41 : Pablito\_20
- Track 42 : Janus\_21
- Track 43 : Nishikigoi\_20
- Track 44 : Vanseggelen\_25
- Track 45 : Yosif\_21
- Track 46 : Verse\_20, Amela\_20
- Track 47 : Alsaber\_21, Kaine\_21
- Track 48 : Celery\_23
- Track 49 : Pavo\_22, Conan\_21
- Track 50 : Saftant\_20
- Track 51 : phiCAM\_21
- Track 52 : ElGato\_21
- Track 53 : Speedwell\_27
- Track 54 : Verabelle\_21
- Track 55 : Provolone\_21
- Track 56 : Dexers\_19
- Track 57 : phiHau3\_22
- Track 58 : BroPlease\_21, GreenWeasel\_22
- Track 59 : Itza\_20, Celia\_20, Urza\_20
- Track 60 : VieEnRose\_20
- Track 61 : Keiki\_16, Pirate\_16
- Track 62 : Kubed\_16
- Track 63 : Attacne\_16
- Track 64 : P9.1\_16
- Track 65 : PHL010M04\_16
- Track 66 : PHL071N05\_16
- Track 67 : MEAK\_16
- Track 68 : LilBandit\_16
- Track 69 : PHL067M10\_16
- Track 70 : P106A\_16
- Track 71 : Solid\_16
- Track 72 : P106M\_16, P106I\_16, P106C\_16, P106L\_16
- Track 73 : Ouroboros\_16
- Track 74 : Cota\_16
- Track 75 : P14.4\_16
- Track 76 : MrAK\_16
- Track 77 : Procrass1\_16
- Track 78 : PAS50\_16
- Track 79 : SKKY\_16
- Track 80 : PHL114L00\_16
- Track 81 : ATCC29399BT\_16
- Track 82 : PA6\_16

- Track 83 : Enoki\_16
- Track 84 : Leviosa\_16
- Track 85 : ATCC29399BC\_16, P107C\_16
- Track 86 : P104B\_16
- Track 87 : Rileysaurus\_16
- Track 88 : BruceLethal\_16
- Track 89 : PHL037M02\_16
- Track 90 : PHL060L00\_16
- Track 91 : PHL111M01\_16
- Track 92 : P100.1\_16
- Track 93 : Wizzo\_16
- Track 94 : Moyashi\_16
- Track 95 : P108C\_16
- Track 96 : QueenBey\_16
- Track 97 : Aquarius\_16
- Track 98 : PHL112N00\_16
- Track 99 : P105\_16
- Track 100 : DrParker\_16
- Track 101 : P107A\_16
- Track 102 : Lauchelly\_16
- Track 103 : Supernova\_16
- Track 104 : P101A\_16
- Track 105 : P1.1\_16
- Track 106 : PAD20\_16
- Track 107 : Stormborn\_16
- Track 108 : PHL113M01\_16
- Track 109 : P104A\_16
- Track 110 : P100A\_16
- Track 111 : P100D\_16
- Track 112 : Enochoraptor\_16
- Track 113 : Teagster\_20
- Track 114 : RootBeer\_17
- Track 115 : Kumotta\_19, MargaretKali\_19
- Track 116 : BrayBeast\_18
- Track 117 : Sarge\_18
- Track 118 : Shoya\_17
- Track 119 : Zucker\_20, Bauer\_21
- Track 120 : BlackSpider\_19
- Track 121 : CocoCinnamon\_23
- Track 122 : Maja\_18
- Track 123 : Hum25\_19
- Track 124 : Pitbull\_18
- Track 125 : MrSmee\_18
- Track 126 : Khuang\_16
- Track 127 : Success\_63
- Track 128 : ArV2\_17
- Track 129 : Kromp\_19
- Track 130 : Elener\_19
- Track 131 : Ibantik\_81
- Track 132 : Ponzi\_55

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

The start number called the most often in the published annotations is 15, it was called in 143 of the 161 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- ATCC29399BC\_16, ATCC29399BT\_16, Aaronocolus\_20, AbbyDaisy\_19, Alsaber\_21, Alvy\_22, Amela\_20, Amethyst\_20, Andris\_20, Animus\_21, Aquarius\_16, ArV2\_17, Asten\_20, Attacne\_16, BarryBee\_22, BartholomewSD\_22, BeardedLady\_21, Bovely\_20, Bowden\_21, Brataylor\_21, BroPlease\_21, BruceLethal\_16, BryanRecycles\_21, Caelum\_21, Caliburn\_20, Celery\_23, Celeste\_20, Celia\_20, Chucky\_20, Conan\_21, Cota\_16, Danzina\_21, Dattran\_21, Daudau\_20, Dexers\_19, Diane\_20, DrParker\_16, Dwayne\_20, ELB20\_19, Eddasa\_21, Ejemplo\_20, ElGato\_21, Emaanora\_22, EnochSoames\_22, Enochoraptor\_16, Enoki\_16, Esperer\_20, GirlDinner\_20, Goby\_20, Godpower\_21, GreenWeasel\_22, Haizum\_20, Hank144\_21, Hippo\_20, Hydra\_22, Indigo\_20, Issmi\_21, Itza\_20, Izzy\_21, Janus\_21, Jash\_21, Jevington\_22, Kaine\_21, Katalie\_21, Keiki\_16, Khuang\_16, Kubed\_16, Lannister\_21, Lauchelly\_16, Legacy\_20, Leviosa\_16, Leviticus\_20, Lika\_20, Loofah\_21, Lorelei\_20, MEAK\_16, Maneekul\_20, Marav\_23, Moyashi\_16, MrAK\_16, Nabi\_20, Nanodon\_22, Nerdos\_20, Nishikigoi\_20, Oliynyk\_21, Omar\_21, Ouroboros\_16, Ozzie\_20, OzzyJ\_21, P100.1\_16, P100A\_16, P100D\_16, P101A\_16, P104A\_16, P104B\_16, P105\_16, P106A\_16, P106C\_16, P106I\_16, P106L\_16, P106M\_16, P107A\_16, P107C\_16, P108C\_16, PA6\_16, PAD20\_16, PAS50\_16, PHL037M02\_16, Pablito\_20, Paedore\_20, Paolo\_22, Pavo\_22, Phettuccine\_20, Pirate\_16, Procrass1\_16, Provolone\_21, Puginator\_22, QueenBey\_16, R4\_20, Rana\_20, Ragga\_19, RedBear\_22, Rileysaurus\_16, RootBeer\_17, Rusticus\_21, SKKY\_16, Saftant\_20, SarahRose\_20, Snorlax\_20, Solid\_16, South40\_21, Speedwell\_27, SqueakyClean\_21, Stormborn\_16, Sujidade\_21, SunsetPointe\_20, Supernova\_16, Superstar\_23, TagePhighter\_21, Tefunt\_20, Thestral\_21, TinaBelcher\_20, Toma\_20, Triste\_20, Triumph\_22, TrvxScott\_19, TuanPN\_20, Unstoppable\_20, Urza\_20, Vanseggelen\_25, Verabelle\_21, Verse\_20, VieEnRose\_20, Werner\_20, Whatever\_20, Wizzo\_16, Yasdniil\_20, Yosif\_21, Zainub\_22, Zemlya\_21,

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

- LilBandit\_16, P1.1\_16, P14.4\_16, P9.1\_16, PHL010M04\_16, PHL060L00\_16, PHL067M10\_16, PHL071N05\_16, PHL112N00\_16, PHL113M01\_16, PHL114L00\_16, phiCAM\_21, phiHau3\_22,

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

- Bauer\_21, BlackSpider\_19, BrayBeast\_18, CocoCinnamon\_23, Elener\_19, Hum25\_19, Ibantik\_81, Kromp\_19, Kumotta\_19, Maja\_18, MargaretKali\_19, MrSmee\_18, PHL111M01\_16, Pitbull\_18, Ponzi\_55, Sarge\_18, Shoya\_17, Success\_63, Teagster\_20, Zucker\_20,

## **Summary by start number:**

Start 8:

- Found in 1 of 193 ( 0.5% ) of genes in pham
- No Manual Annotations of this start.
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Elener\_19 (singleton),



Start 11:

- Found in 11 of 193 ( 5.7% ) of genes in pham
- Manual Annotations of this start: 3 of 161
- Called 27.3% of time when present
- Phage (with cluster) where this start called: Hum25\_19 (FQ), Pitbull\_18 (FQ), phiHau3\_22 (BD4),

Start 12:

- Found in 1 of 193 ( 0.5% ) of genes in pham
- No Manual Annotations of this start.
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Teagster\_20 (EB),

Start 13:

- Found in 53 of 193 ( 27.5% ) of genes in pham
- Manual Annotations of this start: 9 of 161
- Called 32.1% of time when present
- Phage (with cluster) where this start called: CocoCinnamon\_23 (FO), Kumotta\_19 (FB), LilBandit\_16 (BU), Maja\_18 (FO), MargaretKali\_19 (FB), P1.1\_16 (BU), P14.4\_16 (BU), P9.1\_16 (BU), PHL010M04\_16 (BU), PHL060L00\_16 (BU), PHL067M10\_16 (BU), PHL071N05\_16 (BU), PHL112N00\_16 (BU), PHL113M01\_16 (BU), PHL114L00\_16 (BU), Sarge\_18 (FB), Shoya\_17 (FB),

Start 14:

- Found in 1 of 193 ( 0.5% ) of genes in pham
- No Manual Annotations of this start.
- Called 100.0% of time when present
- Phage (with cluster) where this start called: PHL111M01\_16 (BU),

Start 15:

- Found in 173 of 193 ( 89.6% ) of genes in pham
- Manual Annotations of this start: 143 of 161
- Called 92.5% of time when present
- Phage (with cluster) where this start called: ATCC29399BC\_16 (BU), ATCC29399BT\_16 (BU), Aaronocolus\_20 (BD1), AbbyDaisy\_19 (AY), Alsaber\_21 (BD3), Alvy\_22 (BD2), Amela\_20 (BD3), Amethyst\_20 (BD2), Andris\_20 (BD2), Animus\_21 (BD2), Aquarius\_16 (BU), ArV2\_17 (singleton), Asten\_20 (BD1), Attacne\_16 (BU), BarryBee\_22 (BD1), BartholomewSD\_22 (BD2), BeardedLady\_21 (BD1), Bovely\_20 (BD1), Bowden\_21 (BD2), Brataylor\_21 (BD1), BroPlease\_21 (BD4), BruceLethal\_16 (BU), BryanRecycles\_21 (BD1), Caelum\_21 (BD2), Caliburn\_20 (BD1), Celery\_23 (BD3), Celeste\_20 (BD1), Celia\_20 (BD6), Chucky\_20 (BD1), Conan\_21 (BD3), Cota\_16 (BU), Danzina\_21 (BD1), Dattran\_21 (BD1), Daudau\_20 (BD2), Dexers\_19 (BD3), Diane\_20 (BD2), DrParker\_16 (BU), Dwayne\_20 (BD1), ELB20\_19 (BD2), Eddasa\_21 (BD1), Ejemplo\_20 (BD1), ElGato\_21 (BD3), Emaanora\_22 (BD1), EnochSoames\_22 (BD1), Enochoraptor\_16 (BU), Enoki\_16 (BU), Esperer\_20 (BD1), GirlDinner\_20 (BD2), Goby\_20 (BD1), Godpower\_21 (BD1), GreenWeasel\_22 (BD4), Haizum\_20 (BD2), Hank144\_21 (BD2), Hippo\_20 (BD1), Hydra\_22 (BD1), Indigo\_20 (BD1), Issmi\_21 (BD2), Itza\_20 (BD6), Izzy\_21 (BD1), Janus\_21 (BD2), Jash\_21 (BD1), Jevington\_22 (BD2), Kaine\_21 (BD3), Katalie\_21 (BD1), Keiki\_16 (BU), Khuang\_16 (UNK), Kubed\_16 (BU), Lannister\_21 (BD1), Lauchelly\_16 (BU), Legacy\_20 (BD1), Leviosa\_16 (BU), Leviticus\_20 (BD1), Lika\_20 (BD1), Loofah\_21 (BD2), Lorelei\_20 (BD1), MEAK\_16



(BU), Maneekul\_20 (BD1), Marav\_23 (BD2), Moyashi\_16 (BU), MrAK\_16 (BU), Nabi\_20 (BD1), Nanodon\_22 (BD1), Nerdos\_20 (BD1), Nishikigoi\_20 (BD2), Oliynyk\_21 (BD1), Omar\_21 (BD2), Ouroboros\_16 (BU), Ozzie\_20 (BD1), OzzyJ\_21 (BD1), P100.1\_16 (BU), P100A\_16 (BU), P100D\_16 (BU), P101A\_16 (BU), P104A\_16 (BU), P104B\_16 (BU), P105\_16 (BU), P106A\_16 (BU), P106C\_16 (BU), P106L\_16 (BU), P106L\_16 (BU), P106M\_16 (BU), P107A\_16 (BU), P107C\_16 (BU), P108C\_16 (BU), PA6\_16 (BU), PAD20\_16 (BU), PAS50\_16 (BU), PHL037M02\_16 (BU), Pablito\_20 (BD2), Paedore\_20 (BD2), Paolo\_22 (BD2), Pavo\_22 (BD3), Phettuccine\_20 (BD1), Pirate\_16 (BU), Procrass1\_16 (BU), Provolone\_21 (BD3), Puginator\_22 (BD2), QueenBey\_16 (BU), R4\_20 (BD2), Rana\_20 (BD1), Raqqa\_19 (AY), RedBear\_22 (BD1), Rileysaurus\_16 (BU), RootBeer\_17 (FA), Rusticus\_21 (BD1), SKKY\_16 (BU), Saftant\_20 (BD3), SarahRose\_20 (BD1), Snorlax\_20 (BD1), Solid\_16 (BU), South40\_21 (BD1), Speedwell\_27 (BD3), SqueakyClean\_21 (BD2), Stormborn\_16 (BU), Sujidade\_21 (BD1), SunsetPointe\_20 (BD1), Supernova\_16 (BU), Superstar\_23 (BD2), TagePhighter\_21 (BD1), Tefunt\_20 (BD2), Thestral\_21 (BD2), TinaBelcher\_20 (BD2), Toma\_20 (BD1), Triste\_20 (BD1), Triumph\_22 (BD2), TrvxScott\_19 (BD2), TuanPN\_20 (BD1), Unstoppable\_20 (BD1), Urza\_20 (BD6), Vanseggelen\_25 (BD3), Verabelle\_21 (BD3), Verse\_20 (BD3), VieEnRose\_20 (BD6), Werner\_20 (BD1), Whatever\_20 (BD1), Wizzo\_16 (BU), Yasdnil\_20 (BD1), Yosif\_21 (BD3), Zainub\_22 (BD2), Zemlya\_21 (BD1),

#### Start 17:

- Found in 7 of 193 ( 3.6% ) of genes in pham
- Manual Annotations of this start: 1 of 161
- Called 42.9% of time when present
- Phage (with cluster) where this start called: BlackSpider\_19 (FN), BrayBeast\_18 (FB), MrSmee\_18 (UNK),

#### Start 18:

- Found in 2 of 193 ( 1.0% ) of genes in pham
- Manual Annotations of this start: 2 of 161
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Bauer\_21 (FN), Zucker\_20 (FN),

#### Start 19:

- Found in 4 of 193 ( 2.1% ) of genes in pham
- Manual Annotations of this start: 3 of 161
- Called 75.0% of time when present
- Phage (with cluster) where this start called: Ibantik\_81 (singleton), Kromp\_19 (singleton), Success\_63 (singleton),

#### Start 22:

- Found in 1 of 193 ( 0.5% ) of genes in pham
- No Manual Annotations of this start.
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Ponzi\_55 (singleton),

#### Start 59:

- Found in 116 of 193 ( 60.1% ) 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\_21 (BD3),

## **Summary by clusters:**

There are 15 clusters represented in this pham: FQ, singleton, FA, EB, BU, FB, BD6, BD1, BD3, BD2, AY, BD4, UNK, FN, FO,

Info for manual annotations of cluster AY:

- Start number 15 was manually annotated 1 time for cluster AY.

Info for manual annotations of cluster BD1:

- Start number 15 was manually annotated 55 times for cluster BD1.

Info for manual annotations of cluster BD2:

- Start number 15 was manually annotated 32 times for cluster BD2.

Info for manual annotations of cluster BD3:

- Start number 15 was manually annotated 9 times for cluster BD3.

Info for manual annotations of cluster BD4:

- Start number 11 was manually annotated 1 time for cluster BD4.
- Start number 15 was manually annotated 2 times for cluster BD4.

Info for manual annotations of cluster BD6:

- Start number 15 was manually annotated 4 times for cluster BD6.

Info for manual annotations of cluster BU:

- Start number 13 was manually annotated 4 times for cluster BU.
- Start number 15 was manually annotated 39 times for cluster BU.

Info for manual annotations of cluster FA:

- Start number 15 was manually annotated 1 time for cluster FA.

Info for manual annotations of cluster FB:

- Start number 13 was manually annotated 4 times for cluster FB.
- Start number 17 was manually annotated 1 time for cluster FB.

Info for manual annotations of cluster FN:

- Start number 18 was manually annotated 2 times for cluster FN.

Info for manual annotations of cluster FO:

- Start number 13 was manually annotated 1 time for cluster FO.

Info for manual annotations of cluster FQ:

- Start number 11 was manually annotated 2 times for cluster FQ.

## **Gene Information:**

Gene: ATCC29399BC\_16 Start: 12232, Stop: 13389, Start Num: 15

Candidate Starts for ATCC29399BC\_16:

(Start: 13 @12229 has 9 MA's), (Start: 15 @12232 has 143 MA's), (23, 12259), (26, 12283), (30, 12310), (32, 12316), (34, 12322), (38, 12337), (42, 12352), (43, 12355), (44, 12358), (50, 12388), (61, 12451), (66, 12493), (74, 12526), (75, 12535), (77, 12541), (78, 12550), (80, 12568), (81, 12571), (96, 12643), (97, 12646), (105, 12679), (107, 12685), (114, 12730), (116, 12742), (120, 12757), (122, 12766), (123, 12769), (125, 12784), (127, 12796), (138, 12838), (141, 12850), (142, 12859), (146, 12874), (147, 12877), (151, 12901), (153, 12916), (156, 12943), (157, 12946), (164, 13003), (169, 13036), (173, 13072), (177, 13099), (187, 13141), (190, 13156), (191, 13159), (195, 13183), (197, 13195), (200, 13204), (202, 13210), (211, 13252), (218, 13288), (227, 13333), (229, 13345), (230, 13354), (232, 13366), (235, 13375),

Gene: ATCC29399BT\_16 Start: 12235, Stop: 13392, Start Num: 15

Candidate Starts for ATCC29399BT\_16:

(Start: 15 @12235 has 143 MA's), (23, 12262), (26, 12286), (34, 12325), (38, 12340), (42, 12355), (43, 12358), (44, 12361), (50, 12391), (61, 12454), (66, 12496), (74, 12529), (75, 12538), (76, 12541), (77, 12544), (78, 12553), (80, 12571), (81, 12574), (93, 12634), (96, 12646), (97, 12649), (105, 12682), (107, 12688), (116, 12745), (120, 12760), (121, 12763), (122, 12769), (123, 12772), (125, 12787), (127, 12799), (133, 12820), (137, 12838), (138, 12841), (141, 12853), (142, 12862), (147, 12880), (151, 12904), (153, 12919), (156, 12946), (164, 13006), (169, 13039), (173, 13075), (177, 13102), (187, 13144), (190, 13159), (191, 13162), (195, 13186), (197, 13198), (202, 13213), (208, 13240), (211, 13255), (218, 13291), (227, 13336), (230, 13357), (232, 13369), (235, 13378),

Gene: Aaronocolus\_20 Start: 15854, Stop: 17068, Start Num: 15

Candidate Starts for Aaronocolus\_20:

(Start: 15 @15854 has 143 MA's), (23, 15881), (59, 16064), (67, 16127), (87, 16226), (92, 16253), (107, 16322), (112, 16352), (140, 16472), (158, 16571), (186, 16769), (189, 16775), (196, 16814), (203, 16838), (210, 16865), (211, 16874), (217, 16907), (229, 16967), (235, 16997), (246, 17045), (249, 17054), (250, 17060),

Gene: AbbyDaisy\_19 Start: 15422, Stop: 16528, Start Num: 15

Candidate Starts for AbbyDaisy\_19:

(Start: 11 @15416 has 3 MA's), (Start: 15 @15422 has 143 MA's), (24, 15452), (30, 15500), (34, 15512), (37, 15524), (59, 15629), (66, 15680), (92, 15806), (94, 15818), (112, 15887), (126, 15959), (196, 16334), (211, 16394), (231, 16493),

Gene: Alsaber\_21 Start: 16538, Stop: 17755, Start Num: 15

Candidate Starts for Alsaber\_21:

(Start: 15 @16538 has 143 MA's), (23, 16565), (29, 16616), (59, 16748), (62, 16763), (75, 16850), (87, 16910), (107, 17006), (112, 17036), (124, 17093), (128, 17117), (149, 17192), (152, 17219), (158, 17255), (184, 17444), (189, 17459), (191, 17474), (201, 17519), (207, 17540), (211, 17558), (229, 17651), (235, 17681), (249, 17741), (250, 17747),

Gene: Alvy\_22 Start: 15862, Stop: 17073, Start Num: 15

Candidate Starts for Alvy\_22:

(Start: 15 @15862 has 143 MA's), (59, 16072), (61, 16084), (62, 16087), (70, 16147), (92, 16261), (95, 16276), (116, 16384), (128, 16441), (131, 16453), (148, 16513), (160, 16600), (161, 16621), (178, 16738), (189, 16783), (191, 16798), (207, 16864), (211, 16882), (219, 16924), (224, 16951), (229, 16975), (249, 17059), (250, 17065),

Gene: Amela\_20 Start: 16831, Stop: 18048, Start Num: 15

Candidate Starts for Amela\_20:

(Start: 15 @16831 has 143 MA's), (23, 16858), (29, 16909), (53, 17011), (59, 17041), (66, 17101), (75, 17143), (87, 17203), (107, 17299), (112, 17329), (124, 17386), (127, 17407), (149, 17485), (158, 17548), (189, 17752), (191, 17767), (207, 17833), (211, 17851), (229, 17944), (235, 17974), (249,

18034), (250, 18040),

Gene: Amethyst\_20 Start: 16313, Stop: 17527, Start Num: 15

Candidate Starts for Amethyst\_20:

(Start: 15 @16313 has 143 MA's), (23, 16340), (57, 16517), (61, 16535), (62, 16538), (70, 16598), (92, 16712), (116, 16835), (128, 16892), (178, 17189), (189, 17234), (203, 17297), (229, 17426), (246, 17504), (249, 17513), (250, 17519),

Gene: Andris\_20 Start: 15567, Stop: 16778, Start Num: 15

Candidate Starts for Andris\_20:

(Start: 15 @15567 has 143 MA's), (49, 15723), (59, 15777), (61, 15789), (62, 15792), (70, 15852), (92, 15966), (95, 15981), (116, 16089), (128, 16146), (140, 16185), (148, 16218), (152, 16248), (158, 16284), (160, 16305), (178, 16443), (189, 16488), (191, 16503), (201, 16548), (203, 16551), (210, 16578), (211, 16587), (229, 16680), (249, 16764), (250, 16770),

Gene: Animus\_21 Start: 15903, Stop: 17114, Start Num: 15

Candidate Starts for Animus\_21:

(Start: 15 @15903 has 143 MA's), (59, 16113), (61, 16125), (62, 16128), (70, 16188), (72, 16200), (92, 16302), (95, 16317), (106, 16368), (148, 16554), (158, 16620), (160, 16641), (178, 16779), (189, 16824), (191, 16839), (201, 16884), (203, 16887), (210, 16914), (211, 16923), (229, 17016), (249, 17100), (250, 17106),

Gene: Aquarius\_16 Start: 12255, Stop: 13412, Start Num: 15

Candidate Starts for Aquarius\_16:

(Start: 13 @12252 has 9 MA's), (Start: 15 @12255 has 143 MA's), (23, 12282), (26, 12306), (30, 12333), (32, 12339), (34, 12345), (38, 12360), (42, 12375), (43, 12378), (44, 12381), (50, 12411), (61, 12474), (63, 12483), (65, 12492), (66, 12516), (74, 12549), (75, 12558), (76, 12561), (77, 12564), (78, 12573), (80, 12591), (83, 12600), (93, 12654), (96, 12666), (97, 12669), (105, 12702), (107, 12708), (114, 12753), (116, 12765), (120, 12780), (121, 12783), (122, 12789), (123, 12792), (125, 12807), (127, 12819), (137, 12858), (138, 12861), (141, 12873), (142, 12882), (146, 12897), (147, 12900), (151, 12924), (153, 12939), (156, 12966), (157, 12969), (164, 13026), (169, 13059), (173, 13095), (177, 13122), (187, 13164), (190, 13179), (191, 13182), (195, 13206), (197, 13218), (200, 13227), (202, 13233), (208, 13260), (211, 13275), (218, 13311), (226, 13353), (227, 13356), (229, 13368), (230, 13377), (232, 13389), (235, 13398),

Gene: ArV2\_17 Start: 13763, Stop: 14869, Start Num: 15

Candidate Starts for ArV2\_17:

(Start: 15 @13763 has 143 MA's), (28, 13835), (31, 13844), (32, 13847), (44, 13889), (50, 13919), (59, 13970), (63, 13991), (66, 14021), (79, 14093), (84, 14108), (92, 14147), (94, 14159), (105, 14192), (111, 14225), (115, 14246), (120, 14267), (123, 14279), (126, 14300), (127, 14306), (160, 14462), (173, 14564), (181, 14609), (185, 14624), (204, 14699), (225, 14807), (233, 14849), (238, 14858),

Gene: Asten\_20 Start: 15820, Stop: 17031, Start Num: 15

Candidate Starts for Asten\_20:

(Start: 15 @15820 has 143 MA's), (59, 16030), (61, 16042), (62, 16045), (67, 16093), (87, 16192), (92, 16219), (107, 16288), (116, 16342), (128, 16399), (149, 16474), (152, 16501), (156, 16531), (159, 16555), (166, 16609), (176, 16687), (189, 16741), (196, 16780), (200, 16798), (210, 16831), (211, 16840), (217, 16873), (219, 16882), (229, 16933), (249, 17017), (250, 17023),

Gene: Attacne\_16 Start: 12235, Stop: 13392, Start Num: 15

Candidate Starts for Attacne\_16:

(Start: 15 @12235 has 143 MA's), (23, 12262), (26, 12286), (30, 12313), (32, 12319), (34, 12325), (38, 12340), (40, 12349), (42, 12355), (43, 12358), (44, 12361), (50, 12391), (61, 12454), (65, 12472), (66,

12496), (74, 12529), (75, 12538), (76, 12541), (77, 12544), (78, 12553), (80, 12571), (93, 12634), (96, 12646), (97, 12649), (105, 12682), (107, 12688), (116, 12745), (120, 12760), (121, 12763), (122, 12769), (123, 12772), (125, 12787), (127, 12799), (138, 12841), (141, 12853), (142, 12862), (146, 12877), (147, 12880), (151, 12904), (153, 12919), (156, 12946), (158, 12952), (164, 13006), (169, 13039), (173, 13075), (177, 13102), (187, 13144), (190, 13159), (191, 13162), (195, 13186), (197, 13198), (200, 13207), (202, 13213), (208, 13240), (211, 13255), (218, 13291), (226, 13333), (227, 13336), (230, 13357), (232, 13369), (235, 13378),

Gene: BarryBee\_22 Start: 15830, Stop: 17041, Start Num: 15

Candidate Starts for BarryBee\_22:

(Start: 15 @15830 has 143 MA's), (59, 16040), (61, 16052), (62, 16055), (67, 16103), (87, 16202), (92, 16229), (107, 16298), (116, 16352), (128, 16409), (149, 16484), (152, 16511), (156, 16541), (159, 16565), (166, 16619), (176, 16697), (189, 16751), (196, 16790), (200, 16808), (210, 16841), (211, 16850), (217, 16883), (219, 16892), (229, 16943), (249, 17027), (250, 17033),

Gene: BartholomewSD\_22 Start: 15862, Stop: 17073, Start Num: 15

Candidate Starts for BartholomewSD\_22:

(Start: 15 @15862 has 143 MA's), (59, 16072), (61, 16084), (62, 16087), (70, 16147), (92, 16261), (95, 16276), (116, 16384), (128, 16441), (131, 16453), (148, 16513), (160, 16600), (161, 16621), (178, 16738), (189, 16783), (191, 16798), (207, 16864), (211, 16882), (219, 16924), (224, 16951), (229, 16975), (249, 17059), (250, 17065),

Gene: Bauer\_21 Start: 16040, Stop: 17158, Start Num: 18

Candidate Starts for Bauer\_21:

(Start: 18 @16040 has 2 MA's), (36, 16127), (54, 16214), (56, 16223), (59, 16247), (61, 16259), (63, 16268), (92, 16430), (93, 16439), (94, 16442), (113, 16526), (115, 16538), (123, 16571), (135, 16622), (143, 16652), (157, 16730), (177, 16880), (185, 16916), (187, 16922), (205, 16994), (207, 17003), (239, 17150),

Gene: BeardedLady\_21 Start: 16101, Stop: 17315, Start Num: 15

Candidate Starts for BeardedLady\_21:

(Start: 15 @16101 has 143 MA's), (23, 16128), (59, 16311), (67, 16374), (87, 16473), (92, 16500), (107, 16569), (112, 16599), (140, 16719), (158, 16818), (186, 17016), (189, 17022), (196, 17061), (203, 17085), (210, 17112), (211, 17121), (217, 17154), (229, 17214), (235, 17244), (246, 17292), (249, 17301), (250, 17307),

Gene: BlackSpider\_19 Start: 15684, Stop: 16802, Start Num: 17

Candidate Starts for BlackSpider\_19:

(4, 15396), (5, 15405), (6, 15465), (7, 15531), (Start: 11 @15675 has 3 MA's), (Start: 13 @15678 has 9 MA's), (Start: 17 @15684 has 1 MA's), (21, 15693), (30, 15756), (36, 15771), (59, 15891), (63, 15912), (74, 15978), (78, 16002), (92, 16074), (93, 16083), (94, 16086), (107, 16128), (115, 16182), (120, 16203), (123, 16215), (126, 16236), (144, 16302), (177, 16524), (209, 16653), (218, 16701), (220, 16710), (228, 16749), (236, 16788),

Gene: Bovely\_20 Start: 15860, Stop: 17074, Start Num: 15

Candidate Starts for Bovely\_20:

(Start: 15 @15860 has 143 MA's), (23, 15887), (59, 16070), (67, 16133), (87, 16232), (92, 16259), (107, 16328), (112, 16358), (140, 16478), (158, 16577), (186, 16775), (189, 16781), (196, 16820), (203, 16844), (210, 16871), (211, 16880), (217, 16913), (229, 16973), (235, 17003), (246, 17051), (249, 17060), (250, 17066),

Gene: Bowden\_21 Start: 15794, Stop: 17005, Start Num: 15

Candidate Starts for Bowden\_21:

(Start: 15 @15794 has 143 MA's), (59, 16004), (61, 16016), (62, 16019), (70, 16079), (92, 16193), (95, 16208), (106, 16259), (116, 16316), (128, 16373), (148, 16445), (158, 16511), (160, 16532), (161, 16553), (178, 16670), (189, 16715), (191, 16730), (207, 16796), (211, 16814), (219, 16856), (224, 16883), (229, 16907), (249, 16991), (250, 16997),

Gene: Brataylor\_21 Start: 15847, Stop: 17058, Start Num: 15

Candidate Starts for Brataylor\_21:

(Start: 15 @15847 has 143 MA's), (23, 15874), (53, 16027), (59, 16057), (67, 16120), (87, 16219), (92, 16246), (107, 16315), (116, 16369), (119, 16381), (128, 16426), (148, 16498), (149, 16501), (158, 16564), (160, 16585), (169, 16660), (186, 16762), (189, 16768), (194, 16804), (196, 16807), (200, 16825), (211, 16867), (248, 17041), (249, 17044), (250, 17050),

Gene: BrayBeast\_18 Start: 14080, Stop: 15198, Start Num: 17

Candidate Starts for BrayBeast\_18:

(Start: 13 @14074 has 9 MA's), (Start: 17 @14080 has 1 MA's), (21, 14089), (54, 14254), (59, 14287), (63, 14308), (92, 14470), (93, 14479), (107, 14524), (113, 14566), (115, 14578), (123, 14611), (198, 15013), (209, 15049), (228, 15145), (236, 15184), (239, 15190),

Gene: BroPlease\_21 Start: 16546, Stop: 17751, Start Num: 15

Candidate Starts for BroPlease\_21:

(10, 16528), (Start: 11 @16540 has 3 MA's), (Start: 15 @16546 has 143 MA's), (32, 16633), (55, 16732), (61, 16768), (70, 16831), (92, 16945), (94, 16957), (106, 17011), (107, 17014), (112, 17044), (116, 17068), (128, 17125), (140, 17164), (148, 17197), (149, 17200), (155, 17248), (189, 17467), (191, 17482), (201, 17527), (210, 17557), (213, 17572), (219, 17608), (246, 17728), (249, 17737), (250, 17743),

Gene: BruceLethal\_16 Start: 12244, Stop: 13401, Start Num: 15

Candidate Starts for BruceLethal\_16:

(Start: 15 @12244 has 143 MA's), (23, 12271), (26, 12295), (32, 12328), (34, 12334), (38, 12349), (42, 12364), (43, 12367), (44, 12370), (50, 12400), (61, 12463), (63, 12472), (66, 12505), (74, 12538), (75, 12547), (76, 12550), (77, 12553), (80, 12580), (93, 12643), (96, 12655), (97, 12658), (105, 12691), (107, 12697), (114, 12742), (116, 12754), (120, 12769), (121, 12772), (122, 12778), (123, 12781), (125, 12796), (127, 12808), (133, 12829), (138, 12850), (141, 12862), (142, 12871), (146, 12886), (147, 12889), (151, 12913), (153, 12928), (156, 12955), (164, 13015), (169, 13048), (173, 13084), (177, 13111), (179, 13123), (187, 13153), (190, 13168), (191, 13171), (195, 13195), (197, 13207), (200, 13216), (202, 13222), (211, 13264), (218, 13300), (230, 13366), (232, 13378), (235, 13387),

Gene: BryanRecycles\_21 Start: 16017, Stop: 17219, Start Num: 15

Candidate Starts for BryanRecycles\_21:

(Start: 15 @16017 has 143 MA's), (23, 16044), (59, 16227), (67, 16290), (87, 16389), (92, 16416), (107, 16485), (112, 16515), (186, 16932), (189, 16938), (196, 16977), (201, 16998), (210, 17028), (211, 17037), (217, 17070), (232, 17151), (245, 17193), (246, 17196), (249, 17205), (250, 17211),

Gene: Caelum\_21 Start: 16340, Stop: 17551, Start Num: 15

Candidate Starts for Caelum\_21:

(Start: 15 @16340 has 143 MA's), (23, 16367), (58, 16547), (61, 16562), (62, 16565), (70, 16625), (87, 16712), (92, 16739), (107, 16808), (116, 16862), (128, 16919), (158, 17057), (189, 17261), (199, 17315), (229, 17453), (246, 17528), (249, 17537), (250, 17543),

Gene: Caliburn\_20 Start: 15834, Stop: 17048, Start Num: 15

Candidate Starts for Caliburn\_20:

(Start: 15 @15834 has 143 MA's), (23, 15861), (59, 16044), (67, 16107), (87, 16206), (92, 16233), (107, 16302), (112, 16332), (140, 16452), (158, 16551), (186, 16749), (189, 16755), (196, 16794),

(203, 16818), (210, 16845), (211, 16854), (217, 16887), (229, 16947), (235, 16977), (246, 17025), (249, 17034), (250, 17040),

Gene: Celery\_23 Start: 16489, Stop: 17706, Start Num: 15

Candidate Starts for Celery\_23:

(Start: 15 @16489 has 143 MA's), (23, 16516), (29, 16567), (59, 16699), (66, 16759), (75, 16801), (107, 16957), (112, 16987), (124, 17044), (127, 17065), (128, 17068), (149, 17143), (152, 17170), (158, 17206), (189, 17410), (191, 17425), (197, 17458), (201, 17470), (211, 17509), (229, 17602), (235, 17632), (249, 17692), (250, 17698),

Gene: Celeste\_20 Start: 15839, Stop: 17050, Start Num: 15

Candidate Starts for Celeste\_20:

(Start: 15 @15839 has 143 MA's), (23, 15866), (48, 15992), (53, 16019), (59, 16049), (67, 16112), (87, 16211), (92, 16238), (107, 16307), (116, 16361), (119, 16373), (128, 16418), (148, 16490), (149, 16493), (158, 16556), (160, 16577), (169, 16652), (186, 16754), (189, 16760), (194, 16796), (196, 16799), (200, 16817), (211, 16859), (248, 17033), (249, 17036), (250, 17042),

Gene: Celia\_20 Start: 16277, Stop: 17497, Start Num: 15

Candidate Starts for Celia\_20:

(Start: 15 @16277 has 143 MA's), (25, 16319), (32, 16364), (49, 16433), (57, 16481), (59, 16487), (91, 16673), (92, 16676), (97, 16700), (107, 16745), (116, 16799), (152, 16958), (158, 16994), (183, 17177), (191, 17213), (196, 17237), (200, 17255), (203, 17261), (211, 17297), (219, 17339), (244, 17465), (249, 17483), (250, 17489),

Gene: Chucky\_20 Start: 15831, Stop: 17042, Start Num: 15

Candidate Starts for Chucky\_20:

(Start: 15 @15831 has 143 MA's), (59, 16041), (61, 16053), (62, 16056), (67, 16104), (87, 16203), (92, 16230), (107, 16299), (116, 16353), (128, 16410), (149, 16485), (152, 16512), (156, 16542), (159, 16566), (166, 16620), (176, 16698), (189, 16752), (196, 16791), (200, 16809), (210, 16842), (211, 16851), (217, 16884), (219, 16893), (229, 16944), (249, 17028), (250, 17034),

Gene: CocoCinnamon\_23 Start: 15713, Stop: 16837, Start Num: 13

Candidate Starts for CocoCinnamon\_23:

(Start: 13 @15713 has 9 MA's), (Start: 17 @15719 has 1 MA's), (59, 15926), (68, 15986), (93, 16118), (113, 16205), (115, 16217), (123, 16250), (126, 16271), (157, 16409), (177, 16559), (178, 16562), (185, 16595), (198, 16652), (200, 16658), (205, 16673), (239, 16829),

Gene: Conan\_21 Start: 16260, Stop: 17477, Start Num: 15

Candidate Starts for Conan\_21:

(Start: 15 @16260 has 143 MA's), (23, 16287), (29, 16338), (59, 16470), (75, 16572), (107, 16728), (112, 16758), (116, 16782), (124, 16815), (128, 16839), (149, 16914), (158, 16977), (189, 17181), (191, 17196), (201, 17241), (207, 17262), (211, 17280), (229, 17373), (235, 17403), (249, 17463), (250, 17469),

Gene: Cota\_16 Start: 12250, Stop: 13407, Start Num: 15

Candidate Starts for Cota\_16:

(Start: 13 @12247 has 9 MA's), (Start: 15 @12250 has 143 MA's), (23, 12277), (26, 12301), (30, 12328), (32, 12334), (34, 12340), (38, 12355), (42, 12370), (43, 12373), (44, 12376), (50, 12406), (61, 12469), (65, 12487), (66, 12511), (74, 12544), (75, 12553), (77, 12559), (78, 12568), (80, 12586), (83, 12595), (93, 12649), (97, 12664), (107, 12703), (108, 12706), (114, 12748), (116, 12760), (120, 12775), (121, 12778), (122, 12784), (123, 12787), (125, 12802), (127, 12814), (132, 12832), (141, 12868), (142, 12877), (146, 12892), (147, 12895), (151, 12919), (153, 12934), (156, 12961), (157, 12964), (164, 13021), (169, 13054), (173, 13090), (177, 13117), (187, 13159), (190, 13174), (191,



13177), (195, 13201), (200, 13222), (202, 13228), (211, 13270), (218, 13306), (226, 13348), (230, 13372), (232, 13384), (235, 13393),

Gene: Danzina\_21 Start: 16049, Stop: 17260, Start Num: 15

Candidate Starts for Danzina\_21:

(Start: 15 @16049 has 143 MA's), (23, 16076), (48, 16202), (50, 16208), (53, 16229), (59, 16259), (67, 16322), (87, 16421), (92, 16448), (107, 16517), (116, 16571), (117, 16574), (119, 16583), (128, 16628), (148, 16700), (149, 16703), (158, 16766), (160, 16787), (169, 16862), (186, 16964), (189, 16970), (194, 17006), (196, 17009), (200, 17027), (211, 17069), (248, 17243), (249, 17246), (250, 17252),

Gene: Dattran\_21 Start: 15838, Stop: 17049, Start Num: 15

Candidate Starts for Dattran\_21:

(Start: 15 @15838 has 143 MA's), (23, 15865), (48, 15991), (53, 16018), (59, 16048), (67, 16111), (87, 16210), (92, 16237), (107, 16306), (116, 16360), (119, 16372), (128, 16417), (148, 16489), (149, 16492), (158, 16555), (160, 16576), (169, 16651), (186, 16753), (189, 16759), (194, 16795), (196, 16798), (200, 16816), (211, 16858), (248, 17032), (249, 17035), (250, 17041),

Gene: Daudau\_20 Start: 15774, Stop: 16985, Start Num: 15

Candidate Starts for Daudau\_20:

(Start: 15 @15774 has 143 MA's), (30, 15855), (39, 15882), (55, 15960), (59, 15984), (61, 15996), (70, 16059), (90, 16158), (92, 16173), (95, 16188), (116, 16296), (128, 16353), (148, 16425), (158, 16491), (178, 16650), (189, 16695), (191, 16710), (211, 16794), (213, 16800), (219, 16836), (224, 16863), (229, 16887), (249, 16971), (250, 16977),

Gene: Dexers\_19 Start: 16241, Stop: 17458, Start Num: 15

Candidate Starts for Dexers\_19:

(Start: 15 @16241 has 143 MA's), (23, 16268), (29, 16319), (59, 16451), (62, 16466), (75, 16553), (87, 16613), (107, 16709), (112, 16739), (128, 16820), (149, 16895), (152, 16922), (158, 16958), (184, 17147), (189, 17162), (191, 17177), (201, 17222), (207, 17243), (211, 17261), (229, 17354), (235, 17384), (249, 17444), (250, 17450),

Gene: Diane\_20 Start: 16306, Stop: 17520, Start Num: 15

Candidate Starts for Diane\_20:

(Start: 15 @16306 has 143 MA's), (23, 16333), (39, 16414), (43, 16432), (55, 16492), (57, 16510), (61, 16528), (62, 16531), (70, 16591), (92, 16705), (116, 16828), (128, 16885), (178, 17182), (186, 17221), (189, 17227), (203, 17290), (229, 17419), (246, 17497), (249, 17506), (250, 17512),

Gene: DrParker\_16 Start: 12276, Stop: 13433, Start Num: 15

Candidate Starts for DrParker\_16:

(Start: 13 @12273 has 9 MA's), (Start: 15 @12276 has 143 MA's), (23, 12303), (26, 12327), (30, 12354), (34, 12366), (38, 12381), (40, 12390), (42, 12396), (43, 12399), (44, 12402), (50, 12432), (61, 12495), (65, 12513), (66, 12537), (74, 12570), (75, 12579), (76, 12582), (77, 12585), (78, 12594), (80, 12612), (83, 12621), (93, 12675), (96, 12687), (97, 12690), (105, 12723), (107, 12729), (116, 12786), (120, 12801), (121, 12804), (122, 12810), (123, 12813), (125, 12828), (127, 12840), (132, 12858), (137, 12879), (142, 12903), (146, 12918), (147, 12921), (151, 12945), (153, 12960), (156, 12987), (157, 12990), (169, 13080), (173, 13116), (177, 13143), (187, 13185), (190, 13200), (191, 13203), (195, 13227), (197, 13239), (200, 13248), (202, 13254), (211, 13296), (218, 13332), (226, 13374), (227, 13377), (229, 13389), (230, 13398), (232, 13410), (235, 13419),

Gene: Dwayne\_20 Start: 15827, Stop: 17038, Start Num: 15

Candidate Starts for Dwayne\_20:

(Start: 15 @15827 has 143 MA's), (59, 16037), (61, 16049), (62, 16052), (67, 16100), (87, 16199), (92, 16226), (107, 16295), (116, 16349), (128, 16406), (149, 16481), (152, 16508), (156, 16538), (159, 16562), (166, 16616), (176, 16694), (189, 16748), (196, 16787), (200, 16805), (210, 16838), (211, 16847), (217, 16880), (219, 16889), (229, 16940), (249, 17024), (250, 17030),

Gene: ELB20\_19 Start: 15893, Stop: 17104, Start Num: 15

Candidate Starts for ELB20\_19:

(Start: 15 @15893 has 143 MA's), (39, 16001), (59, 16103), (61, 16115), (62, 16118), (70, 16178), (92, 16292), (95, 16307), (116, 16415), (124, 16448), (128, 16472), (148, 16544), (152, 16574), (159, 16628), (160, 16631), (161, 16652), (178, 16769), (189, 16814), (191, 16829), (211, 16913), (212, 16916), (213, 16919), (219, 16955), (227, 16994), (229, 17006), (239, 17045), (246, 17081), (249, 17090), (250, 17096),

Gene: Eddasa\_21 Start: 16017, Stop: 17219, Start Num: 15

Candidate Starts for Eddasa\_21:

(Start: 15 @16017 has 143 MA's), (23, 16044), (59, 16227), (67, 16290), (87, 16389), (92, 16416), (107, 16485), (112, 16515), (186, 16932), (189, 16938), (196, 16977), (201, 16998), (210, 17028), (211, 17037), (217, 17070), (232, 17151), (245, 17193), (246, 17196), (249, 17205), (250, 17211),

Gene: Ejemplo\_20 Start: 15827, Stop: 17038, Start Num: 15

Candidate Starts for Ejemplo\_20:

(Start: 15 @15827 has 143 MA's), (23, 15854), (59, 16037), (61, 16049), (62, 16052), (87, 16199), (92, 16226), (116, 16349), (128, 16406), (149, 16481), (152, 16508), (156, 16538), (160, 16565), (166, 16616), (189, 16748), (196, 16787), (200, 16805), (209, 16835), (210, 16838), (211, 16847), (217, 16880), (219, 16889), (229, 16940), (242, 17000), (249, 17024), (250, 17030),

Gene: ElGato\_21 Start: 16263, Stop: 17480, Start Num: 15

Candidate Starts for ElGato\_21:

(Start: 15 @16263 has 143 MA's), (23, 16290), (29, 16341), (59, 16473), (75, 16575), (107, 16731), (112, 16761), (116, 16785), (124, 16818), (128, 16842), (149, 16917), (158, 16980), (184, 17169), (189, 17184), (191, 17199), (201, 17244), (207, 17265), (211, 17283), (229, 17376), (235, 17406), (249, 17466), (250, 17472),

Gene: Elener\_19 Start: 16464, Stop: 17870, Start Num: 8

Candidate Starts for Elener\_19:

(1, 15846), (2, 16167), (3, 16203), (8, 16464), (9, 16482), (Start: 13 @16503 has 9 MA's), (35, 16602), (46, 16668), (70, 16821), (71, 16830), (130, 17175), (169, 17415), (171, 17442), (189, 17529), (191, 17544), (193, 17559), (217, 17673), (237, 17766), (247, 17826),

Gene: Emaanora\_22 Start: 15830, Stop: 17041, Start Num: 15

Candidate Starts for Emaanora\_22:

(Start: 15 @15830 has 143 MA's), (59, 16040), (61, 16052), (62, 16055), (67, 16103), (87, 16202), (92, 16229), (107, 16298), (116, 16352), (128, 16409), (149, 16484), (152, 16511), (156, 16541), (159, 16565), (166, 16619), (176, 16697), (189, 16751), (196, 16790), (200, 16808), (210, 16841), (211, 16850), (217, 16883), (219, 16892), (229, 16943), (249, 17027), (250, 17033),

Gene: EnochSoames\_22 Start: 16013, Stop: 17215, Start Num: 15

Candidate Starts for EnochSoames\_22:

(Start: 15 @16013 has 143 MA's), (23, 16040), (59, 16223), (67, 16286), (87, 16385), (92, 16412), (107, 16481), (112, 16511), (140, 16631), (186, 16928), (189, 16934), (196, 16973), (201, 16994), (210, 17024), (211, 17033), (217, 17066), (232, 17147), (245, 17189), (246, 17192), (249, 17201), (250, 17207),

Gene: Enochoraptor\_16 Start: 12247, Stop: 13404, Start Num: 15

Candidate Starts for Enochoraptor\_16:

(Start: 13 @12244 has 9 MA's), (Start: 15 @12247 has 143 MA's), (23, 12274), (26, 12298), (30, 12325), (34, 12337), (38, 12352), (42, 12367), (43, 12370), (50, 12403), (61, 12466), (63, 12475), (66, 12508), (74, 12541), (75, 12550), (76, 12553), (77, 12556), (78, 12565), (80, 12583), (81, 12586), (93, 12646), (96, 12658), (97, 12661), (105, 12694), (107, 12700), (114, 12745), (116, 12757), (121, 12775), (122, 12781), (123, 12784), (125, 12799), (127, 12811), (137, 12850), (141, 12865), (142, 12874), (146, 12889), (147, 12892), (151, 12916), (156, 12958), (157, 12961), (158, 12964), (164, 13018), (169, 13051), (173, 13087), (177, 13114), (178, 13117), (187, 13156), (190, 13171), (191, 13174), (195, 13198), (197, 13210), (200, 13219), (202, 13225), (208, 13252), (211, 13267), (218, 13303), (226, 13345), (227, 13348), (229, 13360), (230, 13369), (232, 13381), (235, 13390),

Gene: Enoki\_16 Start: 12229, Stop: 13386, Start Num: 15

Candidate Starts for Enoki\_16:

(Start: 13 @12226 has 9 MA's), (Start: 15 @12229 has 143 MA's), (23, 12256), (26, 12280), (30, 12307), (32, 12313), (34, 12319), (38, 12334), (42, 12349), (43, 12352), (44, 12355), (50, 12385), (61, 12448), (65, 12466), (66, 12490), (74, 12523), (75, 12532), (77, 12538), (78, 12547), (80, 12565), (83, 12574), (97, 12643), (105, 12676), (107, 12682), (116, 12739), (120, 12754), (121, 12757), (122, 12763), (123, 12766), (125, 12781), (127, 12793), (137, 12832), (138, 12835), (141, 12847), (142, 12856), (146, 12871), (147, 12874), (151, 12898), (153, 12913), (156, 12940), (157, 12943), (164, 13000), (169, 13033), (173, 13069), (177, 13096), (178, 13099), (187, 13138), (190, 13153), (191, 13156), (195, 13180), (197, 13192), (200, 13201), (202, 13207), (218, 13285), (226, 13327), (229, 13342), (230, 13351), (232, 13363), (235, 13372),

Gene: Esperer\_20 Start: 15854, Stop: 17068, Start Num: 15

Candidate Starts for Esperer\_20:

(Start: 15 @15854 has 143 MA's), (23, 15881), (59, 16064), (67, 16127), (87, 16226), (92, 16253), (107, 16322), (112, 16352), (140, 16472), (158, 16571), (186, 16769), (189, 16775), (196, 16814), (203, 16838), (210, 16865), (211, 16874), (217, 16907), (229, 16967), (235, 16997), (246, 17045), (249, 17054), (250, 17060),

Gene: GirlDinner\_20 Start: 15565, Stop: 16776, Start Num: 15

Candidate Starts for GirlDinner\_20:

(Start: 15 @15565 has 143 MA's), (59, 15775), (61, 15787), (62, 15790), (70, 15850), (92, 15964), (95, 15979), (106, 16030), (148, 16216), (158, 16282), (159, 16300), (160, 16303), (178, 16441), (189, 16486), (191, 16501), (201, 16546), (203, 16549), (206, 16564), (210, 16576), (211, 16585), (229, 16678), (249, 16762), (250, 16768),

Gene: Goby\_20 Start: 15844, Stop: 17055, Start Num: 15

Candidate Starts for Goby\_20:

(Start: 15 @15844 has 143 MA's), (23, 15871), (48, 15997), (53, 16024), (59, 16054), (67, 16117), (87, 16216), (92, 16243), (107, 16312), (116, 16366), (119, 16378), (128, 16423), (148, 16495), (149, 16498), (158, 16561), (160, 16582), (169, 16657), (186, 16759), (189, 16765), (194, 16801), (196, 16804), (200, 16822), (211, 16864), (248, 17038), (249, 17041), (250, 17047),

Gene: Godpower\_21 Start: 15855, Stop: 17066, Start Num: 15

Candidate Starts for Godpower\_21:

(Start: 15 @15855 has 143 MA's), (23, 15882), (59, 16065), (61, 16077), (62, 16080), (67, 16128), (87, 16227), (92, 16254), (107, 16323), (116, 16377), (128, 16434), (149, 16509), (156, 16566), (160, 16593), (189, 16776), (196, 16815), (209, 16863), (210, 16866), (211, 16875), (217, 16908), (249, 17052), (250, 17058),

Gene: GreenWeasel\_22 Start: 16555, Stop: 17760, Start Num: 15

Candidate Starts for GreenWeasel\_22:

(10, 16537), (Start: 11 @16549 has 3 MA's), (Start: 15 @16555 has 143 MA's), (32, 16642), (55, 16741), (61, 16777), (70, 16840), (92, 16954), (94, 16966), (106, 17020), (107, 17023), (112, 17053), (116, 17077), (128, 17134), (140, 17173), (148, 17206), (149, 17209), (155, 17257), (189, 17476), (191, 17491), (201, 17536), (210, 17566), (213, 17581), (219, 17617), (246, 17737), (249, 17746), (250, 17752),

Gene: Haizum\_20 Start: 16338, Stop: 17552, Start Num: 15

Candidate Starts for Haizum\_20:

(Start: 15 @16338 has 143 MA's), (23, 16365), (39, 16446), (55, 16524), (57, 16542), (61, 16560), (62, 16563), (70, 16623), (92, 16737), (116, 16860), (128, 16917), (178, 17214), (189, 17259), (203, 17322), (229, 17451), (246, 17529), (249, 17538), (250, 17544),

Gene: Hank144\_21 Start: 15960, Stop: 17171, Start Num: 15

Candidate Starts for Hank144\_21:

(Start: 15 @15960 has 143 MA's), (39, 16068), (42, 16083), (59, 16170), (61, 16182), (62, 16185), (70, 16245), (92, 16359), (95, 16374), (116, 16482), (148, 16611), (158, 16677), (160, 16698), (161, 16719), (178, 16836), (186, 16875), (189, 16881), (191, 16896), (210, 16971), (211, 16980), (229, 17073), (249, 17157), (250, 17163),

Gene: Hippo\_20 Start: 15830, Stop: 17041, Start Num: 15

Candidate Starts for Hippo\_20:

(Start: 15 @15830 has 143 MA's), (59, 16040), (61, 16052), (62, 16055), (67, 16103), (87, 16202), (92, 16229), (107, 16298), (116, 16352), (128, 16409), (149, 16484), (152, 16511), (156, 16541), (159, 16565), (166, 16619), (176, 16697), (189, 16751), (196, 16790), (200, 16808), (210, 16841), (211, 16850), (217, 16883), (219, 16892), (229, 16943), (235, 16973), (249, 17027), (250, 17033),

Gene: Hum25\_19 Start: 13554, Stop: 15002, Start Num: 11

Candidate Starts for Hum25\_19:

(10, 13542), (Start: 11 @13554 has 3 MA's), (20, 13569), (23, 13584), (38, 13662), (41, 13677), (44, 13683), (45, 13689), (47, 13704), (51, 13716), (55, 13740), (68, 13824), (92, 13947), (98, 13974), (102, 13989), (113, 14046), (119, 14076), (123, 14091), (136, 14145), (139, 14151), (150, 14202), (152, 14217), (157, 14250), (166, 14316), (167, 14328), (178, 14415), (182, 14436), (188, 14457), (207, 14556), (218, 14610), (225, 14649), (226, 14652), (234, 14694), (252, 14820), (253, 14853), (254, 14901),

Gene: Hydra\_22 Start: 16382, Stop: 17596, Start Num: 15

Candidate Starts for Hydra\_22:

(Start: 15 @16382 has 143 MA's), (23, 16409), (59, 16592), (67, 16655), (87, 16754), (92, 16781), (107, 16850), (112, 16880), (140, 17000), (158, 17099), (186, 17297), (189, 17303), (196, 17342), (203, 17366), (210, 17393), (211, 17402), (217, 17435), (229, 17495), (235, 17525), (246, 17573), (249, 17582), (250, 17588),

Gene: Ibantik\_81 Start: 42960, Stop: 44192, Start Num: 19

Candidate Starts for Ibantik\_81:

(Start: 19 @42960 has 3 MA's), (32, 43035), (33, 43038), (52, 43125), (60, 43161), (73, 43257), (85, 43329), (88, 43335), (89, 43338), (94, 43374), (101, 43404), (116, 43485), (139, 43578), (160, 43707), (172, 43803), (177, 43830), (212, 43989), (214, 43998), (216, 44013), (220, 44031), (221, 44037), (225, 44061), (230, 44088), (243, 44154), (251, 44187),

Gene: Indigo\_20 Start: 15854, Stop: 17068, Start Num: 15

Candidate Starts for Indigo\_20:

(Start: 15 @15854 has 143 MA's), (23, 15881), (59, 16064), (67, 16127), (87, 16226), (92, 16253), (107, 16322), (112, 16352), (140, 16472), (158, 16571), (186, 16769), (189, 16775), (196, 16814), (203, 16838), (210, 16865), (211, 16874), (217, 16907), (229, 16967), (235, 16997), (246, 17045), (249, 17054), (250, 17060),

Gene: Issmi\_21 Start: 16769, Stop: 17983, Start Num: 15

Candidate Starts for Issmi\_21:

(Start: 15 @16769 has 143 MA's), (23, 16796), (42, 16892), (57, 16973), (59, 16979), (61, 16991), (62, 16994), (70, 17054), (72, 17066), (92, 17168), (94, 17180), (107, 17237), (116, 17291), (128, 17348), (158, 17486), (189, 17690), (203, 17753), (210, 17780), (212, 17792), (229, 17882), (246, 17960), (249, 17969), (250, 17975),

Gene: Itza\_20 Start: 16200, Stop: 17420, Start Num: 15

Candidate Starts for Itza\_20:

(Start: 15 @16200 has 143 MA's), (25, 16242), (32, 16287), (49, 16356), (57, 16404), (59, 16410), (91, 16596), (92, 16599), (97, 16623), (107, 16668), (116, 16722), (152, 16881), (158, 16917), (183, 17100), (191, 17136), (196, 17160), (200, 17178), (203, 17184), (211, 17220), (219, 17262), (244, 17388), (249, 17406), (250, 17412),

Gene: Izzy\_21 Start: 16064, Stop: 17266, Start Num: 15

Candidate Starts for Izzy\_21:

(Start: 15 @16064 has 143 MA's), (23, 16091), (59, 16274), (67, 16337), (87, 16436), (92, 16463), (107, 16532), (112, 16562), (186, 16979), (189, 16985), (196, 17024), (201, 17045), (210, 17075), (211, 17084), (217, 17117), (232, 17198), (245, 17240), (246, 17243), (249, 17252), (250, 17258),

Gene: Janus\_21 Start: 15903, Stop: 17114, Start Num: 15

Candidate Starts for Janus\_21:

(Start: 15 @15903 has 143 MA's), (59, 16113), (61, 16125), (62, 16128), (70, 16188), (72, 16200), (92, 16302), (95, 16317), (106, 16368), (145, 16542), (148, 16554), (158, 16620), (159, 16638), (160, 16641), (178, 16779), (189, 16824), (191, 16839), (201, 16884), (203, 16887), (210, 16914), (211, 16923), (229, 17016), (249, 17100), (250, 17106),

Gene: Jash\_21 Start: 16017, Stop: 17219, Start Num: 15

Candidate Starts for Jash\_21:

(Start: 15 @16017 has 143 MA's), (23, 16044), (59, 16227), (67, 16290), (87, 16389), (92, 16416), (107, 16485), (112, 16515), (186, 16932), (189, 16938), (196, 16977), (201, 16998), (210, 17028), (211, 17037), (217, 17070), (232, 17151), (245, 17193), (246, 17196), (249, 17205), (250, 17211),

Gene: Jevington\_22 Start: 16207, Stop: 17418, Start Num: 15

Candidate Starts for Jevington\_22:

(Start: 15 @16207 has 143 MA's), (30, 16288), (59, 16417), (61, 16429), (70, 16492), (92, 16606), (95, 16621), (116, 16729), (124, 16762), (128, 16786), (148, 16858), (158, 16924), (159, 16942), (160, 16945), (161, 16966), (178, 17083), (189, 17128), (191, 17143), (211, 17227), (213, 17233), (227, 17308), (229, 17320), (246, 17395), (249, 17404), (250, 17410),

Gene: Kaine\_21 Start: 16241, Stop: 17458, Start Num: 15

Candidate Starts for Kaine\_21:

(Start: 15 @16241 has 143 MA's), (23, 16268), (29, 16319), (59, 16451), (62, 16466), (75, 16553), (87, 16613), (107, 16709), (112, 16739), (124, 16796), (128, 16820), (149, 16895), (152, 16922), (158, 16958), (184, 17147), (189, 17162), (191, 17177), (201, 17222), (207, 17243), (211, 17261), (229, 17354), (235, 17384), (249, 17444), (250, 17450),

Gene: Katalie\_21 Start: 16096, Stop: 17307, Start Num: 15

Candidate Starts for Katalie\_21:

(Start: 15 @16096 has 143 MA's), (23, 16123), (53, 16276), (59, 16306), (67, 16369), (87, 16468), (92, 16495), (107, 16564), (128, 16675), (148, 16747), (149, 16750), (152, 16777), (158, 16813), (160, 16834), (189, 17017), (194, 17053), (196, 17056), (200, 17074), (211, 17116), (229, 17209), (249, 17293), (250, 17299),

Gene: Keiki\_16 Start: 12250, Stop: 13407, Start Num: 15

Candidate Starts for Keiki\_16:

(Start: 15 @12250 has 143 MA's), (23, 12277), (26, 12301), (32, 12334), (34, 12340), (38, 12355), (42, 12370), (43, 12373), (44, 12376), (50, 12406), (61, 12469), (63, 12478), (66, 12511), (74, 12544), (75, 12553), (76, 12556), (77, 12559), (78, 12568), (80, 12586), (81, 12589), (93, 12649), (96, 12661), (97, 12664), (107, 12703), (108, 12706), (114, 12748), (116, 12760), (120, 12775), (121, 12778), (122, 12784), (123, 12787), (125, 12802), (127, 12814), (133, 12835), (138, 12856), (141, 12868), (142, 12877), (146, 12892), (147, 12895), (151, 12919), (153, 12934), (156, 12961), (164, 13021), (169, 13054), (173, 13090), (177, 13117), (187, 13159), (190, 13174), (191, 13177), (195, 13201), (197, 13213), (202, 13228), (211, 13270), (218, 13306), (226, 13348), (227, 13351), (230, 13372), (232, 13384), (235, 13393),

Gene: Khuang\_16 Start: 13963, Stop: 15075, Start Num: 15

Candidate Starts for Khuang\_16:

(5, 13687), (Start: 13 @13960 has 9 MA's), (Start: 15 @13963 has 143 MA's), (27, 14017), (39, 14056), (44, 14077), (59, 14158), (62, 14173), (66, 14212), (92, 14341), (105, 14389), (106, 14392), (115, 14443), (129, 14512), (136, 14530), (157, 14635), (184, 14815), (192, 14857), (210, 14929), (213, 14944), (235, 15058),

Gene: Kromp\_19 Start: 17084, Stop: 18241, Start Num: 19

Candidate Starts for Kromp\_19:

(Start: 19 @17084 has 3 MA's), (48, 17225), (61, 17294), (93, 17492), (106, 17549), (113, 17588), (135, 17687), (168, 17888), (170, 17900), (206, 18083), (218, 18140), (227, 18185), (228, 18188),

Gene: Kubed\_16 Start: 12239, Stop: 13396, Start Num: 15

Candidate Starts for Kubed\_16:

(Start: 15 @12239 has 143 MA's), (23, 12266), (26, 12290), (30, 12317), (34, 12329), (38, 12344), (42, 12359), (43, 12362), (44, 12365), (50, 12395), (55, 12422), (61, 12458), (63, 12467), (66, 12500), (74, 12533), (75, 12542), (76, 12545), (77, 12548), (78, 12557), (93, 12638), (96, 12650), (97, 12653), (105, 12686), (107, 12692), (116, 12749), (120, 12764), (121, 12767), (122, 12773), (123, 12776), (125, 12791), (137, 12842), (138, 12845), (141, 12857), (142, 12866), (146, 12881), (147, 12884), (151, 12908), (153, 12923), (156, 12950), (158, 12956), (162, 13001), (169, 13043), (173, 13079), (175, 13085), (177, 13106), (178, 13109), (187, 13148), (190, 13163), (191, 13166), (194, 13187), (195, 13190), (197, 13202), (202, 13217), (208, 13244), (211, 13259), (218, 13295), (226, 13337), (227, 13340), (230, 13361), (232, 13373), (235, 13382),

Gene: Kumotta\_19 Start: 15048, Stop: 16172, Start Num: 13

Candidate Starts for Kumotta\_19:

(Start: 11 @15045 has 3 MA's), (Start: 13 @15048 has 9 MA's), (41, 15162), (51, 15201), (55, 15225), (62, 15264), (107, 15489), (109, 15501), (113, 15531), (115, 15543), (118, 15555), (120, 15564), (167, 15813), (173, 15861), (174, 15864),

Gene: Lannister\_21 Start: 15861, Stop: 17075, Start Num: 15

Candidate Starts for Lannister\_21:

(Start: 15 @15861 has 143 MA's), (23, 15888), (59, 16071), (61, 16083), (67, 16134), (87, 16233), (92, 16260), (107, 16329), (116, 16383), (128, 16440), (149, 16515), (152, 16542), (156, 16572), (159, 16596), (189, 16782), (196, 16821), (200, 16839), (209, 16869), (210, 16872), (211, 16881), (217,

16914), (219, 16923), (248, 17058), (249, 17061), (250, 17067),

Gene: Lauchelly\_16 Start: 12253, Stop: 13410, Start Num: 15

Candidate Starts for Lauchelly\_16:

(Start: 13 @12250 has 9 MA's), (Start: 15 @12253 has 143 MA's), (23, 12280), (26, 12304), (32, 12337), (34, 12343), (38, 12358), (42, 12373), (43, 12376), (44, 12379), (50, 12409), (61, 12472), (63, 12481), (65, 12490), (66, 12514), (74, 12547), (75, 12556), (76, 12559), (77, 12562), (78, 12571), (80, 12589), (81, 12592), (96, 12664), (97, 12667), (105, 12700), (107, 12706), (121, 12781), (122, 12787), (123, 12790), (125, 12805), (127, 12817), (137, 12856), (138, 12859), (141, 12871), (142, 12880), (146, 12895), (147, 12898), (151, 12922), (153, 12937), (156, 12964), (164, 13024), (169, 13057), (173, 13093), (177, 13120), (178, 13123), (187, 13162), (190, 13177), (191, 13180), (195, 13204), (197, 13216), (202, 13231), (211, 13273), (218, 13309), (226, 13351), (227, 13354), (229, 13366), (230, 13375), (232, 13387), (235, 13396),

Gene: Legacy\_20 Start: 15825, Stop: 17039, Start Num: 15

Candidate Starts for Legacy\_20:

(Start: 15 @15825 has 143 MA's), (23, 15852), (59, 16035), (67, 16098), (87, 16197), (92, 16224), (107, 16293), (112, 16323), (140, 16443), (158, 16542), (186, 16740), (189, 16746), (196, 16785), (203, 16809), (210, 16836), (211, 16845), (217, 16878), (229, 16938), (235, 16968), (246, 17016), (249, 17025), (250, 17031),

Gene: Leviosa\_16 Start: 12267, Stop: 13424, Start Num: 15

Candidate Starts for Leviosa\_16:

(Start: 15 @12267 has 143 MA's), (23, 12294), (26, 12318), (32, 12351), (34, 12357), (38, 12372), (42, 12387), (43, 12390), (44, 12393), (50, 12423), (61, 12486), (66, 12528), (74, 12561), (75, 12570), (76, 12573), (77, 12576), (80, 12603), (81, 12606), (96, 12678), (97, 12681), (105, 12714), (107, 12720), (114, 12765), (116, 12777), (121, 12795), (122, 12801), (123, 12804), (125, 12819), (127, 12831), (137, 12870), (138, 12873), (141, 12885), (142, 12894), (146, 12909), (147, 12912), (151, 12936), (153, 12951), (156, 12978), (157, 12981), (164, 13038), (169, 13071), (173, 13107), (177, 13134), (178, 13137), (187, 13176), (190, 13191), (191, 13194), (195, 13218), (197, 13230), (202, 13245), (208, 13272), (211, 13287), (218, 13323), (226, 13365), (227, 13368), (230, 13389), (232, 13401),

Gene: Leviticus\_20 Start: 15854, Stop: 17068, Start Num: 15

Candidate Starts for Leviticus\_20:

(Start: 15 @15854 has 143 MA's), (23, 15881), (59, 16064), (67, 16127), (87, 16226), (92, 16253), (107, 16322), (112, 16352), (140, 16472), (158, 16571), (186, 16769), (189, 16775), (196, 16814), (203, 16838), (210, 16865), (211, 16874), (217, 16907), (229, 16967), (235, 16997), (246, 17045), (249, 17054), (250, 17060),

Gene: Lika\_20 Start: 15859, Stop: 17070, Start Num: 15

Candidate Starts for Lika\_20:

(Start: 15 @15859 has 143 MA's), (23, 15886), (59, 16069), (61, 16081), (62, 16084), (67, 16132), (87, 16231), (92, 16258), (107, 16327), (116, 16381), (128, 16438), (149, 16513), (156, 16570), (160, 16597), (189, 16780), (196, 16819), (209, 16867), (210, 16870), (211, 16879), (217, 16912), (249, 17056), (250, 17062),

Gene: LilBandit\_16 Start: 12248, Stop: 13408, Start Num: 13

Candidate Starts for LilBandit\_16:

(Start: 13 @12248 has 9 MA's), (Start: 15 @12251 has 143 MA's), (23, 12278), (26, 12302), (30, 12329), (32, 12335), (34, 12341), (42, 12371), (43, 12374), (44, 12377), (50, 12407), (61, 12470), (63, 12479), (65, 12488), (66, 12512), (74, 12545), (75, 12554), (76, 12557), (77, 12560), (78, 12569), (80, 12587), (83, 12596), (93, 12650), (96, 12662), (97, 12665), (105, 12698), (107, 12704), (114, 12749), (116, 12761), (120, 12776), (121, 12779), (122, 12785), (123, 12788), (125, 12803), (127, 12815),



(137, 12854), (138, 12857), (141, 12869), (142, 12878), (146, 12893), (147, 12896), (151, 12920), (153, 12935), (156, 12962), (157, 12965), (169, 13055), (173, 13091), (177, 13118), (187, 13160), (190, 13175), (191, 13178), (195, 13202), (197, 13214), (200, 13223), (202, 13229), (211, 13271), (226, 13349), (229, 13364), (230, 13373), (232, 13385), (235, 13394),

Gene: Loofah\_21 Start: 15822, Stop: 17033, Start Num: 15

Candidate Starts for Loofah\_21:

(Start: 15 @15822 has 143 MA's), (39, 15930), (59, 16032), (61, 16044), (62, 16047), (70, 16107), (92, 16221), (95, 16236), (116, 16344), (124, 16377), (128, 16401), (148, 16473), (152, 16503), (159, 16557), (160, 16560), (161, 16581), (178, 16698), (189, 16743), (191, 16758), (211, 16842), (212, 16845), (213, 16848), (219, 16884), (227, 16923), (229, 16935), (239, 16974), (245, 17007), (246, 17010), (249, 17019), (250, 17025),

Gene: Lorelei\_20 Start: 15829, Stop: 17040, Start Num: 15

Candidate Starts for Lorelei\_20:

(Start: 15 @15829 has 143 MA's), (23, 15856), (53, 16009), (59, 16039), (67, 16102), (87, 16201), (92, 16228), (107, 16297), (116, 16351), (117, 16354), (119, 16363), (128, 16408), (148, 16480), (149, 16483), (158, 16546), (160, 16567), (169, 16642), (176, 16696), (186, 16744), (189, 16750), (194, 16786), (196, 16789), (200, 16807), (211, 16849), (248, 17023), (249, 17026), (250, 17032),

Gene: MEAK\_16 Start: 12237, Stop: 13394, Start Num: 15

Candidate Starts for MEAK\_16:

(Start: 13 @12234 has 9 MA's), (Start: 15 @12237 has 143 MA's), (23, 12264), (26, 12288), (30, 12315), (32, 12321), (34, 12327), (38, 12342), (42, 12357), (43, 12360), (44, 12363), (50, 12393), (61, 12456), (63, 12465), (66, 12498), (74, 12531), (75, 12540), (77, 12546), (78, 12555), (80, 12573), (81, 12576), (83, 12582), (93, 12636), (96, 12648), (97, 12651), (105, 12684), (107, 12690), (116, 12747), (120, 12762), (121, 12765), (122, 12771), (123, 12774), (125, 12789), (127, 12801), (133, 12822), (137, 12840), (138, 12843), (141, 12855), (142, 12864), (146, 12879), (147, 12882), (151, 12906), (153, 12921), (156, 12948), (157, 12951), (164, 13008), (169, 13041), (173, 13077), (177, 13104), (187, 13146), (190, 13161), (191, 13164), (195, 13188), (197, 13200), (200, 13209), (202, 13215), (211, 13257), (218, 13293), (227, 13338), (230, 13359), (235, 13380),

Gene: Maja\_18 Start: 14689, Stop: 15813, Start Num: 13

Candidate Starts for Maja\_18:

(Start: 11 @14686 has 3 MA's), (Start: 13 @14689 has 9 MA's), (Start: 17 @14695 has 1 MA's), (59, 14902), (68, 14962), (93, 15094), (99, 15121), (113, 15181), (115, 15193), (123, 15226), (126, 15247), (157, 15385), (177, 15535), (198, 15628), (200, 15634), (205, 15649), (239, 15805),

Gene: Maneekul\_20 Start: 15826, Stop: 17037, Start Num: 15

Candidate Starts for Maneekul\_20:

(Start: 15 @15826 has 143 MA's), (23, 15853), (59, 16036), (61, 16048), (62, 16051), (87, 16198), (92, 16225), (116, 16348), (128, 16405), (149, 16480), (152, 16507), (156, 16537), (160, 16564), (166, 16615), (189, 16747), (196, 16786), (200, 16804), (209, 16834), (210, 16837), (211, 16846), (217, 16879), (219, 16888), (229, 16939), (242, 16999), (249, 17023), (250, 17029),

Gene: Marav\_23 Start: 16557, Stop: 17768, Start Num: 15

Candidate Starts for Marav\_23:

(Start: 15 @16557 has 143 MA's), (30, 16638), (59, 16767), (61, 16779), (70, 16842), (92, 16956), (95, 16971), (116, 17079), (124, 17112), (148, 17208), (152, 17238), (158, 17274), (159, 17292), (160, 17295), (161, 17316), (178, 17433), (189, 17478), (191, 17493), (211, 17577), (213, 17583), (227, 17658), (229, 17670), (246, 17745), (249, 17754), (250, 17760),

Gene: MargaretKali\_19 Start: 14683, Stop: 15807, Start Num: 13

Candidate Starts for MargaretKali\_19:

(Start: 11 @14680 has 3 MA's), (Start: 13 @14683 has 9 MA's), (41, 14797), (51, 14836), (55, 14860), (62, 14899), (107, 15124), (109, 15136), (113, 15166), (115, 15178), (118, 15190), (120, 15199), (167, 15448), (173, 15496), (174, 15499),

Gene: Moyashi\_16 Start: 12273, Stop: 13430, Start Num: 15

Candidate Starts for Moyashi\_16:

(Start: 13 @12270 has 9 MA's), (Start: 15 @12273 has 143 MA's), (23, 12300), (26, 12324), (30, 12351), (34, 12363), (38, 12378), (40, 12387), (42, 12393), (43, 12396), (44, 12399), (50, 12429), (61, 12492), (65, 12510), (66, 12534), (74, 12567), (75, 12576), (77, 12582), (78, 12591), (83, 12618), (97, 12687), (107, 12726), (108, 12729), (116, 12783), (120, 12798), (121, 12801), (122, 12807), (123, 12810), (125, 12825), (127, 12837), (132, 12855), (141, 12891), (142, 12900), (146, 12915), (147, 12918), (151, 12942), (153, 12957), (156, 12984), (158, 12990), (164, 13044), (169, 13077), (173, 13113), (177, 13140), (178, 13143), (187, 13182), (190, 13197), (191, 13200), (195, 13224), (197, 13236), (200, 13245), (202, 13251), (211, 13293), (218, 13329), (227, 13374), (229, 13386), (230, 13395), (232, 13407), (235, 13416), (239, 13425),

Gene: MrAK\_16 Start: 12284, Stop: 13441, Start Num: 15

Candidate Starts for MrAK\_16:

(Start: 13 @12281 has 9 MA's), (Start: 15 @12284 has 143 MA's), (23, 12311), (26, 12335), (30, 12362), (32, 12368), (34, 12374), (38, 12389), (40, 12398), (42, 12404), (43, 12407), (44, 12410), (50, 12440), (61, 12503), (65, 12521), (66, 12545), (74, 12578), (75, 12587), (77, 12593), (78, 12602), (83, 12629), (97, 12698), (107, 12737), (108, 12740), (116, 12794), (120, 12809), (121, 12812), (122, 12818), (123, 12821), (125, 12836), (127, 12848), (132, 12866), (141, 12902), (142, 12911), (146, 12926), (147, 12929), (151, 12953), (153, 12968), (156, 12995), (158, 13001), (164, 13055), (169, 13088), (173, 13124), (177, 13151), (178, 13154), (187, 13193), (190, 13208), (191, 13211), (195, 13235), (197, 13247), (200, 13256), (202, 13262), (211, 13304), (218, 13340), (227, 13385), (229, 13397), (230, 13406), (232, 13418), (235, 13427),

Gene: MrSmee\_18 Start: 13774, Stop: 14892, Start Num: 17

Candidate Starts for MrSmee\_18:

(Start: 17 @13774 has 1 MA's), (32, 13852), (36, 13861), (59, 13981), (61, 13993), (63, 14002), (78, 14092), (92, 14164), (93, 14173), (94, 14176), (107, 14218), (115, 14272), (123, 14305), (135, 14356), (165, 14524), (177, 14614), (196, 14695), (209, 14743), (218, 14791), (220, 14800), (228, 14839), (236, 14878),

Gene: Nabi\_20 Start: 15829, Stop: 17040, Start Num: 15

Candidate Starts for Nabi\_20:

(Start: 15 @15829 has 143 MA's), (23, 15856), (53, 16009), (59, 16039), (67, 16102), (87, 16201), (92, 16228), (107, 16297), (116, 16351), (117, 16354), (119, 16363), (128, 16408), (148, 16480), (149, 16483), (158, 16546), (160, 16567), (169, 16642), (176, 16696), (186, 16744), (189, 16750), (194, 16786), (196, 16789), (200, 16807), (211, 16849), (248, 17023), (249, 17026), (250, 17032),

Gene: Nanodon\_22 Start: 16037, Stop: 17248, Start Num: 15

Candidate Starts for Nanodon\_22:

(Start: 15 @16037 has 143 MA's), (23, 16064), (53, 16217), (59, 16247), (67, 16310), (87, 16409), (90, 16421), (92, 16436), (107, 16505), (116, 16559), (148, 16688), (149, 16691), (158, 16754), (159, 16772), (189, 16958), (194, 16994), (196, 16997), (200, 17015), (211, 17057), (229, 17150), (249, 17234), (250, 17240),

Gene: Nerdos\_20 Start: 15854, Stop: 17068, Start Num: 15

Candidate Starts for Nerdos\_20:

(Start: 15 @15854 has 143 MA's), (23, 15881), (59, 16064), (67, 16127), (87, 16226), (92, 16253), (107, 16322), (112, 16352), (140, 16472), (158, 16571), (186, 16769), (189, 16775), (196, 16814), (203, 16838), (210, 16865), (211, 16874), (217, 16907), (229, 16967), (235, 16997), (246, 17045), (249, 17054), (250, 17060),

Gene: Nishikigoi\_20 Start: 16338, Stop: 17552, Start Num: 15

Candidate Starts for Nishikigoi\_20:

(Start: 15 @16338 has 143 MA's), (23, 16365), (39, 16446), (55, 16524), (57, 16542), (61, 16560), (62, 16563), (70, 16623), (92, 16737), (107, 16806), (116, 16860), (128, 16917), (178, 17214), (189, 17259), (203, 17322), (229, 17451), (246, 17529), (249, 17538), (250, 17544),

Gene: Oliynyk\_21 Start: 16017, Stop: 17219, Start Num: 15

Candidate Starts for Oliynyk\_21:

(Start: 15 @16017 has 143 MA's), (23, 16044), (59, 16227), (67, 16290), (87, 16389), (92, 16416), (107, 16485), (112, 16515), (186, 16932), (189, 16938), (196, 16977), (201, 16998), (210, 17028), (211, 17037), (217, 17070), (232, 17151), (245, 17193), (246, 17196), (249, 17205), (250, 17211),

Gene: Omar\_21 Start: 16673, Stop: 17887, Start Num: 15

Candidate Starts for Omar\_21:

(Start: 15 @16673 has 143 MA's), (23, 16700), (55, 16859), (57, 16877), (59, 16883), (61, 16895), (62, 16898), (70, 16958), (92, 17072), (107, 17141), (116, 17195), (124, 17228), (128, 17252), (152, 17354), (154, 17360), (184, 17579), (185, 17585), (189, 17594), (212, 17696), (229, 17786), (246, 17864), (249, 17873), (250, 17879),

Gene: Ouroboros\_16 Start: 12239, Stop: 13396, Start Num: 15

Candidate Starts for Ouroboros\_16:

(Start: 15 @12239 has 143 MA's), (23, 12266), (26, 12290), (30, 12317), (32, 12323), (34, 12329), (38, 12344), (42, 12359), (43, 12362), (44, 12365), (50, 12395), (61, 12458), (63, 12467), (66, 12500), (74, 12533), (75, 12542), (76, 12545), (77, 12548), (78, 12557), (80, 12575), (81, 12578), (93, 12638), (96, 12650), (97, 12653), (105, 12686), (107, 12692), (108, 12695), (114, 12737), (116, 12749), (120, 12764), (121, 12767), (122, 12773), (123, 12776), (125, 12791), (127, 12803), (133, 12824), (138, 12845), (141, 12857), (142, 12866), (146, 12881), (147, 12884), (151, 12908), (153, 12923), (156, 12950), (164, 13010), (169, 13043), (173, 13079), (177, 13106), (187, 13148), (190, 13163), (195, 13190), (197, 13202), (202, 13217), (208, 13244), (211, 13259), (218, 13295), (226, 13337), (230, 13361), (232, 13373),

Gene: Ozzie\_20 Start: 15834, Stop: 17048, Start Num: 15

Candidate Starts for Ozzie\_20:

(Start: 15 @15834 has 143 MA's), (23, 15861), (59, 16044), (67, 16107), (87, 16206), (92, 16233), (107, 16302), (112, 16332), (140, 16452), (158, 16551), (186, 16749), (189, 16755), (196, 16794), (203, 16818), (210, 16845), (211, 16854), (217, 16887), (229, 16947), (235, 16977), (246, 17025), (249, 17034), (250, 17040),

Gene: OzzyJ\_21 Start: 15821, Stop: 17032, Start Num: 15

Candidate Starts for OzzyJ\_21:

(Start: 15 @15821 has 143 MA's), (59, 16031), (61, 16043), (62, 16046), (67, 16094), (87, 16193), (92, 16220), (107, 16289), (116, 16343), (128, 16400), (149, 16475), (152, 16502), (156, 16532), (159, 16556), (166, 16610), (176, 16688), (189, 16742), (196, 16781), (200, 16799), (210, 16832), (211, 16841), (217, 16874), (219, 16883), (229, 16934), (249, 17018), (250, 17024),

Gene: P1.1\_16 Start: 12239, Stop: 13399, Start Num: 13

Candidate Starts for P1.1\_16:

(Start: 13 @12239 has 9 MA's), (Start: 15 @12242 has 143 MA's), (23, 12269), (26, 12293), (30, 12320), (32, 12326), (34, 12332), (38, 12347), (42, 12362), (43, 12365), (44, 12368), (50, 12398), (61, 12461), (65, 12479), (66, 12503), (74, 12536), (75, 12545), (77, 12551), (78, 12560), (80, 12578), (83, 12587), (93, 12641), (96, 12653), (97, 12656), (105, 12689), (107, 12695), (114, 12740), (116, 12752), (120, 12767), (121, 12770), (122, 12776), (123, 12779), (125, 12794), (127, 12806), (137, 12845), (138, 12848), (141, 12860), (142, 12869), (146, 12884), (147, 12887), (151, 12911), (153, 12926), (156, 12953), (157, 12956), (164, 13013), (169, 13046), (173, 13082), (177, 13109), (178, 13112), (187, 13151), (190, 13166), (191, 13169), (195, 13193), (200, 13214), (202, 13220), (211, 13262), (218, 13298), (227, 13343), (229, 13355), (230, 13364), (235, 13385),

Gene: P100.1\_16 Start: 12249, Stop: 13406, Start Num: 15

Candidate Starts for P100.1\_16:

(Start: 13 @12246 has 9 MA's), (Start: 15 @12249 has 143 MA's), (23, 12276), (26, 12300), (30, 12327), (34, 12339), (38, 12354), (40, 12363), (42, 12369), (43, 12372), (44, 12375), (49, 12402), (50, 12405), (61, 12468), (65, 12486), (66, 12510), (74, 12543), (75, 12552), (76, 12555), (77, 12558), (78, 12567), (80, 12585), (83, 12594), (96, 12660), (97, 12663), (105, 12696), (107, 12702), (116, 12759), (121, 12777), (122, 12783), (123, 12786), (125, 12801), (127, 12813), (132, 12831), (137, 12852), (142, 12876), (146, 12891), (147, 12894), (151, 12918), (153, 12933), (156, 12960), (157, 12963), (164, 13020), (169, 13053), (173, 13089), (177, 13116), (187, 13158), (190, 13173), (191, 13176), (195, 13200), (197, 13212), (200, 13221), (202, 13227), (211, 13269), (218, 13305), (226, 13347), (227, 13350), (229, 13362), (230, 13371), (232, 13383), (235, 13392),

Gene: P100A\_16 Start: 12249, Stop: 13406, Start Num: 15

Candidate Starts for P100A\_16:

(Start: 15 @12249 has 143 MA's), (23, 12276), (26, 12300), (32, 12333), (34, 12339), (38, 12354), (42, 12369), (43, 12372), (44, 12375), (50, 12405), (54, 12429), (61, 12468), (63, 12477), (66, 12510), (74, 12543), (75, 12552), (77, 12558), (78, 12567), (80, 12585), (81, 12588), (93, 12648), (96, 12660), (97, 12663), (105, 12696), (107, 12702), (108, 12705), (114, 12747), (116, 12759), (121, 12777), (125, 12801), (127, 12813), (138, 12855), (142, 12876), (146, 12891), (147, 12894), (151, 12918), (153, 12933), (156, 12960), (164, 13020), (169, 13053), (173, 13089), (177, 13116), (178, 13119), (187, 13158), (190, 13173), (191, 13176), (195, 13200), (202, 13227), (208, 13254), (211, 13269), (218, 13305), (227, 13350), (230, 13371), (232, 13383), (235, 13392),

Gene: P100D\_16 Start: 12245, Stop: 13402, Start Num: 15

Candidate Starts for P100D\_16:

(Start: 13 @12242 has 9 MA's), (Start: 15 @12245 has 143 MA's), (23, 12272), (26, 12296), (30, 12323), (32, 12329), (34, 12335), (38, 12350), (42, 12365), (43, 12368), (44, 12371), (50, 12401), (61, 12464), (65, 12482), (66, 12506), (74, 12539), (75, 12548), (77, 12554), (78, 12563), (80, 12581), (83, 12590), (93, 12644), (96, 12656), (97, 12659), (105, 12692), (107, 12698), (114, 12743), (116, 12755), (121, 12773), (122, 12779), (123, 12782), (125, 12797), (127, 12809), (133, 12830), (137, 12848), (138, 12851), (141, 12863), (142, 12872), (146, 12887), (147, 12890), (151, 12914), (153, 12929), (156, 12956), (157, 12959), (164, 13016), (169, 13049), (173, 13085), (177, 13112), (187, 13154), (190, 13169), (191, 13172), (195, 13196), (197, 13208), (200, 13217), (202, 13223), (211, 13265), (218, 13301), (226, 13343), (230, 13367), (232, 13379), (235, 13388),

Gene: P101A\_16 Start: 12257, Stop: 13414, Start Num: 15

Candidate Starts for P101A\_16:

(Start: 13 @12254 has 9 MA's), (Start: 15 @12257 has 143 MA's), (23, 12284), (26, 12308), (30, 12335), (32, 12341), (34, 12347), (38, 12362), (42, 12377), (43, 12380), (44, 12383), (50, 12413), (61, 12476), (65, 12494), (66, 12518), (74, 12551), (75, 12560), (76, 12563), (77, 12566), (78, 12575), (80, 12593), (83, 12602), (96, 12668), (97, 12671), (105, 12704), (107, 12710), (116, 12767), (120, 12782), (121, 12785), (122, 12791), (123, 12794), (125, 12809), (127, 12821), (132, 12839), (137, 12860), (142, 12884), (146, 12899), (147, 12902), (151, 12926), (153, 12941), (156, 12968), (157, 12971),

(169, 13061), (173, 13097), (177, 13124), (187, 13166), (190, 13181), (191, 13184), (195, 13208), (197, 13220), (200, 13229), (202, 13235), (211, 13277), (218, 13313), (226, 13355), (227, 13358), (229, 13370), (230, 13379), (232, 13391), (235, 13400),

Gene: P104A\_16 Start: 12234, Stop: 13391, Start Num: 15

Candidate Starts for P104A\_16:

(Start: 15 @12234 has 143 MA's), (23, 12261), (26, 12285), (32, 12318), (34, 12324), (38, 12339), (42, 12354), (43, 12357), (44, 12360), (50, 12390), (61, 12453), (65, 12471), (66, 12495), (74, 12528), (75, 12537), (77, 12543), (78, 12552), (80, 12570), (83, 12579), (96, 12645), (97, 12648), (105, 12681), (107, 12687), (116, 12744), (120, 12759), (121, 12762), (122, 12768), (123, 12771), (125, 12786), (127, 12798), (137, 12837), (138, 12840), (141, 12852), (142, 12861), (146, 12876), (147, 12879), (151, 12903), (153, 12918), (156, 12945), (157, 12948), (164, 13005), (169, 13038), (173, 13074), (177, 13101), (178, 13104), (187, 13143), (190, 13158), (191, 13161), (195, 13185), (202, 13212), (208, 13239), (211, 13254), (218, 13290), (226, 13332), (230, 13356), (232, 13368), (235, 13377),

Gene: P104B\_16 Start: 12251, Stop: 13408, Start Num: 15

Candidate Starts for P104B\_16:

(Start: 13 @12248 has 9 MA's), (Start: 15 @12251 has 143 MA's), (23, 12278), (26, 12302), (30, 12329), (32, 12335), (34, 12341), (38, 12356), (42, 12371), (43, 12374), (44, 12377), (50, 12407), (61, 12470), (63, 12479), (65, 12488), (66, 12512), (74, 12545), (75, 12554), (77, 12560), (78, 12569), (80, 12587), (83, 12596), (96, 12662), (97, 12665), (105, 12698), (107, 12704), (114, 12749), (120, 12776), (121, 12779), (122, 12785), (123, 12788), (125, 12803), (127, 12815), (137, 12854), (141, 12869), (142, 12878), (146, 12893), (147, 12896), (151, 12920), (153, 12935), (156, 12962), (157, 12965), (164, 13022), (169, 13055), (177, 13118), (187, 13160), (190, 13175), (191, 13178), (195, 13202), (197, 13214), (200, 13223), (202, 13229), (208, 13256), (211, 13271), (218, 13307), (227, 13352), (230, 13373), (232, 13385), (235, 13394),

Gene: P105\_16 Start: 12154, Stop: 13311, Start Num: 15

Candidate Starts for P105\_16:

(Start: 13 @12151 has 9 MA's), (Start: 15 @12154 has 143 MA's), (23, 12181), (26, 12205), (30, 12232), (32, 12238), (34, 12244), (38, 12259), (42, 12274), (43, 12277), (44, 12280), (50, 12310), (61, 12373), (65, 12391), (66, 12415), (74, 12448), (75, 12457), (77, 12463), (78, 12472), (83, 12499), (97, 12568), (107, 12607), (108, 12610), (116, 12664), (120, 12679), (121, 12682), (122, 12688), (123, 12691), (125, 12706), (127, 12718), (132, 12736), (141, 12772), (142, 12781), (146, 12796), (147, 12799), (151, 12823), (153, 12838), (156, 12865), (158, 12871), (164, 12925), (169, 12958), (173, 12994), (177, 13021), (178, 13024), (187, 13063), (190, 13078), (191, 13081), (195, 13105), (197, 13117), (200, 13126), (202, 13132), (218, 13210), (227, 13255), (229, 13267), (230, 13276), (232, 13288), (235, 13297),

Gene: P106A\_16 Start: 12279, Stop: 13436, Start Num: 15

Candidate Starts for P106A\_16:

(Start: 13 @12276 has 9 MA's), (Start: 15 @12279 has 143 MA's), (23, 12306), (26, 12330), (30, 12357), (34, 12369), (38, 12384), (40, 12393), (42, 12399), (43, 12402), (44, 12405), (50, 12435), (61, 12498), (65, 12516), (66, 12540), (74, 12573), (75, 12582), (76, 12585), (77, 12588), (78, 12597), (80, 12615), (83, 12624), (93, 12678), (96, 12690), (97, 12693), (105, 12726), (107, 12732), (116, 12789), (120, 12804), (121, 12807), (122, 12813), (123, 12816), (125, 12831), (127, 12843), (132, 12861), (137, 12882), (141, 12897), (142, 12906), (146, 12921), (147, 12924), (151, 12948), (153, 12963), (156, 12990), (157, 12993), (169, 13083), (173, 13119), (177, 13146), (187, 13188), (190, 13203), (191, 13206), (195, 13230), (200, 13251), (202, 13257), (208, 13284), (211, 13299), (218, 13335), (227, 13380), (230, 13401), (232, 13413), (235, 13422),

Gene: P106C\_16 Start: 12279, Stop: 13436, Start Num: 15

Candidate Starts for P106C\_16:

(Start: 13 @12276 has 9 MA's), (Start: 15 @12279 has 143 MA's), (23, 12306), (26, 12330), (30, 12357), (34, 12369), (38, 12384), (40, 12393), (42, 12399), (43, 12402), (44, 12405), (50, 12435), (61, 12498), (65, 12516), (66, 12540), (74, 12573), (75, 12582), (76, 12585), (77, 12588), (78, 12597), (80, 12615), (83, 12624), (93, 12678), (96, 12690), (97, 12693), (105, 12726), (107, 12732), (116, 12789), (120, 12804), (121, 12807), (122, 12813), (123, 12816), (125, 12831), (127, 12843), (132, 12861), (137, 12882), (141, 12897), (142, 12906), (146, 12921), (147, 12924), (151, 12948), (153, 12963), (156, 12990), (157, 12993), (169, 13083), (173, 13119), (177, 13146), (187, 13188), (190, 13203), (191, 13206), (195, 13230), (200, 13251), (202, 13257), (208, 13284), (211, 13299), (218, 13335), (227, 13380), (229, 13392), (230, 13401), (232, 13413), (235, 13422),

Gene: P106I\_16 Start: 12279, Stop: 13436, Start Num: 15

Candidate Starts for P106I\_16:

(Start: 13 @12276 has 9 MA's), (Start: 15 @12279 has 143 MA's), (23, 12306), (26, 12330), (30, 12357), (34, 12369), (38, 12384), (40, 12393), (42, 12399), (43, 12402), (44, 12405), (50, 12435), (61, 12498), (65, 12516), (66, 12540), (74, 12573), (75, 12582), (76, 12585), (77, 12588), (78, 12597), (80, 12615), (83, 12624), (93, 12678), (96, 12690), (97, 12693), (105, 12726), (107, 12732), (116, 12789), (120, 12804), (121, 12807), (122, 12813), (123, 12816), (125, 12831), (127, 12843), (132, 12861), (137, 12882), (141, 12897), (142, 12906), (146, 12921), (147, 12924), (151, 12948), (153, 12963), (156, 12990), (157, 12993), (169, 13083), (173, 13119), (177, 13146), (187, 13188), (190, 13203), (191, 13206), (195, 13230), (200, 13251), (202, 13257), (208, 13284), (211, 13299), (218, 13335), (227, 13380), (229, 13392), (230, 13401), (232, 13413), (235, 13422),

Gene: P106L\_16 Start: 12279, Stop: 13436, Start Num: 15

Candidate Starts for P106L\_16:

(Start: 13 @12276 has 9 MA's), (Start: 15 @12279 has 143 MA's), (23, 12306), (26, 12330), (30, 12357), (34, 12369), (38, 12384), (40, 12393), (42, 12399), (43, 12402), (44, 12405), (50, 12435), (61, 12498), (65, 12516), (66, 12540), (74, 12573), (75, 12582), (76, 12585), (77, 12588), (78, 12597), (80, 12615), (83, 12624), (93, 12678), (96, 12690), (97, 12693), (105, 12726), (107, 12732), (116, 12789), (120, 12804), (121, 12807), (122, 12813), (123, 12816), (125, 12831), (127, 12843), (132, 12861), (137, 12882), (141, 12897), (142, 12906), (146, 12921), (147, 12924), (151, 12948), (153, 12963), (156, 12990), (157, 12993), (169, 13083), (173, 13119), (177, 13146), (187, 13188), (190, 13203), (191, 13206), (195, 13230), (200, 13251), (202, 13257), (208, 13284), (211, 13299), (218, 13335), (227, 13380), (229, 13392), (230, 13401), (232, 13413), (235, 13422),

Gene: P106M\_16 Start: 12279, Stop: 13436, Start Num: 15

Candidate Starts for P106M\_16:

(Start: 13 @12276 has 9 MA's), (Start: 15 @12279 has 143 MA's), (23, 12306), (26, 12330), (30, 12357), (34, 12369), (38, 12384), (40, 12393), (42, 12399), (43, 12402), (44, 12405), (50, 12435), (61, 12498), (65, 12516), (66, 12540), (74, 12573), (75, 12582), (76, 12585), (77, 12588), (78, 12597), (80, 12615), (83, 12624), (93, 12678), (96, 12690), (97, 12693), (105, 12726), (107, 12732), (116, 12789), (120, 12804), (121, 12807), (122, 12813), (123, 12816), (125, 12831), (127, 12843), (132, 12861), (137, 12882), (141, 12897), (142, 12906), (146, 12921), (147, 12924), (151, 12948), (153, 12963), (156, 12990), (157, 12993), (169, 13083), (173, 13119), (177, 13146), (187, 13188), (190, 13203), (191, 13206), (195, 13230), (200, 13251), (202, 13257), (208, 13284), (211, 13299), (218, 13335), (227, 13380), (229, 13392), (230, 13401), (232, 13413), (235, 13422),

Gene: P107A\_16 Start: 12255, Stop: 13412, Start Num: 15

Candidate Starts for P107A\_16:

(Start: 15 @12255 has 143 MA's), (23, 12282), (26, 12306), (30, 12333), (32, 12339), (34, 12345), (38, 12360), (42, 12375), (43, 12378), (44, 12381), (50, 12411), (61, 12474), (63, 12483), (65, 12492), (66, 12516), (74, 12549), (75, 12558), (76, 12561), (77, 12564), (78, 12573), (80, 12591), (81, 12594), (96, 12666), (97, 12669), (105, 12702), (107, 12708), (116, 12765), (121, 12783), (122, 12789), (123, 12792), (125, 12807), (127, 12819), (133, 12840), (138, 12861), (141, 12873), (142, 12882), (146,

12897), (147, 12900), (151, 12924), (153, 12939), (156, 12966), (157, 12969), (164, 13026), (169, 13059), (173, 13095), (177, 13122), (178, 13125), (187, 13164), (190, 13179), (191, 13182), (195, 13206), (197, 13218), (202, 13233), (208, 13260), (211, 13275), (218, 13311), (227, 13356), (230, 13377), (232, 13389), (235, 13398),

Gene: P107C\_16 Start: 12232, Stop: 13389, Start Num: 15

Candidate Starts for P107C\_16:

(Start: 13 @12229 has 9 MA's), (Start: 15 @12232 has 143 MA's), (23, 12259), (26, 12283), (30, 12310), (32, 12316), (34, 12322), (38, 12337), (42, 12352), (43, 12355), (44, 12358), (50, 12388), (61, 12451), (66, 12493), (74, 12526), (75, 12535), (77, 12541), (78, 12550), (80, 12568), (81, 12571), (96, 12643), (97, 12646), (105, 12679), (107, 12685), (114, 12730), (116, 12742), (120, 12757), (122, 12766), (123, 12769), (125, 12784), (127, 12796), (138, 12838), (141, 12850), (142, 12859), (146, 12874), (147, 12877), (151, 12901), (153, 12916), (156, 12943), (157, 12946), (164, 13003), (169, 13036), (173, 13072), (177, 13099), (187, 13141), (190, 13156), (191, 13159), (195, 13183), (197, 13195), (200, 13204), (202, 13210), (211, 13252), (218, 13288), (227, 13333), (229, 13345), (230, 13354), (232, 13366), (235, 13375),

Gene: P108C\_16 Start: 12240, Stop: 13397, Start Num: 15

Candidate Starts for P108C\_16:

(Start: 13 @12237 has 9 MA's), (Start: 15 @12240 has 143 MA's), (23, 12267), (26, 12291), (32, 12324), (34, 12330), (38, 12345), (42, 12360), (43, 12363), (44, 12366), (50, 12396), (61, 12459), (65, 12477), (66, 12501), (74, 12534), (75, 12543), (76, 12546), (77, 12549), (78, 12558), (80, 12576), (83, 12585), (93, 12639), (96, 12651), (97, 12654), (105, 12687), (107, 12693), (116, 12750), (120, 12765), (121, 12768), (122, 12774), (125, 12792), (127, 12804), (132, 12822), (137, 12843), (141, 12858), (142, 12867), (146, 12882), (147, 12885), (151, 12909), (153, 12924), (156, 12951), (157, 12954), (169, 13044), (173, 13080), (177, 13107), (187, 13149), (190, 13164), (191, 13167), (195, 13191), (197, 13203), (202, 13218), (211, 13260), (218, 13296), (226, 13338), (227, 13341), (229, 13353), (230, 13362), (232, 13374), (235, 13383),

Gene: P14.4\_16 Start: 12243, Stop: 13403, Start Num: 13

Candidate Starts for P14.4\_16:

(Start: 13 @12243 has 9 MA's), (Start: 15 @12246 has 143 MA's), (23, 12273), (26, 12297), (30, 12324), (32, 12330), (34, 12336), (38, 12351), (42, 12366), (43, 12369), (44, 12372), (50, 12402), (61, 12465), (65, 12483), (66, 12507), (74, 12540), (75, 12549), (76, 12552), (77, 12555), (78, 12564), (80, 12582), (83, 12591), (93, 12645), (96, 12657), (97, 12660), (105, 12693), (107, 12699), (114, 12744), (116, 12756), (120, 12771), (121, 12774), (122, 12780), (123, 12783), (125, 12798), (127, 12810), (137, 12849), (138, 12852), (141, 12864), (142, 12873), (146, 12888), (147, 12891), (151, 12915), (153, 12930), (156, 12957), (157, 12960), (164, 13017), (173, 13086), (177, 13113), (178, 13116), (187, 13155), (190, 13170), (191, 13173), (195, 13197), (200, 13218), (202, 13224), (211, 13266), (218, 13302), (226, 13344), (229, 13359), (230, 13368), (232, 13380), (235, 13389),

Gene: P9.1\_16 Start: 12238, Stop: 13398, Start Num: 13

Candidate Starts for P9.1\_16:

(Start: 13 @12238 has 9 MA's), (Start: 15 @12241 has 143 MA's), (23, 12268), (26, 12292), (30, 12319), (34, 12331), (38, 12346), (40, 12355), (42, 12361), (43, 12364), (44, 12367), (50, 12397), (61, 12460), (65, 12478), (66, 12502), (74, 12535), (75, 12544), (77, 12550), (78, 12559), (80, 12577), (83, 12586), (96, 12652), (97, 12655), (98, 12658), (105, 12688), (107, 12694), (114, 12739), (116, 12751), (120, 12766), (121, 12769), (122, 12775), (123, 12778), (125, 12793), (127, 12805), (137, 12844), (141, 12859), (142, 12868), (146, 12883), (147, 12886), (151, 12910), (153, 12925), (156, 12952), (157, 12955), (169, 13045), (173, 13081), (177, 13108), (178, 13111), (187, 13150), (190, 13165), (191, 13168), (195, 13192), (202, 13219), (211, 13261), (218, 13297), (226, 13339), (229, 13354), (230, 13363), (232, 13375), (235, 13384),



Gene: PA6\_16 Start: 12270, Stop: 13427, Start Num: 15

Candidate Starts for PA6\_16:

(Start: 13 @12267 has 9 MA's), (Start: 15 @12270 has 143 MA's), (23, 12297), (26, 12321), (30, 12348), (32, 12354), (34, 12360), (38, 12375), (40, 12384), (42, 12390), (43, 12393), (44, 12396), (50, 12426), (61, 12489), (63, 12498), (65, 12507), (66, 12531), (74, 12564), (75, 12573), (76, 12576), (77, 12579), (78, 12588), (80, 12606), (83, 12615), (96, 12681), (97, 12684), (105, 12717), (107, 12723), (114, 12768), (116, 12780), (120, 12795), (121, 12798), (122, 12804), (123, 12807), (125, 12822), (127, 12834), (137, 12873), (138, 12876), (141, 12888), (142, 12897), (146, 12912), (147, 12915), (151, 12939), (153, 12954), (156, 12981), (157, 12984), (164, 13041), (169, 13074), (173, 13110), (177, 13137), (178, 13140), (187, 13179), (190, 13194), (191, 13197), (195, 13221), (200, 13242), (202, 13248), (208, 13275), (211, 13290), (218, 13326), (227, 13371), (229, 13383), (230, 13392), (232, 13404), (235, 13413),

Gene: PAD20\_16 Start: 12238, Stop: 13395, Start Num: 15

Candidate Starts for PAD20\_16:

(Start: 13 @12235 has 9 MA's), (Start: 15 @12238 has 143 MA's), (23, 12265), (26, 12289), (30, 12316), (32, 12322), (34, 12328), (38, 12343), (42, 12358), (43, 12361), (44, 12364), (50, 12394), (61, 12457), (65, 12475), (66, 12499), (74, 12532), (75, 12541), (76, 12544), (77, 12547), (78, 12556), (80, 12574), (83, 12583), (96, 12649), (105, 12685), (107, 12691), (114, 12736), (116, 12748), (120, 12763), (121, 12766), (122, 12772), (123, 12775), (125, 12790), (127, 12802), (137, 12841), (141, 12856), (142, 12865), (146, 12880), (147, 12883), (151, 12907), (153, 12922), (156, 12949), (157, 12952), (164, 13009), (169, 13042), (173, 13078), (177, 13105), (187, 13147), (190, 13162), (191, 13165), (195, 13189), (197, 13201), (200, 13210), (202, 13216), (211, 13258), (218, 13294), (227, 13339), (229, 13351), (230, 13360), (232, 13372), (235, 13381),

Gene: PAS50\_16 Start: 12247, Stop: 13404, Start Num: 15

Candidate Starts for PAS50\_16:

(Start: 13 @12244 has 9 MA's), (Start: 15 @12247 has 143 MA's), (23, 12274), (26, 12298), (30, 12325), (32, 12331), (34, 12337), (38, 12352), (42, 12367), (43, 12370), (44, 12373), (50, 12403), (61, 12466), (65, 12484), (66, 12508), (74, 12541), (75, 12550), (76, 12553), (77, 12556), (78, 12565), (80, 12583), (83, 12592), (96, 12658), (97, 12661), (107, 12700), (116, 12757), (120, 12772), (121, 12775), (122, 12781), (123, 12784), (125, 12799), (127, 12811), (132, 12829), (137, 12850), (142, 12874), (146, 12889), (147, 12892), (151, 12916), (153, 12931), (156, 12958), (157, 12961), (169, 13051), (173, 13087), (177, 13114), (187, 13156), (190, 13171), (191, 13174), (195, 13198), (197, 13210), (200, 13219), (202, 13225), (211, 13267), (218, 13303), (226, 13345), (227, 13348), (230, 13369), (232, 13381), (235, 13390),

Gene: PHL010M04\_16 Start: 12238, Stop: 13398, Start Num: 13

Candidate Starts for PHL010M04\_16:

(Start: 13 @12238 has 9 MA's), (Start: 15 @12241 has 143 MA's), (23, 12268), (26, 12292), (32, 12325), (34, 12331), (38, 12346), (42, 12361), (43, 12364), (44, 12367), (50, 12397), (61, 12460), (63, 12469), (65, 12478), (66, 12502), (74, 12535), (75, 12544), (76, 12547), (77, 12550), (78, 12559), (80, 12577), (81, 12580), (96, 12652), (97, 12655), (107, 12694), (114, 12739), (116, 12751), (120, 12766), (121, 12769), (122, 12775), (123, 12778), (125, 12793), (127, 12805), (133, 12826), (138, 12847), (141, 12859), (142, 12868), (146, 12883), (147, 12886), (151, 12910), (153, 12925), (156, 12952), (164, 13012), (169, 13045), (173, 13081), (177, 13108), (178, 13111), (187, 13150), (190, 13165), (191, 13168), (195, 13192), (197, 13204), (200, 13213), (202, 13219), (211, 13261), (218, 13297), (227, 13342), (229, 13354), (230, 13363), (232, 13375), (235, 13384),

Gene: PHL037M02\_16 Start: 12249, Stop: 13406, Start Num: 15

Candidate Starts for PHL037M02\_16:

(Start: 15 @12249 has 143 MA's), (23, 12276), (26, 12300), (32, 12333), (34, 12339), (38, 12354), (42, 12369), (43, 12372), (44, 12375), (50, 12405), (61, 12468), (63, 12477), (66, 12510), (74, 12543), (75,

12552), (76, 12555), (77, 12558), (80, 12585), (81, 12588), (96, 12660), (97, 12663), (105, 12696), (107, 12702), (114, 12747), (116, 12759), (120, 12774), (121, 12777), (125, 12801), (127, 12813), (138, 12855), (142, 12876), (146, 12891), (147, 12894), (151, 12918), (153, 12933), (156, 12960), (164, 13020), (169, 13053), (173, 13089), (177, 13116), (178, 13119), (187, 13158), (190, 13173), (191, 13176), (195, 13200), (197, 13212), (200, 13221), (202, 13227), (211, 13269), (218, 13305), (226, 13347), (227, 13350), (229, 13362), (230, 13371), (232, 13383), (235, 13392),

Gene: PHL060L00\_16 Start: 12254, Stop: 13414, Start Num: 13

Candidate Starts for PHL060L00\_16:

(Start: 13 @12254 has 9 MA's), (Start: 15 @12257 has 143 MA's), (23, 12284), (26, 12308), (30, 12335), (32, 12341), (34, 12347), (38, 12362), (40, 12371), (42, 12377), (43, 12380), (44, 12383), (49, 12410), (50, 12413), (61, 12476), (65, 12494), (66, 12518), (74, 12551), (75, 12560), (76, 12563), (77, 12566), (78, 12575), (80, 12593), (83, 12602), (96, 12668), (97, 12671), (105, 12704), (107, 12710), (114, 12755), (116, 12767), (121, 12785), (122, 12791), (123, 12794), (125, 12809), (127, 12821), (137, 12860), (138, 12863), (141, 12875), (142, 12884), (146, 12899), (147, 12902), (151, 12926), (153, 12941), (156, 12968), (157, 12971), (164, 13028), (169, 13061), (173, 13097), (177, 13124), (178, 13127), (179, 13136), (187, 13166), (190, 13181), (191, 13184), (195, 13208), (197, 13220), (200, 13229), (211, 13277), (218, 13313), (226, 13355), (227, 13358), (229, 13370), (230, 13379), (232, 13391), (235, 13400),

Gene: PHL067M10\_16 Start: 12215, Stop: 13375, Start Num: 13

Candidate Starts for PHL067M10\_16:

(Start: 13 @12215 has 9 MA's), (Start: 15 @12218 has 143 MA's), (23, 12245), (26, 12269), (30, 12296), (34, 12308), (38, 12323), (42, 12338), (43, 12341), (44, 12344), (50, 12374), (61, 12437), (65, 12455), (66, 12479), (74, 12512), (75, 12521), (76, 12524), (77, 12527), (78, 12536), (80, 12554), (81, 12557), (83, 12563), (96, 12629), (97, 12632), (105, 12665), (107, 12671), (116, 12728), (120, 12743), (121, 12746), (122, 12752), (123, 12755), (125, 12770), (127, 12782), (137, 12821), (141, 12836), (142, 12845), (146, 12860), (147, 12863), (151, 12887), (153, 12902), (156, 12929), (157, 12932), (169, 13022), (173, 13058), (177, 13085), (178, 13088), (187, 13127), (190, 13142), (191, 13145), (195, 13169), (197, 13181), (200, 13190), (202, 13196), (211, 13238), (218, 13274), (226, 13316), (227, 13319), (229, 13331), (230, 13340), (232, 13352), (235, 13361),

Gene: PHL071N05\_16 Start: 12243, Stop: 13403, Start Num: 13

Candidate Starts for PHL071N05\_16:

(Start: 13 @12243 has 9 MA's), (Start: 15 @12246 has 143 MA's), (23, 12273), (26, 12297), (30, 12324), (32, 12330), (34, 12336), (38, 12351), (42, 12366), (43, 12369), (44, 12372), (50, 12402), (61, 12465), (65, 12483), (66, 12507), (74, 12540), (75, 12549), (76, 12552), (77, 12555), (78, 12564), (80, 12582), (81, 12585), (93, 12645), (96, 12657), (97, 12660), (105, 12693), (107, 12699), (114, 12744), (116, 12756), (121, 12774), (122, 12780), (123, 12783), (125, 12798), (127, 12810), (132, 12828), (133, 12831), (137, 12849), (138, 12852), (141, 12864), (142, 12873), (146, 12888), (147, 12891), (151, 12915), (153, 12930), (156, 12957), (157, 12960), (164, 13017), (169, 13050), (173, 13086), (177, 13113), (178, 13116), (187, 13155), (190, 13170), (191, 13173), (195, 13197), (197, 13209), (200, 13218), (202, 13224), (211, 13266), (218, 13302), (226, 13344), (227, 13347), (229, 13359), (230, 13368), (232, 13380), (235, 13389),

Gene: PHL111M01\_16 Start: 12241, Stop: 13398, Start Num: 14

Candidate Starts for PHL111M01\_16:

(14, 12241), (23, 12268), (26, 12292), (30, 12319), (32, 12325), (34, 12331), (38, 12346), (40, 12355), (42, 12361), (43, 12364), (44, 12367), (50, 12397), (61, 12460), (65, 12478), (66, 12502), (74, 12535), (75, 12544), (76, 12547), (77, 12550), (78, 12559), (80, 12577), (83, 12586), (96, 12652), (97, 12655), (105, 12688), (107, 12694), (114, 12739), (116, 12751), (120, 12766), (121, 12769), (122, 12775), (123, 12778), (125, 12793), (127, 12805), (132, 12823), (137, 12844), (141, 12859), (142, 12868), (146, 12883), (147, 12886), (151, 12910), (153, 12925), (156, 12952), (158, 12958), (164, 13012),

(169, 13045), (173, 13081), (177, 13108), (178, 13111), (187, 13150), (190, 13165), (191, 13168), (195, 13192), (197, 13204), (200, 13213), (202, 13219), (208, 13246), (211, 13261), (218, 13297), (227, 13342), (229, 13354), (230, 13363), (232, 13375), (235, 13384),

Gene: PHL112N00\_16 Start: 12236, Stop: 13396, Start Num: 13

Candidate Starts for PHL112N00\_16:

(Start: 13 @12236 has 9 MA's), (Start: 15 @12239 has 143 MA's), (23, 12266), (26, 12290), (30, 12317), (32, 12323), (34, 12329), (38, 12344), (42, 12359), (43, 12362), (44, 12365), (47, 12386), (50, 12395), (61, 12458), (65, 12476), (66, 12500), (74, 12533), (75, 12542), (76, 12545), (77, 12548), (78, 12557), (80, 12575), (81, 12578), (83, 12584), (93, 12638), (96, 12650), (97, 12653), (105, 12686), (107, 12692), (114, 12737), (116, 12749), (120, 12764), (121, 12767), (122, 12773), (123, 12776), (125, 12791), (127, 12803), (133, 12824), (137, 12842), (138, 12845), (141, 12857), (142, 12866), (146, 12881), (147, 12884), (151, 12908), (153, 12923), (156, 12950), (157, 12953), (164, 13010), (169, 13043), (173, 13079), (177, 13106), (187, 13148), (190, 13163), (191, 13166), (195, 13190), (197, 13202), (200, 13211), (202, 13217), (208, 13244), (211, 13259), (218, 13295), (227, 13340), (229, 13352), (230, 13361), (232, 13373), (235, 13382),

Gene: PHL113M01\_16 Start: 12257, Stop: 13417, Start Num: 13

Candidate Starts for PHL113M01\_16:

(Start: 13 @12257 has 9 MA's), (Start: 15 @12260 has 143 MA's), (23, 12287), (26, 12311), (30, 12338), (32, 12344), (34, 12350), (38, 12365), (42, 12380), (43, 12383), (44, 12386), (50, 12416), (61, 12479), (63, 12488), (65, 12497), (66, 12521), (74, 12554), (75, 12563), (77, 12569), (78, 12578), (80, 12596), (83, 12605), (96, 12671), (97, 12674), (105, 12707), (107, 12713), (114, 12758), (116, 12770), (120, 12785), (121, 12788), (122, 12794), (123, 12797), (125, 12812), (127, 12824), (137, 12863), (141, 12878), (142, 12887), (146, 12902), (147, 12905), (151, 12929), (153, 12944), (156, 12971), (157, 12974), (164, 13031), (169, 13064), (173, 13100), (177, 13127), (187, 13169), (190, 13184), (191, 13187), (195, 13211), (197, 13223), (200, 13232), (202, 13238), (211, 13280), (218, 13316), (227, 13361), (229, 13373), (230, 13382), (232, 13394), (235, 13403),

Gene: PHL114L00\_16 Start: 12241, Stop: 13401, Start Num: 13

Candidate Starts for PHL114L00\_16:

(Start: 13 @12241 has 9 MA's), (Start: 15 @12244 has 143 MA's), (23, 12271), (26, 12295), (30, 12322), (32, 12328), (34, 12334), (38, 12349), (43, 12367), (50, 12400), (61, 12463), (63, 12472), (66, 12505), (74, 12538), (75, 12547), (77, 12553), (78, 12562), (81, 12583), (96, 12655), (97, 12658), (105, 12691), (107, 12697), (108, 12700), (114, 12742), (116, 12754), (120, 12769), (121, 12772), (122, 12778), (123, 12781), (125, 12796), (127, 12808), (138, 12850), (141, 12862), (146, 12886), (147, 12889), (151, 12913), (153, 12928), (156, 12955), (158, 12961), (164, 13015), (169, 13048), (173, 13084), (177, 13111), (178, 13114), (187, 13153), (190, 13168), (191, 13171), (195, 13195), (200, 13216), (202, 13222), (211, 13264), (218, 13300), (226, 13342), (230, 13366), (232, 13378), (235, 13387),

Gene: Pablito\_20 Start: 15663, Stop: 16874, Start Num: 15

Candidate Starts for Pablito\_20:

(Start: 15 @15663 has 143 MA's), (39, 15771), (42, 15786), (59, 15873), (61, 15885), (62, 15888), (70, 15948), (92, 16062), (95, 16077), (116, 16185), (124, 16218), (148, 16314), (152, 16344), (158, 16380), (159, 16398), (160, 16401), (161, 16422), (178, 16539), (189, 16584), (191, 16599), (201, 16644), (210, 16674), (227, 16764), (229, 16776), (245, 16848), (246, 16851), (249, 16860), (250, 16866),

Gene: Paedore\_20 Start: 15822, Stop: 17033, Start Num: 15

Candidate Starts for Paedore\_20:

(Start: 15 @15822 has 143 MA's), (39, 15930), (59, 16032), (61, 16044), (62, 16047), (70, 16107), (92, 16221), (95, 16236), (116, 16344), (124, 16377), (128, 16401), (148, 16473), (152, 16503), (159,

16557), (160, 16560), (161, 16581), (178, 16698), (189, 16743), (191, 16758), (211, 16842), (212, 16845), (213, 16848), (219, 16884), (227, 16923), (229, 16935), (239, 16974), (245, 17007), (246, 17010), (249, 17019), (250, 17025),

Gene: Paolo\_22 Start: 16220, Stop: 17431, Start Num: 15

Candidate Starts for Paolo\_22:

(Start: 15 @16220 has 143 MA's), (30, 16301), (59, 16430), (61, 16442), (70, 16505), (92, 16619), (95, 16634), (116, 16742), (124, 16775), (128, 16799), (148, 16871), (158, 16937), (159, 16955), (160, 16958), (161, 16979), (178, 17096), (189, 17141), (191, 17156), (211, 17240), (213, 17246), (227, 17321), (229, 17333), (246, 17408), (249, 17417), (250, 17423),

Gene: Pavo\_22 Start: 16533, Stop: 17750, Start Num: 15

Candidate Starts for Pavo\_22:

(Start: 15 @16533 has 143 MA's), (23, 16560), (29, 16611), (59, 16743), (75, 16845), (107, 17001), (112, 17031), (116, 17055), (124, 17088), (128, 17112), (149, 17187), (158, 17250), (189, 17454), (191, 17469), (201, 17514), (207, 17535), (211, 17553), (229, 17646), (235, 17676), (249, 17736), (250, 17742),

Gene: Phettuccine\_20 Start: 15854, Stop: 17068, Start Num: 15

Candidate Starts for Phettuccine\_20:

(Start: 15 @15854 has 143 MA's), (23, 15881), (59, 16064), (67, 16127), (87, 16226), (92, 16253), (107, 16322), (112, 16352), (140, 16472), (158, 16571), (186, 16769), (189, 16775), (196, 16814), (203, 16838), (210, 16865), (211, 16874), (217, 16907), (229, 16967), (235, 16997), (246, 17045), (249, 17054), (250, 17060),

Gene: Pirate\_16 Start: 12235, Stop: 13392, Start Num: 15

Candidate Starts for Pirate\_16:

(Start: 15 @12235 has 143 MA's), (23, 12262), (26, 12286), (32, 12319), (34, 12325), (38, 12340), (42, 12355), (43, 12358), (44, 12361), (50, 12391), (61, 12454), (63, 12463), (66, 12496), (74, 12529), (75, 12538), (76, 12541), (77, 12544), (78, 12553), (80, 12571), (81, 12574), (93, 12634), (96, 12646), (97, 12649), (107, 12688), (108, 12691), (114, 12733), (116, 12745), (120, 12760), (121, 12763), (122, 12769), (123, 12772), (125, 12787), (127, 12799), (133, 12820), (138, 12841), (141, 12853), (142, 12862), (146, 12877), (147, 12880), (151, 12904), (153, 12919), (156, 12946), (164, 13006), (169, 13039), (173, 13075), (177, 13102), (187, 13144), (190, 13159), (191, 13162), (195, 13186), (197, 13198), (202, 13213), (211, 13255), (218, 13291), (226, 13333), (227, 13336), (230, 13357), (232, 13369), (235, 13378),

Gene: Pitbull\_18 Start: 13184, Stop: 14632, Start Num: 11

Candidate Starts for Pitbull\_18:

(10, 13172), (Start: 11 @13184 has 3 MA's), (20, 13199), (23, 13214), (31, 13268), (38, 13292), (40, 13301), (41, 13307), (44, 13313), (45, 13319), (47, 13334), (51, 13346), (55, 13370), (68, 13454), (73, 13478), (92, 13577), (98, 13604), (102, 13619), (113, 13676), (119, 13706), (123, 13721), (136, 13775), (139, 13781), (150, 13832), (152, 13847), (157, 13880), (166, 13946), (167, 13958), (178, 14045), (182, 14066), (188, 14087), (207, 14186), (218, 14240), (225, 14279), (234, 14324), (252, 14450), (253, 14483), (254, 14531),

Gene: Ponzi\_55 Start: 37563, Stop: 38783, Start Num: 22

Candidate Starts for Ponzi\_55:

(Start: 19 @37551 has 3 MA's), (22, 37563), (23, 37569), (30, 37620), (33, 37629), (44, 37668), (49, 37695), (109, 38034), (110, 38037), (112, 38052), (116, 38076), (158, 38277), (177, 38421), (215, 38592), (222, 38631), (225, 38652), (243, 38745), (251, 38778),

Gene: Procrass1\_16 Start: 12243, Stop: 13400, Start Num: 15

Candidate Starts for Procrass1\_16:

(Start: 13 @12240 has 9 MA's), (Start: 15 @12243 has 143 MA's), (23, 12270), (26, 12294), (30, 12321), (32, 12327), (34, 12333), (38, 12348), (40, 12357), (42, 12363), (43, 12366), (44, 12369), (50, 12399), (61, 12462), (63, 12471), (66, 12504), (74, 12537), (75, 12546), (77, 12552), (78, 12561), (80, 12579), (81, 12582), (83, 12588), (93, 12642), (96, 12654), (97, 12657), (105, 12690), (107, 12696), (116, 12753), (120, 12768), (121, 12771), (122, 12777), (123, 12780), (125, 12795), (127, 12807), (137, 12846), (141, 12861), (142, 12870), (146, 12885), (147, 12888), (151, 12912), (153, 12927), (156, 12954), (157, 12957), (164, 13014), (169, 13047), (173, 13083), (177, 13110), (178, 13113), (179, 13122), (187, 13152), (190, 13167), (191, 13170), (195, 13194), (200, 13215), (202, 13221), (211, 13263), (218, 13299), (226, 13341), (229, 13356), (230, 13365), (232, 13377), (235, 13386),

Gene: Provolone\_21 Start: 16263, Stop: 17480, Start Num: 15

Candidate Starts for Provolone\_21:

(Start: 15 @16263 has 143 MA's), (23, 16290), (29, 16341), (59, 16473), (75, 16575), (107, 16731), (112, 16761), (116, 16785), (124, 16818), (128, 16842), (149, 16917), (158, 16980), (161, 17022), (184, 17169), (189, 17184), (191, 17199), (201, 17244), (207, 17265), (211, 17283), (229, 17376), (235, 17406), (249, 17466), (250, 17472),

Gene: Puginator\_22 Start: 16265, Stop: 17476, Start Num: 15

Candidate Starts for Puginator\_22:

(Start: 15 @16265 has 143 MA's), (59, 16475), (61, 16487), (70, 16550), (92, 16664), (95, 16679), (116, 16787), (124, 16820), (128, 16844), (148, 16916), (158, 16982), (159, 17000), (160, 17003), (161, 17024), (178, 17141), (189, 17186), (191, 17201), (227, 17366), (229, 17378), (246, 17453), (249, 17462), (250, 17468),

Gene: QueenBey\_16 Start: 12243, Stop: 13400, Start Num: 15

Candidate Starts for QueenBey\_16:

(Start: 13 @12240 has 9 MA's), (Start: 15 @12243 has 143 MA's), (23, 12270), (26, 12294), (32, 12327), (34, 12333), (38, 12348), (42, 12363), (43, 12366), (44, 12369), (50, 12399), (61, 12462), (63, 12471), (65, 12480), (66, 12504), (74, 12537), (75, 12546), (76, 12549), (77, 12552), (78, 12561), (80, 12579), (81, 12582), (93, 12642), (96, 12654), (97, 12657), (107, 12696), (108, 12699), (114, 12741), (116, 12753), (121, 12771), (122, 12777), (123, 12780), (125, 12795), (127, 12807), (133, 12828), (138, 12849), (141, 12861), (142, 12870), (146, 12885), (147, 12888), (151, 12912), (153, 12927), (156, 12954), (164, 13014), (169, 13047), (173, 13083), (177, 13110), (178, 13113), (187, 13152), (190, 13167), (191, 13170), (195, 13194), (200, 13215), (202, 13221), (211, 13263), (218, 13299), (226, 13341), (227, 13344), (229, 13356), (230, 13365), (232, 13377), (235, 13386),

Gene: R4\_20 Start: 15904, Stop: 17115, Start Num: 15

Candidate Starts for R4\_20:

(Start: 15 @15904 has 143 MA's), (39, 16012), (59, 16114), (61, 16126), (62, 16129), (70, 16189), (92, 16303), (95, 16318), (116, 16426), (124, 16459), (128, 16483), (148, 16555), (152, 16585), (159, 16639), (160, 16642), (161, 16663), (178, 16780), (189, 16825), (191, 16840), (211, 16924), (212, 16927), (213, 16930), (219, 16966), (227, 17005), (229, 17017), (239, 17056), (246, 17092), (249, 17101), (250, 17107),

Gene: Rana\_20 Start: 15829, Stop: 17040, Start Num: 15

Candidate Starts for Rana\_20:

(Start: 15 @15829 has 143 MA's), (23, 15856), (53, 16009), (59, 16039), (67, 16102), (87, 16201), (92, 16228), (107, 16297), (116, 16351), (117, 16354), (119, 16363), (128, 16408), (148, 16480), (149, 16483), (158, 16546), (160, 16567), (169, 16642), (176, 16696), (186, 16744), (189, 16750), (194, 16786), (196, 16789), (200, 16807), (211, 16849), (248, 17023), (249, 17026), (250, 17032),

Gene: Raqqa\_19 Start: 15720, Stop: 16826, Start Num: 15

Candidate Starts for Raqqa\_19:

(Start: 11 @15714 has 3 MA's), (Start: 15 @15720 has 143 MA's), (24, 15750), (30, 15798), (34, 15810), (37, 15822), (59, 15927), (66, 15978), (74, 16011), (92, 16104), (94, 16116), (112, 16185), (126, 16257), (173, 16521), (196, 16632), (231, 16791),

Gene: RedBear\_22 Start: 16096, Stop: 17307, Start Num: 15

Candidate Starts for RedBear\_22:

(Start: 15 @16096 has 143 MA's), (23, 16123), (53, 16276), (59, 16306), (67, 16369), (87, 16468), (92, 16495), (107, 16564), (128, 16675), (148, 16747), (149, 16750), (152, 16777), (158, 16813), (160, 16834), (189, 17017), (194, 17053), (196, 17056), (200, 17074), (211, 17116), (229, 17209), (249, 17293), (250, 17299),

Gene: Rileysaurus\_16 Start: 12238, Stop: 13395, Start Num: 15

Candidate Starts for Rileysaurus\_16:

(Start: 15 @12238 has 143 MA's), (23, 12265), (26, 12289), (32, 12322), (34, 12328), (38, 12343), (42, 12358), (43, 12361), (44, 12364), (50, 12394), (61, 12457), (63, 12466), (66, 12499), (74, 12532), (75, 12541), (76, 12544), (77, 12547), (78, 12556), (80, 12574), (81, 12577), (93, 12637), (96, 12649), (97, 12652), (105, 12685), (107, 12691), (108, 12694), (114, 12736), (116, 12748), (121, 12766), (122, 12772), (123, 12775), (125, 12790), (127, 12802), (137, 12841), (138, 12844), (141, 12856), (142, 12865), (146, 12880), (147, 12883), (151, 12907), (153, 12922), (156, 12949), (164, 13009), (169, 13042), (173, 13078), (177, 13105), (178, 13108), (187, 13147), (190, 13162), (191, 13165), (195, 13189), (197, 13201), (202, 13216), (208, 13243), (211, 13258), (218, 13294), (227, 13339), (230, 13360), (232, 13372), (235, 13381),

Gene: RootBeer\_17 Start: 14184, Stop: 15296, Start Num: 15

Candidate Starts for RootBeer\_17:

(Start: 15 @14184 has 143 MA's), (26, 14223), (44, 14298), (55, 14355), (59, 14379), (66, 14433), (92, 14562), (94, 14574), (105, 14610), (115, 14664), (126, 14718), (213, 15165),

Gene: Rusticus\_21 Start: 16017, Stop: 17219, Start Num: 15

Candidate Starts for Rusticus\_21:

(Start: 15 @16017 has 143 MA's), (23, 16044), (59, 16227), (67, 16290), (87, 16389), (92, 16416), (107, 16485), (112, 16515), (186, 16932), (189, 16938), (196, 16977), (201, 16998), (210, 17028), (211, 17037), (217, 17070), (232, 17151), (245, 17193), (246, 17196), (249, 17205), (250, 17211),

Gene: SKKY\_16 Start: 12278, Stop: 13435, Start Num: 15

Candidate Starts for SKKY\_16:

(Start: 13 @12275 has 9 MA's), (Start: 15 @12278 has 143 MA's), (23, 12305), (26, 12329), (30, 12356), (34, 12368), (38, 12383), (40, 12392), (42, 12398), (43, 12401), (44, 12404), (50, 12434), (61, 12497), (65, 12515), (66, 12539), (74, 12572), (75, 12581), (77, 12587), (78, 12596), (83, 12623), (97, 12692), (107, 12731), (108, 12734), (116, 12788), (120, 12803), (121, 12806), (122, 12812), (123, 12815), (125, 12830), (127, 12842), (132, 12860), (141, 12896), (142, 12905), (146, 12920), (147, 12923), (151, 12947), (153, 12962), (156, 12989), (158, 12995), (164, 13049), (169, 13082), (173, 13118), (177, 13145), (178, 13148), (187, 13187), (190, 13202), (191, 13205), (195, 13229), (200, 13250), (202, 13256), (211, 13298), (218, 13334), (227, 13379), (229, 13391), (230, 13400), (232, 13412), (235, 13421),

Gene: Saftant\_20 Start: 16811, Stop: 18028, Start Num: 15

Candidate Starts for Saftant\_20:

(Start: 15 @16811 has 143 MA's), (28, 16886), (29, 16889), (59, 17021), (107, 17279), (112, 17309), (116, 17333), (124, 17366), (128, 17390), (152, 17492), (158, 17528), (189, 17732), (191, 17747), (201, 17792), (210, 17822), (211, 17831), (232, 17945), (235, 17954), (249, 18014), (250, 18020),

Gene: SarahRose\_20 Start: 15827, Stop: 17038, Start Num: 15

Candidate Starts for SarahRose\_20:

(Start: 15 @15827 has 143 MA's), (59, 16037), (61, 16049), (62, 16052), (67, 16100), (87, 16199), (92, 16226), (107, 16295), (116, 16349), (128, 16406), (149, 16481), (152, 16508), (156, 16538), (159, 16562), (166, 16616), (176, 16694), (189, 16748), (200, 16805), (210, 16838), (211, 16847), (217, 16880), (219, 16889), (229, 16940), (249, 17024), (250, 17030),

Gene: Sarge\_18 Start: 13985, Stop: 15109, Start Num: 13

Candidate Starts for Sarge\_18:

(Start: 13 @13985 has 9 MA's), (Start: 17 @13991 has 1 MA's), (54, 14165), (59, 14198), (63, 14219), (78, 14309), (92, 14381), (93, 14390), (94, 14393), (115, 14489), (123, 14522), (185, 14867), (198, 14924), (205, 14945), (228, 15056), (236, 15095), (239, 15101),

Gene: Shoya\_17 Start: 13621, Stop: 14745, Start Num: 13

Candidate Starts for Shoya\_17:

(Start: 13 @13621 has 9 MA's), (Start: 17 @13627 has 1 MA's), (21, 13636), (54, 13801), (59, 13834), (63, 13855), (78, 13945), (92, 14017), (93, 14026), (107, 14071), (113, 14113), (115, 14125), (123, 14158), (198, 14560), (209, 14596), (228, 14692), (236, 14731), (239, 14737),

Gene: Snorlax\_20 Start: 15830, Stop: 17041, Start Num: 15

Candidate Starts for Snorlax\_20:

(Start: 15 @15830 has 143 MA's), (59, 16040), (61, 16052), (62, 16055), (67, 16103), (87, 16202), (92, 16229), (107, 16298), (116, 16352), (128, 16409), (149, 16484), (152, 16511), (156, 16541), (159, 16565), (166, 16619), (176, 16697), (189, 16751), (196, 16790), (200, 16808), (210, 16841), (211, 16850), (217, 16883), (219, 16892), (229, 16943), (249, 17027), (250, 17033),

Gene: Solid\_16 Start: 12232, Stop: 13389, Start Num: 15

Candidate Starts for Solid\_16:

(Start: 13 @12229 has 9 MA's), (Start: 15 @12232 has 143 MA's), (23, 12259), (26, 12283), (30, 12310), (32, 12316), (34, 12322), (38, 12337), (42, 12352), (43, 12355), (44, 12358), (50, 12388), (61, 12451), (66, 12493), (74, 12526), (75, 12535), (76, 12538), (77, 12541), (78, 12550), (80, 12568), (83, 12577), (93, 12631), (96, 12643), (97, 12646), (105, 12679), (107, 12685), (114, 12730), (116, 12742), (120, 12757), (121, 12760), (122, 12766), (123, 12769), (125, 12784), (127, 12796), (137, 12835), (138, 12838), (141, 12850), (142, 12859), (146, 12874), (147, 12877), (151, 12901), (153, 12916), (156, 12943), (157, 12946), (164, 13003), (169, 13036), (173, 13072), (177, 13099), (190, 13156), (191, 13159), (195, 13183), (200, 13204), (202, 13210), (208, 13237), (211, 13252), (218, 13288), (227, 13333), (229, 13345), (230, 13354), (232, 13366), (235, 13375),

Gene: South40\_21 Start: 16096, Stop: 17307, Start Num: 15

Candidate Starts for South40\_21:

(Start: 15 @16096 has 143 MA's), (23, 16123), (53, 16276), (59, 16306), (67, 16369), (87, 16468), (92, 16495), (107, 16564), (128, 16675), (148, 16747), (149, 16750), (152, 16777), (158, 16813), (160, 16834), (189, 17017), (194, 17053), (196, 17056), (200, 17074), (211, 17116), (229, 17209), (249, 17293), (250, 17299),

Gene: Speedwell\_27 Start: 18557, Stop: 19774, Start Num: 15

Candidate Starts for Speedwell\_27:

(Start: 15 @18557 has 143 MA's), (23, 18584), (29, 18635), (59, 18767), (66, 18827), (67, 18830), (87, 18929), (107, 19025), (124, 19112), (149, 19211), (152, 19238), (158, 19274), (189, 19478), (191, 19493), (201, 19538), (211, 19577), (212, 19580), (232, 19691), (249, 19760), (250, 19766),

Gene: SqueakyClean\_21 Start: 15829, Stop: 17040, Start Num: 15

Candidate Starts for SqueakyClean\_21:

(Start: 15 @15829 has 143 MA's), (59, 16039), (61, 16051), (62, 16054), (70, 16114), (72, 16126), (92, 16228), (95, 16243), (106, 16294), (148, 16480), (158, 16546), (160, 16567), (178, 16705), (189, 16750), (191, 16765), (201, 16810), (203, 16813), (210, 16840), (211, 16849), (229, 16942), (249, 17026), (250, 17032),

Gene: Stormborn\_16 Start: 12254, Stop: 13411, Start Num: 15

Candidate Starts for Stormborn\_16:

(Start: 13 @12251 has 9 MA's), (Start: 15 @12254 has 143 MA's), (23, 12281), (26, 12305), (30, 12332), (32, 12338), (34, 12344), (38, 12359), (42, 12374), (43, 12377), (44, 12380), (50, 12410), (61, 12473), (63, 12482), (66, 12515), (74, 12548), (75, 12557), (76, 12560), (77, 12563), (78, 12572), (80, 12590), (96, 12665), (97, 12668), (105, 12701), (107, 12707), (114, 12752), (116, 12764), (120, 12779), (121, 12782), (125, 12806), (127, 12818), (138, 12860), (142, 12881), (146, 12896), (147, 12899), (151, 12923), (153, 12938), (156, 12965), (164, 13025), (169, 13058), (173, 13094), (177, 13121), (178, 13124), (187, 13163), (190, 13178), (191, 13181), (195, 13205), (197, 13217), (200, 13226), (202, 13232), (211, 13274), (218, 13310), (226, 13352), (230, 13376), (232, 13388), (235, 13397),

Gene: Success\_63 Start: 39166, Stop: 40425, Start Num: 19

Candidate Starts for Success\_63:

(Start: 19 @39166 has 3 MA's), (23, 39184), (25, 39199), (26, 39208), (61, 39379), (100, 39610), (104, 39625), (105, 39634), (145, 39841), (155, 39904), (167, 39994), (174, 40045), (180, 40081), (189, 40117), (215, 40234), (216, 40246), (222, 40273), (225, 40294), (229, 40312), (243, 40387), (251, 40420),

Gene: Sujidade\_21 Start: 16135, Stop: 17346, Start Num: 15

Candidate Starts for Sujidade\_21:

(Start: 15 @16135 has 143 MA's), (23, 16162), (59, 16345), (61, 16357), (62, 16360), (67, 16408), (87, 16507), (92, 16534), (107, 16603), (116, 16657), (128, 16714), (149, 16789), (156, 16846), (160, 16873), (189, 17056), (196, 17095), (209, 17143), (210, 17146), (211, 17155), (217, 17188), (249, 17332), (250, 17338),

Gene: SunsetPointe\_20 Start: 15844, Stop: 17058, Start Num: 15

Candidate Starts for SunsetPointe\_20:

(Start: 15 @15844 has 143 MA's), (23, 15871), (59, 16054), (67, 16117), (87, 16216), (92, 16243), (107, 16312), (112, 16342), (140, 16462), (158, 16561), (186, 16759), (189, 16765), (196, 16804), (203, 16828), (210, 16855), (211, 16864), (217, 16897), (229, 16957), (235, 16987), (246, 17035), (249, 17044), (250, 17050),

Gene: Supernova\_16 Start: 12250, Stop: 13407, Start Num: 15

Candidate Starts for Supernova\_16:

(Start: 13 @12247 has 9 MA's), (Start: 15 @12250 has 143 MA's), (23, 12277), (26, 12301), (30, 12328), (32, 12334), (34, 12340), (38, 12355), (40, 12364), (42, 12370), (43, 12373), (44, 12376), (50, 12406), (61, 12469), (66, 12511), (74, 12544), (75, 12553), (77, 12559), (78, 12568), (83, 12595), (97, 12664), (107, 12703), (108, 12706), (116, 12760), (120, 12775), (121, 12778), (122, 12784), (123, 12787), (125, 12802), (127, 12814), (132, 12832), (141, 12868), (142, 12877), (146, 12892), (147, 12895), (151, 12919), (153, 12934), (156, 12961), (158, 12967), (164, 13021), (169, 13054), (173, 13090), (177, 13117), (178, 13120), (187, 13159), (190, 13174), (195, 13201), (197, 13213), (200, 13222), (202, 13228), (208, 13255), (211, 13270), (218, 13306), (227, 13351), (229, 13363), (230, 13372), (232, 13384), (235, 13393),

Gene: Superstar\_23 Start: 17541, Stop: 18755, Start Num: 15

Candidate Starts for Superstar\_23:



(Start: 15 @17541 has 143 MA's), (23, 17568), (55, 17727), (61, 17763), (62, 17766), (70, 17826), (92, 17940), (107, 18009), (116, 18063), (128, 18120), (158, 18258), (189, 18462), (219, 18603), (229, 18654), (246, 18732), (249, 18741), (250, 18747),

Gene: TagePhighter\_21 Start: 15830, Stop: 17041, Start Num: 15

Candidate Starts for TagePhighter\_21:

(Start: 15 @15830 has 143 MA's), (59, 16040), (61, 16052), (62, 16055), (67, 16103), (87, 16202), (92, 16229), (107, 16298), (116, 16352), (128, 16409), (149, 16484), (152, 16511), (156, 16541), (159, 16565), (166, 16619), (176, 16697), (189, 16751), (196, 16790), (200, 16808), (210, 16841), (211, 16850), (217, 16883), (219, 16892), (229, 16943), (249, 17027), (250, 17033),

Gene: Teagster\_20 Start: 15351, Stop: 16520, Start Num: 12

Candidate Starts for Teagster\_20:

(12, 15351), (16, 15357), (23, 15381), (31, 15438), (39, 15462), (61, 15579), (64, 15591), (70, 15642), (72, 15654), (76, 15672), (92, 15753), (103, 15798), (107, 15822), (223, 16431), (240, 16509),

Gene: Tefunt\_20 Start: 16338, Stop: 17552, Start Num: 15

Candidate Starts for Tefunt\_20:

(Start: 15 @16338 has 143 MA's), (23, 16365), (39, 16446), (55, 16524), (57, 16542), (61, 16560), (62, 16563), (70, 16623), (92, 16737), (116, 16860), (128, 16917), (178, 17214), (189, 17259), (203, 17322), (229, 17451), (246, 17529), (249, 17538), (250, 17544),

Gene: Thestral\_21 Start: 15797, Stop: 17008, Start Num: 15

Candidate Starts for Thestral\_21:

(Start: 15 @15797 has 143 MA's), (59, 16007), (61, 16019), (62, 16022), (70, 16082), (92, 16196), (95, 16211), (106, 16262), (128, 16376), (148, 16448), (158, 16514), (160, 16535), (178, 16673), (189, 16718), (191, 16733), (207, 16799), (211, 16817), (219, 16859), (224, 16886), (229, 16910), (249, 16994), (250, 17000),

Gene: TinaBelcher\_20 Start: 15745, Stop: 16956, Start Num: 15

Candidate Starts for TinaBelcher\_20:

(Start: 15 @15745 has 143 MA's), (59, 15955), (61, 15967), (62, 15970), (70, 16030), (92, 16144), (95, 16159), (106, 16210), (116, 16267), (128, 16324), (148, 16396), (158, 16462), (160, 16483), (161, 16504), (178, 16621), (189, 16666), (191, 16681), (207, 16747), (211, 16765), (219, 16807), (224, 16834), (229, 16858), (249, 16942), (250, 16948),

Gene: Toma\_20 Start: 15844, Stop: 17055, Start Num: 15

Candidate Starts for Toma\_20:

(Start: 15 @15844 has 143 MA's), (23, 15871), (48, 15997), (53, 16024), (59, 16054), (67, 16117), (87, 16216), (92, 16243), (107, 16312), (116, 16366), (119, 16378), (128, 16423), (148, 16495), (149, 16498), (158, 16561), (160, 16582), (169, 16657), (186, 16759), (189, 16765), (194, 16801), (196, 16804), (200, 16822), (211, 16864), (248, 17038), (249, 17041), (250, 17047),

Gene: Triste\_20 Start: 15821, Stop: 17032, Start Num: 15

Candidate Starts for Triste\_20:

(Start: 15 @15821 has 143 MA's), (59, 16031), (61, 16043), (62, 16046), (67, 16094), (87, 16193), (92, 16220), (107, 16289), (116, 16343), (128, 16400), (149, 16475), (152, 16502), (156, 16532), (159, 16556), (166, 16610), (176, 16688), (189, 16742), (196, 16781), (200, 16799), (210, 16832), (211, 16841), (217, 16874), (219, 16883), (229, 16934), (249, 17018), (250, 17024),

Gene: Triumph\_22 Start: 15746, Stop: 16957, Start Num: 15

Candidate Starts for Triumph\_22:

(Start: 15 @15746 has 143 MA's), (49, 15902), (59, 15956), (61, 15968), (62, 15971), (70, 16031), (92, 16145), (95, 16160), (106, 16211), (128, 16325), (145, 16385), (148, 16397), (158, 16463), (160, 16484), (178, 16622), (185, 16658), (189, 16667), (191, 16682), (201, 16727), (203, 16730), (210, 16757), (211, 16766), (229, 16859), (241, 16907), (246, 16934), (249, 16943), (250, 16949),

Gene: TrvxScott\_19 Start: 15747, Stop: 16958, Start Num: 15

Candidate Starts for TrvxScott\_19:

(Start: 15 @15747 has 143 MA's), (59, 15957), (61, 15969), (62, 15972), (70, 16032), (92, 16146), (95, 16161), (106, 16212), (116, 16269), (128, 16326), (148, 16398), (158, 16464), (160, 16485), (178, 16623), (189, 16668), (191, 16683), (207, 16749), (211, 16767), (219, 16809), (224, 16836), (229, 16860), (249, 16944), (250, 16950),

Gene: TuanPN\_20 Start: 15827, Stop: 17038, Start Num: 15

Candidate Starts for TuanPN\_20:

(Start: 15 @15827 has 143 MA's), (23, 15854), (59, 16037), (61, 16049), (62, 16052), (87, 16199), (92, 16226), (116, 16349), (128, 16406), (149, 16481), (152, 16508), (156, 16538), (160, 16565), (166, 16616), (189, 16748), (196, 16787), (200, 16805), (209, 16835), (210, 16838), (211, 16847), (217, 16880), (219, 16889), (229, 16940), (242, 17000), (249, 17024), (250, 17030),

Gene: Unstoppable\_20 Start: 15845, Stop: 17059, Start Num: 15

Candidate Starts for Unstoppable\_20:

(Start: 15 @15845 has 143 MA's), (23, 15872), (59, 16055), (67, 16118), (87, 16217), (92, 16244), (107, 16313), (112, 16343), (140, 16463), (158, 16562), (186, 16760), (189, 16766), (196, 16805), (203, 16829), (210, 16856), (211, 16865), (217, 16898), (229, 16958), (235, 16988), (246, 17036), (249, 17045), (250, 17051),

Gene: Urza\_20 Start: 16212, Stop: 17432, Start Num: 15

Candidate Starts for Urza\_20:

(Start: 15 @16212 has 143 MA's), (25, 16254), (32, 16299), (49, 16368), (57, 16416), (59, 16422), (91, 16608), (92, 16611), (97, 16635), (107, 16680), (116, 16734), (152, 16893), (158, 16929), (183, 17112), (191, 17148), (196, 17172), (200, 17190), (203, 17196), (211, 17232), (219, 17274), (244, 17400), (249, 17418), (250, 17424),

Gene: Vanseggelen\_25 Start: 16195, Stop: 17409, Start Num: 15

Candidate Starts for Vanseggelen\_25:

(Start: 15 @16195 has 143 MA's), (23, 16222), (29, 16273), (59, 16405), (66, 16465), (67, 16468), (87, 16567), (107, 16663), (109, 16675), (124, 16750), (128, 16774), (149, 16849), (152, 16876), (158, 16912), (189, 17116), (191, 17131), (200, 17173), (201, 17176), (211, 17215), (232, 17329), (249, 17395), (250, 17401),

Gene: Verabelle\_21 Start: 16526, Stop: 17743, Start Num: 15

Candidate Starts for Verabelle\_21:

(Start: 15 @16526 has 143 MA's), (23, 16553), (29, 16604), (53, 16706), (59, 16736), (66, 16796), (67, 16799), (75, 16838), (107, 16994), (112, 17024), (124, 17081), (127, 17102), (149, 17180), (152, 17207), (158, 17243), (189, 17447), (191, 17462), (211, 17546), (229, 17639), (232, 17660), (249, 17729), (250, 17735),

Gene: Verse\_20 Start: 16825, Stop: 18042, Start Num: 15

Candidate Starts for Verse\_20:

(Start: 15 @16825 has 143 MA's), (23, 16852), (29, 16903), (53, 17005), (59, 17035), (66, 17095), (75, 17137), (87, 17197), (107, 17293), (112, 17323), (124, 17380), (127, 17401), (149, 17479), (158, 17542), (189, 17746), (191, 17761), (207, 17827), (211, 17845), (229, 17938), (235, 17968), (249, 18028), (250, 18034),

Gene: VieEnRose\_20 Start: 16278, Stop: 17498, Start Num: 15

Candidate Starts for VieEnRose\_20:

(Start: 15 @16278 has 143 MA's), (25, 16320), (32, 16365), (49, 16434), (57, 16482), (59, 16488), (91, 16674), (92, 16677), (107, 16746), (116, 16800), (134, 16875), (152, 16959), (158, 16995), (163, 17055), (183, 17178), (191, 17214), (196, 17238), (200, 17256), (203, 17262), (211, 17298), (219, 17340), (232, 17412), (249, 17484), (250, 17490),

Gene: Werner\_20 Start: 15831, Stop: 17042, Start Num: 15

Candidate Starts for Werner\_20:

(Start: 15 @15831 has 143 MA's), (59, 16041), (61, 16053), (62, 16056), (67, 16104), (87, 16203), (92, 16230), (107, 16299), (116, 16353), (128, 16410), (149, 16485), (152, 16512), (156, 16542), (159, 16566), (166, 16620), (176, 16698), (189, 16752), (196, 16791), (200, 16809), (210, 16842), (211, 16851), (217, 16884), (219, 16893), (229, 16944), (249, 17028), (250, 17034),

Gene: Whatever\_20 Start: 15831, Stop: 17042, Start Num: 15

Candidate Starts for Whatever\_20:

(Start: 15 @15831 has 143 MA's), (59, 16041), (61, 16053), (62, 16056), (67, 16104), (87, 16203), (92, 16230), (107, 16299), (116, 16353), (128, 16410), (149, 16485), (152, 16512), (156, 16542), (159, 16566), (166, 16620), (176, 16698), (189, 16752), (196, 16791), (200, 16809), (210, 16842), (211, 16851), (217, 16884), (219, 16893), (229, 16944), (249, 17028), (250, 17034),

Gene: Wizzo\_16 Start: 12265, Stop: 13422, Start Num: 15

Candidate Starts for Wizzo\_16:

(Start: 13 @12262 has 9 MA's), (Start: 15 @12265 has 143 MA's), (23, 12292), (26, 12316), (30, 12343), (32, 12349), (34, 12355), (38, 12370), (42, 12385), (43, 12388), (44, 12391), (50, 12421), (61, 12484), (65, 12502), (66, 12526), (69, 12535), (74, 12559), (75, 12568), (76, 12571), (77, 12574), (78, 12583), (80, 12601), (83, 12610), (93, 12664), (96, 12676), (97, 12679), (105, 12712), (107, 12718), (116, 12775), (120, 12790), (121, 12793), (122, 12799), (123, 12802), (125, 12817), (127, 12829), (137, 12868), (141, 12883), (142, 12892), (146, 12907), (147, 12910), (151, 12934), (153, 12949), (156, 12976), (157, 12979), (164, 13036), (169, 13069), (173, 13105), (177, 13132), (187, 13174), (190, 13189), (191, 13192), (195, 13216), (200, 13237), (202, 13243), (211, 13285), (218, 13321), (226, 13363), (229, 13378), (230, 13387), (232, 13399), (235, 13408),

Gene: Yasdniil\_20 Start: 15823, Stop: 17034, Start Num: 15

Candidate Starts for Yasdniil\_20:

(Start: 15 @15823 has 143 MA's), (23, 15850), (59, 16033), (61, 16045), (62, 16048), (87, 16195), (92, 16222), (116, 16345), (128, 16402), (149, 16477), (152, 16504), (156, 16534), (160, 16561), (166, 16612), (189, 16744), (196, 16783), (200, 16801), (209, 16831), (210, 16834), (211, 16843), (217, 16876), (219, 16885), (229, 16936), (242, 16996), (249, 17020), (250, 17026),

Gene: Yosif\_21 Start: 16799, Stop: 17983, Start Num: 15

Candidate Starts for Yosif\_21:

(Start: 15 @16799 has 143 MA's), (29, 16877), (30, 16880), (32, 16886), (57, 17003), (59, 17009), (66, 17069), (82, 17153), (86, 17168), (92, 17198), (116, 17321), (124, 17354), (152, 17480), (158, 17516), (176, 17642), (191, 17711), (196, 17735), (211, 17795), (249, 17969), (250, 17975),

Gene: Zainub\_22 Start: 16178, Stop: 17389, Start Num: 15

Candidate Starts for Zainub\_22:

(Start: 15 @16178 has 143 MA's), (30, 16259), (59, 16388), (61, 16400), (70, 16463), (92, 16577), (95, 16592), (116, 16700), (124, 16733), (128, 16757), (148, 16829), (158, 16895), (159, 16913), (160, 16916), (161, 16937), (178, 17054), (189, 17099), (191, 17114), (211, 17198), (213, 17204), (227, 17279), (229, 17291), (246, 17366), (249, 17375), (250, 17381),

Gene: Zemlya\_21 Start: 15855, Stop: 17066, Start Num: 15

Candidate Starts for Zemlya\_21:

(Start: 15 @15855 has 143 MA's), (23, 15882), (48, 16008), (50, 16014), (53, 16035), (59, 16065), (67, 16128), (87, 16227), (92, 16254), (107, 16323), (116, 16377), (119, 16389), (128, 16434), (148, 16506), (149, 16509), (158, 16572), (160, 16593), (169, 16668), (186, 16770), (189, 16776), (194, 16812), (196, 16815), (200, 16833), (211, 16875), (248, 17049), (249, 17052), (250, 17058),

Gene: Zucker\_20 Start: 15353, Stop: 16471, Start Num: 18

Candidate Starts for Zucker\_20:

(Start: 18 @15353 has 2 MA's), (36, 15440), (54, 15527), (56, 15536), (59, 15560), (61, 15572), (63, 15581), (92, 15743), (93, 15752), (94, 15755), (113, 15839), (115, 15851), (123, 15884), (135, 15935), (143, 15965), (157, 16043), (177, 16193), (185, 16229), (187, 16235), (205, 16307), (207, 16316), (239, 16463),

Gene: phiCAM\_21 Start: 18698, Stop: 19705, Start Num: 59

Candidate Starts for phiCAM\_21:

(Start: 15 @18488 has 143 MA's), (23, 18515), (29, 18566), (59, 18698), (66, 18758), (75, 18800), (107, 18956), (112, 18986), (124, 19043), (128, 19067), (149, 19142), (152, 19169), (158, 19205), (189, 19409), (191, 19424), (201, 19469), (211, 19508), (229, 19601), (235, 19631), (249, 19691), (250, 19697),

Gene: phiHau3\_22 Start: 16517, Stop: 17728, Start Num: 11

Candidate Starts for phiHau3\_22:

(10, 16505), (Start: 11 @16517 has 3 MA's), (Start: 15 @16523 has 143 MA's), (32, 16610), (55, 16709), (61, 16745), (70, 16808), (92, 16922), (94, 16934), (106, 16988), (107, 16991), (112, 17021), (116, 17045), (128, 17102), (140, 17141), (148, 17174), (149, 17177), (155, 17225), (189, 17444), (191, 17459), (201, 17504), (210, 17534), (213, 17549), (219, 17585), (246, 17705), (249, 17714), (250, 17720),