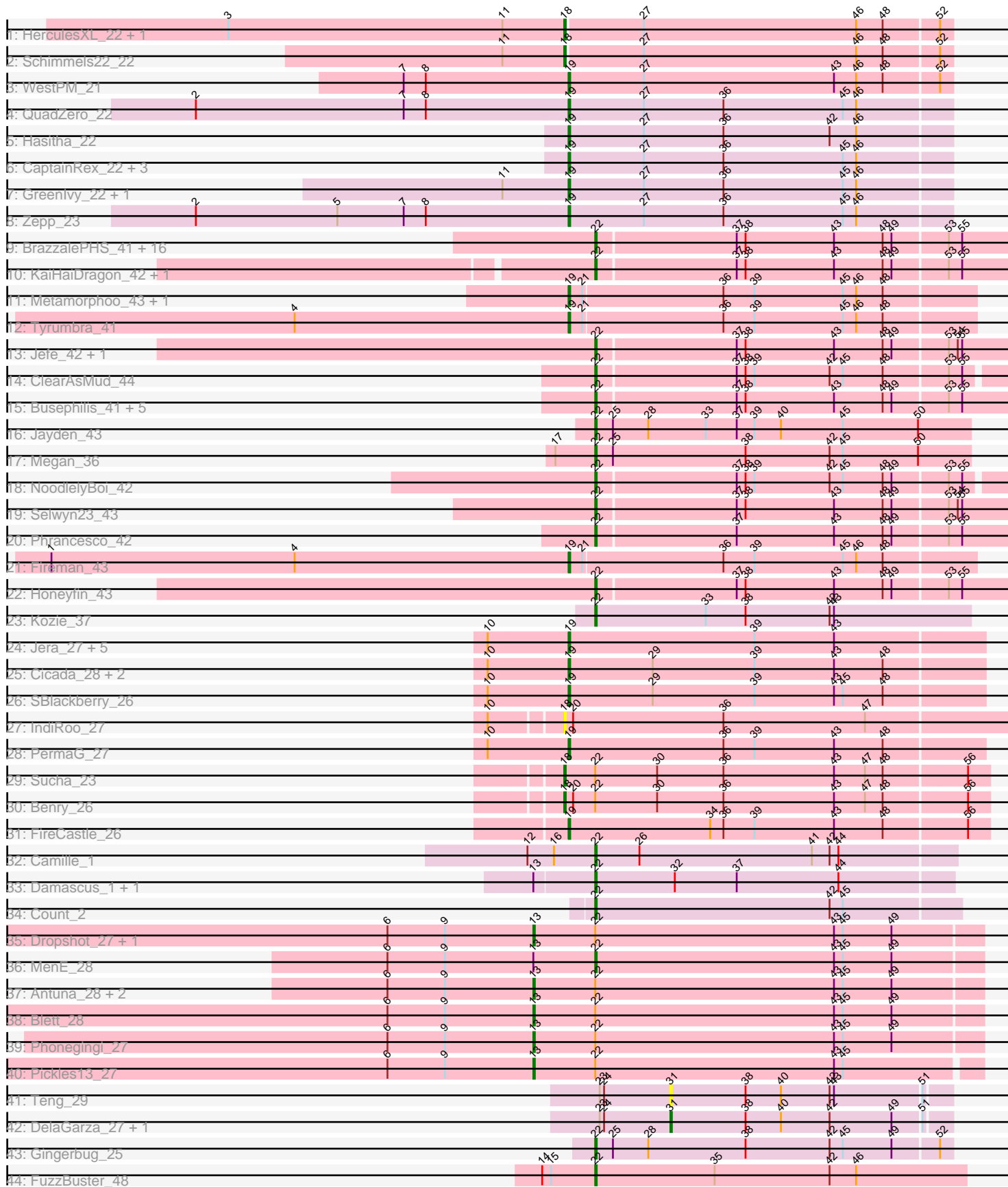


Pham 196465



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 196465 Report

This analysis was run 12/09/24 on database version 580.

Pham number 196465 has 85 members, 4 are drafts.

Phages represented in each track:

- Track 1 : HerculesXL\_22, Tinyman4\_22
- Track 2 : Schimmels22\_22
- Track 3 : WestPM\_21
- Track 4 : QuadZero\_22
- Track 5 : Hasitha\_22
- Track 6 : CaptainRex\_22, LilTerminator\_23, Fulton\_22, Librie\_22
- Track 7 : Greenlvy\_22, Zayuliv\_22
- Track 8 : Zepp\_23
- Track 9 : BrazzalePHS\_41, Hermeonysus\_41, Paschalis\_41, CrazyRich\_41, Cranjis\_43, Ganandorf\_41, Phorgeous\_41, Crisis\_43, Quhwah\_45, Scumberland\_43, Savannah\_41, Ramiel05\_41, Jollipop\_42, LittleFortune\_43, Kowalski\_41, Antares\_42, Onika\_41
- Track 10 : KaiHaiDragon\_42, EarickHC\_42
- Track 11 : Metamorphoo\_43, RobsFeet\_44
- Track 12 : Tyumbra\_41
- Track 13 : Jefe\_42, Yeti\_42
- Track 14 : ClearAsMud\_44
- Track 15 : Busephilis\_41, PierreOrion\_42, Piperis\_42, Pulchra\_43, PiperSansNom\_42, Shotgun\_41
- Track 16 : Jayden\_43
- Track 17 : Megan\_36
- Track 18 : NoodlelyBoi\_42
- Track 19 : Selwyn23\_43
- Track 20 : Phrancesco\_42
- Track 21 : Fireman\_43
- Track 22 : Honeyfin\_43
- Track 23 : Kozie\_37
- Track 24 : Jera\_27, Htur\_26, Zanella\_26, Rasovi\_26, TurboVicky\_26, Typher\_28
- Track 25 : Cicada\_28, Goodman\_27, Johann\_27
- Track 26 : SBlackberry\_26
- Track 27 : IndiRoo\_27
- Track 28 : PermaG\_27
- Track 29 : Sucha\_23
- Track 30 : Benry\_26
- Track 31 : FireCastle\_26
- Track 32 : Camille\_1
- Track 33 : Damascus\_1, DizzyRudy\_1

- Track 34 : Count\_2
- Track 35 : Dropshot\_27, Warren\_28
- Track 36 : MenE\_28
- Track 37 : Antuna\_28, Appa\_27, Bush\_28
- Track 38 : Blett\_28
- Track 39 : Phonegingi\_27
- Track 40 : Pickles13\_27
- Track 41 : Teng\_29
- Track 42 : DelaGarza\_27, Lesiram\_28
- Track 43 : Gingerbug\_25
- Track 44 : FuzzBuster\_48

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

The start number called the most often in the published annotations is 22, it was called in 41 of the 81 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Antares\_42, BrazzalePHS\_41, Busephilis\_41, Camille\_1, ClearAsMud\_44, Count\_2, Cranjis\_43, CrazyRich\_41, Crisis\_43, Damascus\_1, DizzyRudy\_1, EarickHC\_42, FuzzBuster\_48, Ganandorf\_41, Gingerbug\_25, Hermeonysus\_41, Honeyfin\_43, Jayden\_43, Jefe\_42, Jollipop\_42, KaiHaiDragon\_42, Kowalski\_41, Kozie\_37, LittleFortune\_43, Megan\_36, MenE\_28, NoodlelyBoi\_42, Onika\_41, Paschalis\_41, Phorgeous\_41, Phrancesco\_42, PierreOrion\_42, PiperSansNom\_42, Piperis\_42, Pulchra\_43, Quhwah\_45, Ramiel05\_41, Savannah\_41, Scumberland\_43, Selwyn23\_43, Shotgun\_41, Yeti\_42,

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

- Antuna\_28, Appa\_27, Benry\_26, Blett\_28, Bush\_28, Dropshot\_27, Phonegingi\_27, Pickles13\_27, Sucha\_23, Warren\_28,

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

- CaptainRex\_22, Cicada\_28, DelaGarza\_27, FireCastle\_26, Fireman\_43, Fulton\_22, Goodman\_27, Greenlvy\_22, Hasitha\_22, HerculesXL\_22, Htur\_26, IndiRoo\_27, Jera\_27, Johann\_27, Lesiram\_28, Librie\_22, LilTerminator\_23, Metamorphoo\_43, PermaG\_27, QuadZero\_22, Rasovi\_26, RobsFeet\_44, SBlackberry\_26, Schimmels22\_22, Teng\_29, Tinyman4\_22, TurboVicky\_26, Typher\_28, Tyrumbra\_41, WestPM\_21, Zanella\_26, Zayuliv\_22, Zepp\_23,

**Summary by start number:**

Start 13:

- Found in 11 of 85 ( 12.9% ) of genes in pham
- Manual Annotations of this start: 8 of 81
- Called 72.7% of time when present
- Phage (with cluster) where this start called: Antuna\_28 (GA), Appa\_27 (GA), Blett\_28 (GA), Bush\_28 (GA), Dropshot\_27 (GA), Phonegingi\_27 (GA), Pickles13\_27 (GA), Warren\_28 (GA),

Start 18:

- Found in 6 of 85 ( 7.1% ) of genes in pham
- Manual Annotations of this start: 5 of 81
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Berry\_26 (EJ), HerculesXL\_22 (EA11), IndiRoo\_27 (EJ), Schimmels22\_22 (EA11), Sucha\_23 (EJ), Tinyman4\_22 (EA11),

Start 19:

- Found in 26 of 85 ( 30.6% ) of genes in pham
- Manual Annotations of this start: 25 of 81
- Called 100.0% of time when present
- Phage (with cluster) where this start called: CaptainRex\_22 (EA5), Cicada\_28 (EJ), FireCastle\_26 (EJ), Fireman\_43 (EC), Fulton\_22 (EA5), Goodman\_27 (EJ), Greenlvy\_22 (EA5), Hasitha\_22 (EA5), Htur\_26 (EJ), Jera\_27 (EJ), Johann\_27 (EJ), Librie\_22 (EA5), LilTerminator\_23 (EA5), Metamorphoo\_43 (EC), PermaG\_27 (EJ), QuadZero\_22 (EA5), Rasovi\_26 (EJ), RobsFeet\_44 (EC), SBlackberry\_26 (EJ), TurboVicky\_26 (EJ), Typher\_28 (EJ), Tyumbra\_41 (EC), WestPM\_21 (EA11), Zanella\_26 (EJ), Zayuliv\_22 (EA5), Zepp\_23 (EA5),

Start 22:

- Found in 52 of 85 ( 61.2% ) of genes in pham
- Manual Annotations of this start: 41 of 81
- Called 80.8% of time when present
- Phage (with cluster) where this start called: Antares\_42 (EC), BrazzalePHS\_41 (EC), Busephilis\_41 (EC), Camille\_1 (EL), ClearAsMud\_44 (EC), Count\_2 (EL), Cranjis\_43 (EC), CrazyRich\_41 (EC), Crisis\_43 (EC), Damascus\_1 (EL), DizzyRudy\_1 (EL), EarickHC\_42 (EC), FuzzBuster\_48 (singleton), Ganandorf\_41 (EC), Gingerbug\_25 (GF), Hermeonysus\_41 (EC), Honeyfin\_43 (EC), Jayden\_43 (EC), Jefe\_42 (EC), Jollipop\_42 (EC), KaiHaiDragon\_42 (EC), Kowalski\_41 (EC), Kozie\_37 (EI), LittleFortune\_43 (EC), Megan\_36 (EC), MenE\_28 (GA), NoodlelyBoi\_42 (EC), Onika\_41 (EC), Paschalis\_41 (EC), Phorgeous\_41 (EC), Phrancesco\_42 (EC), PierreOrion\_42 (EC), PiperSansNom\_42 (EC), Piperis\_42 (EC), Pulchra\_43 (EC), Quhwah\_45 (EC), Ramiel05\_41 (EC), Savannah\_41 (EC), Scumberland\_43 (EC), Selwyn23\_43 (EC), Shotgun\_41 (EC), Yeti\_42 (EC),

Start 31:

- Found in 3 of 85 ( 3.5% ) of genes in pham
- Manual Annotations of this start: 2 of 81
- Called 100.0% of time when present
- Phage (with cluster) where this start called: DelaGarza\_27 (GF), Lesiram\_28 (GF), Teng\_29 (GF),

### Summary by clusters:

There are 9 clusters represented in this pham: EL, singleton, EA11, EJ, EC, GF, GA, EI, EA5,

Info for manual annotations of cluster EA11:

- Start number 18 was manually annotated 3 times for cluster EA11.
- Start number 19 was manually annotated 1 time for cluster EA11.

Info for manual annotations of cluster EA5:

- Start number 19 was manually annotated 8 times for cluster EA5.

Info for manual annotations of cluster EC:

- Start number 19 was manually annotated 4 times for cluster EC.
- Start number 22 was manually annotated 33 times for cluster EC.

Info for manual annotations of cluster EI:

- Start number 22 was manually annotated 1 time for cluster EI.

Info for manual annotations of cluster EJ:

- Start number 18 was manually annotated 2 times for cluster EJ.
- Start number 19 was manually annotated 12 times for cluster EJ.

Info for manual annotations of cluster EL:

- Start number 22 was manually annotated 4 times for cluster EL.

Info for manual annotations of cluster GA:

- Start number 13 was manually annotated 8 times for cluster GA.
- Start number 22 was manually annotated 1 time for cluster GA.

Info for manual annotations of cluster GF:

- Start number 22 was manually annotated 1 time for cluster GF.
- Start number 31 was manually annotated 2 times for cluster GF.

### ***Gene Information:***

Gene: Antares\_42 Start: 29929, Stop: 30222, Start Num: 22

Candidate Starts for Antares\_42:

(Start: 22 @29929 has 41 MA's), (37, 30022), (38, 30028), (43, 30088), (48, 30121), (49, 30127), (53, 30163), (55, 30172),

Gene: Antuna\_28 Start: 18326, Stop: 18628, Start Num: 13

Candidate Starts for Antuna\_28:

(6, 18227), (9, 18266), (Start: 13 @18326 has 8 MA's), (Start: 22 @18368 has 41 MA's), (43, 18530), (45, 18536), (49, 18569),

Gene: Appa\_27 Start: 18188, Stop: 18493, Start Num: 13

Candidate Starts for Appa\_27:

(6, 18089), (9, 18128), (Start: 13 @18188 has 8 MA's), (Start: 22 @18230 has 41 MA's), (43, 18392), (45, 18398), (49, 18431),

Gene: Benry\_26 Start: 18897, Stop: 19181, Start Num: 18

Candidate Starts for Benry\_26:

(Start: 18 @18897 has 5 MA's), (20, 18903), (Start: 22 @18918 has 41 MA's), (30, 18960), (36, 19005), (43, 19080), (47, 19101), (48, 19113), (56, 19167),

Gene: Blett\_28 Start: 18338, Stop: 18640, Start Num: 13

Candidate Starts for Blett\_28:

(6, 18239), (9, 18278), (Start: 13 @18338 has 8 MA's), (Start: 22 @18380 has 41 MA's), (43, 18542), (45, 18548), (49, 18581),

Gene: BrazzalePHS\_41 Start: 29724, Stop: 30017, Start Num: 22

Candidate Starts for BrazzalePHS\_41:

(Start: 22 @29724 has 41 MA's), (37, 29817), (38, 29823), (43, 29883), (48, 29916), (49, 29922), (53, 29958), (55, 29967),

Gene: Busephilis\_41 Start: 29665, Stop: 29958, Start Num: 22

Candidate Starts for Busephilis\_41:

(Start: 22 @29665 has 41 MA's), (37, 29758), (38, 29764), (43, 29824), (48, 29857), (49, 29863), (53, 29899), (55, 29908),

Gene: Bush\_28 Start: 18316, Stop: 18618, Start Num: 13

Candidate Starts for Bush\_28:

(6, 18217), (9, 18256), (Start: 13 @18316 has 8 MA's), (Start: 22 @18358 has 41 MA's), (43, 18520), (45, 18526), (49, 18559),

Gene: Camille\_1 Start: 116, Stop: 358, Start Num: 22

Candidate Starts for Camille\_1:

(12, 71), (16, 89), (Start: 22 @116 has 41 MA's), (26, 146), (41, 263), (42, 275), (44, 281),

Gene: CaptainRex\_22 Start: 16502, Stop: 16759, Start Num: 19

Candidate Starts for CaptainRex\_22:

(Start: 19 @16502 has 25 MA's), (27, 16553), (36, 16607), (45, 16688), (46, 16697),

Gene: Cicada\_28 Start: 20423, Stop: 20701, Start Num: 19

Candidate Starts for Cicada\_28:

(10, 20369), (Start: 19 @20423 has 25 MA's), (29, 20480), (39, 20549), (43, 20603), (48, 20636),

Gene: ClearAsMud\_44 Start: 29829, Stop: 30116, Start Num: 22

Candidate Starts for ClearAsMud\_44:

(Start: 22 @29829 has 41 MA's), (37, 29922), (38, 29928), (39, 29934), (42, 29985), (45, 29994), (48, 30021), (53, 30063), (55, 30072),

Gene: Count\_2 Start: 251, Stop: 496, Start Num: 22

Candidate Starts for Count\_2:

(Start: 22 @251 has 41 MA's), (42, 410), (45, 419),

Gene: Cranjis\_43 Start: 29884, Stop: 30177, Start Num: 22

Candidate Starts for Cranjis\_43:

(Start: 22 @29884 has 41 MA's), (37, 29977), (38, 29983), (43, 30043), (48, 30076), (49, 30082), (53, 30118), (55, 30127),

Gene: CrazyRich\_41 Start: 29693, Stop: 29986, Start Num: 22

Candidate Starts for CrazyRich\_41:

(Start: 22 @29693 has 41 MA's), (37, 29786), (38, 29792), (43, 29852), (48, 29885), (49, 29891), (53, 29927), (55, 29936),

Gene: Crisis\_43 Start: 29684, Stop: 29977, Start Num: 22

Candidate Starts for Crisis\_43:

(Start: 22 @29684 has 41 MA's), (37, 29777), (38, 29783), (43, 29843), (48, 29876), (49, 29882), (53, 29918), (55, 29927),

Gene: Damascus\_1 Start: 74, Stop: 313, Start Num: 22

Candidate Starts for Damascus\_1:

(Start: 13 @35 has 8 MA's), (Start: 22 @74 has 41 MA's), (32, 128), (37, 170), (44, 239),

Gene: DelaGarza\_27 Start: 18870, Stop: 19055, Start Num: 31

Candidate Starts for DelaGarza\_27:

(23, 18822), (24, 18825), (Start: 31 @18870 has 2 MA's), (38, 18921), (40, 18945), (42, 18978), (49, 19020), (51, 19038),

Gene: DizzyRudy\_1 Start: 74, Stop: 313, Start Num: 22

Candidate Starts for DizzyRudy\_1:

(Start: 13 @35 has 8 MA's), (Start: 22 @74 has 41 MA's), (32, 128), (37, 170), (44, 239),

Gene: Dropshot\_27 Start: 18188, Stop: 18490, Start Num: 13

Candidate Starts for Dropshot\_27:

(6, 18089), (9, 18128), (Start: 13 @18188 has 8 MA's), (Start: 22 @18230 has 41 MA's), (43, 18392), (45, 18398), (49, 18431),

Gene: EarickHC\_42 Start: 29607, Stop: 29900, Start Num: 22

Candidate Starts for EarickHC\_42:

(Start: 22 @29607 has 41 MA's), (37, 29700), (38, 29706), (43, 29766), (48, 29799), (49, 29805), (53, 29841), (55, 29850),

Gene: FireCastle\_26 Start: 20491, Stop: 20772, Start Num: 19

Candidate Starts for FireCastle\_26:

(Start: 19 @20491 has 25 MA's), (34, 20587), (36, 20596), (39, 20617), (43, 20671), (48, 20704), (56, 20758),

Gene: Fireman\_43 Start: 31207, Stop: 31476, Start Num: 19

Candidate Starts for Fireman\_43:

(1, 30856), (4, 31021), (Start: 19 @31207 has 25 MA's), (21, 31216), (36, 31309), (39, 31330), (45, 31390), (46, 31399), (48, 31417),

Gene: Fulton\_22 Start: 16484, Stop: 16741, Start Num: 19

Candidate Starts for Fulton\_22:

(Start: 19 @16484 has 25 MA's), (27, 16535), (36, 16589), (45, 16670), (46, 16679),

Gene: FuzzBuster\_48 Start: 30251, Stop: 30502, Start Num: 22

Candidate Starts for FuzzBuster\_48:

(14, 30215), (15, 30221), (Start: 22 @30251 has 41 MA's), (35, 30332), (42, 30410), (46, 30428),

Gene: Ganandorf\_41 Start: 29746, Stop: 30039, Start Num: 22

Candidate Starts for Ganandorf\_41:

(Start: 22 @29746 has 41 MA's), (37, 29839), (38, 29845), (43, 29905), (48, 29938), (49, 29944), (53, 29980), (55, 29989),

Gene: Gingerbug\_25 Start: 18946, Stop: 19185, Start Num: 22

Candidate Starts for Gingerbug\_25:

(Start: 22 @18946 has 41 MA's), (25, 18958), (28, 18982), (38, 19048), (42, 19105), (45, 19114), (49, 19147), (52, 19177),

Gene: Goodman\_27 Start: 20336, Stop: 20614, Start Num: 19

Candidate Starts for Goodman\_27:

(10, 20282), (Start: 19 @20336 has 25 MA's), (29, 20393), (39, 20462), (43, 20516), (48, 20549),

Gene: Greenlvy\_22 Start: 17076, Stop: 17333, Start Num: 19

Candidate Starts for Greenlvy\_22:

(11, 17034), (Start: 19 @17076 has 25 MA's), (27, 17127), (36, 17181), (45, 17262), (46, 17271),

Gene: Hasitha\_22 Start: 16502, Stop: 16759, Start Num: 19

Candidate Starts for Hasitha\_22:

(Start: 19 @16502 has 25 MA's), (27, 16553), (36, 16607), (42, 16679), (46, 16697),

Gene: HerculesXL\_22 Start: 16593, Stop: 16850, Start Num: 18

Candidate Starts for HerculesXL\_22:

(3, 16365), (11, 16551), (Start: 18 @16593 has 5 MA's), (27, 16644), (46, 16788), (48, 16806), (52, 16842),

Gene: Hermeonysus\_41 Start: 29613, Stop: 29906, Start Num: 22

Candidate Starts for Hermeonysus\_41:

(Start: 22 @29613 has 41 MA's), (37, 29706), (38, 29712), (43, 29772), (48, 29805), (49, 29811), (53, 29847), (55, 29856),

Gene: Honeyfin\_43 Start: 29934, Stop: 30227, Start Num: 22

Candidate Starts for Honeyfin\_43:

(Start: 22 @29934 has 41 MA's), (37, 30027), (38, 30033), (43, 30093), (48, 30126), (49, 30132), (53, 30168), (55, 30177),

Gene: Htur\_26 Start: 20391, Stop: 20669, Start Num: 19

Candidate Starts for Htur\_26:

(10, 20337), (Start: 19 @20391 has 25 MA's), (39, 20517), (43, 20571),

Gene: IndiRoo\_27 Start: 18907, Stop: 19206, Start Num: 18

Candidate Starts for IndiRoo\_27:

(10, 18862), (Start: 18 @18907 has 5 MA's), (20, 18913), (36, 19015), (47, 19111),

Gene: Jayden\_43 Start: 30188, Stop: 30442, Start Num: 22

Candidate Starts for Jayden\_43:

(Start: 22 @30188 has 41 MA's), (25, 30200), (28, 30224), (33, 30263), (37, 30284), (39, 30296), (40, 30314), (45, 30356), (50, 30407),

Gene: Jefe\_42 Start: 29671, Stop: 29964, Start Num: 22

Candidate Starts for Jefe\_42:

(Start: 22 @29671 has 41 MA's), (37, 29764), (38, 29770), (43, 29830), (48, 29863), (49, 29869), (53, 29905), (54, 29911), (55, 29914),

Gene: Jera\_27 Start: 19448, Stop: 19726, Start Num: 19

Candidate Starts for Jera\_27:

(10, 19394), (Start: 19 @19448 has 25 MA's), (39, 19574), (43, 19628),

Gene: Johann\_27 Start: 20336, Stop: 20614, Start Num: 19

Candidate Starts for Johann\_27:

(10, 20282), (Start: 19 @20336 has 25 MA's), (29, 20393), (39, 20462), (43, 20516), (48, 20549),

Gene: Jollipop\_42 Start: 30010, Stop: 30303, Start Num: 22

Candidate Starts for Jollipop\_42:

(Start: 22 @30010 has 41 MA's), (37, 30103), (38, 30109), (43, 30169), (48, 30202), (49, 30208), (53, 30244), (55, 30253),

Gene: KaiHaiDragon\_42 Start: 29607, Stop: 29900, Start Num: 22



Candidate Starts for KaiHaiDragon\_42:

(Start: 22 @29607 has 41 MA's), (37, 29700), (38, 29706), (43, 29766), (48, 29799), (49, 29805), (53, 29841), (55, 29850),

Gene: Kowalski\_41 Start: 29720, Stop: 30013, Start Num: 22

Candidate Starts for Kowalski\_41:

(Start: 22 @29720 has 41 MA's), (37, 29813), (38, 29819), (43, 29879), (48, 29912), (49, 29918), (53, 29954), (55, 29963),

Gene: Kozie\_37 Start: 29192, Stop: 29446, Start Num: 22

Candidate Starts for Kozie\_37:

(Start: 22 @29192 has 41 MA's), (33, 29267), (38, 29294), (42, 29351), (43, 29354),

Gene: Lesiram\_28 Start: 18839, Stop: 19024, Start Num: 31

Candidate Starts for Lesiram\_28:

(23, 18791), (24, 18794), (Start: 31 @18839 has 2 MA's), (38, 18890), (40, 18914), (42, 18947), (49, 18989), (51, 19007),

Gene: Librie\_22 Start: 16502, Stop: 16759, Start Num: 19

Candidate Starts for Librie\_22:

(Start: 19 @16502 has 25 MA's), (27, 16553), (36, 16607), (45, 16688), (46, 16697),

Gene: LilTerminator\_23 Start: 16508, Stop: 16765, Start Num: 19

Candidate Starts for LilTerminator\_23:

(Start: 19 @16508 has 25 MA's), (27, 16559), (36, 16613), (45, 16694), (46, 16703),

Gene: LittleFortune\_43 Start: 29976, Stop: 30269, Start Num: 22

Candidate Starts for LittleFortune\_43:

(Start: 22 @29976 has 41 MA's), (37, 30069), (38, 30075), (43, 30135), (48, 30168), (49, 30174), (53, 30210), (55, 30219),

Gene: Megan\_36 Start: 30627, Stop: 30881, Start Num: 22

Candidate Starts for Megan\_36:

(17, 30600), (Start: 22 @30627 has 41 MA's), (25, 30639), (38, 30729), (42, 30786), (45, 30795), (50, 30846),

Gene: MenE\_28 Start: 18498, Stop: 18758, Start Num: 22

Candidate Starts for MenE\_28:

(6, 18357), (9, 18396), (Start: 13 @18456 has 8 MA's), (Start: 22 @18498 has 41 MA's), (43, 18660), (45, 18666), (49, 18699),

Gene: Metamorphoo\_43 Start: 30469, Stop: 30738, Start Num: 19

Candidate Starts for Metamorphoo\_43:

(Start: 19 @30469 has 25 MA's), (21, 30478), (36, 30571), (39, 30592), (45, 30652), (46, 30661), (48, 30679),

Gene: NoodlelyBoi\_42 Start: 30039, Stop: 30326, Start Num: 22

Candidate Starts for NoodlelyBoi\_42:

(Start: 22 @30039 has 41 MA's), (37, 30132), (38, 30138), (39, 30144), (42, 30195), (45, 30204), (48, 30231), (49, 30237), (53, 30273), (55, 30282),

Gene: Onika\_41 Start: 29695, Stop: 29988, Start Num: 22

Candidate Starts for Onika\_41:

(Start: 22 @29695 has 41 MA's), (37, 29788), (38, 29794), (43, 29854), (48, 29887), (49, 29893), (53, 29929), (55, 29938),

Gene: Paschalis\_41 Start: 29702, Stop: 29995, Start Num: 22

Candidate Starts for Paschalis\_41:

(Start: 22 @29702 has 41 MA's), (37, 29795), (38, 29801), (43, 29861), (48, 29894), (49, 29900), (53, 29936), (55, 29945),

Gene: PermaG\_27 Start: 20401, Stop: 20679, Start Num: 19

Candidate Starts for PermaG\_27:

(10, 20347), (Start: 19 @20401 has 25 MA's), (36, 20506), (39, 20527), (43, 20581), (48, 20614),

Gene: Phonegingi\_27 Start: 18231, Stop: 18533, Start Num: 13

Candidate Starts for Phonegingi\_27:

(6, 18132), (9, 18171), (Start: 13 @18231 has 8 MA's), (Start: 22 @18273 has 41 MA's), (43, 18435), (45, 18441), (49, 18474),

Gene: Phorgeous\_41 Start: 29565, Stop: 29858, Start Num: 22

Candidate Starts for Phorgeous\_41:

(Start: 22 @29565 has 41 MA's), (37, 29658), (38, 29664), (43, 29724), (48, 29757), (49, 29763), (53, 29799), (55, 29808),

Gene: Phrancesco\_42 Start: 29846, Stop: 30148, Start Num: 22

Candidate Starts for Phrancesco\_42:

(Start: 22 @29846 has 41 MA's), (37, 29939), (43, 30005), (48, 30038), (49, 30044), (53, 30080), (55, 30089),

Gene: Pickles13\_27 Start: 18619, Stop: 18918, Start Num: 13

Candidate Starts for Pickles13\_27:

(6, 18520), (9, 18559), (Start: 13 @18619 has 8 MA's), (Start: 22 @18661 has 41 MA's), (43, 18823), (45, 18829),

Gene: PierreOrion\_42 Start: 29869, Stop: 30162, Start Num: 22

Candidate Starts for PierreOrion\_42:

(Start: 22 @29869 has 41 MA's), (37, 29962), (38, 29968), (43, 30028), (48, 30061), (49, 30067), (53, 30103), (55, 30112),

Gene: PiperSansNom\_42 Start: 30009, Stop: 30302, Start Num: 22

Candidate Starts for PiperSansNom\_42:

(Start: 22 @30009 has 41 MA's), (37, 30102), (38, 30108), (43, 30168), (48, 30201), (49, 30207), (53, 30243), (55, 30252),

Gene: Piperis\_42 Start: 29688, Stop: 29981, Start Num: 22

Candidate Starts for Piperis\_42:

(Start: 22 @29688 has 41 MA's), (37, 29781), (38, 29787), (43, 29847), (48, 29880), (49, 29886), (53, 29922), (55, 29931),

Gene: Pulchra\_43 Start: 30085, Stop: 30378, Start Num: 22

Candidate Starts for Pulchra\_43:

(Start: 22 @30085 has 41 MA's), (37, 30178), (38, 30184), (43, 30244), (48, 30277), (49, 30283), (53, 30319), (55, 30328),

Gene: QuadZero\_22 Start: 16512, Stop: 16769, Start Num: 19

Candidate Starts for QuadZero\_22:

(2, 16263), (7, 16404), (8, 16419), (Start: 19 @16512 has 25 MA's), (27, 16563), (36, 16617), (45, 16698), (46, 16707),

Gene: Quhwah\_45 Start: 30317, Stop: 30610, Start Num: 22

Candidate Starts for Quhwah\_45:

(Start: 22 @30317 has 41 MA's), (37, 30410), (38, 30416), (43, 30476), (48, 30509), (49, 30515), (53, 30551), (55, 30560),

Gene: Ramiel05\_41 Start: 29720, Stop: 30013, Start Num: 22

Candidate Starts for Ramiel05\_41:

(Start: 22 @29720 has 41 MA's), (37, 29813), (38, 29819), (43, 29879), (48, 29912), (49, 29918), (53, 29954), (55, 29963),

Gene: Rasovi\_26 Start: 20391, Stop: 20669, Start Num: 19

Candidate Starts for Rasovi\_26:

(10, 20337), (Start: 19 @20391 has 25 MA's), (39, 20517), (43, 20571),

Gene: RobsFeet\_44 Start: 30750, Stop: 31019, Start Num: 19

Candidate Starts for RobsFeet\_44:

(Start: 19 @30750 has 25 MA's), (21, 30759), (36, 30852), (39, 30873), (45, 30933), (46, 30942), (48, 30960),

Gene: SBlackberry\_26 Start: 20201, Stop: 20479, Start Num: 19

Candidate Starts for SBlackberry\_26:

(10, 20147), (Start: 19 @20201 has 25 MA's), (29, 20258), (39, 20327), (43, 20381), (45, 20387), (48, 20414),

Gene: Savannah\_41 Start: 29747, Stop: 30040, Start Num: 22

Candidate Starts for Savannah\_41:

(Start: 22 @29747 has 41 MA's), (37, 29840), (38, 29846), (43, 29906), (48, 29939), (49, 29945), (53, 29981), (55, 29990),

Gene: Schimmels22\_22 Start: 16956, Stop: 17213, Start Num: 18

Candidate Starts for Schimmels22\_22:

(11, 16914), (Start: 18 @16956 has 5 MA's), (27, 17007), (46, 17151), (48, 17169), (52, 17205),

Gene: Scumberland\_43 Start: 29942, Stop: 30235, Start Num: 22

Candidate Starts for Scumberland\_43:

(Start: 22 @29942 has 41 MA's), (37, 30035), (38, 30041), (43, 30101), (48, 30134), (49, 30140), (53, 30176), (55, 30185),

Gene: Selwyn23\_43 Start: 29919, Stop: 30212, Start Num: 22

Candidate Starts for Selwyn23\_43:

(Start: 22 @29919 has 41 MA's), (37, 30012), (38, 30018), (43, 30078), (48, 30111), (49, 30117), (53, 30153), (54, 30159), (55, 30162),

Gene: Shotgun\_41 Start: 29546, Stop: 29839, Start Num: 22

Candidate Starts for Shotgun\_41:

(Start: 22 @29546 has 41 MA's), (37, 29639), (38, 29645), (43, 29705), (48, 29738), (49, 29744), (53, 29780), (55, 29789),

Gene: Sucha\_23 Start: 17894, Stop: 18178, Start Num: 18

Candidate Starts for Sucha\_23:

(Start: 18 @17894 has 5 MA's), (Start: 22 @17915 has 41 MA's), (30, 17957), (36, 18002), (43, 18077), (47, 18098), (48, 18110), (56, 18164),

Gene: Teng\_29 Start: 18889, Stop: 19074, Start Num: 31

Candidate Starts for Teng\_29:

(23, 18841), (24, 18844), (Start: 31 @18889 has 2 MA's), (38, 18940), (40, 18964), (42, 18997), (43, 19000), (51, 19057),

Gene: Tinyman4\_22 Start: 16593, Stop: 16850, Start Num: 18

Candidate Starts for Tinyman4\_22:

(3, 16365), (11, 16551), (Start: 18 @16593 has 5 MA's), (27, 16644), (46, 16788), (48, 16806), (52, 16842),

Gene: TurboVicky\_26 Start: 20200, Stop: 20478, Start Num: 19

Candidate Starts for TurboVicky\_26:

(10, 20146), (Start: 19 @20200 has 25 MA's), (39, 20326), (43, 20380),

Gene: Typher\_28 Start: 20329, Stop: 20607, Start Num: 19

Candidate Starts for Typher\_28:

(10, 20275), (Start: 19 @20329 has 25 MA's), (39, 20455), (43, 20509),

Gene: Tyrumbra\_41 Start: 30550, Stop: 30819, Start Num: 19

Candidate Starts for Tyrumbra\_41:

(4, 30364), (Start: 19 @30550 has 25 MA's), (21, 30559), (36, 30652), (39, 30673), (45, 30733), (46, 30742), (48, 30760),

Gene: Warren\_28 Start: 18392, Stop: 18691, Start Num: 13

Candidate Starts for Warren\_28:

(6, 18293), (9, 18332), (Start: 13 @18392 has 8 MA's), (Start: 22 @18434 has 41 MA's), (43, 18596), (45, 18602), (49, 18635),

Gene: WestPM\_21 Start: 16437, Stop: 16694, Start Num: 19

Candidate Starts for WestPM\_21:

(7, 16326), (8, 16341), (Start: 19 @16437 has 25 MA's), (27, 16488), (43, 16617), (46, 16632), (48, 16650), (52, 16686),

Gene: Yeti\_42 Start: 29721, Stop: 30014, Start Num: 22

Candidate Starts for Yeti\_42:

(Start: 22 @29721 has 41 MA's), (37, 29814), (38, 29820), (43, 29880), (48, 29913), (49, 29919), (53, 29955), (54, 29961), (55, 29964),

Gene: Zanella\_26 Start: 20203, Stop: 20481, Start Num: 19

Candidate Starts for Zanella\_26:

(10, 20149), (Start: 19 @20203 has 25 MA's), (39, 20329), (43, 20383),

Gene: Zayuliv\_22 Start: 17098, Stop: 17355, Start Num: 19

Candidate Starts for Zayuliv\_22:

(11, 17056), (Start: 19 @17098 has 25 MA's), (27, 17149), (36, 17203), (45, 17284), (46, 17293),

Gene: Zepp\_23 Start: 16496, Stop: 16753, Start Num: 19

Candidate Starts for Zepp\_23:

(2, 16247), (5, 16343), (7, 16388), (8, 16403), (Start: 19 @16496 has 25 MA's), (27, 16547), (36, 16601), (45, 16682), (46, 16691),