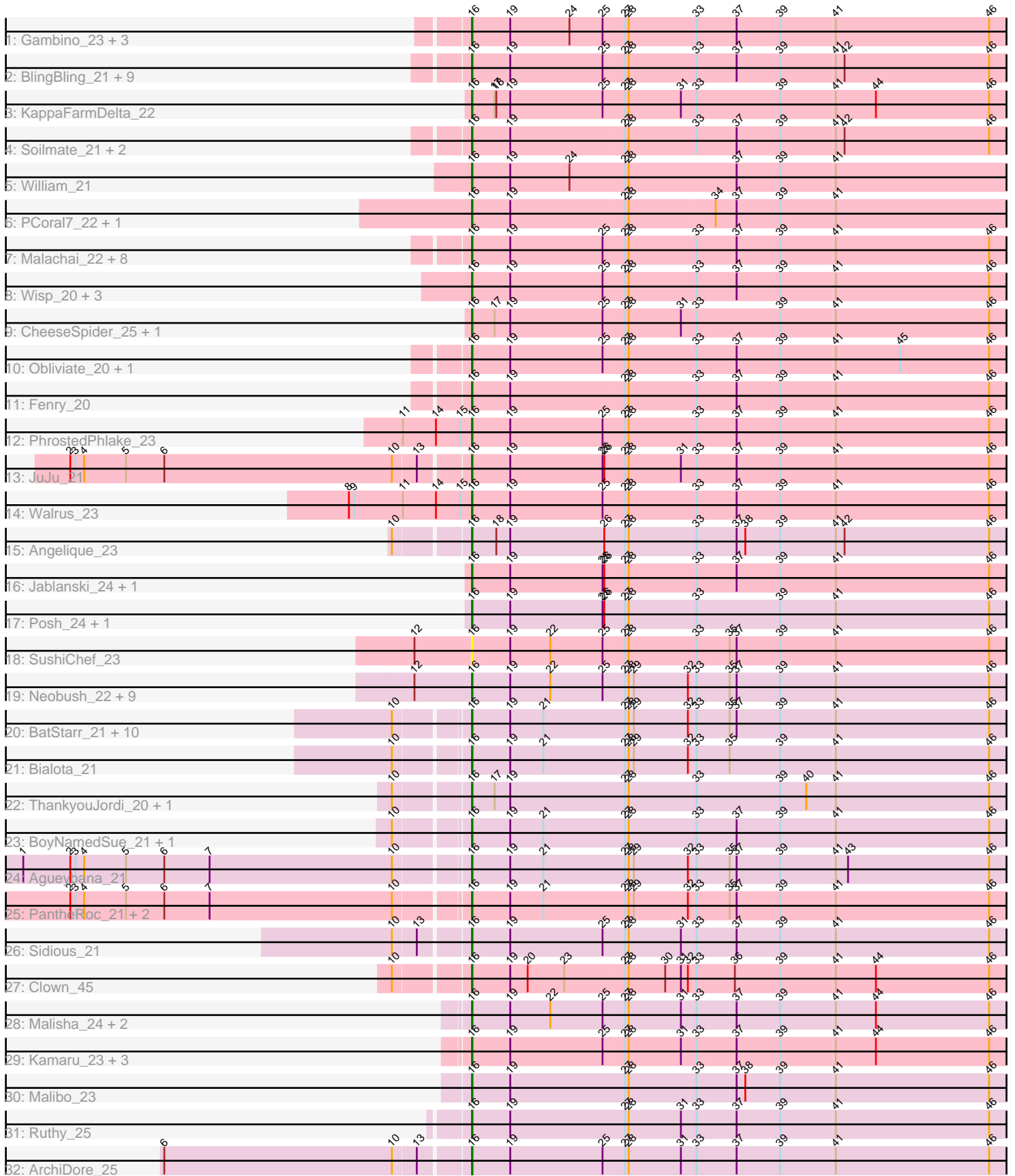


Pham 296451



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 296451 Report

This analysis was run 04/25/26 on database version 644.

Pham number 296451 has 90 members, 6 are drafts.

Phages represented in each track:

- Track 1 : Gambino\_23, Azula\_23, MissRona\_23, Blueberry\_23
- Track 2 : BlingBling\_21, Guacamole\_21, Zarbodnamra\_21, JasperJr\_21, Zilla\_21, Archis\_22, Utz\_21, Melba\_21, Barco\_21, MintFen\_21
- Track 3 : KappaFarmDelta\_22
- Track 4 : Soilmate\_21, CarolAnn\_21, Blino\_21
- Track 5 : William\_21
- Track 6 : PCoral7\_22, Toast\_22
- Track 7 : Malachai\_22, Pipp\_21, Jalammah\_23, Samba\_21, Begonia\_22, Lysidious\_22, Hitter\_21, Frokostdame\_21, Mellie\_20
- Track 8 : Wisp\_20, CaptainKirk2\_21, UmaThurman\_21, Delian\_21
- Track 9 : CheeseSpider\_25, Murp\_22
- Track 10 : Obliviate\_20, ZiggyZoo\_20
- Track 11 : Fenry\_20
- Track 12 : PhrostedPhlake\_23
- Track 13 : JuJu\_21
- Track 14 : Walrus\_23
- Track 15 : Angelique\_23
- Track 16 : Jablanski\_24, Pytheas\_24
- Track 17 : Posh\_24, Wrigley\_24
- Track 18 : SushiChef\_23
- Track 19 : Neobush\_22, Suscepit\_22, Zameen\_22, Antonio\_22, Maridalia\_21, Eudoria\_22, Trumpet\_22, Tayonia\_22, Manasvini\_22, Kita\_22
- Track 20 : BatStarr\_21, Nymphadora\_21, Madavieve\_21, TimTam\_21, Bosnia\_21, Zirinka\_21, Madeline\_21, Hugley\_21, Herod\_21, Ohgeesy\_21, Eviarto\_21
- Track 21 : Bialota\_21
- Track 22 : ThankyouJordi\_20, WelcomeAyanna\_20
- Track 23 : BoyNamedSue\_21, AlumE\_21
- Track 24 : Agueybana\_21
- Track 25 : PantheRoc\_21, BaxterFox\_20, Yeezy\_22
- Track 26 : Sidious\_21
- Track 27 : Clown\_45
- Track 28 : Malisha\_24, Squiddly\_25, Spooky\_23
- Track 29 : Kamaru\_23, Holliday\_23, Budski\_23, Whitney\_24
- Track 30 : Malibo\_23
- Track 31 : Ruthy\_25
- Track 32 : ArchiDore\_25

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

The start number called the most often in the published annotations is 16, it was called in 84 of the 84 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Agueybana\_21, AlumE\_21, Angelique\_23, Antonio\_22, ArchiDore\_25, Archis\_22, Azula\_23, Barco\_21, BatStarr\_21, BaxterFox\_20, Begonia\_22, Bialota\_21, BlingBling\_21, Blino\_21, Blueberry\_23, Bosnia\_21, BoyNamedSue\_21, Budski\_23, CaptainKirk2\_21, CarolAnn\_21, CheeseSpider\_25, Clown\_45, Delian\_21, Eudoria\_22, Eviarto\_21, Fenry\_20, Frokostdame\_21, Gambino\_23, Guacamole\_21, Herod\_21, Hitter\_21, Holliday\_23, Hugley\_21, Jablanski\_24, Jalammah\_23, JasperJr\_21, JuJu\_21, Kamaru\_23, KappaFarmDelta\_22, Kita\_22, Lysidious\_22, Madavieve\_21, Madeline\_21, Malachai\_22, Malibo\_23, Malisha\_24, Manasvini\_22, Maridalia\_21, Melba\_21, Mellie\_20, MintFen\_21, MissRona\_23, Murp\_22, Neobush\_22, Nymphadora\_21, Obliviate\_20, Ohgeesy\_21, PCoral7\_22, PantheRoc\_21, PhrostedPhlake\_23, Pipp\_21, Posh\_24, Pytheas\_24, Ruthy\_25, Samba\_21, Sidious\_21, Soilmate\_21, Spooky\_23, Squiddly\_25, Suscepit\_22, SushiChef\_23, Tayonia\_22, ThankyouJordi\_20, TimTam\_21, Toast\_22, Trumpet\_22, UmaThurman\_21, Utz\_21, Walrus\_23, WelcomeAyanna\_20, Whitney\_24, William\_21, Wisp\_20, Wrigley\_24, Yeezy\_22, Zameen\_22, Zarbodnamra\_21, ZiggyZoo\_20, Zilla\_21, Zirinka\_21,

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

- 

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

- 

### **Summary by start number:**

Start 16:

- Found in 90 of 90 ( 100.0% ) of genes in pham
- Manual Annotations of this start: 84 of 84
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Agueybana\_21 (CZ1), AlumE\_21 (CZ1), Angelique\_23 (CY1), Antonio\_22 (CZ1), ArchiDore\_25 (DW), Archis\_22 (CV), Azula\_23 (CV), Barco\_21 (CV), BatStarr\_21 (CZ1), BaxterFox\_20 (CZ3), Begonia\_22 (CV), Bialota\_21 (CZ1), BlingBling\_21 (CV), Blino\_21 (CV), Blueberry\_23 (CV), Bosnia\_21 (CZ1), BoyNamedSue\_21 (CZ1), Budski\_23 (DN), CaptainKirk2\_21 (CV), CarolAnn\_21 (CV), CheeseSpider\_25 (CV), Clown\_45 (DC2), Delian\_21 (CV), Eudoria\_22 (CZ1), Eviarto\_21 (CZ1), Fenry\_20 (CV), Frokostdame\_21 (CV), Gambino\_23 (CV), Guacamole\_21 (CV), Herod\_21 (CZ1), Hitter\_21 (CV), Holliday\_23 (DN1), Hugley\_21 (CZ1), Jablanski\_24 (CY3), Jalammah\_23 (CV), JasperJr\_21 (CV), JuJu\_21 (CV), Kamaru\_23 (DN1), KappaFarmDelta\_22 (CV), Kita\_22 (CZ1), Lysidious\_22 (CV), Madavieve\_21 (CZ1), Madeline\_21 (CZ1), Malachai\_22 (CV), Malibo\_23 (DW), Malisha\_24 (DN), Manasvini\_22 (CZ1), Maridalia\_21 (CZ1), Melba\_21 (CV), Mellie\_20 (CV), MintFen\_21 (CV), MissRona\_23 (CV), Murp\_22 (CV), Neobush\_22 (CZ1), Nymphadora\_21 (CZ1), Obliviate\_20 (CV), Ohgeesy\_21 (CZ), PCoral7\_22 (CV), PantheRoc\_21 (CZ3), PhrostedPhlake\_23 (CV),

Pipp\_21 (CV), Posh\_24 (CY4), Pytheas\_24 (CY3), Ruthy\_25 (DW), Samba\_21 (CV), Sidious\_21 (CZ7), Soilmate\_21 (CV), Spooky\_23 (DN2), Squiddly\_25 (DN2), Suscepit\_22 (CZ1), SushiChef\_23 (CZ), Tayonia\_22 (CZ1), ThankyouJordi\_20 (CZ1), TimTam\_21 (CZ1), Toast\_22 (CV), Trumpet\_22 (CZ1), UmaThurman\_21 (CV), Utz\_21 (CV), Walrus\_23 (CV), WelcomeAyanna\_20 (CZ1), Whitney\_24 (DN1), William\_21 (CV), Wisp\_20 (CV), Wrigley\_24 (CY4), Yeezy\_22 (CZ3), Zameen\_22 (CZ1), Zarbodnamra\_21 (CV), ZiggyZoo\_20 (CV), Zilla\_21 (CV), Zirinka\_21 (CZ1),

### **Summary by clusters:**

There are 13 clusters represented in this pham: DN, CY3, CY1, CY4, CZ3, CZ1, CZ7, CZ, DN1, DN2, DW, DC2, CV,

Info for manual annotations of cluster CV:

- Start number 16 was manually annotated 39 times for cluster CV.

Info for manual annotations of cluster CY1:

- Start number 16 was manually annotated 1 time for cluster CY1.

Info for manual annotations of cluster CY3:

- Start number 16 was manually annotated 2 times for cluster CY3.

Info for manual annotations of cluster CY4:

- Start number 16 was manually annotated 2 times for cluster CY4.

Info for manual annotations of cluster CZ:

- Start number 16 was manually annotated 1 time for cluster CZ.

Info for manual annotations of cluster CZ1:

- Start number 16 was manually annotated 24 times for cluster CZ1.

Info for manual annotations of cluster CZ3:

- Start number 16 was manually annotated 3 times for cluster CZ3.

Info for manual annotations of cluster CZ7:

- Start number 16 was manually annotated 1 time for cluster CZ7.

Info for manual annotations of cluster DC2:

- Start number 16 was manually annotated 1 time for cluster DC2.

Info for manual annotations of cluster DN:

- Start number 16 was manually annotated 2 times for cluster DN.

Info for manual annotations of cluster DN1:

- Start number 16 was manually annotated 3 times for cluster DN1.

Info for manual annotations of cluster DN2:

- Start number 16 was manually annotated 2 times for cluster DN2.

Info for manual annotations of cluster DW:

- Start number 16 was manually annotated 3 times for cluster DW.

### **Gene Information:**

Gene: Agueybana\_21 Start: 20174, Stop: 21085, Start Num: 16

Candidate Starts for Agueybana\_21:

(1, 19433), (2, 19514), (3, 19523), (4, 19538), (5, 19610), (6, 19676), (7, 19754), (10, 20066), (Start: 16 @20174 has 84 MA's), (19, 20240), (21, 20297), (27, 20435), (28, 20441), (29, 20450), (32, 20543), (33, 20558), (35, 20615), (37, 20627), (39, 20702), (41, 20795), (43, 20813), (46, 21053),

Gene: AlumE\_21 Start: 20173, Stop: 21084, Start Num: 16

Candidate Starts for AlumE\_21:

(10, 20065), (Start: 16 @20173 has 84 MA's), (19, 20239), (21, 20296), (27, 20434), (28, 20440), (33, 20557), (37, 20626), (39, 20701), (41, 20794), (46, 21052),

Gene: Angelique\_23 Start: 20524, Stop: 21435, Start Num: 16

Candidate Starts for Angelique\_23:

(10, 20413), (Start: 16 @20524 has 84 MA's), (18, 20566), (19, 20590), (26, 20752), (27, 20785), (28, 20791), (33, 20908), (37, 20977), (38, 20992), (39, 21052), (41, 21145), (42, 21157), (46, 21403),

Gene: Antonio\_22 Start: 20294, Stop: 21205, Start Num: 16

Candidate Starts for Antonio\_22:

(12, 20198), (Start: 16 @20294 has 84 MA's), (19, 20360), (22, 20429), (25, 20519), (27, 20555), (28, 20561), (29, 20570), (32, 20663), (33, 20678), (35, 20735), (37, 20747), (39, 20822), (41, 20915), (46, 21173),

Gene: ArchiDore\_25 Start: 22305, Stop: 23216, Start Num: 16

Candidate Starts for ArchiDore\_25:

(6, 21804), (10, 22194), (13, 22233), (Start: 16 @22305 has 84 MA's), (19, 22371), (25, 22530), (27, 22566), (28, 22572), (31, 22662), (33, 22689), (37, 22758), (39, 22833), (41, 22926), (46, 23184),

Gene: Archis\_22 Start: 19231, Stop: 20142, Start Num: 16

Candidate Starts for Archis\_22:

(Start: 16 @19231 has 84 MA's), (19, 19297), (25, 19456), (27, 19492), (28, 19498), (33, 19615), (37, 19684), (39, 19759), (41, 19852), (42, 19864), (46, 20110),

Gene: Azula\_23 Start: 19335, Stop: 20246, Start Num: 16

Candidate Starts for Azula\_23:

(Start: 16 @19335 has 84 MA's), (19, 19401), (24, 19503), (25, 19560), (27, 19596), (28, 19602), (33, 19719), (37, 19788), (39, 19863), (41, 19956), (46, 20214),

Gene: Barco\_21 Start: 19020, Stop: 19931, Start Num: 16

Candidate Starts for Barco\_21:

(Start: 16 @19020 has 84 MA's), (19, 19086), (25, 19245), (27, 19281), (28, 19287), (33, 19404), (37, 19473), (39, 19548), (41, 19641), (42, 19653), (46, 19899),

Gene: BatStarr\_21 Start: 20161, Stop: 21072, Start Num: 16

Candidate Starts for BatStarr\_21:

(10, 20053), (Start: 16 @20161 has 84 MA's), (19, 20227), (21, 20284), (27, 20422), (28, 20428), (29, 20437), (32, 20530), (33, 20545), (35, 20602), (37, 20614), (39, 20689), (41, 20782), (46, 21040),

Gene: BaxterFox\_20 Start: 19500, Stop: 20411, Start Num: 16

Candidate Starts for BaxterFox\_20:

(2, 18840), (3, 18849), (4, 18864), (5, 18936), (6, 19002), (7, 19080), (10, 19392), (Start: 16 @19500 has 84 MA's), (19, 19566), (21, 19623), (27, 19761), (28, 19767), (29, 19776), (32, 19869), (33, 19884),

(35, 19941), (37, 19953), (39, 20028), (41, 20121), (46, 20379),

Gene: Begonia\_22 Start: 19498, Stop: 20412, Start Num: 16

Candidate Starts for Begonia\_22:

(Start: 16 @19498 has 84 MA's), (19, 19564), (25, 19723), (27, 19759), (28, 19765), (33, 19882), (37, 19951), (39, 20026), (41, 20119), (46, 20380),

Gene: Bialota\_21 Start: 20173, Stop: 21084, Start Num: 16

Candidate Starts for Bialota\_21:

(10, 20065), (Start: 16 @20173 has 84 MA's), (19, 20239), (21, 20296), (27, 20434), (28, 20440), (29, 20449), (32, 20542), (33, 20557), (35, 20614), (39, 20701), (41, 20794), (46, 21052),

Gene: BlingBling\_21 Start: 19020, Stop: 19931, Start Num: 16

Candidate Starts for BlingBling\_21:

(Start: 16 @19020 has 84 MA's), (19, 19086), (25, 19245), (27, 19281), (28, 19287), (33, 19404), (37, 19473), (39, 19548), (41, 19641), (42, 19653), (46, 19899),

Gene: Blino\_21 Start: 18988, Stop: 19899, Start Num: 16

Candidate Starts for Blino\_21:

(Start: 16 @18988 has 84 MA's), (19, 19054), (27, 19249), (28, 19255), (33, 19372), (37, 19441), (39, 19516), (41, 19609), (42, 19621), (46, 19867),

Gene: Blueberry\_23 Start: 19335, Stop: 20246, Start Num: 16

Candidate Starts for Blueberry\_23:

(Start: 16 @19335 has 84 MA's), (19, 19401), (24, 19503), (25, 19560), (27, 19596), (28, 19602), (33, 19719), (37, 19788), (39, 19863), (41, 19956), (46, 20214),

Gene: Bosnia\_21 Start: 20161, Stop: 21072, Start Num: 16

Candidate Starts for Bosnia\_21:

(10, 20053), (Start: 16 @20161 has 84 MA's), (19, 20227), (21, 20284), (27, 20422), (28, 20428), (29, 20437), (32, 20530), (33, 20545), (35, 20602), (37, 20614), (39, 20689), (41, 20782), (46, 21040),

Gene: BoyNamedSue\_21 Start: 20173, Stop: 21084, Start Num: 16

Candidate Starts for BoyNamedSue\_21:

(10, 20065), (Start: 16 @20173 has 84 MA's), (19, 20239), (21, 20296), (27, 20434), (28, 20440), (33, 20557), (37, 20626), (39, 20701), (41, 20794), (46, 21052),

Gene: Budski\_23 Start: 19385, Stop: 20299, Start Num: 16

Candidate Starts for Budski\_23:

(Start: 16 @19385 has 84 MA's), (19, 19451), (25, 19610), (27, 19646), (28, 19652), (31, 19742), (33, 19769), (37, 19838), (39, 19913), (41, 20006), (44, 20075), (46, 20267),

Gene: CaptainKirk2\_21 Start: 19041, Stop: 19952, Start Num: 16

Candidate Starts for CaptainKirk2\_21:

(Start: 16 @19041 has 84 MA's), (19, 19107), (25, 19266), (27, 19302), (28, 19308), (33, 19425), (37, 19494), (39, 19569), (41, 19662), (46, 19920),

Gene: CarolAnn\_21 Start: 18987, Stop: 19898, Start Num: 16

Candidate Starts for CarolAnn\_21:

(Start: 16 @18987 has 84 MA's), (19, 19053), (27, 19248), (28, 19254), (33, 19371), (37, 19440), (39, 19515), (41, 19608), (42, 19620), (46, 19866),

Gene: CheeseSpider\_25 Start: 19586, Stop: 20497, Start Num: 16

Candidate Starts for CheeseSpider\_25:

(Start: 16 @19586 has 84 MA's), (17, 19625), (19, 19652), (25, 19811), (27, 19847), (28, 19853), (31, 19943), (33, 19970), (39, 20114), (41, 20207), (46, 20465),

Gene: Clown\_45 Start: 36252, Stop: 37166, Start Num: 16

Candidate Starts for Clown\_45:

(10, 36141), (Start: 16 @36252 has 84 MA's), (19, 36318), (20, 36348), (23, 36411), (27, 36513), (28, 36519), (30, 36582), (31, 36609), (32, 36621), (33, 36636), (36, 36702), (39, 36780), (41, 36873), (44, 36942), (46, 37134),

Gene: Delian\_21 Start: 19041, Stop: 19952, Start Num: 16

Candidate Starts for Delian\_21:

(Start: 16 @19041 has 84 MA's), (19, 19107), (25, 19266), (27, 19302), (28, 19308), (33, 19425), (37, 19494), (39, 19569), (41, 19662), (46, 19920),

Gene: Eudoria\_22 Start: 20294, Stop: 21205, Start Num: 16

Candidate Starts for Eudoria\_22:

(12, 20198), (Start: 16 @20294 has 84 MA's), (19, 20360), (22, 20429), (25, 20519), (27, 20555), (28, 20561), (29, 20570), (32, 20663), (33, 20678), (35, 20735), (37, 20747), (39, 20822), (41, 20915), (46, 21173),

Gene: Eviarto\_21 Start: 20161, Stop: 21072, Start Num: 16

Candidate Starts for Eviarto\_21:

(10, 20053), (Start: 16 @20161 has 84 MA's), (19, 20227), (21, 20284), (27, 20422), (28, 20428), (29, 20437), (32, 20530), (33, 20545), (35, 20602), (37, 20614), (39, 20689), (41, 20782), (46, 21040),

Gene: Fenry\_20 Start: 18739, Stop: 19650, Start Num: 16

Candidate Starts for Fenry\_20:

(Start: 16 @18739 has 84 MA's), (19, 18805), (27, 19000), (28, 19006), (33, 19123), (37, 19192), (39, 19267), (41, 19360), (46, 19618),

Gene: Frokostdame\_21 Start: 18989, Stop: 19900, Start Num: 16

Candidate Starts for Frokostdame\_21:

(Start: 16 @18989 has 84 MA's), (19, 19055), (25, 19214), (27, 19250), (28, 19256), (33, 19373), (37, 19442), (39, 19517), (41, 19610), (46, 19868),

Gene: Gambino\_23 Start: 19335, Stop: 20246, Start Num: 16

Candidate Starts for Gambino\_23:

(Start: 16 @19335 has 84 MA's), (19, 19401), (24, 19503), (25, 19560), (27, 19596), (28, 19602), (33, 19719), (37, 19788), (39, 19863), (41, 19956), (46, 20214),

Gene: Guacamole\_21 Start: 19024, Stop: 19935, Start Num: 16

Candidate Starts for Guacamole\_21:

(Start: 16 @19024 has 84 MA's), (19, 19090), (25, 19249), (27, 19285), (28, 19291), (33, 19408), (37, 19477), (39, 19552), (41, 19645), (42, 19657), (46, 19903),

Gene: Herod\_21 Start: 20161, Stop: 21072, Start Num: 16

Candidate Starts for Herod\_21:

(10, 20053), (Start: 16 @20161 has 84 MA's), (19, 20227), (21, 20284), (27, 20422), (28, 20428), (29, 20437), (32, 20530), (33, 20545), (35, 20602), (37, 20614), (39, 20689), (41, 20782), (46, 21040),

Gene: Hitter\_21 Start: 19020, Stop: 19931, Start Num: 16

Candidate Starts for Hitter\_21:

(Start: 16 @19020 has 84 MA's), (19, 19086), (25, 19245), (27, 19281), (28, 19287), (33, 19404), (37, 19473), (39, 19548), (41, 19641), (46, 19899),

Gene: Holliday\_23 Start: 19385, Stop: 20299, Start Num: 16

Candidate Starts for Holliday\_23:

(Start: 16 @19385 has 84 MA's), (19, 19451), (25, 19610), (27, 19646), (28, 19652), (31, 19742), (33, 19769), (37, 19838), (39, 19913), (41, 20006), (44, 20075), (46, 20267),

Gene: Hugley\_21 Start: 20161, Stop: 21072, Start Num: 16

Candidate Starts for Hugley\_21:

(10, 20053), (Start: 16 @20161 has 84 MA's), (19, 20227), (21, 20284), (27, 20422), (28, 20428), (29, 20437), (32, 20530), (33, 20545), (35, 20602), (37, 20614), (39, 20689), (41, 20782), (46, 21040),

Gene: Jablanski\_24 Start: 20700, Stop: 21611, Start Num: 16

Candidate Starts for Jablanski\_24:

(Start: 16 @20700 has 84 MA's), (19, 20766), (25, 20925), (26, 20928), (27, 20961), (28, 20967), (33, 21084), (37, 21153), (39, 21228), (41, 21321), (46, 21579),

Gene: Jalamah\_23 Start: 19814, Stop: 20725, Start Num: 16

Candidate Starts for Jalamah\_23:

(Start: 16 @19814 has 84 MA's), (19, 19880), (25, 20039), (27, 20075), (28, 20081), (33, 20198), (37, 20267), (39, 20342), (41, 20435), (46, 20693),

Gene: JasperJr\_21 Start: 19024, Stop: 19935, Start Num: 16

Candidate Starts for JasperJr\_21:

(Start: 16 @19024 has 84 MA's), (19, 19090), (25, 19249), (27, 19285), (28, 19291), (33, 19408), (37, 19477), (39, 19552), (41, 19645), (42, 19657), (46, 19903),

Gene: JuJu\_21 Start: 18942, Stop: 19853, Start Num: 16

Candidate Starts for JuJu\_21:

(2, 18282), (3, 18291), (4, 18306), (5, 18378), (6, 18444), (10, 18834), (13, 18873), (Start: 16 @18942 has 84 MA's), (19, 19008), (25, 19167), (26, 19170), (27, 19203), (28, 19209), (31, 19299), (33, 19326), (37, 19395), (39, 19470), (41, 19563), (46, 19821),

Gene: Kamaru\_23 Start: 19385, Stop: 20299, Start Num: 16

Candidate Starts for Kamaru\_23:

(Start: 16 @19385 has 84 MA's), (19, 19451), (25, 19610), (27, 19646), (28, 19652), (31, 19742), (33, 19769), (37, 19838), (39, 19913), (41, 20006), (44, 20075), (46, 20267),

Gene: KappaFarmDelta\_22 Start: 19388, Stop: 20299, Start Num: 16

Candidate Starts for KappaFarmDelta\_22:

(Start: 16 @19388 has 84 MA's), (17, 19427), (18, 19430), (19, 19454), (25, 19613), (27, 19649), (28, 19655), (31, 19745), (33, 19772), (39, 19916), (41, 20009), (44, 20075), (46, 20267),

Gene: Kita\_22 Start: 20294, Stop: 21205, Start Num: 16

Candidate Starts for Kita\_22:

(12, 20198), (Start: 16 @20294 has 84 MA's), (19, 20360), (22, 20429), (25, 20519), (27, 20555), (28, 20561), (29, 20570), (32, 20663), (33, 20678), (35, 20735), (37, 20747), (39, 20822), (41, 20915), (46, 21173),

Gene: Lysidious\_22 Start: 19544, Stop: 20455, Start Num: 16

Candidate Starts for Lysidious\_22:

(Start: 16 @19544 has 84 MA's), (19, 19610), (25, 19769), (27, 19805), (28, 19811), (33, 19928), (37, 19997), (39, 20072), (41, 20165), (46, 20423),

Gene: Madavieve\_21 Start: 20441, Stop: 21352, Start Num: 16

Candidate Starts for Madavieve\_21:

(10, 20333), (Start: 16 @20441 has 84 MA's), (19, 20507), (21, 20564), (27, 20702), (28, 20708), (29, 20717), (32, 20810), (33, 20825), (35, 20882), (37, 20894), (39, 20969), (41, 21062), (46, 21320),

Gene: Madeline\_21 Start: 20459, Stop: 21370, Start Num: 16

Candidate Starts for Madeline\_21:

(10, 20351), (Start: 16 @20459 has 84 MA's), (19, 20525), (21, 20582), (27, 20720), (28, 20726), (29, 20735), (32, 20828), (33, 20843), (35, 20900), (37, 20912), (39, 20987), (41, 21080), (46, 21338),

Gene: Malachai\_22 Start: 19498, Stop: 20412, Start Num: 16

Candidate Starts for Malachai\_22:

(Start: 16 @19498 has 84 MA's), (19, 19564), (25, 19723), (27, 19759), (28, 19765), (33, 19882), (37, 19951), (39, 20026), (41, 20119), (46, 20380),

Gene: Malibo\_23 Start: 19343, Stop: 20254, Start Num: 16

Candidate Starts for Malibo\_23:

(Start: 16 @19343 has 84 MA's), (19, 19409), (27, 19604), (28, 19610), (33, 19727), (37, 19796), (38, 19811), (39, 19871), (41, 19964), (46, 20222),

Gene: Malisha\_24 Start: 21166, Stop: 22080, Start Num: 16

Candidate Starts for Malisha\_24:

(Start: 16 @21166 has 84 MA's), (19, 21232), (22, 21301), (25, 21391), (27, 21427), (28, 21433), (31, 21523), (33, 21550), (37, 21619), (39, 21694), (41, 21787), (44, 21856), (46, 22048),

Gene: Manasvini\_22 Start: 20294, Stop: 21205, Start Num: 16

Candidate Starts for Manasvini\_22:

(12, 20198), (Start: 16 @20294 has 84 MA's), (19, 20360), (22, 20429), (25, 20519), (27, 20555), (28, 20561), (29, 20570), (32, 20663), (33, 20678), (35, 20735), (37, 20747), (39, 20822), (41, 20915), (46, 21173),

Gene: Maridalia\_21 Start: 20294, Stop: 21205, Start Num: 16

Candidate Starts for Maridalia\_21:

(12, 20198), (Start: 16 @20294 has 84 MA's), (19, 20360), (22, 20429), (25, 20519), (27, 20555), (28, 20561), (29, 20570), (32, 20663), (33, 20678), (35, 20735), (37, 20747), (39, 20822), (41, 20915), (46, 21173),

Gene: Melba\_21 Start: 19020, Stop: 19931, Start Num: 16

Candidate Starts for Melba\_21:

(Start: 16 @19020 has 84 MA's), (19, 19086), (25, 19245), (27, 19281), (28, 19287), (33, 19404), (37, 19473), (39, 19548), (41, 19641), (42, 19653), (46, 19899),

Gene: Mellie\_20 Start: 18781, Stop: 19692, Start Num: 16

Candidate Starts for Mellie\_20:

(Start: 16 @18781 has 84 MA's), (19, 18847), (25, 19006), (27, 19042), (28, 19048), (33, 19165), (37, 19234), (39, 19309), (41, 19402), (46, 19660),

Gene: MintFen\_21 Start: 19020, Stop: 19931, Start Num: 16

Candidate Starts for MintFen\_21:

(Start: 16 @19020 has 84 MA's), (19, 19086), (25, 19245), (27, 19281), (28, 19287), (33, 19404), (37, 19473), (39, 19548), (41, 19641), (42, 19653), (46, 19899),

Gene: MissRona\_23 Start: 19335, Stop: 20246, Start Num: 16

Candidate Starts for MissRona\_23:

(Start: 16 @19335 has 84 MA's), (19, 19401), (24, 19503), (25, 19560), (27, 19596), (28, 19602), (33, 19719), (37, 19788), (39, 19863), (41, 19956), (46, 20214),

Gene: Murp\_22 Start: 19288, Stop: 20199, Start Num: 16

Candidate Starts for Murp\_22:

(Start: 16 @19288 has 84 MA's), (17, 19327), (19, 19354), (25, 19513), (27, 19549), (28, 19555), (31, 19645), (33, 19672), (39, 19816), (41, 19909), (46, 20167),

Gene: Neobush\_22 Start: 20294, Stop: 21205, Start Num: 16

Candidate Starts for Neobush\_22:

(12, 20198), (Start: 16 @20294 has 84 MA's), (19, 20360), (22, 20429), (25, 20519), (27, 20555), (28, 20561), (29, 20570), (32, 20663), (33, 20678), (35, 20735), (37, 20747), (39, 20822), (41, 20915), (46, 21173),

Gene: Nymphadora\_21 Start: 20161, Stop: 21072, Start Num: 16

Candidate Starts for Nymphadora\_21:

(10, 20053), (Start: 16 @20161 has 84 MA's), (19, 20227), (21, 20284), (27, 20422), (28, 20428), (29, 20437), (32, 20530), (33, 20545), (35, 20602), (37, 20614), (39, 20689), (41, 20782), (46, 21040),

Gene: Obliviate\_20 Start: 18810, Stop: 19721, Start Num: 16

Candidate Starts for Obliviate\_20:

(Start: 16 @18810 has 84 MA's), (19, 18876), (25, 19035), (27, 19071), (28, 19077), (33, 19194), (37, 19263), (39, 19338), (41, 19431), (45, 19539), (46, 19689),

Gene: Ohgeesy\_21 Start: 19784, Stop: 20695, Start Num: 16

Candidate Starts for Ohgeesy\_21:

(10, 19676), (Start: 16 @19784 has 84 MA's), (19, 19850), (21, 19907), (27, 20045), (28, 20051), (29, 20060), (32, 20153), (33, 20168), (35, 20225), (37, 20237), (39, 20312), (41, 20405), (46, 20663),

Gene: PCoral7\_22 Start: 19309, Stop: 20226, Start Num: 16

Candidate Starts for PCoral7\_22:

(Start: 16 @19309 has 84 MA's), (19, 19375), (27, 19570), (28, 19576), (34, 19723), (37, 19759), (39, 19834), (41, 19930),

Gene: PantheRoc\_21 Start: 19492, Stop: 20403, Start Num: 16

Candidate Starts for PantheRoc\_21:

(2, 18832), (3, 18841), (4, 18856), (5, 18928), (6, 18994), (7, 19072), (10, 19384), (Start: 16 @19492 has 84 MA's), (19, 19558), (21, 19615), (27, 19753), (28, 19759), (29, 19768), (32, 19861), (33, 19876), (35, 19933), (37, 19945), (39, 20020), (41, 20113), (46, 20371),

Gene: PhrostedPhlake\_23 Start: 19713, Stop: 20624, Start Num: 16

Candidate Starts for PhrostedPhlake\_23:

(11, 19599), (14, 19656), (15, 19698), (Start: 16 @19713 has 84 MA's), (19, 19779), (25, 19938), (27, 19974), (28, 19980), (33, 20097), (37, 20166), (39, 20241), (41, 20334), (46, 20592),

Gene: Pipp\_21 Start: 19014, Stop: 19925, Start Num: 16

Candidate Starts for Pipp\_21:

(Start: 16 @19014 has 84 MA's), (19, 19080), (25, 19239), (27, 19275), (28, 19281), (33, 19398), (37, 19467), (39, 19542), (41, 19635), (46, 19893),

Gene: Posh\_24 Start: 20553, Stop: 21464, Start Num: 16

Candidate Starts for Posh\_24:

(Start: 16 @20553 has 84 MA's), (19, 20619), (25, 20778), (26, 20781), (27, 20814), (28, 20820), (33, 20937), (39, 21081), (41, 21174), (46, 21432),

Gene: Pytheas\_24 Start: 20699, Stop: 21610, Start Num: 16

Candidate Starts for Pytheas\_24:

(Start: 16 @20699 has 84 MA's), (19, 20765), (25, 20924), (26, 20927), (27, 20960), (28, 20966), (33, 21083), (37, 21152), (39, 21227), (41, 21320), (46, 21578),

Gene: Ruthy\_25 Start: 22394, Stop: 23305, Start Num: 16

Candidate Starts for Ruthy\_25:

(Start: 16 @22394 has 84 MA's), (19, 22460), (27, 22655), (28, 22661), (31, 22751), (33, 22778), (37, 22847), (39, 22922), (41, 23015), (46, 23273),

Gene: Samba\_21 Start: 19098, Stop: 20009, Start Num: 16

Candidate Starts for Samba\_21:

(Start: 16 @19098 has 84 MA's), (19, 19164), (25, 19323), (27, 19359), (28, 19365), (33, 19482), (37, 19551), (39, 19626), (41, 19719), (46, 19977),

Gene: Sidious\_21 Start: 19616, Stop: 20527, Start Num: 16

Candidate Starts for Sidious\_21:

(10, 19505), (13, 19544), (Start: 16 @19616 has 84 MA's), (19, 19682), (25, 19841), (27, 19877), (28, 19883), (31, 19973), (33, 20000), (37, 20069), (39, 20144), (41, 20237), (46, 20495),

Gene: Soilmate\_21 Start: 18987, Stop: 19898, Start Num: 16

Candidate Starts for Soilmate\_21:

(Start: 16 @18987 has 84 MA's), (19, 19053), (27, 19248), (28, 19254), (33, 19371), (37, 19440), (39, 19515), (41, 19608), (42, 19620), (46, 19866),

Gene: Spooky\_23 Start: 19375, Stop: 20289, Start Num: 16

Candidate Starts for Spooky\_23:

(Start: 16 @19375 has 84 MA's), (19, 19441), (22, 19510), (25, 19600), (27, 19636), (28, 19642), (31, 19732), (33, 19759), (37, 19828), (39, 19903), (41, 19996), (44, 20065), (46, 20257),

Gene: Squiddly\_25 Start: 20787, Stop: 21701, Start Num: 16

Candidate Starts for Squiddly\_25:

(Start: 16 @20787 has 84 MA's), (19, 20853), (22, 20922), (25, 21012), (27, 21048), (28, 21054), (31, 21144), (33, 21171), (37, 21240), (39, 21315), (41, 21408), (44, 21477), (46, 21669),

Gene: Suscepit\_22 Start: 20294, Stop: 21205, Start Num: 16

Candidate Starts for Suscepit\_22:

(12, 20198), (Start: 16 @20294 has 84 MA's), (19, 20360), (22, 20429), (25, 20519), (27, 20555), (28, 20561), (29, 20570), (32, 20663), (33, 20678), (35, 20735), (37, 20747), (39, 20822), (41, 20915), (46, 21173),

Gene: SushiChef\_23 Start: 20360, Stop: 21271, Start Num: 16

Candidate Starts for SushiChef\_23:

(12, 20264), (Start: 16 @20360 has 84 MA's), (19, 20426), (22, 20495), (25, 20585), (27, 20621), (28, 20627), (33, 20744), (35, 20801), (37, 20813), (39, 20888), (41, 20981), (46, 21239),

Gene: Tayonia\_22 Start: 20294, Stop: 21205, Start Num: 16

Candidate Starts for Tayonia\_22:

(12, 20198), (Start: 16 @20294 has 84 MA's), (19, 20360), (22, 20429), (25, 20519), (27, 20555), (28, 20561), (29, 20570), (32, 20663), (33, 20678), (35, 20735), (37, 20747), (39, 20822), (41, 20915), (46, 21173),

Gene: ThankyouJordi\_20 Start: 20133, Stop: 21047, Start Num: 16

Candidate Starts for ThankyouJordi\_20:

(10, 20022), (Start: 16 @20133 has 84 MA's), (17, 20172), (19, 20199), (27, 20397), (28, 20403), (33, 20520), (39, 20664), (40, 20709), (41, 20757), (46, 21015),

Gene: TimTam\_21 Start: 20161, Stop: 21072, Start Num: 16

Candidate Starts for TimTam\_21:

(10, 20053), (Start: 16 @20161 has 84 MA's), (19, 20227), (21, 20284), (27, 20422), (28, 20428), (29, 20437), (32, 20530), (33, 20545), (35, 20602), (37, 20614), (39, 20689), (41, 20782), (46, 21040),

Gene: Toast\_22 Start: 19309, Stop: 20226, Start Num: 16

Candidate Starts for Toast\_22:

(Start: 16 @19309 has 84 MA's), (19, 19375), (27, 19570), (28, 19576), (34, 19723), (37, 19759), (39, 19834), (41, 19930),

Gene: Trumpet\_22 Start: 20294, Stop: 21205, Start Num: 16

Candidate Starts for Trumpet\_22:

(12, 20198), (Start: 16 @20294 has 84 MA's), (19, 20360), (22, 20429), (25, 20519), (27, 20555), (28, 20561), (29, 20570), (32, 20663), (33, 20678), (35, 20735), (37, 20747), (39, 20822), (41, 20915), (46, 21173),

Gene: UmaThurman\_21 Start: 19145, Stop: 20056, Start Num: 16

Candidate Starts for UmaThurman\_21:

(Start: 16 @19145 has 84 MA's), (19, 19211), (25, 19370), (27, 19406), (28, 19412), (33, 19529), (37, 19598), (39, 19673), (41, 19766), (46, 20024),

Gene: Utz\_21 Start: 19015, Stop: 19926, Start Num: 16

Candidate Starts for Utz\_21:

(Start: 16 @19015 has 84 MA's), (19, 19081), (25, 19240), (27, 19276), (28, 19282), (33, 19399), (37, 19468), (39, 19543), (41, 19636), (42, 19648), (46, 19894),

Gene: Walrus\_23 Start: 19560, Stop: 20471, Start Num: 16

Candidate Starts for Walrus\_23:

(8, 19353), (9, 19362), (11, 19446), (14, 19503), (15, 19545), (Start: 16 @19560 has 84 MA's), (19, 19626), (25, 19785), (27, 19821), (28, 19827), (33, 19944), (37, 20013), (39, 20088), (41, 20181), (46, 20439),

Gene: WelcomeAyanna\_20 Start: 20133, Stop: 21047, Start Num: 16

Candidate Starts for WelcomeAyanna\_20:

(10, 20022), (Start: 16 @20133 has 84 MA's), (17, 20172), (19, 20199), (27, 20397), (28, 20403), (33, 20520), (39, 20664), (40, 20709), (41, 20757), (46, 21015),

Gene: Whitney\_24 Start: 20189, Stop: 21103, Start Num: 16

Candidate Starts for Whitney\_24:

(Start: 16 @20189 has 84 MA's), (19, 20255), (25, 20414), (27, 20450), (28, 20456), (31, 20546), (33, 20573), (37, 20642), (39, 20717), (41, 20810), (44, 20879), (46, 21071),

Gene: William\_21 Start: 19064, Stop: 19978, Start Num: 16

Candidate Starts for William\_21:

(Start: 16 @19064 has 84 MA's), (19, 19130), (24, 19232), (27, 19325), (28, 19331), (37, 19514), (39, 19589), (41, 19682),

Gene: Wisp\_20 Start: 18730, Stop: 19641, Start Num: 16

Candidate Starts for Wisp\_20:

(Start: 16 @18730 has 84 MA's), (19, 18796), (25, 18955), (27, 18991), (28, 18997), (33, 19114), (37, 19183), (39, 19258), (41, 19351), (46, 19609),

Gene: Wrigley\_24 Start: 20450, Stop: 21361, Start Num: 16

Candidate Starts for Wrigley\_24:

(Start: 16 @20450 has 84 MA's), (19, 20516), (25, 20675), (26, 20678), (27, 20711), (28, 20717), (33, 20834), (39, 20978), (41, 21071), (46, 21329),

Gene: Yeezy\_22 Start: 19516, Stop: 20427, Start Num: 16

Candidate Starts for Yeezy\_22:

(2, 18856), (3, 18865), (4, 18880), (5, 18952), (6, 19018), (7, 19096), (10, 19408), (Start: 16 @19516 has 84 MA's), (19, 19582), (21, 19639), (27, 19777), (28, 19783), (29, 19792), (32, 19885), (33, 19900), (35, 19957), (37, 19969), (39, 20044), (41, 20137), (46, 20395),

Gene: Zameen\_22 Start: 20294, Stop: 21205, Start Num: 16

Candidate Starts for Zameen\_22:

(12, 20198), (Start: 16 @20294 has 84 MA's), (19, 20360), (22, 20429), (25, 20519), (27, 20555), (28, 20561), (29, 20570), (32, 20663), (33, 20678), (35, 20735), (37, 20747), (39, 20822), (41, 20915), (46, 21173),

Gene: Zarbodnamra\_21 Start: 19019, Stop: 19930, Start Num: 16

Candidate Starts for Zarbodnamra\_21:

(Start: 16 @19019 has 84 MA's), (19, 19085), (25, 19244), (27, 19280), (28, 19286), (33, 19403), (37, 19472), (39, 19547), (41, 19640), (42, 19652), (46, 19898),

Gene: ZiggyZoo\_20 Start: 18810, Stop: 19721, Start Num: 16

Candidate Starts for ZiggyZoo\_20:

(Start: 16 @18810 has 84 MA's), (19, 18876), (25, 19035), (27, 19071), (28, 19077), (33, 19194), (37, 19263), (39, 19338), (41, 19431), (45, 19539), (46, 19689),

Gene: Zilla\_21 Start: 19037, Stop: 19948, Start Num: 16

Candidate Starts for Zilla\_21:

(Start: 16 @19037 has 84 MA's), (19, 19103), (25, 19262), (27, 19298), (28, 19304), (33, 19421), (37, 19490), (39, 19565), (41, 19658), (42, 19670), (46, 19916),

Gene: Zirinka\_21 Start: 20173, Stop: 21084, Start Num: 16

Candidate Starts for Zirinka\_21:

(10, 20065), (Start: 16 @20173 has 84 MA's), (19, 20239), (21, 20296), (27, 20434), (28, 20440), (29, 20449), (32, 20542), (33, 20557), (35, 20614), (37, 20626), (39, 20701), (41, 20794), (46, 21052),