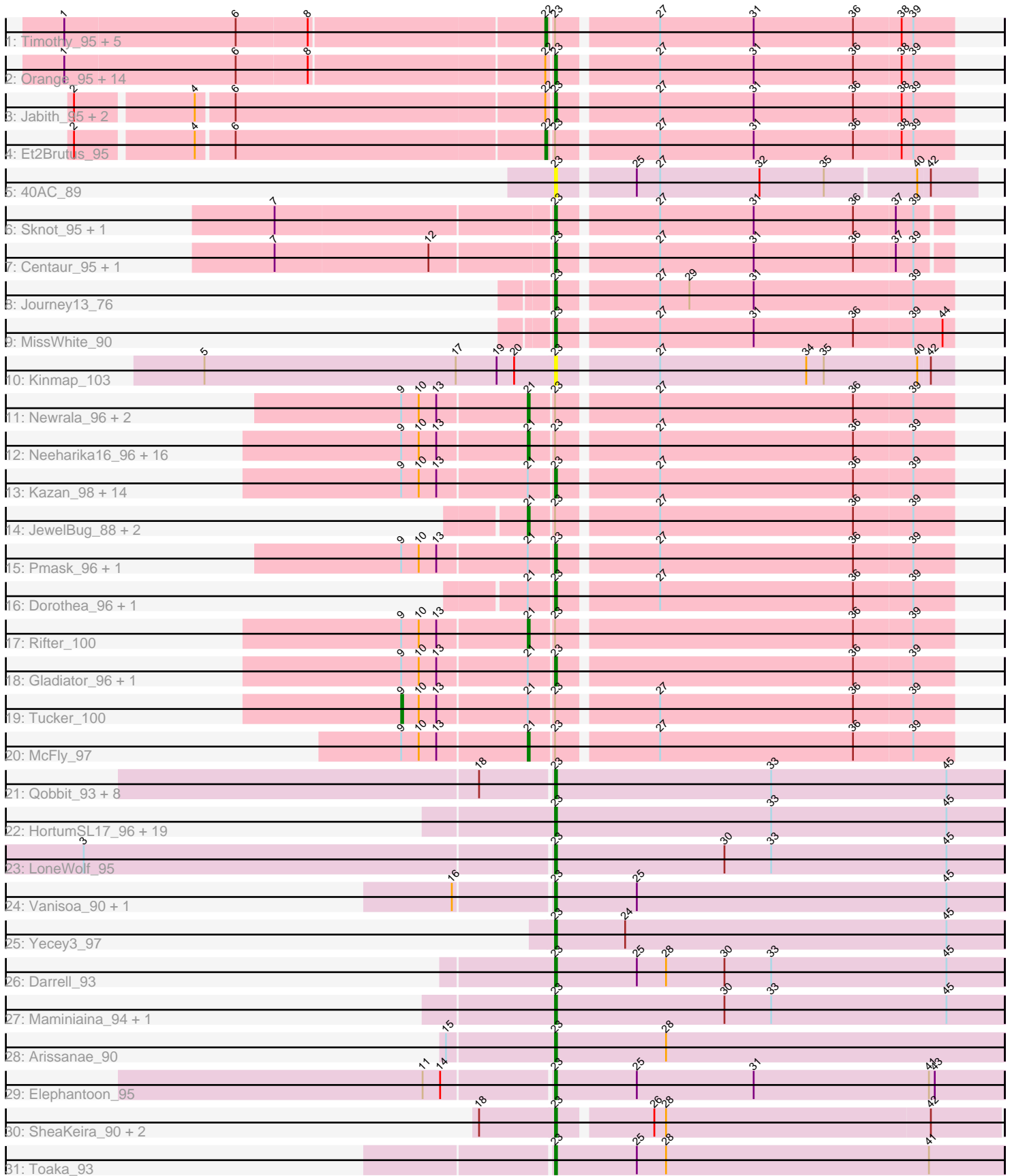


# Pham 208468



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 208468 Report

This analysis was run 02/22/25 on database version 588.

Pham number 208468 has 122 members, 20 are drafts.

Phages represented in each track:

- Track 1 : Timothy\_95, Aneem\_96, Munch\_94, Lucivia\_96, Insomnia\_95, Sham4\_92
- Track 2 : Orange\_95, Joselito\_93, Gilberta\_93, TinyTimmy\_93, Bachome\_93, Ebony\_94, Mulciber\_94, Flaverint\_96, Petersenfast\_89, Bud\_88, Mabel\_95, Snape\_95, Bowtie\_91, MaCh\_95, Fibonacci\_95
- Track 3 : Jabith\_95, Salz\_91, Hutc2\_92
- Track 4 : Et2Brutus\_95
- Track 5 : 40AC\_89
- Track 6 : Sknot\_95, Baehexic\_94
- Track 7 : Centaur\_95, Terrific\_96
- Track 8 : Journey13\_76
- Track 9 : MissWhite\_90
- Track 10 : Kinmap\_103
- Track 11 : Newrala\_96, Hoot\_92, SuperAwesome\_97
- Track 12 : Neeharika16\_96, Zaka\_100, EricB\_95, Indra\_102, VohminGhazi\_97, Hexamo\_99, Zulu\_101, BABullseye\_90, Lilbunny\_96, Gruunaga\_100, Cookiedough\_97, Wiks\_99, Koko\_101, Artemis2UCLA\_99, SmellyB\_97, Isiphiwo\_94, CloudWang3\_100
- Track 13 : Kazan\_98, DaVinci\_95, Chartreuse\_95, Hammer\_100, Roksolana\_100, BlessJoy\_99, Yokurt\_99, Candra\_95, Jeffabunny\_88, Blue7\_101, ToneTone\_96, Helmet\_101, Priamo\_97, Garak\_101, Temprado\_101
- Track 14 : JewelBug\_88, Jordennis\_94, Kipper29\_96
- Track 15 : Pmask\_96, GreedyLawyer\_87
- Track 16 : Dorothea\_96, Polyphemus\_88
- Track 17 : Rifter\_100
- Track 18 : Gladiator\_96, SuperCallie99\_94
- Track 19 : Tucker\_100
- Track 20 : McFly\_97
- Track 21 : Qobbit\_93, EmyBug\_92, Alma\_93, Fayely\_93, Conquerage\_93, ExplosioNervosa\_93, Priya\_93, Eidsmoe\_93, Spouty\_93
- Track 22 : HortumSL17\_96, Catalina\_97, Aliter\_88, Onglai\_93, Scherzo\_93, Phonnegut\_95, Tubs\_95, Sachima\_91, Lilleskat\_92, Pioneer\_95, Phaeder\_95, Jiawan\_93, Hanray\_93, Beemo\_95, Myxus\_95, Holecx\_94, RyeScarlet\_96, Ugenie5\_82, PackMan\_90, EdogawaKiddo\_94
- Track 23 : LoneWolf\_95
- Track 24 : Vanisoa\_90, Rahalelujah\_94
- Track 25 : Yecey3\_97
- Track 26 : Darrell\_93

- Track 27 : Maminaiaina\_94, BogosyJay\_94
- Track 28 : Arissanae\_90
- Track 29 : Elephantoon\_95
- Track 30 : SheaKeira\_90, Charm\_90, DreamTeam1\_91
- Track 31 : Toaka\_93

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

The start number called the most often in the published annotations is 23, it was called in 69 of the 102 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- 40AC\_89, Aliter\_88, Alma\_93, Arissanae\_90, Bachome\_93, Baehexic\_94, Beemo\_95, BlessJoy\_99, Blue7\_101, BogosyJay\_94, Bowtie\_91, Bud\_88, Candra\_95, Catalina\_97, Centaur\_95, Charm\_90, Chartreuse\_95, Conquerage\_93, DaVinci\_95, Darrell\_93, Dorothea\_96, DreamTeam1\_91, Ebony\_94, EdogawaKiddo\_94, Eidsmoe\_93, Elephantoon\_95, EmyBug\_92, ExplosioNervosa\_93, Fayely\_93, Fibonacci\_95, Flaverint\_96, Garak\_101, Gilberta\_93, Gladiator\_96, GreedyLawyer\_87, Hammer\_100, Hanray\_93, Helmet\_101, Halex\_94, HortumSL17\_96, Hutc2\_92, Jabith\_95, Jeffabunny\_88, Jiawan\_93, Joselito\_93, Journey13\_76, Kazan\_98, Kinmap\_103, Lilleskat\_92, LoneWolf\_95, MaCh\_95, Mabel\_95, Maminaiaina\_94, MissWhite\_90, Mulciber\_94, Myxus\_95, Onglai\_93, Orange\_95, PackMan\_90, Petersenfast\_89, Phaeder\_95, Phonnegut\_95, Pioneer\_95, Pmask\_96, Polyphemos\_88, Priamo\_97, Priya\_93, Qobbit\_93, Rahalelujah\_94, Roksolana\_100, RyeScarlet\_96, Sachima\_91, Salz\_91, Scherzo\_93, SheaKeira\_90, Sknot\_95, Snape\_95, Spouty\_93, SuperCallie99\_94, Temprado\_101, Terrific\_96, TinyTimmy\_93, Toaka\_93, ToneTone\_96, Tubs\_95, Ugenie5\_82, Vanisoa\_90, Yecy3\_97, Yokurt\_99,

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

- Aneem\_96, Artemis2UCLA\_99, BABullseye\_90, CloudWang3\_100, Cookiedough\_97, EricB\_95, Et2Brutus\_95, Gruunaga\_100, Hexamo\_99, Hoot\_92, Indra\_102, Insomnia\_95, Isiphiwo\_94, JewelBug\_88, Jordennis\_94, Kipper29\_96, Koko\_101, Lilbunny\_96, Lucivia\_96, McFly\_97, Munch\_94, Neeharika16\_96, Newrala\_96, Rifter\_100, Sham4\_92, SmellyB\_97, SuperAwesome\_97, Timothy\_95, Tucker\_100, VohminGhazi\_97, Wiks\_99, Zaka\_100, Zulu\_101,

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

- 

**Summary by start number:**

Start 9:

- Found in 42 of 122 ( 34.4% ) of genes in pham
- Manual Annotations of this start: 1 of 102
- Called 2.4% of time when present
- Phage (with cluster) where this start called: Tucker\_100 (A6),

Start 21:

- Found in 47 of 122 ( 38.5% ) of genes in pham

- Manual Annotations of this start: 25 of 102
- Called 53.2% of time when present
- Phage (with cluster) where this start called: Artemis2UCLA\_99 (A6), BABullseye\_90 (A6), CloudWang3\_100 (A6), Cookiedough\_97 (A6), EricB\_95 (A6), Gruunaga\_100 (A6), Hexamo\_99 (A6), Hoot\_92 (A6), Indra\_102 (A6), Isiphiwo\_94 (A6), JewelBug\_88 (A6), Jordennis\_94 (A6), Kipper29\_96 (A6), Koko\_101 (A6), Lilbunny\_96 (A6), McFly\_97 (A6), Neeharika16\_96 (A6), Newrala\_96 (A6), Rifter\_100 (A6), SmellyB\_97 (A6), SuperAwesome\_97 (A6), VohminGhazi\_97 (A6), Wiks\_99 (A6), Zaka\_100 (A6), Zulu\_101 (A6),

#### Start 22:

- Found in 25 of 122 ( 20.5% ) of genes in pham
- Manual Annotations of this start: 7 of 102
- Called 28.0% of time when present
- Phage (with cluster) where this start called: Aneem\_96 (A11), Et2Brutus\_95 (A11), Insomnia\_95 (A11), Lucivia\_96 (A11), Munch\_94 (A11), Sham4\_92 (A11), Timothy\_95 (A11),

#### Start 23:

- Found in 122 of 122 ( 100.0% ) of genes in pham
- Manual Annotations of this start: 69 of 102
- Called 73.0% of time when present
- Phage (with cluster) where this start called: 40AC\_89 (A17), Aliter\_88 (A9), Alma\_93 (A9), Arissanae\_90 (A9), Bachome\_93 (A11), Baehexic\_94 (A2), Beemo\_95 (A9), BlessJoy\_99 (A6), Blue7\_101 (A6), BogosyJay\_94 (A9), Bowtie\_91 (A11), Bud\_88 (A11), Candra\_95 (A6), Catalina\_97 (A9), Centaur\_95 (A2), Charm\_90 (A9), Chartreuse\_95 (A6), Conquerage\_93 (A9), DaVinci\_95 (A6), Darrell\_93 (A9), Dorothea\_96 (A6), DreamTeam1\_91 (A9), Ebony\_94 (A11), EdogawaKiddo\_94 (A9), Eidsmoe\_93 (A9), Elephantoon\_95 (A9), EmyBug\_92 (A9), ExplosioNervosa\_93 (A9), Fayely\_93 (A9), Fibonacci\_95 (A11), Flaverint\_96 (A11), Garak\_101 (A6), Gilberta\_93 (A11), Gladiator\_96 (A6), GreedyLawyer\_87 (A6), Hammer\_100 (A6), Hanray\_93 (A9), Helmet\_101 (A6), Halex\_94 (A9), HortumSL17\_96 (A9), Hutc2\_92 (A11), Jabith\_95 (A11), Jeffabunny\_88 (A6), Jiawan\_93 (A9), Joselito\_93 (A11), Journey13\_76 (A2), Kazan\_98 (A6), Kinmap\_103 (A21), Lilleskat\_92 (A9), LoneWolf\_95 (A9), MaCh\_95 (A11), Mabel\_95 (A11), Maminiaina\_94 (A9), MissWhite\_90 (A2), Mulciber\_94 (A11), Myxus\_95 (A9), Onglai\_93 (A9), Orange\_95 (A11), PackMan\_90 (A9), Petersenfast\_89 (A11), Phaeder\_95 (A9), Phonnegut\_95 (A9), Pioneer\_95 (A9), Pmask\_96 (A6), Polyphemus\_88 (A6), Priamo\_97 (A6), Priya\_93 (A9), Qobbit\_93 (A9), Rahalelujah\_94 (A9), Roksolana\_100 (A6), RyeScarlet\_96 (A9), Sachima\_91 (A9), Salz\_91 (A11), Scherzo\_93 (A9), SheaKeira\_90 (A9), Sknot\_95 (A2), Snape\_95 (A11), Spouty\_93 (A9), SuperCallie99\_94 (A6), Temprado\_101 (A6), Terrific\_96 (A2), TinyTimmy\_93 (A11), Toaka\_93 (A9), ToneTone\_96 (A6), Tubs\_95 (A9), Ugenie5\_82 (A9), Vanisoa\_90 (A9), Yecey3\_97 (A9), Yokurt\_99 (A6),

#### Summary by clusters:

There are 6 clusters represented in this pham: A21, A17, A11, A2, A6, A9,

Info for manual annotations of cluster A11:

- Start number 22 was manually annotated 7 times for cluster A11.
- Start number 23 was manually annotated 17 times for cluster A11.

Info for manual annotations of cluster A2:

- Start number 23 was manually annotated 4 times for cluster A2.

Info for manual annotations of cluster A6:

- Start number 9 was manually annotated 1 time for cluster A6.
- Start number 21 was manually annotated 25 times for cluster A6.
- Start number 23 was manually annotated 14 times for cluster A6.

Info for manual annotations of cluster A9:

- Start number 23 was manually annotated 34 times for cluster A9.

### **Gene Information:**

Gene: 40AC\_89 Start: 50824, Stop: 50618, Start Num: 23

Candidate Starts for 40AC\_89:

(Start: 23 @50824 has 69 MA's), (25, 50788), (27, 50776), (32, 50725), (35, 50692), (40, 50647), (42, 50641),

Gene: Aliter\_88 Start: 47544, Stop: 47314, Start Num: 23

Candidate Starts for Aliter\_88:

(Start: 23 @47544 has 69 MA's), (33, 47433), (45, 47343),

Gene: Alma\_93 Start: 50375, Stop: 50145, Start Num: 23

Candidate Starts for Alma\_93:

(18, 50411), (Start: 23 @50375 has 69 MA's), (33, 50264), (45, 50174),

Gene: Aneem\_96 Start: 49808, Stop: 49608, Start Num: 22

Candidate Starts for Aneem\_96:

(1, 50048), (6, 49961), (8, 49925), (Start: 22 @49808 has 7 MA's), (Start: 23 @49805 has 69 MA's), (27, 49757), (31, 49709), (36, 49658), (38, 49634), (39, 49628),

Gene: Arissanae\_90 Start: 50239, Stop: 50009, Start Num: 23

Candidate Starts for Arissanae\_90:

(15, 50293), (Start: 23 @50239 has 69 MA's), (28, 50182),

Gene: Artemis2UCLA\_99 Start: 49409, Stop: 49200, Start Num: 21

Candidate Starts for Artemis2UCLA\_99:

(Start: 9 @49472 has 1 MA's), (10, 49463), (13, 49454), (Start: 21 @49409 has 25 MA's), (Start: 23 @49397 has 69 MA's), (27, 49349), (36, 49250), (39, 49220),

Gene: BABullseye\_90 Start: 47547, Stop: 47338, Start Num: 21

Candidate Starts for BABullseye\_90:

(Start: 9 @47610 has 1 MA's), (10, 47601), (13, 47592), (Start: 21 @47547 has 25 MA's), (Start: 23 @47535 has 69 MA's), (27, 47487), (36, 47388), (39, 47358),

Gene: Bachome\_93 Start: 48853, Stop: 48656, Start Num: 23

Candidate Starts for Bachome\_93:

(1, 49096), (6, 49009), (8, 48973), (Start: 22 @48856 has 7 MA's), (Start: 23 @48853 has 69 MA's), (27, 48805), (31, 48757), (36, 48706), (38, 48682), (39, 48676),

Gene: Baehexic\_94 Start: 50815, Stop: 50621, Start Num: 23

Candidate Starts for Baehexic\_94:

(7, 50953), (Start: 23 @50815 has 69 MA's), (27, 50767), (31, 50719), (36, 50668), (37, 50647), (39, 50638),

Gene: Beemo\_95 Start: 50377, Stop: 50147, Start Num: 23

Candidate Starts for Beemo\_95:

(Start: 23 @50377 has 69 MA's), (33, 50266), (45, 50176),

Gene: BlessJoy\_99 Start: 49921, Stop: 49724, Start Num: 23

Candidate Starts for BlessJoy\_99:

(Start: 9 @49996 has 1 MA's), (10, 49987), (13, 49978), (Start: 21 @49933 has 25 MA's), (Start: 23 @49921 has 69 MA's), (27, 49873), (36, 49774), (39, 49744),

Gene: Blue7\_101 Start: 49631, Stop: 49434, Start Num: 23

Candidate Starts for Blue7\_101:

(Start: 9 @49706 has 1 MA's), (10, 49697), (13, 49688), (Start: 21 @49643 has 25 MA's), (Start: 23 @49631 has 69 MA's), (27, 49583), (36, 49484), (39, 49454),

Gene: BogosyJay\_94 Start: 50379, Stop: 50149, Start Num: 23

Candidate Starts for BogosyJay\_94:

(Start: 23 @50379 has 69 MA's), (30, 50292), (33, 50268), (45, 50178),

Gene: Bowtie\_91 Start: 48412, Stop: 48215, Start Num: 23

Candidate Starts for Bowtie\_91:

(1, 48655), (6, 48568), (8, 48532), (Start: 22 @48415 has 7 MA's), (Start: 23 @48412 has 69 MA's), (27, 48364), (31, 48316), (36, 48265), (38, 48241), (39, 48235),

Gene: Bud\_88 Start: 48511, Stop: 48314, Start Num: 23

Candidate Starts for Bud\_88:

(1, 48754), (6, 48667), (8, 48631), (Start: 22 @48514 has 7 MA's), (Start: 23 @48511 has 69 MA's), (27, 48463), (31, 48415), (36, 48364), (38, 48340), (39, 48334),

Gene: Candra\_95 Start: 49243, Stop: 49046, Start Num: 23

Candidate Starts for Candra\_95:

(Start: 9 @49318 has 1 MA's), (10, 49309), (13, 49300), (Start: 21 @49255 has 25 MA's), (Start: 23 @49243 has 69 MA's), (27, 49195), (36, 49096), (39, 49066),

Gene: Catalina\_97 Start: 50491, Stop: 50261, Start Num: 23

Candidate Starts for Catalina\_97:

(Start: 23 @50491 has 69 MA's), (33, 50380), (45, 50290),

Gene: Centaur\_95 Start: 50682, Stop: 50488, Start Num: 23

Candidate Starts for Centaur\_95:

(7, 50820), (12, 50742), (Start: 23 @50682 has 69 MA's), (27, 50634), (31, 50586), (36, 50535), (37, 50514), (39, 50505),

Gene: Charm\_90 Start: 49777, Stop: 49556, Start Num: 23

Candidate Starts for Charm\_90:

(18, 49813), (Start: 23 @49777 has 69 MA's), (26, 49732), (28, 49726), (42, 49591),

Gene: Chartreuse\_95 Start: 48544, Stop: 48347, Start Num: 23

Candidate Starts for Chartreuse\_95:

(Start: 9 @48619 has 1 MA's), (10, 48610), (13, 48601), (Start: 21 @48556 has 25 MA's), (Start: 23 @48544 has 69 MA's), (27, 48496), (36, 48397), (39, 48367),

Gene: CloudWang3\_100 Start: 49938, Stop: 49729, Start Num: 21

Candidate Starts for CloudWang3\_100:

(Start: 9 @50001 has 1 MA's), (10, 49992), (13, 49983), (Start: 21 @49938 has 25 MA's), (Start: 23 @49926 has 69 MA's), (27, 49878), (36, 49779), (39, 49749),

Gene: Conquerage\_93 Start: 50151, Stop: 49921, Start Num: 23

Candidate Starts for Conquerage\_93:

(18, 50187), (Start: 23 @50151 has 69 MA's), (33, 50040), (45, 49950),

Gene: Cookiedough\_97 Start: 49866, Stop: 49657, Start Num: 21

Candidate Starts for Cookiedough\_97:

(Start: 9 @49929 has 1 MA's), (10, 49920), (13, 49911), (Start: 21 @49866 has 25 MA's), (Start: 23 @49854 has 69 MA's), (27, 49806), (36, 49707), (39, 49677),

Gene: DaVinci\_95 Start: 48598, Stop: 48401, Start Num: 23

Candidate Starts for DaVinci\_95:

(Start: 9 @48673 has 1 MA's), (10, 48664), (13, 48655), (Start: 21 @48610 has 25 MA's), (Start: 23 @48598 has 69 MA's), (27, 48550), (36, 48451), (39, 48421),

Gene: Darrell\_93 Start: 49542, Stop: 49312, Start Num: 23

Candidate Starts for Darrell\_93:

(Start: 23 @49542 has 69 MA's), (25, 49500), (28, 49485), (30, 49455), (33, 49431), (45, 49341),

Gene: Dorothea\_96 Start: 49734, Stop: 49537, Start Num: 23

Candidate Starts for Dorothea\_96:

(Start: 21 @49746 has 25 MA's), (Start: 23 @49734 has 69 MA's), (27, 49686), (36, 49587), (39, 49557),

Gene: DreamTeam1\_91 Start: 49748, Stop: 49527, Start Num: 23

Candidate Starts for DreamTeam1\_91:

(18, 49784), (Start: 23 @49748 has 69 MA's), (26, 49703), (28, 49697), (42, 49562),

Gene: Ebony\_94 Start: 49376, Stop: 49179, Start Num: 23

Candidate Starts for Ebony\_94:

(1, 49619), (6, 49532), (8, 49496), (Start: 22 @49379 has 7 MA's), (Start: 23 @49376 has 69 MA's), (27, 49328), (31, 49280), (36, 49229), (38, 49205), (39, 49199),

Gene: EdogawaKiddo\_94 Start: 50453, Stop: 50223, Start Num: 23

Candidate Starts for EdogawaKiddo\_94:

(Start: 23 @50453 has 69 MA's), (33, 50342), (45, 50252),

Gene: Eidsmoe\_93 Start: 50144, Stop: 49914, Start Num: 23

Candidate Starts for Eidsmoe\_93:

(18, 50180), (Start: 23 @50144 has 69 MA's), (33, 50033), (45, 49943),

Gene: Elephantoon\_95 Start: 50266, Stop: 50036, Start Num: 23

Candidate Starts for Elephantoon\_95:

(11, 50329), (14, 50320), (Start: 23 @50266 has 69 MA's), (25, 50224), (31, 50164), (41, 50074), (43, 50071),

Gene: EmyBug\_92 Start: 50146, Stop: 49916, Start Num: 23  
Candidate Starts for EmyBug\_92:  
(18, 50182), (Start: 23 @50146 has 69 MA's), (33, 50035), (45, 49945),

Gene: EricB\_95 Start: 48755, Stop: 48546, Start Num: 21  
Candidate Starts for EricB\_95:  
(Start: 9 @48818 has 1 MA's), (10, 48809), (13, 48800), (Start: 21 @48755 has 25 MA's), (Start: 23 @48743 has 69 MA's), (27, 48695), (36, 48596), (39, 48566),

Gene: Et2Brutus\_95 Start: 49656, Stop: 49456, Start Num: 22  
Candidate Starts for Et2Brutus\_95:  
(2, 49887), (4, 49830), (6, 49812), (Start: 22 @49656 has 7 MA's), (Start: 23 @49653 has 69 MA's), (27, 49605), (31, 49557), (36, 49506), (38, 49482), (39, 49476),

Gene: ExplosioNervosa\_93 Start: 50212, Stop: 49982, Start Num: 23  
Candidate Starts for ExplosioNervosa\_93:  
(18, 50248), (Start: 23 @50212 has 69 MA's), (33, 50101), (45, 50011),

Gene: Fayely\_93 Start: 50120, Stop: 49890, Start Num: 23  
Candidate Starts for Fayely\_93:  
(18, 50156), (Start: 23 @50120 has 69 MA's), (33, 50009), (45, 49919),

Gene: Fibonacci\_95 Start: 49659, Stop: 49462, Start Num: 23  
Candidate Starts for Fibonacci\_95:  
(1, 49902), (6, 49815), (8, 49779), (Start: 22 @49662 has 7 MA's), (Start: 23 @49659 has 69 MA's), (27, 49611), (31, 49563), (36, 49512), (38, 49488), (39, 49482),

Gene: Flaverint\_96 Start: 49803, Stop: 49606, Start Num: 23  
Candidate Starts for Flaverint\_96:  
(1, 50046), (6, 49959), (8, 49923), (Start: 22 @49806 has 7 MA's), (Start: 23 @49803 has 69 MA's), (27, 49755), (31, 49707), (36, 49656), (38, 49632), (39, 49626),

Gene: Garak\_101 Start: 49871, Stop: 49674, Start Num: 23  
Candidate Starts for Garak\_101:  
(Start: 9 @49946 has 1 MA's), (10, 49937), (13, 49928), (Start: 21 @49883 has 25 MA's), (Start: 23 @49871 has 69 MA's), (27, 49823), (36, 49724), (39, 49694),

Gene: Gilberta\_93 Start: 48679, Stop: 48482, Start Num: 23  
Candidate Starts for Gilberta\_93:  
(1, 48922), (6, 48835), (8, 48799), (Start: 22 @48682 has 7 MA's), (Start: 23 @48679 has 69 MA's), (27, 48631), (31, 48583), (36, 48532), (38, 48508), (39, 48502),

Gene: Gladiator\_96 Start: 49591, Stop: 49394, Start Num: 23  
Candidate Starts for Gladiator\_96:  
(Start: 9 @49666 has 1 MA's), (10, 49657), (13, 49648), (Start: 21 @49603 has 25 MA's), (Start: 23 @49591 has 69 MA's), (36, 49444), (39, 49414),

Gene: GreedyLawyer\_87 Start: 49176, Stop: 48979, Start Num: 23  
Candidate Starts for GreedyLawyer\_87:  
(Start: 9 @49251 has 1 MA's), (10, 49242), (13, 49233), (Start: 21 @49188 has 25 MA's), (Start: 23 @49176 has 69 MA's), (27, 49128), (36, 49029), (39, 48999),



Gene: Gruunaga\_100 Start: 49559, Stop: 49350, Start Num: 21  
Candidate Starts for Gruunaga\_100:  
(Start: 9 @49622 has 1 MA's), (10, 49613), (13, 49604), (Start: 21 @49559 has 25 MA's), (Start: 23 @49547 has 69 MA's), (27, 49499), (36, 49400), (39, 49370),

Gene: Hammer\_100 Start: 49244, Stop: 49047, Start Num: 23  
Candidate Starts for Hammer\_100:  
(Start: 9 @49319 has 1 MA's), (10, 49310), (13, 49301), (Start: 21 @49256 has 25 MA's), (Start: 23 @49244 has 69 MA's), (27, 49196), (36, 49097), (39, 49067),

Gene: Hanray\_93 Start: 50442, Stop: 50212, Start Num: 23  
Candidate Starts for Hanray\_93:  
(Start: 23 @50442 has 69 MA's), (33, 50331), (45, 50241),

Gene: Helmet\_101 Start: 49871, Stop: 49674, Start Num: 23  
Candidate Starts for Helmet\_101:  
(Start: 9 @49946 has 1 MA's), (10, 49937), (13, 49928), (Start: 21 @49883 has 25 MA's), (Start: 23 @49871 has 69 MA's), (27, 49823), (36, 49724), (39, 49694),

Gene: Hexamo\_99 Start: 49424, Stop: 49215, Start Num: 21  
Candidate Starts for Hexamo\_99:  
(Start: 9 @49487 has 1 MA's), (10, 49478), (13, 49469), (Start: 21 @49424 has 25 MA's), (Start: 23 @49412 has 69 MA's), (27, 49364), (36, 49265), (39, 49235),

Gene: Horex\_94 Start: 50455, Stop: 50225, Start Num: 23  
Candidate Starts for Horex\_94:  
(Start: 23 @50455 has 69 MA's), (33, 50344), (45, 50254),

Gene: Hoot\_92 Start: 47072, Stop: 46863, Start Num: 21  
Candidate Starts for Hoot\_92:  
(Start: 9 @47135 has 1 MA's), (10, 47126), (13, 47117), (Start: 21 @47072 has 25 MA's), (Start: 23 @47060 has 69 MA's), (27, 47012), (36, 46913), (39, 46883),

Gene: HortumSL17\_96 Start: 50489, Stop: 50259, Start Num: 23  
Candidate Starts for HortumSL17\_96:  
(Start: 23 @50489 has 69 MA's), (33, 50378), (45, 50288),

Gene: Hutc2\_92 Start: 48543, Stop: 48346, Start Num: 23  
Candidate Starts for Hutc2\_92:  
(2, 48777), (4, 48720), (6, 48702), (Start: 22 @48546 has 7 MA's), (Start: 23 @48543 has 69 MA's), (27, 48495), (31, 48447), (36, 48396), (38, 48372), (39, 48366),

Gene: Indra\_102 Start: 49884, Stop: 49675, Start Num: 21  
Candidate Starts for Indra\_102:  
(Start: 9 @49947 has 1 MA's), (10, 49938), (13, 49929), (Start: 21 @49884 has 25 MA's), (Start: 23 @49872 has 69 MA's), (27, 49824), (36, 49725), (39, 49695),

Gene: Insomnia\_95 Start: 49840, Stop: 49640, Start Num: 22  
Candidate Starts for Insomnia\_95:  
(1, 50080), (6, 49993), (8, 49957), (Start: 22 @49840 has 7 MA's), (Start: 23 @49837 has 69 MA's), (27, 49789), (31, 49741), (36, 49690), (38, 49666), (39, 49660),

Gene: Isiphiwo\_94 Start: 48974, Stop: 48765, Start Num: 21

Candidate Starts for Isiphiwo\_94:

(Start: 9 @49037 has 1 MA's), (10, 49028), (13, 49019), (Start: 21 @48974 has 25 MA's), (Start: 23 @48962 has 69 MA's), (27, 48914), (36, 48815), (39, 48785),

Gene: Jabith\_95 Start: 49851, Stop: 49654, Start Num: 23

Candidate Starts for Jabith\_95:

(2, 50085), (4, 50028), (6, 50010), (Start: 22 @49854 has 7 MA's), (Start: 23 @49851 has 69 MA's), (27, 49803), (31, 49755), (36, 49704), (38, 49680), (39, 49674),

Gene: Jeffabunny\_88 Start: 46015, Stop: 45818, Start Num: 23

Candidate Starts for Jeffabunny\_88:

(Start: 9 @46090 has 1 MA's), (10, 46081), (13, 46072), (Start: 21 @46027 has 25 MA's), (Start: 23 @46015 has 69 MA's), (27, 45967), (36, 45868), (39, 45838),

Gene: JewelBug\_88 Start: 47439, Stop: 47230, Start Num: 21

Candidate Starts for JewelBug\_88:

(Start: 21 @47439 has 25 MA's), (Start: 23 @47427 has 69 MA's), (27, 47379), (36, 47280), (39, 47250),

Gene: Jiawan\_93 Start: 50472, Stop: 50242, Start Num: 23

Candidate Starts for Jiawan\_93:

(Start: 23 @50472 has 69 MA's), (33, 50361), (45, 50271),

Gene: Jordennis\_94 Start: 49343, Stop: 49134, Start Num: 21

Candidate Starts for Jordennis\_94:

(Start: 21 @49343 has 25 MA's), (Start: 23 @49331 has 69 MA's), (27, 49283), (36, 49184), (39, 49154),

Gene: Joselito\_93 Start: 49557, Stop: 49360, Start Num: 23

Candidate Starts for Joselito\_93:

(1, 49800), (6, 49713), (8, 49677), (Start: 22 @49560 has 7 MA's), (Start: 23 @49557 has 69 MA's), (27, 49509), (31, 49461), (36, 49410), (38, 49386), (39, 49380),

Gene: Journey13\_76 Start: 45895, Stop: 45698, Start Num: 23

Candidate Starts for Journey13\_76:

(Start: 23 @45895 has 69 MA's), (27, 45847), (29, 45832), (31, 45799), (39, 45718),

Gene: Kazan\_98 Start: 49213, Stop: 49016, Start Num: 23

Candidate Starts for Kazan\_98:

(Start: 9 @49288 has 1 MA's), (10, 49279), (13, 49270), (Start: 21 @49225 has 25 MA's), (Start: 23 @49213 has 69 MA's), (27, 49165), (36, 49066), (39, 49036),

Gene: Kinmap\_103 Start: 51048, Stop: 50851, Start Num: 23

Candidate Starts for Kinmap\_103:

(5, 51225), (17, 51096), (19, 51075), (20, 51066), (Start: 23 @51048 has 69 MA's), (27, 51000), (34, 50925), (35, 50916), (40, 50868), (42, 50862),

Gene: Kipper29\_96 Start: 49118, Stop: 48909, Start Num: 21

Candidate Starts for Kipper29\_96:

(Start: 21 @49118 has 25 MA's), (Start: 23 @49106 has 69 MA's), (27, 49058), (36, 48959), (39, 48929),

Gene: Koko\_101 Start: 50273, Stop: 50064, Start Num: 21

Candidate Starts for Koko\_101:

(Start: 9 @50336 has 1 MA's), (10, 50327), (13, 50318), (Start: 21 @50273 has 25 MA's), (Start: 23 @50261 has 69 MA's), (27, 50213), (36, 50114), (39, 50084),

Gene: Lilbunny\_96 Start: 48131, Stop: 47922, Start Num: 21

Candidate Starts for Lilbunny\_96:

(Start: 9 @48194 has 1 MA's), (10, 48185), (13, 48176), (Start: 21 @48131 has 25 MA's), (Start: 23 @48119 has 69 MA's), (27, 48071), (36, 47972), (39, 47942),

Gene: Lilleskat\_92 Start: 50443, Stop: 50213, Start Num: 23

Candidate Starts for Lilleskat\_92:

(Start: 23 @50443 has 69 MA's), (33, 50332), (45, 50242),

Gene: LoneWolf\_95 Start: 50480, Stop: 50250, Start Num: 23

Candidate Starts for LoneWolf\_95:

(3, 50717), (Start: 23 @50480 has 69 MA's), (30, 50393), (33, 50369), (45, 50279),

Gene: Lucivia\_96 Start: 49839, Stop: 49639, Start Num: 22

Candidate Starts for Lucivia\_96:

(1, 50079), (6, 49992), (8, 49956), (Start: 22 @49839 has 7 MA's), (Start: 23 @49836 has 69 MA's), (27, 49788), (31, 49740), (36, 49689), (38, 49665), (39, 49659),

Gene: MaCh\_95 Start: 49800, Stop: 49603, Start Num: 23

Candidate Starts for MaCh\_95:

(1, 50043), (6, 49956), (8, 49920), (Start: 22 @49803 has 7 MA's), (Start: 23 @49800 has 69 MA's), (27, 49752), (31, 49704), (36, 49653), (38, 49629), (39, 49623),

Gene: Mabel\_95 Start: 49801, Stop: 49604, Start Num: 23

Candidate Starts for Mabel\_95:

(1, 50044), (6, 49957), (8, 49921), (Start: 22 @49804 has 7 MA's), (Start: 23 @49801 has 69 MA's), (27, 49753), (31, 49705), (36, 49654), (38, 49630), (39, 49624),

Gene: Maminiaina\_94 Start: 50361, Stop: 50131, Start Num: 23

Candidate Starts for Maminiaina\_94:

(Start: 23 @50361 has 69 MA's), (30, 50274), (33, 50250), (45, 50160),

Gene: McFly\_97 Start: 49564, Stop: 49355, Start Num: 21

Candidate Starts for McFly\_97:

(Start: 9 @49627 has 1 MA's), (10, 49618), (13, 49609), (Start: 21 @49564 has 25 MA's), (Start: 23 @49552 has 69 MA's), (27, 49504), (36, 49405), (39, 49375),

Gene: MissWhite\_90 Start: 47674, Stop: 47477, Start Num: 23

Candidate Starts for MissWhite\_90:

(Start: 23 @47674 has 69 MA's), (27, 47626), (31, 47578), (36, 47527), (39, 47497), (44, 47482),

Gene: Mulciber\_94 Start: 49656, Stop: 49459, Start Num: 23

Candidate Starts for Mulciber\_94:

(1, 49899), (6, 49812), (8, 49776), (Start: 22 @49659 has 7 MA's), (Start: 23 @49656 has 69 MA's), (27, 49608), (31, 49560), (36, 49509), (38, 49485), (39, 49479),

Gene: Munch\_94 Start: 49808, Stop: 49608, Start Num: 22

Candidate Starts for Munch\_94:

(1, 50048), (6, 49961), (8, 49925), (Start: 22 @49808 has 7 MA's), (Start: 23 @49805 has 69 MA's), (27, 49757), (31, 49709), (36, 49658), (38, 49634), (39, 49628),

Gene: Myxus\_95 Start: 50489, Stop: 50259, Start Num: 23  
Candidate Starts for Myxus\_95:  
(Start: 23 @50489 has 69 MA's), (33, 50378), (45, 50288),

Gene: Neeharika16\_96 Start: 49317, Stop: 49108, Start Num: 21  
Candidate Starts for Neeharika16\_96:  
(Start: 9 @49380 has 1 MA's), (10, 49371), (13, 49362), (Start: 21 @49317 has 25 MA's), (Start: 23 @49305 has 69 MA's), (27, 49257), (36, 49158), (39, 49128),

Gene: Newrala\_96 Start: 49663, Stop: 49454, Start Num: 21  
Candidate Starts for Newrala\_96:  
(Start: 9 @49726 has 1 MA's), (10, 49717), (13, 49708), (Start: 21 @49663 has 25 MA's), (Start: 23 @49651 has 69 MA's), (27, 49603), (36, 49504), (39, 49474),

Gene: Onglai\_93 Start: 48644, Stop: 48414, Start Num: 23  
Candidate Starts for Onglai\_93:  
(Start: 23 @48644 has 69 MA's), (33, 48533), (45, 48443),

Gene: Orange\_95 Start: 49355, Stop: 49158, Start Num: 23  
Candidate Starts for Orange\_95:  
(1, 49598), (6, 49511), (8, 49475), (Start: 22 @49358 has 7 MA's), (Start: 23 @49355 has 69 MA's), (27, 49307), (31, 49259), (36, 49208), (38, 49184), (39, 49178),

Gene: PackMan\_90 Start: 48403, Stop: 48173, Start Num: 23  
Candidate Starts for PackMan\_90:  
(Start: 23 @48403 has 69 MA's), (33, 48292), (45, 48202),

Gene: Petersenfast\_89 Start: 48236, Stop: 48039, Start Num: 23  
Candidate Starts for Petersenfast\_89:  
(1, 48479), (6, 48392), (8, 48356), (Start: 22 @48239 has 7 MA's), (Start: 23 @48236 has 69 MA's), (27, 48188), (31, 48140), (36, 48089), (38, 48065), (39, 48059),

Gene: Phaeder\_95 Start: 50364, Stop: 50134, Start Num: 23  
Candidate Starts for Phaeder\_95:  
(Start: 23 @50364 has 69 MA's), (33, 50253), (45, 50163),

Gene: Phonnegut\_95 Start: 50376, Stop: 50146, Start Num: 23  
Candidate Starts for Phonnegut\_95:  
(Start: 23 @50376 has 69 MA's), (33, 50265), (45, 50175),

Gene: Pioneer\_95 Start: 50376, Stop: 50146, Start Num: 23  
Candidate Starts for Pioneer\_95:  
(Start: 23 @50376 has 69 MA's), (33, 50265), (45, 50175),

Gene: Pmask\_96 Start: 49852, Stop: 49655, Start Num: 23  
Candidate Starts for Pmask\_96:  
(Start: 9 @49927 has 1 MA's), (10, 49918), (13, 49909), (Start: 21 @49864 has 25 MA's), (Start: 23 @49852 has 69 MA's), (27, 49804), (36, 49705), (39, 49675),

Gene: Polyphemus\_88 Start: 47511, Stop: 47314, Start Num: 23

Candidate Starts for Polyphemus\_88:

(Start: 21 @47523 has 25 MA's), (Start: 23 @47511 has 69 MA's), (27, 47463), (36, 47364), (39, 47334),

Gene: Priamo\_97 Start: 48895, Stop: 48698, Start Num: 23

Candidate Starts for Priamo\_97:

(Start: 9 @48970 has 1 MA's), (10, 48961), (13, 48952), (Start: 21 @48907 has 25 MA's), (Start: 23 @48895 has 69 MA's), (27, 48847), (36, 48748), (39, 48718),

Gene: Priya\_93 Start: 50147, Stop: 49917, Start Num: 23

Candidate Starts for Priya\_93:

(18, 50183), (Start: 23 @50147 has 69 MA's), (33, 50036), (45, 49946),

Gene: Qobbit\_93 Start: 50109, Stop: 49879, Start Num: 23

Candidate Starts for Qobbit\_93:

(18, 50145), (Start: 23 @50109 has 69 MA's), (33, 49998), (45, 49908),

Gene: Rahalelujah\_94 Start: 49952, Stop: 49722, Start Num: 23

Candidate Starts for Rahalelujah\_94:

(16, 50000), (Start: 23 @49952 has 69 MA's), (25, 49910), (45, 49751),

Gene: Rifter\_100 Start: 49051, Stop: 48842, Start Num: 21

Candidate Starts for Rifter\_100:

(Start: 9 @49114 has 1 MA's), (10, 49105), (13, 49096), (Start: 21 @49051 has 25 MA's), (Start: 23 @49039 has 69 MA's), (36, 48892), (39, 48862),

Gene: Roksolana\_100 Start: 49755, Stop: 49558, Start Num: 23

Candidate Starts for Roksolana\_100:

(Start: 9 @49830 has 1 MA's), (10, 49821), (13, 49812), (Start: 21 @49767 has 25 MA's), (Start: 23 @49755 has 69 MA's), (27, 49707), (36, 49608), (39, 49578),

Gene: RyeScarlet\_96 Start: 50362, Stop: 50132, Start Num: 23

Candidate Starts for RyeScarlet\_96:

(Start: 23 @50362 has 69 MA's), (33, 50251), (45, 50161),

Gene: Sachima\_91 Start: 50390, Stop: 50160, Start Num: 23

Candidate Starts for Sachima\_91:

(Start: 23 @50390 has 69 MA's), (33, 50279), (45, 50189),

Gene: Salz\_91 Start: 48465, Stop: 48268, Start Num: 23

Candidate Starts for Salz\_91:

(2, 48699), (4, 48642), (6, 48624), (Start: 22 @48468 has 7 MA's), (Start: 23 @48465 has 69 MA's), (27, 48417), (31, 48369), (36, 48318), (38, 48294), (39, 48288),

Gene: Scherzo\_93 Start: 50407, Stop: 50177, Start Num: 23

Candidate Starts for Scherzo\_93:

(Start: 23 @50407 has 69 MA's), (33, 50296), (45, 50206),

Gene: Sham4\_92 Start: 48554, Stop: 48354, Start Num: 22

Candidate Starts for Sham4\_92:

(1, 48794), (6, 48707), (8, 48671), (Start: 22 @48554 has 7 MA's), (Start: 23 @48551 has 69 MA's), (27, 48503), (31, 48455), (36, 48404), (38, 48380), (39, 48374),

Gene: SheaKeira\_90 Start: 49660, Stop: 49439, Start Num: 23  
Candidate Starts for SheaKeira\_90:  
(18, 49696), (Start: 23 @49660 has 69 MA's), (26, 49615), (28, 49609), (42, 49474),

Gene: Sknot\_95 Start: 50729, Stop: 50535, Start Num: 23  
Candidate Starts for Sknot\_95:  
(7, 50867), (Start: 23 @50729 has 69 MA's), (27, 50681), (31, 50633), (36, 50582), (37, 50561), (39, 50552),

Gene: SmellyB\_97 Start: 49219, Stop: 49010, Start Num: 21  
Candidate Starts for SmellyB\_97:  
(Start: 9 @49282 has 1 MA's), (10, 49273), (13, 49264), (Start: 21 @49219 has 25 MA's), (Start: 23 @49207 has 69 MA's), (27, 49159), (36, 49060), (39, 49030),

Gene: Snape\_95 Start: 49344, Stop: 49147, Start Num: 23  
Candidate Starts for Snape\_95:  
(1, 49587), (6, 49500), (8, 49464), (Start: 22 @49347 has 7 MA's), (Start: 23 @49344 has 69 MA's), (27, 49296), (31, 49248), (36, 49197), (38, 49173), (39, 49167),

Gene: Spouty\_93 Start: 50146, Stop: 49916, Start Num: 23  
Candidate Starts for Spouty\_93:  
(18, 50182), (Start: 23 @50146 has 69 MA's), (33, 50035), (45, 49945),

Gene: SuperAwesome\_97 Start: 49903, Stop: 49694, Start Num: 21  
Candidate Starts for SuperAwesome\_97:  
(Start: 9 @49966 has 1 MA's), (10, 49957), (13, 49948), (Start: 21 @49903 has 25 MA's), (Start: 23 @49891 has 69 MA's), (27, 49843), (36, 49744), (39, 49714),

Gene: SuperCallie99\_94 Start: 49463, Stop: 49266, Start Num: 23  
Candidate Starts for SuperCallie99\_94:  
(Start: 9 @49538 has 1 MA's), (10, 49529), (13, 49520), (Start: 21 @49475 has 25 MA's), (Start: 23 @49463 has 69 MA's), (36, 49316), (39, 49286),

Gene: Temprado\_101 Start: 49871, Stop: 49674, Start Num: 23  
Candidate Starts for Temprado\_101:  
(Start: 9 @49946 has 1 MA's), (10, 49937), (13, 49928), (Start: 21 @49883 has 25 MA's), (Start: 23 @49871 has 69 MA's), (27, 49823), (36, 49724), (39, 49694),

Gene: Terrific\_96 Start: 50697, Stop: 50503, Start Num: 23  
Candidate Starts for Terrific\_96:  
(7, 50835), (12, 50757), (Start: 23 @50697 has 69 MA's), (27, 50649), (31, 50601), (36, 50550), (37, 50529), (39, 50520),

Gene: Timothy\_95 Start: 49324, Stop: 49124, Start Num: 22  
Candidate Starts for Timothy\_95:  
(1, 49564), (6, 49477), (8, 49441), (Start: 22 @49324 has 7 MA's), (Start: 23 @49321 has 69 MA's), (27, 49273), (31, 49225), (36, 49174), (38, 49150), (39, 49144),

Gene: TinyTimmy\_93 Start: 49050, Stop: 48853, Start Num: 23  
Candidate Starts for TinyTimmy\_93:  
(1, 49293), (6, 49206), (8, 49170), (Start: 22 @49053 has 7 MA's), (Start: 23 @49050 has 69 MA's), (27, 49002), (31, 48954), (36, 48903), (38, 48879), (39, 48873),

Gene: Toaka\_93 Start: 50289, Stop: 50059, Start Num: 23  
Candidate Starts for Toaka\_93:  
(Start: 23 @50289 has 69 MA's), (25, 50247), (28, 50232), (41, 50097),

Gene: ToneTone\_96 Start: 49422, Stop: 49225, Start Num: 23  
Candidate Starts for ToneTone\_96:  
(Start: 9 @49497 has 1 MA's), (10, 49488), (13, 49479), (Start: 21 @49434 has 25 MA's), (Start: 23 @49422 has 69 MA's), (27, 49374), (36, 49275), (39, 49245),

Gene: Tubs\_95 Start: 50364, Stop: 50134, Start Num: 23  
Candidate Starts for Tubs\_95:  
(Start: 23 @50364 has 69 MA's), (33, 50253), (45, 50163),

Gene: Tucker\_100 Start: 49700, Stop: 49428, Start Num: 9  
Candidate Starts for Tucker\_100:  
(Start: 9 @49700 has 1 MA's), (10, 49691), (13, 49682), (Start: 21 @49637 has 25 MA's), (Start: 23 @49625 has 69 MA's), (27, 49577), (36, 49478), (39, 49448),

Gene: Ugenie5\_82 Start: 47851, Stop: 47621, Start Num: 23  
Candidate Starts for Ugenie5\_82:  
(Start: 23 @47851 has 69 MA's), (33, 47740), (45, 47650),

Gene: Vanisoa\_90 Start: 50582, Stop: 50352, Start Num: 23  
Candidate Starts for Vanisoa\_90:  
(16, 50630), (Start: 23 @50582 has 69 MA's), (25, 50540), (45, 50381),

Gene: VohminGhazi\_97 Start: 49220, Stop: 49011, Start Num: 21  
Candidate Starts for VohminGhazi\_97:  
(Start: 9 @49283 has 1 MA's), (10, 49274), (13, 49265), (Start: 21 @49220 has 25 MA's), (Start: 23 @49208 has 69 MA's), (27, 49160), (36, 49061), (39, 49031),

Gene: Wiks\_99 Start: 49514, Stop: 49305, Start Num: 21  
Candidate Starts for Wiks\_99:  
(Start: 9 @49577 has 1 MA's), (10, 49568), (13, 49559), (Start: 21 @49514 has 25 MA's), (Start: 23 @49502 has 69 MA's), (27, 49454), (36, 49355), (39, 49325),

Gene: Yecey3\_97 Start: 50292, Stop: 50062, Start Num: 23  
Candidate Starts for Yecey3\_97:  
(Start: 23 @50292 has 69 MA's), (24, 50256), (45, 50091),

Gene: Yokurt\_99 Start: 49502, Stop: 49305, Start Num: 23  
Candidate Starts for Yokurt\_99:  
(Start: 9 @49577 has 1 MA's), (10, 49568), (13, 49559), (Start: 21 @49514 has 25 MA's), (Start: 23 @49502 has 69 MA's), (27, 49454), (36, 49355), (39, 49325),

Gene: Zaka\_100 Start: 49514, Stop: 49305, Start Num: 21  
Candidate Starts for Zaka\_100:  
(Start: 9 @49577 has 1 MA's), (10, 49568), (13, 49559), (Start: 21 @49514 has 25 MA's), (Start: 23 @49502 has 69 MA's), (27, 49454), (36, 49355), (39, 49325),

Gene: Zulu\_101 Start: 49891, Stop: 49682, Start Num: 21  
Candidate Starts for Zulu\_101:

(Start: 9 @49954 has 1 MA's), (10, 49945), (13, 49936), (Start: 21 @49891 has 25 MA's), (Start: 23 @49879 has 69 MA's), (27, 49831), (36, 49732), (39, 49702),