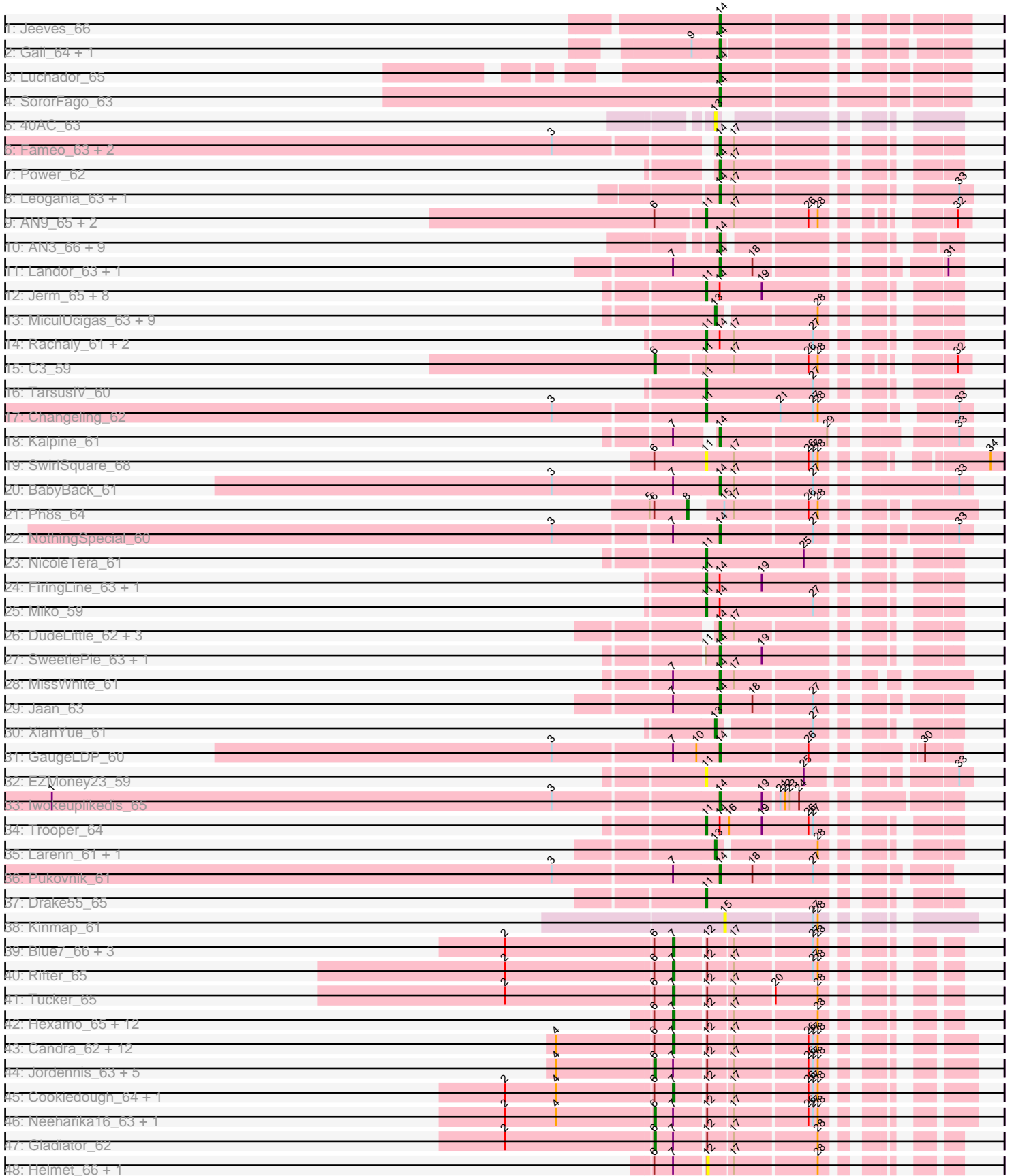


Pham 193843



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 193843 Report

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

Pham number 193843 has 124 members, 12 are drafts.

Phages represented in each track:

- Track 1 : Jeeves\_66
- Track 2 : Gail\_64, Sunhee\_65
- Track 3 : Luchador\_65
- Track 4 : SororFago\_63
- Track 5 : 40AC\_63
- Track 6 : Fameo\_63, QueenB2\_62, Heffalump\_62
- Track 7 : Power\_62
- Track 8 : Leogania\_63, BiancaTri92\_63
- Track 9 : AN9\_65, VC3\_65, ANI8\_65
- Track 10 : AN3\_66, 20ES\_66, Deloris\_64, LadyBird\_68, CRB1\_66, VA6\_64, First\_0065, Benvolio\_60, BengiVuitton\_64, Echild\_63
- Track 11 : Landor\_63, IronMan\_62
- Track 12 : Jerm\_65, LilTurb\_64, Agape74\_65, AbbyPaige\_65, SemperFi\_64, Turbido\_64, Buggy\_65, Georgie2\_64, Crucio\_63
- Track 13 : MiculUcigas\_63, Centaur\_64, Equemioh13\_63, Flare16\_63, WideWale\_64, Piro94\_63, Updawg\_64, HarryHoudini\_64, Baehexic\_62, NaSiaTalie\_63
- Track 14 : Rachaly\_61, BobSwaget\_58, Lokk\_59
- Track 15 : C3\_59
- Track 16 : TarsusIV\_60
- Track 17 : Changeling\_62
- Track 18 : Kalpine\_61
- Track 19 : SwirlSquare\_68
- Track 20 : BabyBack\_61
- Track 21 : Ph8s\_64
- Track 22 : NothingSpecial\_60
- Track 23 : NicoleTera\_61
- Track 24 : FiringLine\_63, QueenBeesly\_63
- Track 25 : Miko\_59
- Track 26 : DudeLittle\_62, Dalmatian\_64, Anselm\_64, Retro23\_64
- Track 27 : SweetiePie\_63, SnapTap\_63
- Track 28 : MissWhite\_61
- Track 29 : Jaan\_63
- Track 30 : XianYue\_61
- Track 31 : GaugeLDP\_60
- Track 32 : EZMoney23\_59
- Track 33 : Iwokeuplikedis\_65

- Track 34 : Trooper\_64
- Track 35 : Larenn\_61, Malec\_62
- Track 36 : Pukovnik\_61
- Track 37 : Drake55\_65
- Track 38 : Kinmap\_61
- Track 39 : Blue7\_66, Hammer\_65, Gruunaga\_65, Roksolana\_66
- Track 40 : Rifter\_65
- Track 41 : Tucker\_65
- Track 42 : Hexamo\_65, Jeffabunny\_65, ToneTone\_62, Lilbunny\_64, Zaka\_65, Artemis2UCLA\_65, Koko\_67, Yokurt\_64, WunderPhul\_65, Zulu\_66, Indra\_68, Wiks\_64, CloudWang3\_66
- Track 43 : Candra\_62, SuperAwesome\_64, Isiphiwo\_62, VohminGhazi\_64, Kazan\_65, SmellyB\_64, JewelBug\_64, Newrala\_64, Kipper29\_64, Hoot\_59, EricB\_63, DaVinci\_62, BABullseye\_57
- Track 44 : Jordennis\_63, Blinn1\_67, Priamo\_66, SuperCallie99\_61, Chartreuse\_61, Dorothea\_64
- Track 45 : Cookiedough\_64, McFly\_64
- Track 46 : Neeharika16\_63, Pmask\_63
- Track 47 : Gladiator\_62
- Track 48 : Helmet\_66, Garak\_66

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

The start number called the most often in the published annotations is 14, it was called in 33 of the 112 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- 20ES\_66, AN3\_66, Anselm\_64, BabyBack\_61, BengiVuitton\_64, Benvolio\_60, BiancaTri92\_63, CRB1\_66, Dalmatian\_64, Deloris\_64, DudeLittle\_62, Echild\_63, Fameo\_63, First\_0065, Gail\_64, GaugeLDP\_60, Heffalump\_62, IronMan\_62, Iwokeuplikedis\_65, Jaan\_63, Jeeves\_66, Kalpine\_61, LadyBird\_68, Landor\_63, Leogania\_63, Luchador\_65, MissWhite\_61, NothingSpecial\_60, Power\_62, Pukovnik\_61, QueenB2\_62, Retro23\_64, SnapTap\_63, SororFago\_63, Sunhee\_65, SweetiePie\_63, VA6\_64,

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

- AbbyPaige\_65, Agape74\_65, BobSwaget\_58, Buggy\_65, Crucio\_63, FiringLine\_63, Georgie2\_64, Jerm\_65, LilTurb\_64, Lokk\_59, Miko\_59, QueenBeesly\_63, Rachaly\_61, SemperFi\_64, Trooper\_64, Turbido\_64,

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

- 40AC\_63, AN9\_65, ANI8\_65, Artemis2UCLA\_65, BABullseye\_57, Baehexic\_62, Blinn1\_67, Blue7\_66, C3\_59, Candra\_62, Centaur\_64, Changeling\_62, Chartreuse\_61, CloudWang3\_66, Cookiedough\_64, DaVinci\_62, Dorothea\_64, Drake55\_65, EZMoney23\_59, Equemioh13\_63, EricB\_63, Flare16\_63, Garak\_66, Gladiator\_62, Gruunaga\_65, Hammer\_65, HarryHoudini\_64, Helmet\_66, Hexamo\_65, Hoot\_59, Indra\_68, Isiphiwo\_62, Jeffabunny\_65, JewelBug\_64, Jordennis\_63, Kazan\_65, Kinmap\_61, Kipper29\_64, Koko\_67, Larenn\_61, Lilbunny\_64, Malec\_62, McFly\_64, MiculUcigas\_63, NaSiaTalie\_63, Neeharika16\_63, Newrala\_64, NicoleTera\_61, Ph8s\_64, Piro94\_63, Pmask\_63,

Priamo\_66, Rifter\_65, Roksolana\_66, SmellyB\_64, SuperAwesome\_64, SuperCallie99\_61, SwirlSquare\_68, TarsusIV\_60, ToneTone\_62, Tucker\_65, Updawg\_64, VC3\_65, VohminGhazi\_64, WideWale\_64, Wiks\_64, WunderPhul\_65, XianYue\_61, Yokurt\_64, Zaka\_65, Zulu\_66,

### Summary by start number:

#### Start 6:

- Found in 51 of 124 ( 41.1% ) of genes in pham
- Manual Annotations of this start: 9 of 112
- Called 19.6% of time when present
- Phage (with cluster) where this start called: Blinn1\_67 (A6), C3\_59 (A2), Chartreuse\_61 (A6), Dorothea\_64 (A6), Gladiator\_62 (A6), Jordennis\_63 (A6), Neeharika16\_63 (A6), Pmask\_63 (A6), Priamo\_66 (A6), SuperCallie99\_61 (A6),

#### Start 7:

- Found in 54 of 124 ( 43.5% ) of genes in pham
- Manual Annotations of this start: 33 of 112
- Called 63.0% of time when present
- Phage (with cluster) where this start called: Artemis2UCLA\_65 (A6), BABullseye\_57 (A6), Blue7\_66 (A6), Candra\_62 (A6), CloudWang3\_66 (A6), Cookiedough\_64 (A6), DaVinci\_62 (A6), EricB\_63 (A6), Gruunaga\_65 (A6), Hammer\_65 (A6), Hexamo\_65 (A6), Hoot\_59 (A6), Indra\_68 (A6), Isiphiwo\_62 (A6), Jeffabunny\_65 (A6), JewelBug\_64 (A6), Kazan\_65 (A6), Kipper29\_64 (A6), Koko\_67 (A6), Lilbunny\_64 (A6), McFly\_64 (A6), Newrala\_64 (A6), Rifter\_65 (A6), Roksolana\_66 (A6), SmellyB\_64 (A6), SuperAwesome\_64 (A6), ToneTone\_62 (A6), Tucker\_65 (A6), VohminGhazi\_64 (A6), Wiks\_64 (A6), WunderPhul\_65 (A6), Yokurt\_64 (A6), Zaka\_65 (A6), Zulu\_66 (A6),

#### Start 8:

- Found in 1 of 124 ( 0.8% ) of genes in pham
- Manual Annotations of this start: 1 of 112
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Ph8s\_64 (A2),

#### Start 11:

- Found in 28 of 124 ( 22.6% ) of genes in pham
- Manual Annotations of this start: 23 of 112
- Called 89.3% of time when present
- Phage (with cluster) where this start called: AN9\_65 (A2), ANI8\_65 (A2), AbbyPaige\_65 (A2), Agape74\_65 (A2), BobSwaget\_58 (A2), Buggy\_65 (A2), Changeling\_62 (A2), Crucio\_63 (A2), Drake55\_65 (A2), EZMoney23\_59 (A2), FiringLine\_63 (A2), Georgie2\_64 (A2), Jerm\_65 (A2), LilTurb\_64 (A2), Lokk\_59 (A2), Miko\_59 (A2), NicoleTera\_61 (A2), QueenBeesly\_63 (A2), Rachaly\_61 (A2), SemperFi\_64 (A2), SwirlSquare\_68 (A2), TarsusIV\_60 (A2), Trooper\_64 (A2), Turbido\_64 (A2), VC3\_65 (A2),

#### Start 12:

- Found in 45 of 124 ( 36.3% ) of genes in pham
- No Manual Annotations of this start.
- Called 4.4% of time when present
- Phage (with cluster) where this start called: Garak\_66 (A6), Helmet\_66 (A6),

#### Start 13:

- Found in 14 of 124 ( 11.3% ) of genes in pham
- Manual Annotations of this start: 13 of 112
- Called 100.0% of time when present
- Phage (with cluster) where this start called: 40AC\_63 (A17), Baehexic\_62 (A2), Centaur\_64 (A2), Equemioh13\_63 (A2), Flare16\_63 (A2), HarryHoudini\_64 (A2), Larenn\_61 (A2), Malec\_62 (A2), MiculUcigas\_63 (A2), NaSiaTalie\_63 (A2), Piro94\_63 (A2), Updawg\_64 (A2), WideWale\_64 (A2), XianYue\_61 (A2),

#### Start 14:

- Found in 53 of 124 ( 42.7% ) of genes in pham
- Manual Annotations of this start: 33 of 112
- Called 69.8% of time when present
- Phage (with cluster) where this start called: 20ES\_66 (A2), AN3\_66 (A2), Anselm\_64 (A2), BabyBack\_61 (A2), BengiVuitton\_64 (A2), Benvolio\_60 (A2), BiancaTri92\_63 (A2), CRB1\_66 (A2), Dalmatian\_64 (A2), Deloris\_64 (A2), DudeLittle\_62 (A2), Echild\_63 (A2), Fameo\_63 (A2), First\_0065 (A2), Gail\_64 (A14), GaugeLDP\_60 (A2), Heffalump\_62 (A2), IronMan\_62 (A2), Iwokeuplikedis\_65 (A2), Jaan\_63 (A2), Jeeves\_66 (A14), Kalpine\_61 (A2), LadyBird\_68 (A2), Landor\_63 (A2), Leogania\_63 (A2), Luchador\_65 (A14), MissWhite\_61 (A2), NothingSpecial\_60 (A2), Power\_62 (A2), Pukovnik\_61 (A2), QueenB2\_62 (A2), Retro23\_64 (A2), SnapTap\_63 (A2), SororFago\_63 (A14), Sunhee\_65 (A14), SweetiePie\_63 (A2), VA6\_64 (A2),

#### Start 15:

- Found in 2 of 124 ( 1.6% ) of genes in pham
- No Manual Annotations of this start.
- Called 50.0% of time when present
- Phage (with cluster) where this start called: Kinmap\_61 (A21),

### **Summary by clusters:**

There are 5 clusters represented in this pham: A14, A17, A2, A21, A6,

#### Info for manual annotations of cluster A14:

- Start number 14 was manually annotated 4 times for cluster A14.

#### Info for manual annotations of cluster A2:

- Start number 6 was manually annotated 1 time for cluster A2.
- Start number 8 was manually annotated 1 time for cluster A2.
- Start number 11 was manually annotated 23 times for cluster A2.
- Start number 13 was manually annotated 13 times for cluster A2.
- Start number 14 was manually annotated 29 times for cluster A2.

#### Info for manual annotations of cluster A6:

- Start number 6 was manually annotated 8 times for cluster A6.
- Start number 7 was manually annotated 33 times for cluster A6.

### **Gene Information:**

Gene: 20ES\_66 Start: 40354, Stop: 40241, Start Num: 14  
Candidate Starts for 20ES\_66:  
(Start: 14 @40354 has 33 MA's),

Gene: 40AC\_63 Start: 41089, Stop: 40973, Start Num: 13  
Candidate Starts for 40AC\_63:  
(Start: 13 @41089 has 13 MA's),

Gene: AN3\_66 Start: 39069, Stop: 38956, Start Num: 14  
Candidate Starts for AN3\_66:  
(Start: 14 @39069 has 33 MA's),

Gene: AN9\_65 Start: 40106, Stop: 39975, Start Num: 11  
Candidate Starts for AN9\_65:  
(Start: 6 @40136 has 9 MA's), (Start: 11 @40106 has 23 MA's), (17, 40088), (26, 40043), (28, 40037),  
(32, 39983),

Gene: ANI8\_65 Start: 40106, Stop: 39975, Start Num: 11  
Candidate Starts for ANI8\_65:  
(Start: 6 @40136 has 9 MA's), (Start: 11 @40106 has 23 MA's), (17, 40088), (26, 40043), (28, 40037),  
(32, 39983),

Gene: AbbyPaige\_65 Start: 40341, Stop: 40210, Start Num: 11  
Candidate Starts for AbbyPaige\_65:  
(Start: 11 @40341 has 23 MA's), (Start: 14 @40332 has 33 MA's), (19, 40305),

Gene: Agape74\_65 Start: 40335, Stop: 40204, Start Num: 11  
Candidate Starts for Agape74\_65:  
(Start: 11 @40335 has 23 MA's), (Start: 14 @40326 has 33 MA's), (19, 40299),

Gene: Anselm\_64 Start: 40239, Stop: 40120, Start Num: 14  
Candidate Starts for Anselm\_64:  
(Start: 14 @40239 has 33 MA's), (17, 40230),

Gene: Artemis2UCLA\_65 Start: 38809, Stop: 38669, Start Num: 7  
Candidate Starts for Artemis2UCLA\_65:  
(Start: 6 @38821 has 9 MA's), (Start: 7 @38809 has 33 MA's), (12, 38791), (17, 38776), (28, 38725),

Gene: BABullseye\_57 Start: 36364, Stop: 36215, Start Num: 7  
Candidate Starts for BABullseye\_57:  
(4, 36436), (Start: 6 @36376 has 9 MA's), (Start: 7 @36364 has 33 MA's), (12, 36346), (17, 36331),  
(26, 36286), (27, 36283), (28, 36280),

Gene: BabyBack\_61 Start: 40331, Stop: 40191, Start Num: 14  
Candidate Starts for BabyBack\_61:  
(3, 40424), (Start: 7 @40349 has 33 MA's), (Start: 14 @40331 has 33 MA's), (17, 40322), (27, 40274),  
(33, 40199),

Gene: Baehexic\_62 Start: 39801, Stop: 39685, Start Num: 13  
Candidate Starts for Baehexic\_62:  
(Start: 13 @39801 has 13 MA's), (28, 39744),

Gene: BengiVuitton\_64 Start: 40331, Stop: 40212, Start Num: 14

Candidate Starts for BengiVuitton\_64:  
(Start: 14 @40331 has 33 MA's),

Gene: Benvolio\_60 Start: 39343, Stop: 39227, Start Num: 14  
Candidate Starts for Benvolio\_60:  
(Start: 14 @39343 has 33 MA's),

Gene: BiancaTri92\_63 Start: 40390, Stop: 40262, Start Num: 14  
Candidate Starts for BiancaTri92\_63:  
(Start: 14 @40390 has 33 MA's), (17, 40381), (33, 40270),

Gene: Blinn1\_67 Start: 38905, Stop: 38744, Start Num: 6  
Candidate Starts for Blinn1\_67:  
(4, 38965), (Start: 6 @38905 has 9 MA's), (Start: 7 @38893 has 33 MA's), (12, 38875), (17, 38860),  
(26, 38815), (27, 38812), (28, 38809),

Gene: Blue7\_66 Start: 38903, Stop: 38763, Start Num: 7  
Candidate Starts for Blue7\_66:  
(2, 39008), (Start: 6 @38915 has 9 MA's), (Start: 7 @38903 has 33 MA's), (12, 38885), (17, 38870),  
(27, 38822), (28, 38819),

Gene: BobSwaget\_58 Start: 38604, Stop: 38473, Start Num: 11  
Candidate Starts for BobSwaget\_58:  
(Start: 11 @38604 has 23 MA's), (Start: 14 @38595 has 33 MA's), (17, 38586), (27, 38535),

Gene: Buggy\_65 Start: 40392, Stop: 40261, Start Num: 11  
Candidate Starts for Buggy\_65:  
(Start: 11 @40392 has 23 MA's), (Start: 14 @40383 has 33 MA's), (19, 40356),

Gene: C3\_59 Start: 40136, Stop: 39975, Start Num: 6  
Candidate Starts for C3\_59:  
(Start: 6 @40136 has 9 MA's), (Start: 11 @40106 has 23 MA's), (17, 40088), (26, 40043), (28, 40037),  
(32, 39983),

Gene: CRB1\_66 Start: 40877, Stop: 40758, Start Num: 14  
Candidate Starts for CRB1\_66:  
(Start: 14 @40877 has 33 MA's),

Gene: Candra\_62 Start: 38728, Stop: 38579, Start Num: 7  
Candidate Starts for Candra\_62:  
(4, 38800), (Start: 6 @38740 has 9 MA's), (Start: 7 @38728 has 33 MA's), (12, 38710), (17, 38695),  
(26, 38650), (27, 38647), (28, 38644),

Gene: Centaur\_64 Start: 40015, Stop: 39899, Start Num: 13  
Candidate Starts for Centaur\_64:  
(Start: 13 @40015 has 13 MA's), (28, 39958),

Gene: Changeling\_62 Start: 40439, Stop: 40296, Start Num: 11  
Candidate Starts for Changeling\_62:  
(3, 40529), (Start: 11 @40439 has 23 MA's), (21, 40391), (27, 40370), (28, 40367), (33, 40304),

Gene: Chartreuse\_61 Start: 38091, Stop: 37930, Start Num: 6  
Candidate Starts for Chartreuse\_61:

(4, 38151), (Start: 6 @38091 has 9 MA's), (Start: 7 @38079 has 33 MA's), (12, 38061), (17, 38046), (26, 38001), (27, 37998), (28, 37995),

Gene: CloudWang3\_66 Start: 39321, Stop: 39181, Start Num: 7

Candidate Starts for CloudWang3\_66:

(Start: 6 @39333 has 9 MA's), (Start: 7 @39321 has 33 MA's), (12, 39303), (17, 39288), (28, 39237),

Gene: Cookiedough\_64 Start: 38707, Stop: 38558, Start Num: 7

Candidate Starts for Cookiedough\_64:

(2, 38812), (4, 38779), (Start: 6 @38719 has 9 MA's), (Start: 7 @38707 has 33 MA's), (12, 38689), (17, 38674), (26, 38629), (27, 38626), (28, 38623),

Gene: Crucio\_63 Start: 40018, Stop: 39887, Start Num: 11

Candidate Starts for Crucio\_63:

(Start: 11 @40018 has 23 MA's), (Start: 14 @40009 has 33 MA's), (19, 39982),

Gene: DaVinci\_62 Start: 38133, Stop: 37984, Start Num: 7

Candidate Starts for DaVinci\_62:

(4, 38205), (Start: 6 @38145 has 9 MA's), (Start: 7 @38133 has 33 MA's), (12, 38115), (17, 38100), (26, 38055), (27, 38052), (28, 38049),

Gene: Dalmatian\_64 Start: 40212, Stop: 40093, Start Num: 14

Candidate Starts for Dalmatian\_64:

(Start: 14 @40212 has 33 MA's), (17, 40203),

Gene: Deloris\_64 Start: 40027, Stop: 39908, Start Num: 14

Candidate Starts for Deloris\_64:

(Start: 14 @40027 has 33 MA's),

Gene: Dorothea\_64 Start: 38717, Stop: 38556, Start Num: 6

Candidate Starts for Dorothea\_64:

(4, 38777), (Start: 6 @38717 has 9 MA's), (Start: 7 @38705 has 33 MA's), (12, 38687), (17, 38672), (26, 38627), (27, 38624), (28, 38621),

Gene: Drake55\_65 Start: 40115, Stop: 39984, Start Num: 11

Candidate Starts for Drake55\_65:

(Start: 11 @40115 has 23 MA's),

Gene: DudeLittle\_62 Start: 39978, Stop: 39859, Start Num: 14

Candidate Starts for DudeLittle\_62:

(Start: 14 @39978 has 33 MA's), (17, 39969),

Gene: EZMoney23\_59 Start: 39508, Stop: 39365, Start Num: 11

Candidate Starts for EZMoney23\_59:

(Start: 11 @39508 has 23 MA's), (25, 39445), (33, 39373),

Gene: Echild\_63 Start: 39367, Stop: 39251, Start Num: 14

Candidate Starts for Echild\_63:

(Start: 14 @39367 has 33 MA's),

Gene: Equemioh13\_63 Start: 39920, Stop: 39804, Start Num: 13

Candidate Starts for Equemioh13\_63:

(Start: 13 @39920 has 13 MA's), (28, 39863),



Gene: EricB\_63 Start: 38685, Stop: 38536, Start Num: 7

Candidate Starts for EricB\_63:

(4, 38757), (Start: 6 @38697 has 9 MA's), (Start: 7 @38685 has 33 MA's), (12, 38667), (17, 38652), (26, 38607), (27, 38604), (28, 38601),

Gene: Fameo\_63 Start: 40337, Stop: 40218, Start Num: 14

Candidate Starts for Fameo\_63:

(3, 40430), (Start: 14 @40337 has 33 MA's), (17, 40328),

Gene: FiringLine\_63 Start: 39999, Stop: 39868, Start Num: 11

Candidate Starts for FiringLine\_63:

(Start: 11 @39999 has 23 MA's), (Start: 14 @39990 has 33 MA's), (19, 39963),

Gene: First\_0065 Start: 40254, Stop: 40141, Start Num: 14

Candidate Starts for First\_0065:

(Start: 14 @40254 has 33 MA's),

Gene: Flare16\_63 Start: 39676, Stop: 39560, Start Num: 13

Candidate Starts for Flare16\_63:

(Start: 13 @39676 has 13 MA's), (28, 39619),

Gene: Gail\_64 Start: 40781, Stop: 40653, Start Num: 14

Candidate Starts for Gail\_64:

(9, 40787), (Start: 14 @40781 has 33 MA's),

Gene: Garak\_66 Start: 39158, Stop: 39036, Start Num: 12

Candidate Starts for Garak\_66:

(Start: 6 @39188 has 9 MA's), (Start: 7 @39176 has 33 MA's), (12, 39158), (17, 39143), (28, 39092),

Gene: GaugeLDP\_60 Start: 39857, Stop: 39732, Start Num: 14

Candidate Starts for GaugeLDP\_60:

(3, 39950), (Start: 7 @39875 has 33 MA's), (10, 39860), (Start: 14 @39857 has 33 MA's), (26, 39803), (30, 39752),

Gene: Georgie2\_64 Start: 40044, Stop: 39913, Start Num: 11

Candidate Starts for Georgie2\_64:

(Start: 11 @40044 has 23 MA's), (Start: 14 @40035 has 33 MA's), (19, 40008),

Gene: Gladiator\_62 Start: 38413, Stop: 38261, Start Num: 6

Candidate Starts for Gladiator\_62:

(2, 38506), (Start: 6 @38413 has 9 MA's), (Start: 7 @38401 has 33 MA's), (12, 38383), (17, 38368), (28, 38317),

Gene: Gruunaga\_65 Start: 39100, Stop: 38960, Start Num: 7

Candidate Starts for Gruunaga\_65:

(2, 39205), (Start: 6 @39112 has 9 MA's), (Start: 7 @39100 has 33 MA's), (12, 39082), (17, 39067), (27, 39019), (28, 39016),

Gene: Hammer\_65 Start: 38707, Stop: 38567, Start Num: 7

Candidate Starts for Hammer\_65:

(2, 38812), (Start: 6 @38719 has 9 MA's), (Start: 7 @38707 has 33 MA's), (12, 38689), (17, 38674), (27, 38626), (28, 38623),

Gene: HarryHoudini\_64 Start: 40119, Stop: 40003, Start Num: 13

Candidate Starts for HarryHoudini\_64:

(Start: 13 @40119 has 13 MA's), (28, 40062),

Gene: Heffalump\_62 Start: 40805, Stop: 40686, Start Num: 14

Candidate Starts for Heffalump\_62:

(3, 40898), (Start: 14 @40805 has 33 MA's), (17, 40796),

Gene: Helmet\_66 Start: 39158, Stop: 39036, Start Num: 12

Candidate Starts for Helmet\_66:

(Start: 6 @39188 has 9 MA's), (Start: 7 @39176 has 33 MA's), (12, 39158), (17, 39143), (28, 39092),

Gene: Hexamo\_65 Start: 38806, Stop: 38666, Start Num: 7

Candidate Starts for Hexamo\_65:

(Start: 6 @38818 has 9 MA's), (Start: 7 @38806 has 33 MA's), (12, 38788), (17, 38773), (28, 38722),

Gene: Hoot\_59 Start: 36543, Stop: 36394, Start Num: 7

Candidate Starts for Hoot\_59:

(4, 36615), (Start: 6 @36555 has 9 MA's), (Start: 7 @36543 has 33 MA's), (12, 36525), (17, 36510), (26, 36465), (27, 36462), (28, 36459),

Gene: Indra\_68 Start: 39177, Stop: 39037, Start Num: 7

Candidate Starts for Indra\_68:

(Start: 6 @39189 has 9 MA's), (Start: 7 @39177 has 33 MA's), (12, 39159), (17, 39144), (28, 39093),

Gene: IronMan\_62 Start: 40812, Stop: 40687, Start Num: 14

Candidate Starts for IronMan\_62:

(Start: 7 @40830 has 33 MA's), (Start: 14 @40812 has 33 MA's), (18, 40791), (31, 40695),

Gene: Isiphiwo\_62 Start: 38259, Stop: 38110, Start Num: 7

Candidate Starts for Isiphiwo\_62:

(4, 38331), (Start: 6 @38271 has 9 MA's), (Start: 7 @38259 has 33 MA's), (12, 38241), (17, 38226), (26, 38181), (27, 38178), (28, 38175),

Gene: Iwokeuplikedis\_65 Start: 39836, Stop: 39705, Start Num: 14

Candidate Starts for Iwokeuplikedis\_65:

(1, 40247), (3, 39926), (Start: 14 @39836 has 33 MA's), (19, 39809), (21, 39800), (22, 39797), (23, 39794), (24, 39788),

Gene: Jaan\_63 Start: 40984, Stop: 40859, Start Num: 14

Candidate Starts for Jaan\_63:

(Start: 7 @41002 has 33 MA's), (Start: 14 @40984 has 33 MA's), (18, 40963), (27, 40927),

Gene: Jeeves\_66 Start: 39766, Stop: 39632, Start Num: 14

Candidate Starts for Jeeves\_66:

(Start: 14 @39766 has 33 MA's),

Gene: Jeffabunny\_65 Start: 38803, Stop: 38663, Start Num: 7

Candidate Starts for Jeffabunny\_65:

(Start: 6 @38815 has 9 MA's), (Start: 7 @38803 has 33 MA's), (12, 38785), (17, 38770), (28, 38719),

Gene: Jerm\_65 Start: 40407, Stop: 40276, Start Num: 11

Candidate Starts for Jerm\_65:

(Start: 11 @40407 has 23 MA's), (Start: 14 @40398 has 33 MA's), (19, 40371),

Gene: JewelBug\_64 Start: 38964, Stop: 38815, Start Num: 7

Candidate Starts for JewelBug\_64:

(4, 39036), (Start: 6 @38976 has 9 MA's), (Start: 7 @38964 has 33 MA's), (12, 38946), (17, 38931), (26, 38886), (27, 38883), (28, 38880),

Gene: Jordennis\_63 Start: 38457, Stop: 38296, Start Num: 6

Candidate Starts for Jordennis\_63:

(4, 38517), (Start: 6 @38457 has 9 MA's), (Start: 7 @38445 has 33 MA's), (12, 38427), (17, 38412), (26, 38367), (27, 38364), (28, 38361),

Gene: Kalpine\_61 Start: 40096, Stop: 39965, Start Num: 14

Candidate Starts for Kalpine\_61:

(Start: 7 @40117 has 33 MA's), (Start: 14 @40096 has 33 MA's), (29, 40030), (33, 39973),

Gene: Kazan\_65 Start: 38698, Stop: 38549, Start Num: 7

Candidate Starts for Kazan\_65:

(4, 38770), (Start: 6 @38710 has 9 MA's), (Start: 7 @38698 has 33 MA's), (12, 38680), (17, 38665), (26, 38620), (27, 38617), (28, 38614),

Gene: Kinmap\_61 Start: 38456, Stop: 38328, Start Num: 15

Candidate Starts for Kinmap\_61:

(15, 38456), (27, 38402), (28, 38399),

Gene: Kipper29\_64 Start: 38711, Stop: 38562, Start Num: 7

Candidate Starts for Kipper29\_64:

(4, 38783), (Start: 6 @38723 has 9 MA's), (Start: 7 @38711 has 33 MA's), (12, 38693), (17, 38678), (26, 38633), (27, 38630), (28, 38627),

Gene: Koko\_67 Start: 39661, Stop: 39521, Start Num: 7

Candidate Starts for Koko\_67:

(Start: 6 @39673 has 9 MA's), (Start: 7 @39661 has 33 MA's), (12, 39643), (17, 39628), (28, 39577),

Gene: LadyBird\_68 Start: 40839, Stop: 40720, Start Num: 14

Candidate Starts for LadyBird\_68:

(Start: 14 @40839 has 33 MA's),

Gene: Landor\_63 Start: 40890, Stop: 40765, Start Num: 14

Candidate Starts for Landor\_63:

(Start: 7 @40908 has 33 MA's), (Start: 14 @40890 has 33 MA's), (18, 40869), (31, 40773),

Gene: Larenn\_61 Start: 39953, Stop: 39837, Start Num: 13

Candidate Starts for Larenn\_61:

(Start: 13 @39953 has 13 MA's), (28, 39896),

Gene: Leogania\_63 Start: 40768, Stop: 40640, Start Num: 14

Candidate Starts for Leogania\_63:

(Start: 14 @40768 has 33 MA's), (17, 40759), (33, 40648),

Gene: LilTurb\_64 Start: 40289, Stop: 40158, Start Num: 11

Candidate Starts for LilTurb\_64:

(Start: 11 @40289 has 23 MA's), (Start: 14 @40280 has 33 MA's), (19, 40253),

Gene: Lilbunny\_64 Start: 38807, Stop: 38667, Start Num: 7

Candidate Starts for Lilbunny\_64:

(Start: 6 @38819 has 9 MA's), (Start: 7 @38807 has 33 MA's), (12, 38789), (17, 38774), (28, 38723),

Gene: Lokk\_59 Start: 39228, Stop: 39097, Start Num: 11

Candidate Starts for Lokk\_59:

(Start: 11 @39228 has 23 MA's), (Start: 14 @39219 has 33 MA's), (17, 39210), (27, 39159),

Gene: Luchador\_65 Start: 41349, Stop: 41215, Start Num: 14

Candidate Starts for Luchador\_65:

(Start: 14 @41349 has 33 MA's),

Gene: Malec\_62 Start: 40520, Stop: 40404, Start Num: 13

Candidate Starts for Malec\_62:

(Start: 13 @40520 has 13 MA's), (28, 40463),

Gene: McFly\_64 Start: 38692, Stop: 38543, Start Num: 7

Candidate Starts for McFly\_64:

(2, 38797), (4, 38764), (Start: 6 @38704 has 9 MA's), (Start: 7 @38692 has 33 MA's), (12, 38674), (17, 38659), (26, 38614), (27, 38611), (28, 38608),

Gene: MiculUcigas\_63 Start: 39579, Stop: 39463, Start Num: 13

Candidate Starts for MiculUcigas\_63:

(Start: 13 @39579 has 13 MA's), (28, 39522),

Gene: Miko\_59 Start: 40006, Stop: 39875, Start Num: 11

Candidate Starts for Miko\_59:

(Start: 11 @40006 has 23 MA's), (Start: 14 @39997 has 33 MA's), (27, 39937),

Gene: MissWhite\_61 Start: 38488, Stop: 38360, Start Num: 14

Candidate Starts for MissWhite\_61:

(Start: 7 @38506 has 33 MA's), (Start: 14 @38488 has 33 MA's), (17, 38479),

Gene: NaSiaTalie\_63 Start: 39673, Stop: 39557, Start Num: 13

Candidate Starts for NaSiaTalie\_63:

(Start: 13 @39673 has 13 MA's), (28, 39616),

Gene: Neeharika16\_63 Start: 38164, Stop: 38003, Start Num: 6

Candidate Starts for Neeharika16\_63:

(2, 38257), (4, 38224), (Start: 6 @38164 has 9 MA's), (Start: 7 @38152 has 33 MA's), (12, 38134), (17, 38119), (26, 38074), (27, 38071), (28, 38068),

Gene: Newrala\_64 Start: 38694, Stop: 38545, Start Num: 7

Candidate Starts for Newrala\_64:

(4, 38766), (Start: 6 @38706 has 9 MA's), (Start: 7 @38694 has 33 MA's), (12, 38676), (17, 38661), (26, 38616), (27, 38613), (28, 38610),

Gene: NicoleTera\_61 Start: 39996, Stop: 39865, Start Num: 11

Candidate Starts for NicoleTera\_61:

(Start: 11 @39996 has 23 MA's), (25, 39933),

Gene: NothingSpecial\_60 Start: 40211, Stop: 40077, Start Num: 14  
Candidate Starts for NothingSpecial\_60:  
(3, 40301), (Start: 7 @40229 has 33 MA's), (Start: 14 @40211 has 33 MA's), (27, 40154), (33, 40085),

Gene: Ph8s\_64 Start: 39243, Stop: 39100, Start Num: 8  
Candidate Starts for Ph8s\_64:  
(5, 39267), (Start: 6 @39264 has 9 MA's), (Start: 8 @39243 has 1 MA's), (15, 39231), (17, 39225),  
(26, 39180), (28, 39174),

Gene: Piro94\_63 Start: 40026, Stop: 39910, Start Num: 13  
Candidate Starts for Piro94\_63:  
(Start: 13 @40026 has 13 MA's), (28, 39969),

Gene: Pmask\_63 Start: 38707, Stop: 38546, Start Num: 6  
Candidate Starts for Pmask\_63:  
(2, 38800), (4, 38767), (Start: 6 @38707 has 9 MA's), (Start: 7 @38695 has 33 MA's), (12, 38677),  
(17, 38662), (26, 38617), (27, 38614), (28, 38611),

Gene: Power\_62 Start: 40040, Stop: 39921, Start Num: 14  
Candidate Starts for Power\_62:  
(Start: 14 @40040 has 33 MA's), (17, 40031),

Gene: Priamo\_66 Start: 38523, Stop: 38362, Start Num: 6  
Candidate Starts for Priamo\_66:  
(4, 38583), (Start: 6 @38523 has 9 MA's), (Start: 7 @38511 has 33 MA's), (12, 38493), (17, 38478),  
(26, 38433), (27, 38430), (28, 38427),

Gene: Pukovnik\_61 Start: 40533, Stop: 40414, Start Num: 14  
Candidate Starts for Pukovnik\_61:  
(3, 40626), (Start: 7 @40551 has 33 MA's), (Start: 14 @40533 has 33 MA's), (18, 40512), (27, 40476),

Gene: QueenB2\_62 Start: 40018, Stop: 39899, Start Num: 14  
Candidate Starts for QueenB2\_62:  
(3, 40111), (Start: 14 @40018 has 33 MA's), (17, 40009),

Gene: QueenBeesly\_63 Start: 39999, Stop: 39868, Start Num: 11  
Candidate Starts for QueenBeesly\_63:  
(Start: 11 @39999 has 23 MA's), (Start: 14 @39990 has 33 MA's), (19, 39963),

Gene: Rachaly\_61 Start: 40151, Stop: 40020, Start Num: 11  
Candidate Starts for Rachaly\_61:  
(Start: 11 @40151 has 23 MA's), (Start: 14 @40142 has 33 MA's), (17, 40133), (27, 40082),

Gene: Retro23\_64 Start: 40232, Stop: 40113, Start Num: 14  
Candidate Starts for Retro23\_64:  
(Start: 14 @40232 has 33 MA's), (17, 40223),

Gene: Rifter\_65 Start: 38303, Stop: 38163, Start Num: 7  
Candidate Starts for Rifter\_65:  
(2, 38408), (Start: 6 @38315 has 9 MA's), (Start: 7 @38303 has 33 MA's), (12, 38285), (17, 38270),  
(27, 38222), (28, 38219),

Gene: Roksolana\_66 Start: 39137, Stop: 38997, Start Num: 7

Candidate Starts for Roksolana\_66:

(2, 39242), (Start: 6 @39149 has 9 MA's), (Start: 7 @39137 has 33 MA's), (12, 39119), (17, 39104), (27, 39056), (28, 39053),

Gene: SemperFi\_64 Start: 40267, Stop: 40136, Start Num: 11

Candidate Starts for SemperFi\_64:

(Start: 11 @40267 has 23 MA's), (Start: 14 @40258 has 33 MA's), (19, 40231),

Gene: SmellyB\_64 Start: 38692, Stop: 38543, Start Num: 7

Candidate Starts for SmellyB\_64:

(4, 38764), (Start: 6 @38704 has 9 MA's), (Start: 7 @38692 has 33 MA's), (12, 38674), (17, 38659), (26, 38614), (27, 38611), (28, 38608),

Gene: SnapTap\_63 Start: 40069, Stop: 39947, Start Num: 14

Candidate Starts for SnapTap\_63:

(Start: 11 @40078 has 23 MA's), (Start: 14 @40069 has 33 MA's), (19, 40042),

Gene: SororFago\_63 Start: 40687, Stop: 40544, Start Num: 14

Candidate Starts for SororFago\_63:

(Start: 14 @40687 has 33 MA's),

Gene: Sunhee\_65 Start: 39237, Stop: 39109, Start Num: 14

Candidate Starts for Sunhee\_65:

(9, 39243), (Start: 14 @39237 has 33 MA's),

Gene: SuperAwesome\_64 Start: 38697, Stop: 38548, Start Num: 7

Candidate Starts for SuperAwesome\_64:

(4, 38769), (Start: 6 @38709 has 9 MA's), (Start: 7 @38697 has 33 MA's), (12, 38679), (17, 38664), (26, 38619), (27, 38616), (28, 38613),

Gene: SuperCallie99\_61 Start: 38591, Stop: 38430, Start Num: 6

Candidate Starts for SuperCallie99\_61:

(4, 38651), (Start: 6 @38591 has 9 MA's), (Start: 7 @38579 has 33 MA's), (12, 38561), (17, 38546), (26, 38501), (27, 38498), (28, 38495),

Gene: SweetiePie\_63 Start: 40201, Stop: 40079, Start Num: 14

Candidate Starts for SweetiePie\_63:

(Start: 11 @40210 has 23 MA's), (Start: 14 @40201 has 33 MA's), (19, 40174),

Gene: SwirlSquare\_68 Start: 39598, Stop: 39446, Start Num: 11

Candidate Starts for SwirlSquare\_68:

(Start: 6 @39631 has 9 MA's), (Start: 11 @39598 has 23 MA's), (17, 39580), (26, 39535), (27, 39532), (28, 39529), (34, 39454),

Gene: TarsusIV\_60 Start: 39672, Stop: 39541, Start Num: 11

Candidate Starts for TarsusIV\_60:

(Start: 11 @39672 has 23 MA's), (27, 39603),

Gene: ToneTone\_62 Start: 38736, Stop: 38596, Start Num: 7

Candidate Starts for ToneTone\_62:

(Start: 6 @38748 has 9 MA's), (Start: 7 @38736 has 33 MA's), (12, 38718), (17, 38703), (28, 38652),

Gene: Trooper\_64 Start: 40399, Stop: 40268, Start Num: 11

Candidate Starts for Trooper\_64:

(Start: 11 @40399 has 23 MA's), (Start: 14 @40390 has 33 MA's), (16, 40384), (19, 40363), (26, 40333), (27, 40330),

Gene: Tucker\_65 Start: 38905, Stop: 38765, Start Num: 7

Candidate Starts for Tucker\_65:

(2, 39010), (Start: 6 @38917 has 9 MA's), (Start: 7 @38905 has 33 MA's), (12, 38887), (17, 38872), (20, 38848), (28, 38821),

Gene: Turbido\_64 Start: 40285, Stop: 40154, Start Num: 11

Candidate Starts for Turbido\_64:

(Start: 11 @40285 has 23 MA's), (Start: 14 @40276 has 33 MA's), (19, 40249),

Gene: Updawg\_64 Start: 39920, Stop: 39804, Start Num: 13

Candidate Starts for Updawg\_64:

(Start: 13 @39920 has 13 MA's), (28, 39863),

Gene: VA6\_64 Start: 40247, Stop: 40134, Start Num: 14

Candidate Starts for VA6\_64:

(Start: 14 @40247 has 33 MA's),

Gene: VC3\_65 Start: 40106, Stop: 39975, Start Num: 11

Candidate Starts for VC3\_65:

(Start: 6 @40136 has 9 MA's), (Start: 11 @40106 has 23 MA's), (17, 40088), (26, 40043), (28, 40037), (32, 39983),

Gene: VohminGhazi\_64 Start: 38693, Stop: 38544, Start Num: 7

Candidate Starts for VohminGhazi\_64:

(4, 38765), (Start: 6 @38705 has 9 MA's), (Start: 7 @38693 has 33 MA's), (12, 38675), (17, 38660), (26, 38615), (27, 38612), (28, 38609),

Gene: WideWale\_64 Start: 39920, Stop: 39804, Start Num: 13

Candidate Starts for WideWale\_64:

(Start: 13 @39920 has 13 MA's), (28, 39863),

Gene: Wiks\_64 Start: 38807, Stop: 38667, Start Num: 7

Candidate Starts for Wiks\_64:

(Start: 6 @38819 has 9 MA's), (Start: 7 @38807 has 33 MA's), (12, 38789), (17, 38774), (28, 38723),

Gene: WunderPhul\_65 Start: 38805, Stop: 38665, Start Num: 7

Candidate Starts for WunderPhul\_65:

(Start: 6 @38817 has 9 MA's), (Start: 7 @38805 has 33 MA's), (12, 38787), (17, 38772), (28, 38721),

Gene: XianYue\_61 Start: 39423, Stop: 39307, Start Num: 13

Candidate Starts for XianYue\_61:

(Start: 13 @39423 has 13 MA's), (27, 39369),

Gene: Yokurt\_64 Start: 38807, Stop: 38667, Start Num: 7

Candidate Starts for Yokurt\_64:

(Start: 6 @38819 has 9 MA's), (Start: 7 @38807 has 33 MA's), (12, 38789), (17, 38774), (28, 38723),

Gene: Zaka\_65 Start: 38807, Stop: 38667, Start Num: 7

Candidate Starts for Zaka\_65:

(Start: 6 @38819 has 9 MA's), (Start: 7 @38807 has 33 MA's), (12, 38789), (17, 38774), (28, 38723),

Gene: Zulu\_66 Start: 39185, Stop: 39045, Start Num: 7

Candidate Starts for Zulu\_66:

(Start: 6 @39197 has 9 MA's), (Start: 7 @39185 has 33 MA's), (12, 39167), (17, 39152), (28, 39101),