

# Pham 304900



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 304900 Report

This analysis was run 06/08/26 on database version 649.

Pham number 304900 has 92 members, 14 are drafts.

Phages represented in each track:

- Track 1 : Drake94\_83, Goose\_87, PeaceMeal1\_83, KittenMittens\_81, Poompha\_84, OKCentral2016\_85
- Track 2 : WalterMcMickey\_86, Twister\_87, Edison31\_73, Salz\_96, Topanga\_76, Hutc2\_97
- Track 3 : Rebeuca\_87
- Track 4 : Sham4\_96, TinyTimmy\_97, Kimba\_96, Flaverint\_100, Insomnia\_99, Wolpertinger\_99, Petersenfast\_93, MaCh\_99, Trooper\_94, Saskia\_97
- Track 5 : Steamy\_91
- Track 6 : PainterBoy\_93, Lucyedi\_94, EagleEye\_96
- Track 7 : Drake55\_96, Centaur\_97, Sknot\_97, Equemioh13\_96, WideWale\_97, MiculUcigas\_96, Gratitude\_94, Updawg\_97, Terrific\_98
- Track 8 : QueenBeesly\_94, Crucio\_94, SnapTap\_94, Jerm\_95, QueenB2\_93, Retro23\_95, Georgie2\_96, Buggy\_84, Dignity\_96, SweetiePie\_94
- Track 9 : Odin\_95
- Track 10 : VA6\_93, AN3\_93
- Track 11 : Superchunk\_98
- Track 12 : NaSiaTalie\_97
- Track 13 : Tomathan\_97, Naji\_86, Duplo\_98, Travvers\_97, DBQu4n\_97, D32\_85
- Track 14 : ANI8\_94, VC3\_93, C3\_87, AN9\_94, Kerberos\_97
- Track 15 : Landor\_92
- Track 16 : Loser\_97, Lokk\_89, AnnaL29\_96, Colin\_93, Prudy\_89, BobSwaget\_88, Rachaly\_91, RedRock\_95, Miko\_90
- Track 17 : Caraxes\_99
- Track 18 : NothingSpecial\_88
- Track 19 : Herbertwm\_89
- Track 20 : ForesterFrank\_89, ArcherNM\_90
- Track 21 : Leogania\_77, BiancaTri92\_90
- Track 22 : Tristan\_91
- Track 23 : NicoleTera\_95
- Track 24 : Milcery\_84, LittleCherry\_84, Prinash11\_86
- Track 25 : Florence1\_83, Florence4\_81
- Track 26 : Micasa\_87
- Track 27 : Swirley\_85
- Track 28 : Cuco\_85
- Track 29 : George\_81, Tarynearal\_87
- Track 30 : PP\_09

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

The start number called the most often in the published annotations is 19, it was called in 62 of the 78 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- AN3\_93, AN9\_94, ANI8\_94, AnnaL29\_96, ArcherNM\_90, BiancaTri92\_90, BobSwaget\_88, Buggy\_84, C3\_87, Colin\_93, Crucio\_94, D32\_85, DBQu4n\_97, Dignity\_96, Drake94\_83, Duplo\_98, EagleEye\_96, Edison31\_73, Flaverint\_100, ForesterFrank\_89, Georgie2\_96, Goose\_87, Herbertwm\_89, Hutc2\_97, Insomnia\_99, Jerm\_95, Kerberos\_97, Kimba\_96, KittenMittens\_81, Landor\_92, Leogania\_77, Lökk\_89, Loser\_97, Lucyedi\_94, MaCh\_99, Miko\_90, NaSiaTalie\_97, Naji\_86, NicoleTera\_95, NothingSpecial\_88, OKCentral2016\_85, PainterBoy\_93, PeaceMeal1\_83, Petersenfast\_93, Poompha\_84, Prudy\_89, QueenB2\_93, QueenBeesly\_94, Rachaly\_91, Rebeuca\_87, RedRock\_95, Retro23\_95, Salz\_96, Saskia\_97, Sham4\_96, SnapTap\_94, Steamy\_91, Superchunk\_98, SweetiePie\_94, TinyTimmy\_97, Tomathan\_97, Topanga\_76, Travvers\_97, Tristan\_91, Trooper\_94, Twister\_87, VA6\_93, VC3\_93, WalterMcMickey\_86, Wolpertinger\_99,

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

- Caraxes\_99, Centaur\_97, Drake55\_96, Equemioh13\_96, Gratitude\_94, MiculUcigas\_96, Odin\_95, Sknot\_97, Terrific\_98, Updawg\_97, WideWale\_97,

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

- Cuco\_85, Florence1\_83, Florence4\_81, George\_81, LittleCherry\_84, Micasa\_87, Milcery\_84, PP\_09, Prinashe11\_86, Swirley\_85, Tarynearal\_87,

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

Start 10:

- Found in 3 of 92 ( 3.3% ) of genes in pham
- No Manual Annotations of this start.
- Called 33.3% of time when present
- Phage (with cluster) where this start called: Caraxes\_99 (A2),

Start 14:

- Found in 10 of 92 ( 10.9% ) of genes in pham
- Manual Annotations of this start: 7 of 78
- Called 90.0% of time when present
- Phage (with cluster) where this start called: Centaur\_97 (A2), Drake55\_96 (A2), Equemioh13\_96 (A2), Gratitude\_94 (A2), MiculUcigas\_96 (A2), Sknot\_97 (A2), Terrific\_98 (A2), Updawg\_97 (A2), WideWale\_97 (A2),

Start 15:

- Found in 12 of 92 ( 13.0% ) of genes in pham
- Manual Annotations of this start: 2 of 78
- Called 33.3% of time when present
- Phage (with cluster) where this start called: Florence1\_83 (A5), Florence4\_81 (A5), Odin\_95 (A2), PP\_09 (A7),

#### Start 17:

- Found in 7 of 92 ( 7.6% ) of genes in pham
- Manual Annotations of this start: 4 of 78
- Called 71.4% of time when present
- Phage (with cluster) where this start called: LittleCherry\_84 (A5), Micasa\_87 (A5), Milcery\_84 (A5), Prin Ashe11\_86 (A5), Swirley\_85 (A5),

#### Start 19:

- Found in 81 of 92 ( 88.0% ) of genes in pham
- Manual Annotations of this start: 62 of 78
- Called 86.4% of time when present
- Phage (with cluster) where this start called: AN3\_93 (A2), AN9\_94 (A2), ANI8\_94 (A2), AnnaL29\_96 (A2), ArcherNM\_90 (A2), BiancaTri92\_90 (A2), BobSwaget\_88 (A2), Buggy\_84 (A2), C3\_87 (A2), Colin\_93 (A2), Crucio\_94 (A2), D32\_85 (A2), DBQu4n\_97 (A2), Dignity\_96 (A2), Drake94\_83 (A10), Duplo\_98 (A2), EagleEye\_96 (A16), Edison31\_73 (A10), Flaverint\_100 (A11), ForesterFrank\_89 (A2), Georgie2\_96 (A2), Goose\_87 (A10), Herbertwm\_89 (A2), Hutc2\_97 (A11), Insomnia\_99 (A11), Jerm\_95 (A2), Kerberos\_97 (A2), Kimba\_96 (A11), KittenMittens\_81 (A10), Landor\_92 (A2), Leogania\_77 (A2), Lokk\_89 (A2), Loser\_97 (A2), Lucyedi\_94 (A16), MaCh\_99 (A11), Miko\_90 (A2), NaSiaTalie\_97 (A2), Naji\_86 (A2), NicoleTera\_95 (A2), NothingSpecial\_88 (A2), OKCentral2016\_85 (A10), PainterBoy\_93 (A16), PeaceMeal1\_83 (A10), Petersenfast\_93 (A11), Poompha\_84 (A10), Prudy\_89 (A2), QueenB2\_93 (A2), QueenBeesly\_94 (A2), Rachaly\_91 (A2), Rebeuca\_87 (A10), RedRock\_95 (A2), Retro23\_95 (A2), Salz\_96 (A11), Saskia\_97 (A11), Sham4\_96 (A11), SnapTap\_94 (A2), Steamy\_91 (A12), Superchunk\_98 (A2), SweetiePie\_94 (A2), TinyTimmy\_97 (A11), Tomathan\_97 (A2), Topanga\_76 (A10), Travvers\_97 (A2), Tristan\_91 (A2), Trooper\_94 (A2), Twister\_87 (A10), VA6\_93 (A2), VC3\_93 (A2), WalterMcMickey\_86 (A10), Wolpertinger\_99 (A11),

#### Start 20:

- Found in 9 of 92 ( 9.8% ) of genes in pham
- Manual Annotations of this start: 2 of 78
- Called 22.2% of time when present
- Phage (with cluster) where this start called: George\_81 (A5), Tarynearal\_87 (A5),

#### Start 23:

- Found in 92 of 92 ( 100.0% ) of genes in pham
- Manual Annotations of this start: 1 of 78
- Called 1.1% of time when present
- Phage (with cluster) where this start called: Cuco\_85 (A5),

### Summary by clusters:

There are 7 clusters represented in this pham: A16, A11, A10, A12, A2, A5, A7,

Info for manual annotations of cluster A10:

- Start number 19 was manually annotated 11 times for cluster A10.

Info for manual annotations of cluster A11:

- Start number 19 was manually annotated 7 times for cluster A11.

Info for manual annotations of cluster A12:

- Start number 19 was manually annotated 1 time for cluster A12.

Info for manual annotations of cluster A16:

- Start number 19 was manually annotated 3 times for cluster A16.

Info for manual annotations of cluster A2:

- Start number 14 was manually annotated 7 times for cluster A2.
- Start number 15 was manually annotated 1 time for cluster A2.
- Start number 19 was manually annotated 40 times for cluster A2.

Info for manual annotations of cluster A5:

- Start number 17 was manually annotated 4 times for cluster A5.
- Start number 20 was manually annotated 2 times for cluster A5.
- Start number 23 was manually annotated 1 time for cluster A5.

Info for manual annotations of cluster A7:

- Start number 15 was manually annotated 1 time for cluster A7.

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

Gene: AN3\_93 Start: 49491, Stop: 49387, Start Num: 19

Candidate Starts for AN3\_93:

(18, 49497), (Start: 19 @49491 has 62 MA's), (22, 49467), (Start: 23 @49464 has 1 MA's),

Gene: AN9\_94 Start: 49621, Stop: 49517, Start Num: 19

Candidate Starts for AN9\_94:

(Start: 19 @49621 has 62 MA's), (Start: 23 @49594 has 1 MA's), (24, 49576),

Gene: ANI8\_94 Start: 49621, Stop: 49517, Start Num: 19

Candidate Starts for ANI8\_94:

(Start: 19 @49621 has 62 MA's), (Start: 23 @49594 has 1 MA's), (24, 49576),

Gene: AnnaL29\_96 Start: 51737, Stop: 51633, Start Num: 19

Candidate Starts for AnnaL29\_96:

(Start: 19 @51737 has 62 MA's), (22, 51713), (Start: 23 @51710 has 1 MA's),

Gene: ArcherNM\_90 Start: 51024, Stop: 50920, Start Num: 19

Candidate Starts for ArcherNM\_90:

(Start: 19 @51024 has 62 MA's), (22, 51000), (Start: 23 @50997 has 1 MA's),

Gene: BiancaTri92\_90 Start: 50689, Stop: 50585, Start Num: 19

Candidate Starts for BiancaTri92\_90:

(16, 50701), (Start: 19 @50689 has 62 MA's), (21, 50668), (Start: 23 @50662 has 1 MA's), (26, 50620), (27, 50599),

Gene: BobSwaget\_88 Start: 48834, Stop: 48730, Start Num: 19

Candidate Starts for BobSwaget\_88:

(Start: 19 @48834 has 62 MA's), (22, 48810), (Start: 23 @48807 has 1 MA's),

Gene: Bugsy\_84 Start: 48373, Stop: 48269, Start Num: 19

Candidate Starts for Bugsy\_84:

(Start: 19 @48373 has 62 MA's), (22, 48349), (Start: 23 @48346 has 1 MA's),

Gene: C3\_87 Start: 49621, Stop: 49517, Start Num: 19  
Candidate Starts for C3\_87:  
(Start: 19 @49621 has 62 MA's), (Start: 23 @49594 has 1 MA's), (24, 49576),

Gene: Caraxes\_99 Start: 51295, Stop: 51158, Start Num: 10  
Candidate Starts for Caraxes\_99:  
(1, 51382), (6, 51337), (10, 51295), (Start: 15 @51277 has 2 MA's), (Start: 19 @51262 has 62 MA's),  
(Start: 23 @51238 has 1 MA's), (28, 51166),

Gene: Centaur\_97 Start: 51531, Stop: 51409, Start Num: 14  
Candidate Starts for Centaur\_97:  
(Start: 14 @51531 has 7 MA's), (Start: 19 @51519 has 62 MA's), (Start: 23 @51492 has 1 MA's), (28,  
51423),

Gene: Colin\_93 Start: 51994, Stop: 51890, Start Num: 19  
Candidate Starts for Colin\_93:  
(Start: 19 @51994 has 62 MA's), (22, 51970), (Start: 23 @51967 has 1 MA's),

Gene: Crucio\_94 Start: 51711, Stop: 51607, Start Num: 19  
Candidate Starts for Crucio\_94:  
(Start: 19 @51711 has 62 MA's), (22, 51687), (Start: 23 @51684 has 1 MA's),

Gene: Cuco\_85 Start: 49160, Stop: 49059, Start Num: 23  
Candidate Starts for Cuco\_85:  
(12, 49211), (13, 49205), (Start: 23 @49160 has 1 MA's), (25, 49124), (29, 49067),

Gene: D32\_85 Start: 47615, Stop: 47511, Start Num: 19  
Candidate Starts for D32\_85:  
(Start: 19 @47615 has 62 MA's), (Start: 23 @47588 has 1 MA's), (24, 47570),

Gene: DBQu4n\_97 Start: 51230, Stop: 51126, Start Num: 19  
Candidate Starts for DBQu4n\_97:  
(Start: 19 @51230 has 62 MA's), (Start: 23 @51203 has 1 MA's), (24, 51185),

Gene: Dignity\_96 Start: 51741, Stop: 51637, Start Num: 19  
Candidate Starts for Dignity\_96:  
(Start: 19 @51741 has 62 MA's), (22, 51717), (Start: 23 @51714 has 1 MA's),

Gene: Drake55\_96 Start: 51249, Stop: 51127, Start Num: 14  
Candidate Starts for Drake55\_96:  
(Start: 14 @51249 has 7 MA's), (Start: 19 @51237 has 62 MA's), (Start: 23 @51210 has 1 MA's), (28,  
51141),

Gene: Drake94\_83 Start: 48766, Stop: 48662, Start Num: 19  
Candidate Starts for Drake94\_83:  
(Start: 19 @48766 has 62 MA's), (Start: 23 @48739 has 1 MA's),

Gene: Duplo\_98 Start: 51287, Stop: 51183, Start Num: 19  
Candidate Starts for Duplo\_98:  
(Start: 19 @51287 has 62 MA's), (Start: 23 @51260 has 1 MA's), (24, 51242),

Gene: EagleEye\_96 Start: 51407, Stop: 51303, Start Num: 19

Candidate Starts for EagleEye\_96:  
(4, 51491), (Start: 19 @51407 has 62 MA's), (Start: 23 @51380 has 1 MA's),

Gene: Edison31\_73 Start: 45753, Stop: 45649, Start Num: 19  
Candidate Starts for Edison31\_73:  
(Start: 19 @45753 has 62 MA's), (Start: 23 @45726 has 1 MA's),

Gene: Equemioh13\_96 Start: 51572, Stop: 51450, Start Num: 14  
Candidate Starts for Equemioh13\_96:  
(Start: 14 @51572 has 7 MA's), (Start: 19 @51560 has 62 MA's), (Start: 23 @51533 has 1 MA's), (28, 51464),

Gene: Flaverint\_100 Start: 51095, Stop: 50988, Start Num: 19  
Candidate Starts for Flaverint\_100:  
(Start: 19 @51095 has 62 MA's), (Start: 23 @51065 has 1 MA's), (28, 50996),

Gene: Florence1\_83 Start: 48106, Stop: 47987, Start Num: 15  
Candidate Starts for Florence1\_83:  
(3, 48178), (5, 48169), (7, 48136), (9, 48133), (Start: 15 @48106 has 2 MA's), (Start: 20 @48085 has 2 MA's), (Start: 23 @48064 has 1 MA's), (25, 48028),

Gene: Florence4\_81 Start: 47171, Stop: 47052, Start Num: 15  
Candidate Starts for Florence4\_81:  
(3, 47243), (5, 47234), (7, 47201), (9, 47198), (Start: 15 @47171 has 2 MA's), (Start: 20 @47150 has 2 MA's), (Start: 23 @47129 has 1 MA's), (25, 47093),

Gene: ForesterFrank\_89 Start: 50952, Stop: 50848, Start Num: 19  
Candidate Starts for ForesterFrank\_89:  
(Start: 19 @50952 has 62 MA's), (22, 50928), (Start: 23 @50925 has 1 MA's),

Gene: George\_81 Start: 49646, Stop: 49548, Start Num: 20  
Candidate Starts for George\_81:  
(3, 49739), (5, 49730), (7, 49697), (9, 49694), (Start: 15 @49667 has 2 MA's), (Start: 17 @49661 has 4 MA's), (Start: 20 @49646 has 2 MA's), (Start: 23 @49625 has 1 MA's), (25, 49589),

Gene: Georgie2\_96 Start: 51855, Stop: 51751, Start Num: 19  
Candidate Starts for Georgie2\_96:  
(Start: 19 @51855 has 62 MA's), (22, 51831), (Start: 23 @51828 has 1 MA's),

Gene: Goose\_87 Start: 49419, Stop: 49315, Start Num: 19  
Candidate Starts for Goose\_87:  
(Start: 19 @49419 has 62 MA's), (Start: 23 @49392 has 1 MA's),

Gene: Gratitude\_94 Start: 51572, Stop: 51450, Start Num: 14  
Candidate Starts for Gratitude\_94:  
(Start: 14 @51572 has 7 MA's), (Start: 19 @51560 has 62 MA's), (Start: 23 @51533 has 1 MA's), (28, 51464),

Gene: Herbertwm\_89 Start: 50204, Stop: 50097, Start Num: 19  
Candidate Starts for Herbertwm\_89:  
(Start: 19 @50204 has 62 MA's), (Start: 23 @50180 has 1 MA's),

Gene: Hutc2\_97 Start: 49903, Stop: 49796, Start Num: 19

Candidate Starts for Hutc2\_97:

(Start: 19 @49903 has 62 MA's), (Start: 23 @49873 has 1 MA's),

Gene: Insomnia\_99 Start: 51129, Stop: 51022, Start Num: 19

Candidate Starts for Insomnia\_99:

(Start: 19 @51129 has 62 MA's), (Start: 23 @51099 has 1 MA's), (28, 51030),

Gene: Jerm\_95 Start: 51599, Stop: 51495, Start Num: 19

Candidate Starts for Jerm\_95:

(Start: 19 @51599 has 62 MA's), (22, 51575), (Start: 23 @51572 has 1 MA's),

Gene: Kerberos\_97 Start: 51250, Stop: 51146, Start Num: 19

Candidate Starts for Kerberos\_97:

(Start: 19 @51250 has 62 MA's), (Start: 23 @51223 has 1 MA's), (24, 51205),

Gene: Kimba\_96 Start: 50153, Stop: 50046, Start Num: 19

Candidate Starts for Kimba\_96:

(Start: 19 @50153 has 62 MA's), (Start: 23 @50123 has 1 MA's), (28, 50054),

Gene: KittenMittens\_81 Start: 48769, Stop: 48665, Start Num: 19

Candidate Starts for KittenMittens\_81:

(Start: 19 @48769 has 62 MA's), (Start: 23 @48742 has 1 MA's),

Gene: Landor\_92 Start: 52182, Stop: 52081, Start Num: 19

Candidate Starts for Landor\_92:

(Start: 19 @52182 has 62 MA's), (Start: 23 @52158 has 1 MA's), (24, 52140), (26, 52116), (27, 52095),

Gene: Leogania\_77 Start: 47504, Stop: 47400, Start Num: 19

Candidate Starts for Leogania\_77:

(16, 47516), (Start: 19 @47504 has 62 MA's), (21, 47483), (Start: 23 @47477 has 1 MA's), (26, 47435), (27, 47414),

Gene: LittleCherry\_84 Start: 48771, Stop: 48658, Start Num: 17

Candidate Starts for LittleCherry\_84:

(3, 48849), (5, 48840), (7, 48807), (9, 48804), (Start: 15 @48777 has 2 MA's), (Start: 17 @48771 has 4 MA's), (Start: 20 @48756 has 2 MA's), (Start: 23 @48735 has 1 MA's), (25, 48699),

Gene: Lokk\_89 Start: 49455, Stop: 49351, Start Num: 19

Candidate Starts for Lokk\_89:

(Start: 19 @49455 has 62 MA's), (22, 49431), (Start: 23 @49428 has 1 MA's),

Gene: Loser\_97 Start: 51981, Stop: 51877, Start Num: 19

Candidate Starts for Loser\_97:

(Start: 19 @51981 has 62 MA's), (22, 51957), (Start: 23 @51954 has 1 MA's),

Gene: Lucyedi\_94 Start: 51420, Stop: 51316, Start Num: 19

Candidate Starts for Lucyedi\_94:

(4, 51504), (Start: 19 @51420 has 62 MA's), (Start: 23 @51393 has 1 MA's),

Gene: MaCh\_99 Start: 51092, Stop: 50985, Start Num: 19

Candidate Starts for MaCh\_99:

(Start: 19 @51092 has 62 MA's), (Start: 23 @51062 has 1 MA's), (28, 50993),

Gene: Micasa\_87 Start: 49438, Stop: 49325, Start Num: 17  
Candidate Starts for Micasa\_87:  
(Start: 15 @49444 has 2 MA's), (Start: 17 @49438 has 4 MA's), (Start: 20 @49423 has 2 MA's), (Start: 23 @49402 has 1 MA's), (25, 49366),

Gene: MiculUcigas\_96 Start: 51290, Stop: 51168, Start Num: 14  
Candidate Starts for MiculUcigas\_96:  
(Start: 14 @51290 has 7 MA's), (Start: 19 @51278 has 62 MA's), (Start: 23 @51251 has 1 MA's), (28, 51182),

Gene: Miko\_90 Start: 50312, Stop: 50208, Start Num: 19  
Candidate Starts for Miko\_90:  
(Start: 19 @50312 has 62 MA's), (22, 50288), (Start: 23 @50285 has 1 MA's),

Gene: Milcery\_84 Start: 49067, Stop: 48954, Start Num: 17  
Candidate Starts for Milcery\_84:  
(3, 49145), (5, 49136), (7, 49103), (9, 49100), (Start: 15 @49073 has 2 MA's), (Start: 17 @49067 has 4 MA's), (Start: 20 @49052 has 2 MA's), (Start: 23 @49031 has 1 MA's), (25, 48995),

Gene: NaSiaTalie\_97 Start: 51439, Stop: 51329, Start Num: 19  
Candidate Starts for NaSiaTalie\_97:  
(Start: 14 @51451 has 7 MA's), (Start: 19 @51439 has 62 MA's), (Start: 23 @51412 has 1 MA's), (28, 51343),

Gene: Naji\_86 Start: 47615, Stop: 47511, Start Num: 19  
Candidate Starts for Naji\_86:  
(Start: 19 @47615 has 62 MA's), (Start: 23 @47588 has 1 MA's), (24, 47570),

Gene: NicoleTera\_95 Start: 51425, Stop: 51324, Start Num: 19  
Candidate Starts for NicoleTera\_95:  
(Start: 19 @51425 has 62 MA's), (Start: 23 @51401 has 1 MA's), (24, 51383), (27, 51338), (28, 51332),

Gene: NothingSpecial\_88 Start: 50971, Stop: 50870, Start Num: 19  
Candidate Starts for NothingSpecial\_88:  
(Start: 19 @50971 has 62 MA's), (Start: 23 @50947 has 1 MA's), (24, 50929), (26, 50905),

Gene: OKCentral2016\_85 Start: 48846, Stop: 48742, Start Num: 19  
Candidate Starts for OKCentral2016\_85:  
(Start: 19 @48846 has 62 MA's), (Start: 23 @48819 has 1 MA's),

Gene: Odin\_95 Start: 51188, Stop: 51069, Start Num: 15  
Candidate Starts for Odin\_95:  
(1, 51293), (6, 51248), (10, 51206), (Start: 15 @51188 has 2 MA's), (Start: 19 @51173 has 62 MA's), (Start: 23 @51149 has 1 MA's), (28, 51077),

Gene: PP\_09 Start: 2269, Stop: 2150, Start Num: 15  
Candidate Starts for PP\_09:  
(2, 2356), (Start: 15 @2269 has 2 MA's), (Start: 23 @2227 has 1 MA's),

Gene: PainterBoy\_93 Start: 51131, Stop: 51027, Start Num: 19  
Candidate Starts for PainterBoy\_93:  
(4, 51215), (Start: 19 @51131 has 62 MA's), (Start: 23 @51104 has 1 MA's),

Gene: PeaceMeal1\_83 Start: 48773, Stop: 48669, Start Num: 19

Candidate Starts for PeaceMeal1\_83:

(Start: 19 @48773 has 62 MA's), (Start: 23 @48746 has 1 MA's),

Gene: Petersenfast\_93 Start: 49528, Stop: 49421, Start Num: 19

Candidate Starts for Petersenfast\_93:

(Start: 19 @49528 has 62 MA's), (Start: 23 @49498 has 1 MA's), (28, 49429),

Gene: Poompha\_84 Start: 48962, Stop: 48858, Start Num: 19

Candidate Starts for Poompha\_84:

(Start: 19 @48962 has 62 MA's), (Start: 23 @48935 has 1 MA's),

Gene: Prin Ashe11\_86 Start: 49334, Stop: 49221, Start Num: 17

Candidate Starts for Prin Ashe11\_86:

(3, 49412), (5, 49403), (7, 49370), (9, 49367), (Start: 15 @49340 has 2 MA's), (Start: 17 @49334 has 4 MA's), (Start: 20 @49319 has 2 MA's), (Start: 23 @49298 has 1 MA's), (25, 49262),

Gene: Prudy\_89 Start: 51224, Stop: 51120, Start Num: 19

Candidate Starts for Prudy\_89:

(Start: 19 @51224 has 62 MA's), (22, 51200), (Start: 23 @51197 has 1 MA's),

Gene: QueenB2\_93 Start: 51229, Stop: 51125, Start Num: 19

Candidate Starts for QueenB2\_93:

(Start: 19 @51229 has 62 MA's), (22, 51205), (Start: 23 @51202 has 1 MA's),

Gene: QueenBeesly\_94 Start: 51807, Stop: 51703, Start Num: 19

Candidate Starts for QueenBeesly\_94:

(Start: 19 @51807 has 62 MA's), (22, 51783), (Start: 23 @51780 has 1 MA's),

Gene: Rachaly\_91 Start: 50455, Stop: 50351, Start Num: 19

Candidate Starts for Rachaly\_91:

(Start: 19 @50455 has 62 MA's), (22, 50431), (Start: 23 @50428 has 1 MA's),

Gene: Rebeuca\_87 Start: 50078, Stop: 49974, Start Num: 19

Candidate Starts for Rebeuca\_87:

(8, 50123), (Start: 19 @50078 has 62 MA's), (Start: 23 @50051 has 1 MA's),

Gene: RedRock\_95 Start: 51739, Stop: 51635, Start Num: 19

Candidate Starts for RedRock\_95:

(Start: 19 @51739 has 62 MA's), (22, 51715), (Start: 23 @51712 has 1 MA's),

Gene: Retro23\_95 Start: 51527, Stop: 51423, Start Num: 19

Candidate Starts for Retro23\_95:

(Start: 19 @51527 has 62 MA's), (22, 51503), (Start: 23 @51500 has 1 MA's),

Gene: Salz\_96 Start: 49825, Stop: 49718, Start Num: 19

Candidate Starts for Salz\_96:

(Start: 19 @49825 has 62 MA's), (Start: 23 @49795 has 1 MA's),

Gene: Saskia\_97 Start: 50316, Stop: 50209, Start Num: 19

Candidate Starts for Saskia\_97:

(Start: 19 @50316 has 62 MA's), (Start: 23 @50286 has 1 MA's), (28, 50217),

Gene: Sham4\_96 Start: 49843, Stop: 49736, Start Num: 19  
Candidate Starts for Sham4\_96:  
(Start: 19 @49843 has 62 MA's), (Start: 23 @49813 has 1 MA's), (28, 49744),

Gene: Sknot\_97 Start: 51578, Stop: 51456, Start Num: 14  
Candidate Starts for Sknot\_97:  
(Start: 14 @51578 has 7 MA's), (Start: 19 @51566 has 62 MA's), (Start: 23 @51539 has 1 MA's), (28, 51470),

Gene: SnapTap\_94 Start: 51510, Stop: 51406, Start Num: 19  
Candidate Starts for SnapTap\_94:  
(Start: 19 @51510 has 62 MA's), (22, 51486), (Start: 23 @51483 has 1 MA's),

Gene: Steamy\_91 Start: 51725, Stop: 51612, Start Num: 19  
Candidate Starts for Steamy\_91:  
(Start: 19 @51725 has 62 MA's), (Start: 23 @51695 has 1 MA's),

Gene: Superchunk\_98 Start: 51262, Stop: 51158, Start Num: 19  
Candidate Starts for Superchunk\_98:  
(1, 51382), (6, 51337), (10, 51295), (Start: 15 @51277 has 2 MA's), (Start: 19 @51262 has 62 MA's),  
(Start: 23 @51238 has 1 MA's), (28, 51166),

Gene: SweetiePie\_94 Start: 51643, Stop: 51539, Start Num: 19  
Candidate Starts for SweetiePie\_94:  
(Start: 19 @51643 has 62 MA's), (22, 51619), (Start: 23 @51616 has 1 MA's),

Gene: Swirley\_85 Start: 47789, Stop: 47676, Start Num: 17  
Candidate Starts for Swirley\_85:  
(3, 47867), (5, 47858), (7, 47825), (9, 47822), (Start: 17 @47789 has 4 MA's), (Start: 20 @47774 has 2 MA's), (Start: 23 @47753 has 1 MA's), (25, 47717),

Gene: Tarynearal\_87 Start: 49212, Stop: 49114, Start Num: 20  
Candidate Starts for Tarynearal\_87:  
(3, 49305), (5, 49296), (7, 49263), (9, 49260), (Start: 15 @49233 has 2 MA's), (Start: 17 @49227 has 4 MA's), (Start: 20 @49212 has 2 MA's), (Start: 23 @49191 has 1 MA's), (25, 49155),

Gene: Terrific\_98 Start: 51546, Stop: 51424, Start Num: 14  
Candidate Starts for Terrific\_98:  
(Start: 14 @51546 has 7 MA's), (Start: 19 @51534 has 62 MA's), (Start: 23 @51507 has 1 MA's), (28, 51438),

Gene: TinyTimmy\_97 Start: 50342, Stop: 50235, Start Num: 19  
Candidate Starts for TinyTimmy\_97:  
(Start: 19 @50342 has 62 MA's), (Start: 23 @50312 has 1 MA's), (28, 50243),

Gene: Tomathan\_97 Start: 51364, Stop: 51260, Start Num: 19  
Candidate Starts for Tomathan\_97:  
(Start: 19 @51364 has 62 MA's), (Start: 23 @51337 has 1 MA's), (24, 51319),

Gene: Topanga\_76 Start: 46554, Stop: 46450, Start Num: 19  
Candidate Starts for Topanga\_76:  
(Start: 19 @46554 has 62 MA's), (Start: 23 @46527 has 1 MA's),

Gene: Travvers\_97 Start: 51281, Stop: 51177, Start Num: 19  
Candidate Starts for Travvers\_97:  
(Start: 19 @51281 has 62 MA's), (Start: 23 @51254 has 1 MA's), (24, 51236),

Gene: Tristan\_91 Start: 51981, Stop: 51880, Start Num: 19  
Candidate Starts for Tristan\_91:  
(11, 52008), (Start: 19 @51981 has 62 MA's), (Start: 23 @51957 has 1 MA's), (24, 51939), (26, 51915),

Gene: Trooper\_94 Start: 51019, Stop: 50912, Start Num: 19  
Candidate Starts for Trooper\_94:  
(Start: 19 @51019 has 62 MA's), (Start: 23 @50995 has 1 MA's), (28, 50926),

Gene: Twister\_87 Start: 49768, Stop: 49664, Start Num: 19  
Candidate Starts for Twister\_87:  
(Start: 19 @49768 has 62 MA's), (Start: 23 @49741 has 1 MA's),

Gene: Updawg\_97 Start: 51572, Stop: 51450, Start Num: 14  
Candidate Starts for Updawg\_97:  
(Start: 14 @51572 has 7 MA's), (Start: 19 @51560 has 62 MA's), (Start: 23 @51533 has 1 MA's), (28, 51464),

Gene: VA6\_93 Start: 51062, Stop: 50958, Start Num: 19  
Candidate Starts for VA6\_93:  
(18, 51068), (Start: 19 @51062 has 62 MA's), (22, 51038), (Start: 23 @51035 has 1 MA's),

Gene: VC3\_93 Start: 49621, Stop: 49517, Start Num: 19  
Candidate Starts for VC3\_93:  
(Start: 19 @49621 has 62 MA's), (Start: 23 @49594 has 1 MA's), (24, 49576),

Gene: WalterMcMickey\_86 Start: 49768, Stop: 49664, Start Num: 19  
Candidate Starts for WalterMcMickey\_86:  
(Start: 19 @49768 has 62 MA's), (Start: 23 @49741 has 1 MA's),

Gene: WideWale\_97 Start: 51572, Stop: 51450, Start Num: 14  
Candidate Starts for WideWale\_97:  
(Start: 14 @51572 has 7 MA's), (Start: 19 @51560 has 62 MA's), (Start: 23 @51533 has 1 MA's), (28, 51464),

Gene: Wolpertinger\_99 Start: 50962, Stop: 50855, Start Num: 19  
Candidate Starts for Wolpertinger\_99:  
(Start: 19 @50962 has 62 MA's), (Start: 23 @50932 has 1 MA's), (28, 50863),