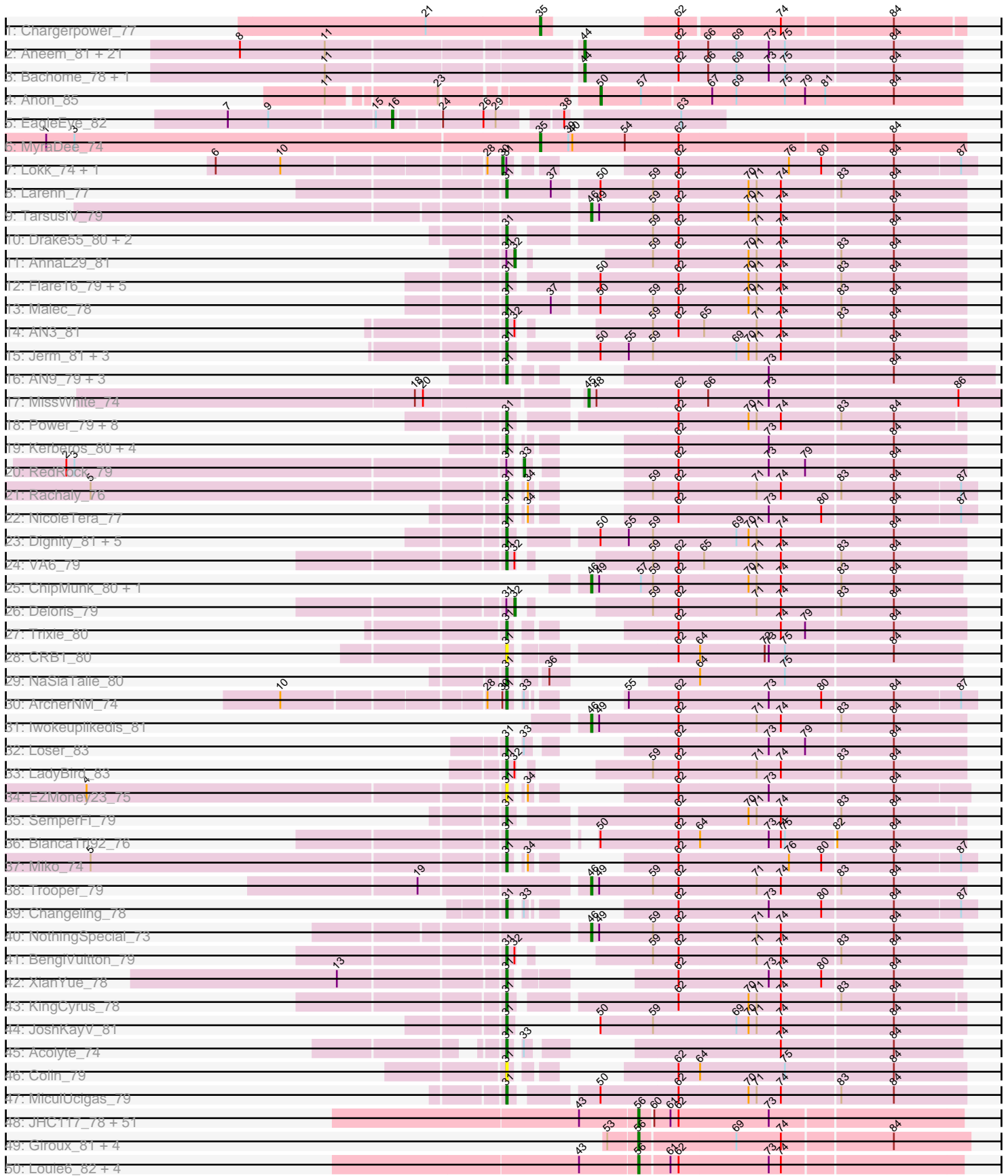
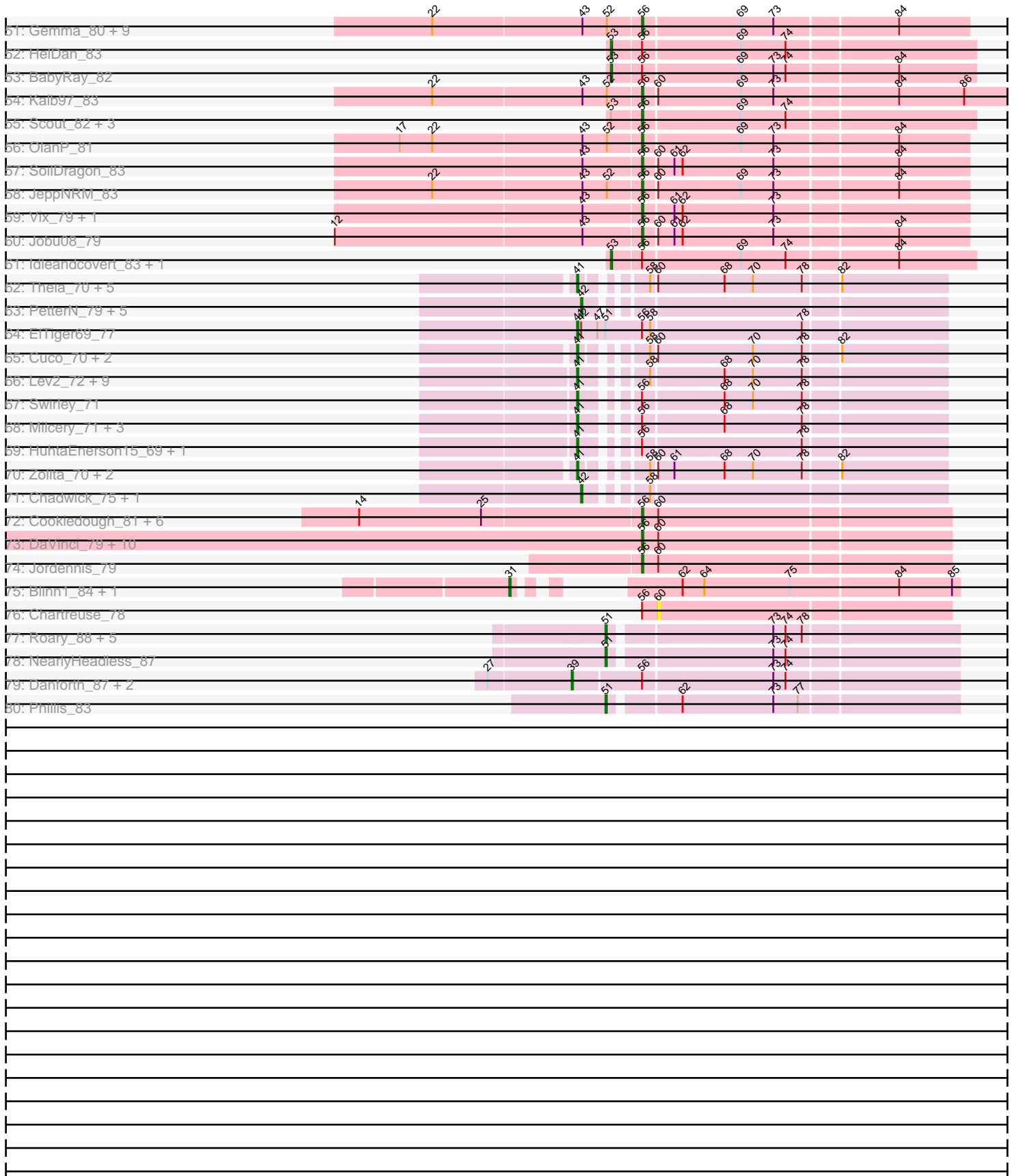


Pham 163315



Pham 163315



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 163315 Report

This analysis was run 04/28/24 on database version 559.

Pham number 163315 has 259 members, 18 are drafts.

Phages represented in each track:

- Track 1 : Chargerpower\_77
- Track 2 : Aneem\_81, Mabel\_80, Lucivia\_81, Orange\_80, Sham4\_76, MaCh\_80, Fibonacci\_79, Bud\_75, Et2Brutus\_79, Gilberta\_77, Timothy\_80, TinyTimmy\_78, Snape\_80, Joselito\_79, Petersenfast\_74, Salz\_75, Hutc2\_76, Insomnia\_78, Munch\_80, Flaverint\_81, Mulciber\_78, Jabith\_79
- Track 3 : Bachome\_78, Ebony\_80
- Track 4 : Anon\_85
- Track 5 : EagleEye\_82
- Track 6 : MyraDee\_74
- Track 7 : Lokk\_74, BobSwaget\_73
- Track 8 : Larenn\_77
- Track 9 : TarsusIV\_79
- Track 10 : Drake55\_80, Piro94\_78, HarryHoudini\_79
- Track 11 : AnnaL29\_81
- Track 12 : Flare16\_79, Centaur\_79, Equemioh13\_79, Updawg\_80, WideWale\_80, Baehexic\_78
- Track 13 : Malec\_78
- Track 14 : AN3\_81
- Track 15 : Jerm\_81, Agape74\_81, Buggy\_81, LilTurb\_80
- Track 16 : AN9\_79, VC3\_78, ANI8\_79, C3\_72
- Track 17 : MissWhite\_74
- Track 18 : Power\_79, SnapTap\_79, FiringLine\_79, Georgie2\_81, First\_0080, 20ES\_81, SweetiePie\_79, Crucio\_79, QueenBeesly\_79
- Track 19 : Kerberos\_80, DBQu4n\_80, StarStuff\_80, Pomar16\_80, Tomathan\_80
- Track 20 : RedRock\_79
- Track 21 : Rachaly\_76
- Track 22 : NicoleTera\_77
- Track 23 : Dignity\_81, Leviathan\_81, Turbido\_80, Whabigail7\_79, AbbyPaige\_81, Smeagan\_82
- Track 24 : VA6\_79
- Track 25 : ChipMunk\_80, EvilGenius\_79
- Track 26 : Deloris\_79
- Track 27 : Trixie\_80
- Track 28 : CRB1\_80
- Track 29 : NaSiaTalie\_80
- Track 30 : ArcherNM\_74
- Track 31 : Iwokeuplikedis\_81

- Track 32 : Loser\_83
- Track 33 : LadyBird\_83
- Track 34 : EZMoney23\_75
- Track 35 : SemperFi\_79
- Track 36 : BiancaTri92\_76
- Track 37 : Miko\_74
- Track 38 : Trooper\_79
- Track 39 : Changeling\_78
- Track 40 : NothingSpecial\_73
- Track 41 : BengiVuitton\_79
- Track 42 : XianYue\_78
- Track 43 : KingCyrus\_78
- Track 44 : JoshKayV\_81
- Track 45 : Acolyte\_74
- Track 46 : Colin\_79
- Track 47 : MiculUcigas\_79
- Track 48 : JHC117\_78, HashRod\_84, LugYA\_86, Grum1\_83, Penny1\_83, Snickers\_79, Mainiac\_82, Grub\_81, Aglet\_84, MoneyMay\_83, Malinsilva\_86, Methuselah\_76, Beauxregard13\_82, Cullens\_84, Grif\_81, Marie\_81, Sabinator\_81, MarQuardt\_83, EpicPhail\_84, JenCasNa\_84, Stagni\_80, LarryKay\_83, Lilith\_81, Sabia\_81, Farber\_83, Wooldri\_85, PGHhamlin\_85, PotatoSplit\_84, Pembroke\_83, Phoxy\_83, AugsMagnumOpus\_86, Spike509\_83, Microwolf\_79, MuchMore\_86, Ollie\_83, MadMarie\_81, Hercules11\_83, Taurus\_84, Watson\_82, SoYo\_80, GingkoMaracino\_83, BreSam8\_83, Tiffany\_82, Colbster\_79, P28Green\_83, DaHudson\_82, Fernando\_84, GtownJaz\_83, Rummer\_82, Dieselweasel\_84, Phoebe\_84, LBerry\_84
- Track 49 : Giroux\_81, Pistachio\_83, SaturnRing\_84, BlueBird\_85, Bugatti\_84
- Track 50 : Louie6\_82, Bxz2\_78, KADY\_80, BuzzBuzz\_77, Daishi\_82
- Track 51 : Gemma\_80, Groupthink\_83, PhishRPhriends\_79, Reba\_78, Kalnoky\_83, Pawn\_81, Manu\_82, Marius\_83, HaveUMetTed\_83, Heliosoles\_80
- Track 52 : HelDan\_83
- Track 53 : BabyRay\_82
- Track 54 : Kalb97\_83
- Track 55 : Scout\_82, Puppy\_84, Heathen\_82, Fred313\_80
- Track 56 : OlanP\_81
- Track 57 : SoilDragon\_83
- Track 58 : JeppNRM\_83
- Track 59 : Vix\_79, Anubis\_87
- Track 60 : Jobu08\_79
- Track 61 : Idleandcovert\_83, TNguyen7\_84
- Track 62 : Theia\_70, Bluefalcon\_67, Dublin\_71, Archetta\_69, Micasa\_69, MarysWell\_71
- Track 63 : PetterN\_79, Benedict\_75, Naca\_74, Airmid\_74, Jabiru\_73, Scorpia\_74
- Track 64 : EITiger69\_77
- Track 65 : Cuco\_70, Midas2\_68, Coog\_68
- Track 66 : Lev2\_72, Tiger\_70, PickleBack\_72, AgentM\_71, ForGetIt\_72, Phlorence\_70, Jovo\_71, Conspiracy\_72, Discoknowium\_69, Aragog\_71
- Track 67 : Swirley\_71
- Track 68 : Milcery\_71, Tarynearal\_70, LittleCherry\_70, George\_66
- Track 69 : HuhtaEnerson15\_69, Bonamassa\_71
- Track 70 : Zolita\_70, SydNat\_71, Ghoulboy\_71
- Track 71 : Chadwick\_75, UnionJack\_75

- Track 72 : Cookiedough\_81, Isiphiwo\_78, Neeharika16\_79, Hoot\_76, Newrala\_80, Pmask\_80, SuperAwesome\_81
- Track 73 : DaVinci\_79, McFly\_81, Candra\_79, EricB\_80, SuperCallie99\_78, SmellyB\_81, BABullseye\_74, VohminGhazi\_81, Kazan\_82, Kipper29\_81, Dorothea\_78
- Track 74 : Jordennis\_79
- Track 75 : Blinn1\_84, Priamo\_82
- Track 76 : Chartreuse\_78
- Track 77 : Roary\_88, Groundhog\_84, Astro\_86, Expelliarmus\_83, Dixon\_85, Smeadley\_86
- Track 78 : NearlyHeadless\_87
- Track 79 : Danforth\_87, Saintus\_82, Stephig9\_85
- Track 80 : Phillis\_83

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

The start number called the most often in the published annotations is 56, it was called in 94 of the 241 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Aglet\_84, Anubis\_87, AugsMagnumOpus\_86, BABullseye\_74, Beauxregard13\_82, BlueBird\_85, BreSam8\_83, Bugatti\_84, BuzzBuzz\_77, Bxz2\_78, Candra\_79, Colbster\_79, Cookiedough\_81, Cullens\_84, DaHudson\_82, DaVinci\_79, Daishi\_82, Dieselweasel\_84, Dorothea\_78, EpicPhail\_84, EricB\_80, Farber\_83, Fernando\_84, Fred313\_80, Gemma\_80, GingkoMaracino\_83, Giroux\_81, Grif\_81, Groupthink\_83, Grub\_81, Grum1\_83, GtownJaz\_83, HashRod\_84, HaveUMetTed\_83, Heathen\_82, Heliosoles\_80, Hercules11\_83, Hoot\_76, Isiphiwo\_78, JHC117\_78, JenCasNa\_84, JeppNRM\_83, Jobu08\_79, Jordennis\_79, KADY\_80, Kalb97\_83, Kalnoky\_83, Kazan\_82, Kipper29\_81, LBerry\_84, LarryKay\_83, Lilith\_81, Louie6\_82, LugYA\_86, MadMarie\_81, Mainiac\_82, Malinsilva\_86, Manu\_82, MarQuardt\_83, Marie\_81, Marius\_83, McFly\_81, Methuselah\_76, Microwolf\_79, MoneyMay\_83, MuchMore\_86, Neeharika16\_79, Newrala\_80, OlanP\_81, Ollie\_83, P28Green\_83, PGHhamlin\_85, Pawn\_81, Pembroke\_83, Penny1\_83, PhishRPhriends\_79, Phoebe\_84, Phoxy\_83, Pistachio\_83, Pmask\_80, PotatoSplit\_84, Puppy\_84, Reba\_78, Rummer\_82, Sabia\_81, Sabinator\_81, SaturnRing\_84, Scout\_82, SmellyB\_81, Snickers\_79, SoYo\_80, SoilDragon\_83, Spike509\_83, Stagni\_80, SuperAwesome\_81, SuperCallie99\_78, Taurus\_84, Tiffany\_82, Vix\_79, VohminGhazi\_81, Watson\_82, Wooldri\_85,

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

- BabyRay\_82, Bonamassa\_71, Chartreuse\_78, Danforth\_87, ElTiger69\_77, George\_66, HelDan\_83, HuhtaEnerson15\_69, Idleandcovert\_83, LittleCherry\_70, Milcery\_71, Saintus\_82, Stephig9\_85, Swirley\_71, TNguyen7\_84, Tarynearal\_70,

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

- 20ES\_81, AN3\_81, AN9\_79, ANI8\_79, AbbyPaige\_81, Acolyte\_74, Agape74\_81, AgentM\_71, Airmid\_74, Aneem\_81, AnnaL29\_81, Anon\_85, Aragog\_71, ArcherNM\_74, Archetta\_69, Astro\_86, Bachome\_78, Baehexic\_78, Benedict\_75, BengiVuitton\_79, BiancaTri92\_76, Blinn1\_84, Bluefalcon\_67, BobSwaget\_73, Bud\_75, Buggy\_81, C3\_72, CRB1\_80, Centaur\_79, Chadwick\_75, Changeling\_78,

Chargerpower\_77, ChipMunk\_80, Colin\_79, Conspiracy\_72, Coog\_68, Crucio\_79, Cuco\_70, DBQu4n\_80, Deloris\_79, Dignity\_81, Discoknowium\_69, Dixon\_85, Drake55\_80, Dublin\_71, EZMoney23\_75, EagleEye\_82, Ebony\_80, Equemioh13\_79, Et2Brutus\_79, EvilGenius\_79, Expelliarmus\_83, Fibonacci\_79, FiringLine\_79, First\_0080, Flare16\_79, Flaverint\_81, ForGetIt\_72, Georgie2\_81, Ghouboy\_71, Gilberta\_77, Groundhog\_84, HarryHoudini\_79, Hutc2\_76, Insomnia\_78, Iwokeuplikedis\_81, Jabiru\_73, Jabith\_79, Jerm\_81, Joselito\_79, JoshKayV\_81, Jovo\_71, Kerberos\_80, KingCyrus\_78, LadyBird\_83, Larenn\_77, Lev2\_72, Leviathan\_81, LilTurb\_80, Loka\_74, Loser\_83, Lucivia\_81, MaCh\_80, Mabel\_80, Malec\_78, MarysWell\_71, Micasa\_69, MiculUcigas\_79, Midas2\_68, Miko\_74, MissWhite\_74, Mulciber\_78, Munch\_80, MyraDee\_74, NaSiaTalie\_80, Naca\_74, NearlyHeadless\_87, NicoleTera\_77, NothingSpecial\_73, Orange\_80, Petersenfast\_74, PetterN\_79, Phillis\_83, Phlorence\_70, PickleBack\_72, Piro94\_78, Pomar16\_80, Power\_79, Priamo\_82, QueenBeesly\_79, Rachaly\_76, RedRock\_79, Roary\_88, Salz\_75, Scorpia\_74, SemperFi\_79, Sham4\_76, Smeadley\_86, Smeagan\_82, SnapTap\_79, Snape\_80, StarStuff\_80, SweetiePie\_79, SydNat\_71, TarsusIV\_79, Theia\_70, Tiger\_70, Timothy\_80, TinyTimmy\_78, Tomathan\_80, Trixie\_80, Trooper\_79, Turbido\_80, UnionJack\_75, Updawg\_80, VA6\_79, VC3\_78, Whabigail7\_79, WideWale\_80, XianYue\_78, Zolita\_70,

### Summary by start number:

#### Start 16:

- Found in 1 of 259 ( 0.4% ) of genes in pham
- Manual Annotations of this start: 1 of 241
- Called 100.0% of time when present
- Phage (with cluster) where this start called: EagleEye\_82 (A16),

#### Start 30:

- Found in 3 of 259 ( 1.2% ) of genes in pham
- Manual Annotations of this start: 2 of 241
- Called 66.7% of time when present
- Phage (with cluster) where this start called: BobSwaget\_73 (A2), Loka\_74 (A2),

#### Start 31:

- Found in 68 of 259 ( 26.3% ) of genes in pham
- Manual Annotations of this start: 58 of 241
- Called 92.6% of time when present
- Phage (with cluster) where this start called: 20ES\_81 (A2), AN3\_81 (A2), AN9\_79 (A2), AN18\_79 (A2), AbbyPaige\_81 (A2), Acolyte\_74 (A2), Agape74\_81 (A2), ArcherNM\_74 (A2), Baehexic\_78 (A2), BengiVuitton\_79 (A2), BiancaTri92\_76 (A2), Blinn1\_84 (A6), Buggy\_81 (A2), C3\_72 (A2), CRB1\_80 (A2), Centaur\_79 (A2), Changeling\_78 (A2), Colin\_79 (A2), Crucio\_79 (A2), DBQu4n\_80 (A2), Dignity\_81 (A2), Drake55\_80 (A2), EZMoney23\_75 (A2), Equemioh13\_79 (A2), FiringLine\_79 (A2), First\_0080 (A2), Flare16\_79 (A2), Georgie2\_81 (A2), HarryHoudini\_79 (A2), Jerm\_81 (A2), JoshKayV\_81 (A2), Kerberos\_80 (A2), KingCyrus\_78 (A2), LadyBird\_83 (A2), Larenn\_77 (A2), Leviathan\_81 (A2), LilTurb\_80 (A2), Loser\_83 (A2), Malec\_78 (A2), MiculUcigas\_79 (A2), Miko\_74 (A2), NaSiaTalie\_80 (A2), NicoleTera\_77 (A2), Piro94\_78 (A2), Pomar16\_80 (A2), Power\_79 (A2), Priamo\_82 (A6), QueenBeesly\_79 (A2), Rachaly\_76 (A2), SemperFi\_79 (A2), Smeagan\_82 (A2), SnapTap\_79 (A2), StarStuff\_80 (A2), SweetiePie\_79 (A2), Tomathan\_80 (A2), Trixie\_80 (A2), Turbido\_80 (A2), Updawg\_80 (A2), VA6\_79 (A2), VC3\_78 (A2), Whabigail7\_79 (A2), WideWale\_80 (A2), XianYue\_78 (A2),

Start 32:

- Found in 6 of 259 ( 2.3% ) of genes in pham
- Manual Annotations of this start: 2 of 241
- Called 33.3% of time when present
- Phage (with cluster) where this start called: AnnaL29\_81 (A2), Deloris\_79 (A2),

Start 33:

- Found in 5 of 259 ( 1.9% ) of genes in pham
- Manual Annotations of this start: 1 of 241
- Called 20.0% of time when present
- Phage (with cluster) where this start called: RedRock\_79 (A2),

Start 35:

- Found in 2 of 259 ( 0.8% ) of genes in pham
- Manual Annotations of this start: 2 of 241
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Chargerpower\_77 (A), MyraDee\_74 (A18),

Start 39:

- Found in 4 of 259 ( 1.5% ) of genes in pham
- Manual Annotations of this start: 3 of 241
- Called 75.0% of time when present
- Phage (with cluster) where this start called: Danforth\_87 (A8), Saintus\_82 (A8), Stephig9\_85 (A8),

Start 41:

- Found in 30 of 259 ( 11.6% ) of genes in pham
- Manual Annotations of this start: 29 of 241
- Called 100.0% of time when present
- Phage (with cluster) where this start called: AgentM\_71 (A5), Aragog\_71 (A5), Archetta\_69 (A5), Bluefalcon\_67 (A5), Bonamassa\_71 (A5), Conspiracy\_72 (A5), Coog\_68 (A5), Cuco\_70 (A5), Discoknowium\_69 (A5), Dublin\_71 (A5), EITiger69\_77 (A5), ForGetIt\_72 (A5), George\_66 (A5), Ghoulboy\_71 (A5), HuhtaEnerson15\_69 (A5), Jovo\_71 (A5), Lev2\_72 (A5), LittleCherry\_70 (A5), MarysWell\_71 (A5), Micasa\_69 (A5), Midas2\_68 (A5), Milcery\_71 (A5), Phlorence\_70 (A5), PickleBack\_72 (A5), Swirley\_71 (A5), SydNat\_71 (A5), Tarynearal\_70 (A5), Theia\_70 (A5), Tiger\_70 (A5), Zolita\_70 (A5),

Start 42:

- Found in 9 of 259 ( 3.5% ) of genes in pham
- Manual Annotations of this start: 8 of 241
- Called 88.9% of time when present
- Phage (with cluster) where this start called: Airmid\_74 (A5), Benedict\_75 (A5), Chadwick\_75 (A5), Jabiru\_73 (A5), Naca\_74 (A5), PetterN\_79 (A5), Scorpia\_74 (A5), UnionJack\_75 (A5),

Start 44:

- Found in 24 of 259 ( 9.3% ) of genes in pham
- Manual Annotations of this start: 21 of 241
- Called 100.0% of time when present

- Phage (with cluster) where this start called: Aneem\_81 (A11), Bachome\_78 (A11), Bud\_75 (A11), Ebony\_80 (A11), Et2Brutus\_79 (A11), Fibonacci\_79 (A11), Flaverint\_81 (A11), Gilberta\_77 (A11), Hutc2\_76 (A11), Insomnia\_78 (A11), Jabith\_79 (A11), Joselito\_79 (A11), Lucivia\_81 (A11), MaCh\_80 (A11), Mabel\_80 (A11), Mulciber\_78 (A11), Munch\_80 (A11), Orange\_80 (A11), Petersenfast\_74 (A11), Salz\_75 (A11), Sham4\_76 (A11), Snape\_80 (A11), Timothy\_80 (A11), TinyTimmy\_78 (A11),

#### Start 45:

- Found in 1 of 259 ( 0.4% ) of genes in pham
- Manual Annotations of this start: 1 of 241
- Called 100.0% of time when present
- Phage (with cluster) where this start called: MissWhite\_74 (A2),

#### Start 46:

- Found in 6 of 259 ( 2.3% ) of genes in pham
- Manual Annotations of this start: 6 of 241
- Called 100.0% of time when present
- Phage (with cluster) where this start called: ChipMunk\_80 (A2), EvilGenius\_79 (A2), Iwokeuplikedis\_81 (A2), NothingSpecial\_73 (A2), TarsusIV\_79 (A2), Trooper\_79 (A2),

#### Start 50:

- Found in 22 of 259 ( 8.5% ) of genes in pham
- Manual Annotations of this start: 1 of 241
- Called 4.5% of time when present
- Phage (with cluster) where this start called: Anon\_85 (A15),

#### Start 51:

- Found in 9 of 259 ( 3.5% ) of genes in pham
- Manual Annotations of this start: 8 of 241
- Called 88.9% of time when present
- Phage (with cluster) where this start called: Astro\_86 (A8), Dixon\_85 (A8), Expelliarmus\_83 (A8), Groundhog\_84 (A8), NearlyHeadless\_87 (A8), Phillis\_83 (A8), Roary\_88 (A8), Smeadley\_86 (A8),

#### Start 53:

- Found in 13 of 259 ( 5.0% ) of genes in pham
- Manual Annotations of this start: 4 of 241
- Called 30.8% of time when present
- Phage (with cluster) where this start called: BabyRay\_82 (A3), HelDan\_83 (A3), Idleandcovert\_83 (A3), TNguyen7\_84 (A3),

#### Start 56:

- Found in 118 of 259 ( 45.6% ) of genes in pham
- Manual Annotations of this start: 94 of 241
- Called 86.4% of time when present
- Phage (with cluster) where this start called: Aglet\_84 (A3), Anubis\_87 (A3), AugsMagnumOpus\_86 (A3), BABullseye\_74 (A6), Beauxregard13\_82 (A3), BlueBird\_85 (A3), BreSam8\_83 (A3), Bugatti\_84 (A3), BuzzBuzz\_77 (A3), Bxz2\_78 (A3), Candra\_79 (A6), Colbster\_79 (A3), Cookiedough\_81 (A6), Cullens\_84 (A3), DaHudson\_82 (A3), DaVinci\_79 (A6), Daishi\_82 (A3), Dieselweasel\_84 (A3), Dorothea\_78 (A6), EpicPhail\_84 (A3), EricB\_80 (A6), Farber\_83 (A3), Fernando\_84



(A3), Fred313\_80 (A3), Gemma\_80 (A3), GingkoMaracino\_83 (A3), Giroux\_81 (A3), Grif\_81 (A3), Groupthink\_83 (A3), Grub\_81 (A3), Grum1\_83 (A3), GtownJaz\_83 (A3), HashRod\_84 (A3), HaveUMetTed\_83 (A3), Heathen\_82 (A3), Heliosoles\_80 (A3), Hercules11\_83 (A3), Hoot\_76 (A6), Isiphiwo\_78 (A6), JHC117\_78 (A3), JenCasNa\_84 (A3), JeppNRM\_83 (A3), Jobu08\_79 (A3), Jordennis\_79 (A6), KADY\_80 (A3), Kalb97\_83 (A3), Kalnoky\_83 (A3), Kazan\_82 (A6), Kipper29\_81 (A6), LBerry\_84 (A3), LarryKay\_83 (A3), Lilith\_81 (A3), Louie6\_82 (A3), LugYA\_86 (A3), MadMarie\_81 (A3), Mainiac\_82 (A3), Malinsilva\_86 (A3), Manu\_82 (A3), MarQuardt\_83 (A3), Marie\_81 (A3), Marius\_83 (A3), McFly\_81 (A6), Methuselah\_76 (A3), Microwolf\_79 (A3), MoneyMay\_83 (A3), MuchMore\_86 (A3), Neeharika16\_79 (A6), Newrala\_80 (A6), OlanP\_81 (A3), Ollie\_83 (A3), P28Green\_83 (A3), PGHhamlin\_85 (A3), Pawn\_81 (A3), Pembroke\_83 (A3), Penny1\_83 (A3), PhishRPhriends\_79 (A3), Phoebe\_84 (A3), Phoxy\_83 (A3), Pistachio\_83 (A3), Pmask\_80 (A6), PotatoSplit\_84 (A3), Puppy\_84 (A3), Reba\_78 (A3), Rummer\_82 (A3), Sabia\_81 (A3), Sabinator\_81 (A3), SaturnRing\_84 (A3), Scout\_82 (A3), SmellyB\_81 (A6), Snickers\_79 (A3), SoYo\_80 (A3), SoilDragon\_83 (A3), Spike509\_83 (A3), Stagni\_80 (A3), SuperAwesome\_81 (A6), SuperCallie99\_78 (A6), Taurus\_84 (A3), Tiffany\_82 (A3), Vix\_79 (A3), VohminGhazi\_81 (A6), Watson\_82 (A3), Wooldri\_85 (A3),

Start 60:

- Found in 88 of 259 ( 34.0% ) of genes in pham
- No Manual Annotations of this start.
- Called 1.1% of time when present
- Phage (with cluster) where this start called: Chartreuse\_78 (A6),

### Summary by clusters:

There are 10 clusters represented in this pham: A, A15, A16, A11, A18, A3, A2, A5, A6, A8,

Info for manual annotations of cluster A:

- Start number 35 was manually annotated 1 time for cluster A.

Info for manual annotations of cluster A11:

- Start number 44 was manually annotated 21 times for cluster A11.

Info for manual annotations of cluster A15:

- Start number 50 was manually annotated 1 time for cluster A15.

Info for manual annotations of cluster A16:

- Start number 16 was manually annotated 1 time for cluster A16.

Info for manual annotations of cluster A18:

- Start number 35 was manually annotated 1 time for cluster A18.

Info for manual annotations of cluster A2:

- Start number 30 was manually annotated 2 times for cluster A2.
- Start number 31 was manually annotated 56 times for cluster A2.
- Start number 32 was manually annotated 2 times for cluster A2.
- Start number 33 was manually annotated 1 time for cluster A2.
- Start number 45 was manually annotated 1 time for cluster A2.
- Start number 46 was manually annotated 6 times for cluster A2.

Info for manual annotations of cluster A3:

- Start number 53 was manually annotated 4 times for cluster A3.
- Start number 56 was manually annotated 78 times for cluster A3.

Info for manual annotations of cluster A5:

- Start number 41 was manually annotated 29 times for cluster A5.
- Start number 42 was manually annotated 8 times for cluster A5.

Info for manual annotations of cluster A6:

- Start number 31 was manually annotated 2 times for cluster A6.
- Start number 56 was manually annotated 16 times for cluster A6.

Info for manual annotations of cluster A8:

- Start number 39 was manually annotated 3 times for cluster A8.
- Start number 51 was manually annotated 8 times for cluster A8.

### **Gene Information:**

Gene: 20ES\_81 Start: 46774, Stop: 46457, Start Num: 31

Candidate Starts for 20ES\_81:

(Start: 31 @46774 has 58 MA's), (62, 46663), (70, 46612), (71, 46606), (74, 46588), (83, 46546), (84, 46507),

Gene: AN3\_81 Start: 45387, Stop: 45106, Start Num: 31

Candidate Starts for AN3\_81:

(Start: 31 @45387 has 58 MA's), (Start: 32 @45381 has 2 MA's), (59, 45333), (62, 45315), (65, 45297), (71, 45258), (74, 45240), (83, 45198), (84, 45159),

Gene: AN9\_79 Start: 45517, Stop: 45221, Start Num: 31

Candidate Starts for AN9\_79:

(Start: 31 @45517 has 58 MA's), (73, 45385), (84, 45295),

Gene: ANI8\_79 Start: 45517, Stop: 45221, Start Num: 31

Candidate Starts for ANI8\_79:

(Start: 31 @45517 has 58 MA's), (73, 45385), (84, 45295),

Gene: AbbyPaige\_81 Start: 47049, Stop: 46729, Start Num: 31

Candidate Starts for AbbyPaige\_81:

(Start: 31 @47049 has 58 MA's), (Start: 50 @46995 has 1 MA's), (55, 46974), (59, 46956), (69, 46896), (70, 46887), (71, 46881), (74, 46863), (84, 46782),

Gene: Acolyte\_74 Start: 46022, Stop: 45753, Start Num: 31

Candidate Starts for Acolyte\_74:

(Start: 31 @46022 has 58 MA's), (Start: 33 @46016 has 1 MA's), (74, 45884), (84, 45803),

Gene: Agape74\_81 Start: 47043, Stop: 46723, Start Num: 31

Candidate Starts for Agape74\_81:

(Start: 31 @47043 has 58 MA's), (Start: 50 @46989 has 1 MA's), (55, 46968), (59, 46950), (69, 46890), (70, 46881), (71, 46875), (74, 46857), (84, 46776),

Gene: AgentM\_71 Start: 44359, Stop: 44114, Start Num: 41  
Candidate Starts for AgentM\_71:  
(Start: 41 @44359 has 29 MA's), (58, 44323), (68, 44272), (70, 44251), (78, 44215),

Gene: Aglet\_84 Start: 46272, Stop: 46042, Start Num: 56  
Candidate Starts for Aglet\_84:  
(43, 46314), (Start: 56 @46272 has 94 MA's), (60, 46263), (61, 46251), (62, 46245), (73, 46179),

Gene: Airmid\_74 Start: 45167, Stop: 44925, Start Num: 42  
Candidate Starts for Airmid\_74:  
(Start: 42 @45167 has 8 MA's),

Gene: Aneem\_81 Start: 45984, Stop: 45709, Start Num: 44  
Candidate Starts for Aneem\_81:  
(8, 46224), (11, 46161), (Start: 44 @45984 has 21 MA's), (62, 45915), (66, 45894), (69, 45873), (73, 45849), (75, 45837), (84, 45759),

Gene: AnnaL29\_81 Start: 47245, Stop: 46979, Start Num: 32  
Candidate Starts for AnnaL29\_81:  
(Start: 31 @47251 has 58 MA's), (Start: 32 @47245 has 2 MA's), (59, 47206), (62, 47188), (70, 47137), (71, 47131), (74, 47113), (83, 47071), (84, 47032),

Gene: Anon\_85 Start: 46676, Stop: 46413, Start Num: 50  
Candidate Starts for Anon\_85:  
(11, 46847), (23, 46775), (Start: 50 @46676 has 1 MA's), (57, 46646), (67, 46598), (69, 46580), (75, 46544), (79, 46529), (81, 46514), (84, 46463),

Gene: Anubis\_87 Start: 46158, Stop: 45928, Start Num: 56  
Candidate Starts for Anubis\_87:  
(43, 46200), (Start: 56 @46158 has 94 MA's), (61, 46137), (62, 46131), (73, 46065),

Gene: Aragog\_71 Start: 44377, Stop: 44132, Start Num: 41  
Candidate Starts for Aragog\_71:  
(Start: 41 @44377 has 29 MA's), (58, 44341), (68, 44290), (70, 44269), (78, 44233),

Gene: ArcherNM\_74 Start: 46349, Stop: 46071, Start Num: 31  
Candidate Starts for ArcherNM\_74:  
(10, 46499), (28, 46361), (Start: 30 @46352 has 2 MA's), (Start: 31 @46349 has 58 MA's), (Start: 33 @46343 has 1 MA's), (55, 46322), (62, 46286), (73, 46220), (80, 46181), (84, 46130), (87, 46082),

Gene: Archetta\_69 Start: 44318, Stop: 44076, Start Num: 41  
Candidate Starts for Archetta\_69:  
(Start: 41 @44318 has 29 MA's), (58, 44285), (60, 44282), (68, 44234), (70, 44213), (78, 44177), (82, 44153),

Gene: Astro\_86 Start: 46880, Stop: 46638, Start Num: 51  
Candidate Starts for Astro\_86:  
(Start: 51 @46880 has 8 MA's), (73, 46769), (74, 46760), (78, 46748),

Gene: AugsMagnumOpus\_86 Start: 46260, Stop: 46030, Start Num: 56  
Candidate Starts for AugsMagnumOpus\_86:  
(43, 46302), (Start: 56 @46260 has 94 MA's), (60, 46251), (61, 46239), (62, 46233), (73, 46167),

Gene: BABullseye\_74 Start: 43477, Stop: 43256, Start Num: 56  
Candidate Starts for BABullseye\_74:  
(Start: 56 @43477 has 94 MA's), (60, 43465),

Gene: BabyRay\_82 Start: 46614, Stop: 46357, Start Num: 53  
Candidate Starts for BabyRay\_82:  
(Start: 53 @46614 has 4 MA's), (Start: 56 @46593 has 94 MA's), (69, 46524), (73, 46500), (74, 46491), (84, 46413),

Gene: Bachome\_78 Start: 44864, Stop: 44589, Start Num: 44  
Candidate Starts for Bachome\_78:  
(11, 45041), (Start: 44 @44864 has 21 MA's), (62, 44795), (66, 44774), (69, 44753), (73, 44729), (75, 44717), (84, 44639),

Gene: Baehexic\_78 Start: 46443, Stop: 46123, Start Num: 31  
Candidate Starts for Baehexic\_78:  
(Start: 31 @46443 has 58 MA's), (Start: 50 @46389 has 1 MA's), (62, 46332), (70, 46281), (71, 46275), (74, 46257), (83, 46215), (84, 46176),

Gene: Beauxregard13\_82 Start: 46275, Stop: 46045, Start Num: 56  
Candidate Starts for Beauxregard13\_82:  
(43, 46317), (Start: 56 @46275 has 94 MA's), (60, 46266), (61, 46254), (62, 46248), (73, 46182),

Gene: Benedict\_75 Start: 44899, Stop: 44657, Start Num: 42  
Candidate Starts for Benedict\_75:  
(Start: 42 @44899 has 8 MA's),

Gene: BengiVuitton\_79 Start: 46581, Stop: 46300, Start Num: 31  
Candidate Starts for BengiVuitton\_79:  
(Start: 31 @46581 has 58 MA's), (Start: 32 @46575 has 2 MA's), (59, 46527), (62, 46509), (71, 46452), (74, 46434), (83, 46392), (84, 46353),

Gene: BiancaTri92\_76 Start: 46264, Stop: 45950, Start Num: 31  
Candidate Starts for BiancaTri92\_76:  
(Start: 31 @46264 has 58 MA's), (Start: 50 @46216 has 1 MA's), (62, 46159), (64, 46144), (73, 46093), (74, 46084), (75, 46081), (82, 46045), (84, 46003),

Gene: Blinn1\_84 Start: 45891, Stop: 45631, Start Num: 31  
Candidate Starts for Blinn1\_84:  
(Start: 31 @45891 has 58 MA's), (62, 45831), (64, 45816), (75, 45753), (84, 45675), (85, 45636),

Gene: BlueBird\_85 Start: 47028, Stop: 46792, Start Num: 56  
Candidate Starts for BlueBird\_85:  
(Start: 53 @47049 has 4 MA's), (Start: 56 @47028 has 94 MA's), (69, 46959), (74, 46926), (84, 46848),

Gene: Bluefalcon\_67 Start: 44317, Stop: 44075, Start Num: 41  
Candidate Starts for Bluefalcon\_67:  
(Start: 41 @44317 has 29 MA's), (58, 44284), (60, 44281), (68, 44233), (70, 44212), (78, 44176), (82, 44152),

Gene: BobSwaget\_73 Start: 44446, Stop: 44162, Start Num: 30  
Candidate Starts for BobSwaget\_73:

(6, 44641), (10, 44593), (28, 44455), (Start: 30 @44446 has 2 MA's), (Start: 31 @44443 has 58 MA's), (62, 44377), (76, 44296), (80, 44272), (84, 44221), (87, 44173),

Gene: Bonamassa\_71 Start: 44547, Stop: 44302, Start Num: 41

Candidate Starts for Bonamassa\_71:

(Start: 41 @44547 has 29 MA's), (Start: 56 @44517 has 94 MA's), (78, 44403),

Gene: BreSam8\_83 Start: 46265, Stop: 46035, Start Num: 56

Candidate Starts for BreSam8\_83:

(43, 46307), (Start: 56 @46265 has 94 MA's), (60, 46256), (61, 46244), (62, 46238), (73, 46172),

Gene: Bud\_75 Start: 44421, Stop: 44146, Start Num: 44

Candidate Starts for Bud\_75:

(8, 44661), (11, 44598), (Start: 44 @44421 has 21 MA's), (62, 44352), (66, 44331), (69, 44310), (73, 44286), (75, 44274), (84, 44196),

Gene: Bugatti\_84 Start: 47028, Stop: 46792, Start Num: 56

Candidate Starts for Bugatti\_84:

(Start: 53 @47049 has 4 MA's), (Start: 56 @47028 has 94 MA's), (69, 46959), (74, 46926), (84, 46848),

Gene: Buggy\_81 Start: 47094, Stop: 46774, Start Num: 31

Candidate Starts for Buggy\_81:

(Start: 31 @47094 has 58 MA's), (Start: 50 @47040 has 1 MA's), (55, 47019), (59, 47001), (69, 46941), (70, 46932), (71, 46926), (74, 46908), (84, 46827),

Gene: BuzzBuzz\_77 Start: 46300, Stop: 46070, Start Num: 56

Candidate Starts for BuzzBuzz\_77:

(43, 46342), (Start: 56 @46300 has 94 MA's), (61, 46279), (62, 46273), (73, 46207), (74, 46198),

Gene: Bxz2\_78 Start: 46307, Stop: 46077, Start Num: 56

Candidate Starts for Bxz2\_78:

(43, 46349), (Start: 56 @46307 has 94 MA's), (61, 46286), (62, 46280), (73, 46214), (74, 46205),

Gene: C3\_72 Start: 45517, Stop: 45221, Start Num: 31

Candidate Starts for C3\_72:

(Start: 31 @45517 has 58 MA's), (73, 45385), (84, 45295),

Gene: CRB1\_80 Start: 47036, Stop: 46719, Start Num: 31

Candidate Starts for CRB1\_80:

(Start: 31 @47036 has 58 MA's), (62, 46925), (64, 46910), (72, 46862), (73, 46859), (75, 46847), (84, 46769),

Gene: Candra\_79 Start: 45172, Stop: 44951, Start Num: 56

Candidate Starts for Candra\_79:

(Start: 56 @45172 has 94 MA's), (60, 45160),

Gene: Centaur\_79 Start: 46321, Stop: 46001, Start Num: 31

Candidate Starts for Centaur\_79:

(Start: 31 @46321 has 58 MA's), (Start: 50 @46267 has 1 MA's), (62, 46210), (70, 46159), (71, 46153), (74, 46135), (83, 46093), (84, 46054),

Gene: Chadwick\_75 Start: 44643, Stop: 44401, Start Num: 42

Candidate Starts for Chadwick\_75:  
(Start: 42 @44643 has 8 MA's), (58, 44610),

Gene: Changeling\_78 Start: 46920, Stop: 46642, Start Num: 31  
Candidate Starts for Changeling\_78:  
(Start: 31 @46920 has 58 MA's), (Start: 33 @46914 has 1 MA's), (62, 46857), (73, 46791), (80, 46752), (84, 46701), (87, 46653),

Gene: Chargerpower\_77 Start: 44887, Stop: 44654, Start Num: 35  
Candidate Starts for Chargerpower\_77:  
(21, 44971), (Start: 35 @44887 has 2 MA's), (62, 44854), (74, 44782), (84, 44704),

Gene: Chartreuse\_78 Start: 44471, Stop: 44262, Start Num: 60  
Candidate Starts for Chartreuse\_78:  
(Start: 56 @44483 has 94 MA's), (60, 44471),

Gene: ChipMunk\_80 Start: 47961, Stop: 47692, Start Num: 46  
Candidate Starts for ChipMunk\_80:  
(Start: 46 @47961 has 6 MA's), (49, 47955), (57, 47925), (59, 47916), (62, 47898), (70, 47847), (71, 47841), (74, 47823), (83, 47781), (84, 47742),

Gene: Colbster\_79 Start: 46275, Stop: 46045, Start Num: 56  
Candidate Starts for Colbster\_79:  
(43, 46317), (Start: 56 @46275 has 94 MA's), (60, 46266), (61, 46254), (62, 46248), (73, 46182),

Gene: Colin\_79 Start: 47629, Stop: 47354, Start Num: 31  
Candidate Starts for Colin\_79:  
(Start: 31 @47629 has 58 MA's), (62, 47563), (64, 47548), (75, 47485), (84, 47407),

Gene: Conspiracy\_72 Start: 44599, Stop: 44354, Start Num: 41  
Candidate Starts for Conspiracy\_72:  
(Start: 41 @44599 has 29 MA's), (58, 44563), (68, 44512), (70, 44491), (78, 44455),

Gene: Coog\_68 Start: 44365, Stop: 44123, Start Num: 41  
Candidate Starts for Coog\_68:  
(Start: 41 @44365 has 29 MA's), (58, 44332), (60, 44329), (70, 44260), (78, 44224), (82, 44200),

Gene: Cookiedough\_81 Start: 45790, Stop: 45569, Start Num: 56  
Candidate Starts for Cookiedough\_81:  
(14, 45994), (25, 45904), (Start: 56 @45790 has 94 MA's), (60, 45778),

Gene: Crucio\_79 Start: 46848, Stop: 46531, Start Num: 31  
Candidate Starts for Crucio\_79:  
(Start: 31 @46848 has 58 MA's), (62, 46737), (70, 46686), (71, 46680), (74, 46662), (83, 46620), (84, 46581),

Gene: Cuco\_70 Start: 44225, Stop: 43983, Start Num: 41  
Candidate Starts for Cuco\_70:  
(Start: 41 @44225 has 29 MA's), (58, 44192), (60, 44189), (70, 44120), (78, 44084), (82, 44060),

Gene: Cullens\_84 Start: 46274, Stop: 46044, Start Num: 56  
Candidate Starts for Cullens\_84:  
(43, 46316), (Start: 56 @46274 has 94 MA's), (60, 46265), (61, 46253), (62, 46247), (73, 46181),

Gene: DBQu4n\_80 Start: 46541, Stop: 46269, Start Num: 31  
Candidate Starts for DBQu4n\_80:  
(Start: 31 @46541 has 58 MA's), (62, 46478), (73, 46412), (84, 46322),

Gene: DaHudson\_82 Start: 46264, Stop: 46034, Start Num: 56  
Candidate Starts for DaHudson\_82:  
(43, 46306), (Start: 56 @46264 has 94 MA's), (60, 46255), (61, 46243), (62, 46237), (73, 46171),

Gene: DaVinci\_79 Start: 44537, Stop: 44316, Start Num: 56  
Candidate Starts for DaVinci\_79:  
(Start: 56 @44537 has 94 MA's), (60, 44525),

Gene: Daishi\_82 Start: 45141, Stop: 44911, Start Num: 56  
Candidate Starts for Daishi\_82:  
(43, 45183), (Start: 56 @45141 has 94 MA's), (61, 45120), (62, 45114), (73, 45048), (74, 45039),

Gene: Danforth\_87 Start: 46987, Stop: 46715, Start Num: 39  
Candidate Starts for Danforth\_87:  
(27, 47047), (Start: 39 @46987 has 3 MA's), (Start: 56 @46939 has 94 MA's), (73, 46846), (74, 46837),

Gene: Deloris\_79 Start: 46271, Stop: 45996, Start Num: 32  
Candidate Starts for Deloris\_79:  
(Start: 31 @46277 has 58 MA's), (Start: 32 @46271 has 2 MA's), (59, 46223), (62, 46205), (71, 46148), (74, 46130), (83, 46088), (84, 46049),

Gene: Dieselweasel\_84 Start: 46273, Stop: 46043, Start Num: 56  
Candidate Starts for Dieselweasel\_84:  
(43, 46315), (Start: 56 @46273 has 94 MA's), (60, 46264), (61, 46252), (62, 46246), (73, 46180),

Gene: Dignity\_81 Start: 47132, Stop: 46812, Start Num: 31  
Candidate Starts for Dignity\_81:  
(Start: 31 @47132 has 58 MA's), (Start: 50 @47078 has 1 MA's), (55, 47057), (59, 47039), (69, 46979), (70, 46970), (71, 46964), (74, 46946), (84, 46865),

Gene: Discoknowium\_69 Start: 44116, Stop: 43871, Start Num: 41  
Candidate Starts for Discoknowium\_69:  
(Start: 41 @44116 has 29 MA's), (58, 44080), (68, 44029), (70, 44008), (78, 43972),

Gene: Dixon\_85 Start: 46439, Stop: 46197, Start Num: 51  
Candidate Starts for Dixon\_85:  
(Start: 51 @46439 has 8 MA's), (73, 46328), (74, 46319), (78, 46307),

Gene: Dorothea\_78 Start: 45783, Stop: 45562, Start Num: 56  
Candidate Starts for Dorothea\_78:  
(Start: 56 @45783 has 94 MA's), (60, 45771),

Gene: Drake55\_80 Start: 46578, Stop: 46258, Start Num: 31  
Candidate Starts for Drake55\_80:  
(Start: 31 @46578 has 58 MA's), (59, 46485), (62, 46467), (71, 46410), (74, 46392), (84, 46311),

Gene: Dublin\_71 Start: 44497, Stop: 44255, Start Num: 41

Candidate Starts for Dublin\_71:

(Start: 41 @44497 has 29 MA's), (58, 44464), (60, 44461), (68, 44413), (70, 44392), (78, 44356), (82, 44332),

Gene: EZMoney23\_75 Start: 46037, Stop: 45765, Start Num: 31

Candidate Starts for EZMoney23\_75:

(4, 46337), (Start: 31 @46037 has 58 MA's), (34, 46031), (62, 45974), (73, 45908), (84, 45818),

Gene: EagleEye\_82 Start: 46572, Stop: 46357, Start Num: 16

Candidate Starts for EagleEye\_82:

(7, 46689), (9, 46659), (15, 46584), (Start: 16 @46572 has 1 MA's), (24, 46542), (26, 46512), (29, 46503), (38, 46464), (63, 46389),

Gene: Ebony\_80 Start: 45555, Stop: 45280, Start Num: 44

Candidate Starts for Ebony\_80:

(11, 45732), (Start: 44 @45555 has 21 MA's), (62, 45486), (66, 45465), (69, 45444), (73, 45420), (75, 45408), (84, 45330),

Gene: EITiger69\_77 Start: 45591, Stop: 45328, Start Num: 41

Candidate Starts for EITiger69\_77:

(Start: 41 @45591 has 29 MA's), (Start: 42 @45588 has 8 MA's), (47, 45576), (Start: 51 @45570 has 8 MA's), (Start: 56 @45543 has 94 MA's), (58, 45537), (78, 45429),

Gene: EpicPhail\_84 Start: 46275, Stop: 46045, Start Num: 56

Candidate Starts for EpicPhail\_84:

(43, 46317), (Start: 56 @46275 has 94 MA's), (60, 46266), (61, 46254), (62, 46248), (73, 46182),

Gene: Equemioh13\_79 Start: 46550, Stop: 46230, Start Num: 31

Candidate Starts for Equemioh13\_79:

(Start: 31 @46550 has 58 MA's), (Start: 50 @46496 has 1 MA's), (62, 46439), (70, 46388), (71, 46382), (74, 46364), (83, 46322), (84, 46283),

Gene: EricB\_80 Start: 45129, Stop: 44908, Start Num: 56

Candidate Starts for EricB\_80:

(Start: 56 @45129 has 94 MA's), (60, 45117),

Gene: Et2Brutus\_79 Start: 45518, Stop: 45243, Start Num: 44

Candidate Starts for Et2Brutus\_79:

(8, 45758), (11, 45695), (Start: 44 @45518 has 21 MA's), (62, 45449), (66, 45428), (69, 45407), (73, 45383), (75, 45371), (84, 45293),

Gene: EvilGenius\_79 Start: 47962, Stop: 47693, Start Num: 46

Candidate Starts for EvilGenius\_79:

(Start: 46 @47962 has 6 MA's), (49, 47956), (57, 47926), (59, 47917), (62, 47899), (70, 47848), (71, 47842), (74, 47824), (83, 47782), (84, 47743),

Gene: Expelliarmus\_83 Start: 46653, Stop: 46411, Start Num: 51

Candidate Starts for Expelliarmus\_83:

(Start: 51 @46653 has 8 MA's), (73, 46542), (74, 46533), (78, 46521),

Gene: Farber\_83 Start: 46261, Stop: 46031, Start Num: 56

Candidate Starts for Farber\_83:

(43, 46303), (Start: 56 @46261 has 94 MA's), (60, 46252), (61, 46240), (62, 46234), (73, 46168),



Gene: Fernando\_84 Start: 46274, Stop: 46044, Start Num: 56

Candidate Starts for Fernando\_84:

(43, 46316), (Start: 56 @46274 has 94 MA's), (60, 46265), (61, 46253), (62, 46247), (73, 46181),

Gene: Fibonacci\_79 Start: 45524, Stop: 45249, Start Num: 44

Candidate Starts for Fibonacci\_79:

(8, 45764), (11, 45701), (Start: 44 @45524 has 21 MA's), (62, 45455), (66, 45434), (69, 45413), (73, 45389), (75, 45377), (84, 45299),

Gene: FiringLine\_79 Start: 46830, Stop: 46513, Start Num: 31

Candidate Starts for FiringLine\_79:

(Start: 31 @46830 has 58 MA's), (62, 46719), (70, 46668), (71, 46662), (74, 46644), (83, 46602), (84, 46563),

Gene: First\_0080 Start: 46674, Stop: 46357, Start Num: 31

Candidate Starts for First\_0080:

(Start: 31 @46674 has 58 MA's), (62, 46563), (70, 46512), (71, 46506), (74, 46488), (83, 46446), (84, 46407),

Gene: Flare16\_79 Start: 46365, Stop: 46045, Start Num: 31

Candidate Starts for Flare16\_79:

(Start: 31 @46365 has 58 MA's), (Start: 50 @46311 has 1 MA's), (62, 46254), (70, 46203), (71, 46197), (74, 46179), (83, 46137), (84, 46098),

Gene: Flaverint\_81 Start: 45982, Stop: 45707, Start Num: 44

Candidate Starts for Flaverint\_81:

(8, 46222), (11, 46159), (Start: 44 @45982 has 21 MA's), (62, 45913), (66, 45892), (69, 45871), (73, 45847), (75, 45835), (84, 45757),

Gene: ForGetIt\_72 Start: 44624, Stop: 44379, Start Num: 41

Candidate Starts for ForGetIt\_72:

(Start: 41 @44624 has 29 MA's), (58, 44588), (68, 44537), (70, 44516), (78, 44480),

Gene: Fred313\_80 Start: 46658, Stop: 46422, Start Num: 56

Candidate Starts for Fred313\_80:

(Start: 53 @46679 has 4 MA's), (Start: 56 @46658 has 94 MA's), (69, 46589), (74, 46556),

Gene: Gemma\_80 Start: 46081, Stop: 45851, Start Num: 56

Candidate Starts for Gemma\_80:

(22, 46231), (43, 46123), (52, 46105), (Start: 56 @46081 has 94 MA's), (69, 46012), (73, 45988), (84, 45901),

Gene: George\_66 Start: 44285, Stop: 44040, Start Num: 41

Candidate Starts for George\_66:

(Start: 41 @44285 has 29 MA's), (Start: 56 @44255 has 94 MA's), (68, 44198), (78, 44141),

Gene: Georgie2\_81 Start: 47034, Stop: 46717, Start Num: 31

Candidate Starts for Georgie2\_81:

(Start: 31 @47034 has 58 MA's), (62, 46923), (70, 46872), (71, 46866), (74, 46848), (83, 46806), (84, 46767),

Gene: Ghouboy\_71 Start: 44592, Stop: 44350, Start Num: 41

Candidate Starts for Ghoulboy\_71:

(Start: 41 @44592 has 29 MA's), (58, 44559), (60, 44556), (61, 44544), (68, 44508), (70, 44487), (78, 44451), (82, 44427),

Gene: Gilberta\_77 Start: 44858, Stop: 44583, Start Num: 44

Candidate Starts for Gilberta\_77:

(8, 45098), (11, 45035), (Start: 44 @44858 has 21 MA's), (62, 44789), (66, 44768), (69, 44747), (73, 44723), (75, 44711), (84, 44633),

Gene: GingkoMaracino\_83 Start: 46157, Stop: 45927, Start Num: 56

Candidate Starts for GingkoMaracino\_83:

(43, 46199), (Start: 56 @46157 has 94 MA's), (60, 46148), (61, 46136), (62, 46130), (73, 46064),

Gene: Giroux\_81 Start: 47027, Stop: 46791, Start Num: 56

Candidate Starts for Giroux\_81:

(Start: 53 @47048 has 4 MA's), (Start: 56 @47027 has 94 MA's), (69, 46958), (74, 46925), (84, 46847),

Gene: Grif\_81 Start: 46348, Stop: 46118, Start Num: 56

Candidate Starts for Grif\_81:

(43, 46390), (Start: 56 @46348 has 94 MA's), (60, 46339), (61, 46327), (62, 46321), (73, 46255),

Gene: Groundhog\_84 Start: 46709, Stop: 46467, Start Num: 51

Candidate Starts for Groundhog\_84:

(Start: 51 @46709 has 8 MA's), (73, 46598), (74, 46589), (78, 46577),

Gene: Groupthink\_83 Start: 46082, Stop: 45852, Start Num: 56

Candidate Starts for Groupthink\_83:

(22, 46232), (43, 46124), (52, 46106), (Start: 56 @46082 has 94 MA's), (69, 46013), (73, 45989), (84, 45902),

Gene: Grub\_81 Start: 46264, Stop: 46034, Start Num: 56

Candidate Starts for Grub\_81:

(43, 46306), (Start: 56 @46264 has 94 MA's), (60, 46255), (61, 46243), (62, 46237), (73, 46171),

Gene: Grum1\_83 Start: 46274, Stop: 46044, Start Num: 56

Candidate Starts for Grum1\_83:

(43, 46316), (Start: 56 @46274 has 94 MA's), (60, 46265), (61, 46253), (62, 46247), (73, 46181),

Gene: GtownJaz\_83 Start: 46272, Stop: 46042, Start Num: 56

Candidate Starts for GtownJaz\_83:

(43, 46314), (Start: 56 @46272 has 94 MA's), (60, 46263), (61, 46251), (62, 46245), (73, 46179),

Gene: HarryHoudini\_79 Start: 46575, Stop: 46255, Start Num: 31

Candidate Starts for HarryHoudini\_79:

(Start: 31 @46575 has 58 MA's), (59, 46482), (62, 46464), (71, 46407), (74, 46389), (84, 46308),

Gene: HashRod\_84 Start: 46301, Stop: 46071, Start Num: 56

Candidate Starts for HashRod\_84:

(43, 46343), (Start: 56 @46301 has 94 MA's), (60, 46292), (61, 46280), (62, 46274), (73, 46208),

Gene: HaveUMetTed\_83 Start: 46070, Stop: 45840, Start Num: 56

Candidate Starts for HaveUMetTed\_83:

(22, 46220), (43, 46112), (52, 46094), (Start: 56 @46070 has 94 MA's), (69, 46001), (73, 45977), (84, 45890),

Gene: Heathen\_82 Start: 46746, Stop: 46510, Start Num: 56

Candidate Starts for Heathen\_82:

(Start: 53 @46767 has 4 MA's), (Start: 56 @46746 has 94 MA's), (69, 46677), (74, 46644),

Gene: HelDan\_83 Start: 46990, Stop: 46733, Start Num: 53

Candidate Starts for HelDan\_83:

(Start: 53 @46990 has 4 MA's), (Start: 56 @46969 has 94 MA's), (69, 46900), (74, 46867),

Gene: Heliosoles\_80 Start: 46086, Stop: 45856, Start Num: 56

Candidate Starts for Heliosoles\_80:

(22, 46236), (43, 46128), (52, 46110), (Start: 56 @46086 has 94 MA's), (69, 46017), (73, 45993), (84, 45906),

Gene: Hercules11\_83 Start: 46283, Stop: 46053, Start Num: 56

Candidate Starts for Hercules11\_83:

(43, 46325), (Start: 56 @46283 has 94 MA's), (60, 46274), (61, 46262), (62, 46256), (73, 46190),

Gene: Hoot\_76 Start: 42987, Stop: 42766, Start Num: 56

Candidate Starts for Hoot\_76:

(14, 43191), (25, 43101), (Start: 56 @42987 has 94 MA's), (60, 42975),

Gene: HuhtaEnerson15\_69 Start: 44200, Stop: 43955, Start Num: 41

Candidate Starts for HuhtaEnerson15\_69:

(Start: 41 @44200 has 29 MA's), (Start: 56 @44170 has 94 MA's), (78, 44056),

Gene: Hutc2\_76 Start: 44408, Stop: 44133, Start Num: 44

Candidate Starts for Hutc2\_76:

(8, 44648), (11, 44585), (Start: 44 @44408 has 21 MA's), (62, 44339), (66, 44318), (69, 44297), (73, 44273), (75, 44261), (84, 44183),

Gene: Idleandcovert\_83 Start: 47049, Stop: 46792, Start Num: 53

Candidate Starts for Idleandcovert\_83:

(Start: 53 @47049 has 4 MA's), (Start: 56 @47028 has 94 MA's), (69, 46959), (74, 46926), (84, 46848),

Gene: Insomnia\_78 Start: 45699, Stop: 45424, Start Num: 44

Candidate Starts for Insomnia\_78:

(8, 45939), (11, 45876), (Start: 44 @45699 has 21 MA's), (62, 45630), (66, 45609), (69, 45588), (73, 45564), (75, 45552), (84, 45474),

Gene: Isiphiwo\_78 Start: 45157, Stop: 44936, Start Num: 56

Candidate Starts for Isiphiwo\_78:

(14, 45361), (25, 45271), (Start: 56 @45157 has 94 MA's), (60, 45145),

Gene: Iwokeuplikedis\_81 Start: 47056, Stop: 46784, Start Num: 46

Candidate Starts for Iwokeuplikedis\_81:

(Start: 46 @47056 has 6 MA's), (49, 47050), (62, 46993), (71, 46936), (74, 46918), (83, 46876), (84, 46837),

Gene: JHC117\_78 Start: 46269, Stop: 46039, Start Num: 56

Candidate Starts for JHC117\_78:

(43, 46311), (Start: 56 @46269 has 94 MA's), (60, 46260), (61, 46248), (62, 46242), (73, 46176),

Gene: Jabiru\_73 Start: 44754, Stop: 44512, Start Num: 42

Candidate Starts for Jabiru\_73:

(Start: 42 @44754 has 8 MA's),

Gene: Jabith\_79 Start: 45716, Stop: 45441, Start Num: 44

Candidate Starts for Jabith\_79:

(8, 45956), (11, 45893), (Start: 44 @45716 has 21 MA's), (62, 45647), (66, 45626), (69, 45605), (73, 45581), (75, 45569), (84, 45491),

Gene: JenCasNa\_84 Start: 46274, Stop: 46044, Start Num: 56

Candidate Starts for JenCasNa\_84:

(43, 46316), (Start: 56 @46274 has 94 MA's), (60, 46265), (61, 46253), (62, 46247), (73, 46181),

Gene: JeppNRM\_83 Start: 46084, Stop: 45854, Start Num: 56

Candidate Starts for JeppNRM\_83:

(22, 46234), (43, 46126), (52, 46108), (Start: 56 @46084 has 94 MA's), (60, 46075), (69, 46015), (73, 45991), (84, 45904),

Gene: Jerm\_81 Start: 47115, Stop: 46795, Start Num: 31

Candidate Starts for Jerm\_81:

(Start: 31 @47115 has 58 MA's), (Start: 50 @47061 has 1 MA's), (55, 47040), (59, 47022), (69, 46962), (70, 46953), (71, 46947), (74, 46929), (84, 46848),

Gene: Jobu08\_79 Start: 46098, Stop: 45868, Start Num: 56

Candidate Starts for Jobu08\_79:

(12, 46320), (43, 46140), (Start: 56 @46098 has 94 MA's), (60, 46089), (61, 46077), (62, 46071), (73, 46005), (84, 45918),

Gene: Jordennis\_79 Start: 45369, Stop: 45148, Start Num: 56

Candidate Starts for Jordennis\_79:

(Start: 56 @45369 has 94 MA's), (60, 45357),

Gene: Joselito\_79 Start: 45736, Stop: 45461, Start Num: 44

Candidate Starts for Joselito\_79:

(8, 45976), (11, 45913), (Start: 44 @45736 has 21 MA's), (62, 45667), (66, 45646), (69, 45625), (73, 45601), (75, 45589), (84, 45511),

Gene: JoshKayV\_81 Start: 47259, Stop: 46987, Start Num: 31

Candidate Starts for JoshKayV\_81:

(Start: 31 @47259 has 58 MA's), (Start: 50 @47253 has 1 MA's), (59, 47214), (69, 47154), (70, 47145), (71, 47139), (74, 47121), (84, 47040),

Gene: Jovo\_71 Start: 44880, Stop: 44635, Start Num: 41

Candidate Starts for Jovo\_71:

(Start: 41 @44880 has 29 MA's), (58, 44844), (68, 44793), (70, 44772), (78, 44736),

Gene: KADY\_80 Start: 46301, Stop: 46071, Start Num: 56

Candidate Starts for KADY\_80:

(43, 46343), (Start: 56 @46301 has 94 MA's), (61, 46280), (62, 46274), (73, 46208), (74, 46199),

Gene: Kalb97\_83 Start: 45452, Stop: 45192, Start Num: 56  
Candidate Starts for Kalb97\_83:  
(22, 45602), (43, 45494), (52, 45476), (Start: 56 @45452 has 94 MA's), (60, 45443), (69, 45383), (73, 45359), (84, 45272), (86, 45224),

Gene: Kalnoky\_83 Start: 46079, Stop: 45849, Start Num: 56  
Candidate Starts for Kalnoky\_83:  
(22, 46229), (43, 46121), (52, 46103), (Start: 56 @46079 has 94 MA's), (69, 46010), (73, 45986), (84, 45899),

Gene: Kazan\_82 Start: 45142, Stop: 44921, Start Num: 56  
Candidate Starts for Kazan\_82:  
(Start: 56 @45142 has 94 MA's), (60, 45130),

Gene: Kerberos\_80 Start: 46561, Stop: 46289, Start Num: 31  
Candidate Starts for Kerberos\_80:  
(Start: 31 @46561 has 58 MA's), (62, 46498), (73, 46432), (84, 46342),

Gene: KingCyrus\_78 Start: 47984, Stop: 47667, Start Num: 31  
Candidate Starts for KingCyrus\_78:  
(Start: 31 @47984 has 58 MA's), (62, 47873), (70, 47822), (71, 47816), (74, 47798), (83, 47756), (84, 47717),

Gene: Kipper29\_81 Start: 45155, Stop: 44934, Start Num: 56  
Candidate Starts for Kipper29\_81:  
(Start: 56 @45155 has 94 MA's), (60, 45143),

Gene: LBerry\_84 Start: 46275, Stop: 46045, Start Num: 56  
Candidate Starts for LBerry\_84:  
(43, 46317), (Start: 56 @46275 has 94 MA's), (60, 46266), (61, 46254), (62, 46248), (73, 46182),

Gene: LadyBird\_83 Start: 47185, Stop: 46904, Start Num: 31  
Candidate Starts for LadyBird\_83:  
(Start: 31 @47185 has 58 MA's), (Start: 32 @47179 has 2 MA's), (59, 47131), (62, 47113), (71, 47056), (74, 47038), (83, 46996), (84, 46957),

Gene: Larenn\_77 Start: 46535, Stop: 46206, Start Num: 31  
Candidate Starts for Larenn\_77:  
(Start: 31 @46535 has 58 MA's), (37, 46502), (Start: 50 @46472 has 1 MA's), (59, 46433), (62, 46415), (70, 46364), (71, 46358), (74, 46340), (83, 46298), (84, 46259),

Gene: LarryKay\_83 Start: 46305, Stop: 46075, Start Num: 56  
Candidate Starts for LarryKay\_83:  
(43, 46347), (Start: 56 @46305 has 94 MA's), (60, 46296), (61, 46284), (62, 46278), (73, 46212),

Gene: Lev2\_72 Start: 44512, Stop: 44267, Start Num: 41  
Candidate Starts for Lev2\_72:  
(Start: 41 @44512 has 29 MA's), (58, 44476), (68, 44425), (70, 44404), (78, 44368),

Gene: Leviathan\_81 Start: 47181, Stop: 46861, Start Num: 31  
Candidate Starts for Leviathan\_81:  
(Start: 31 @47181 has 58 MA's), (Start: 50 @47127 has 1 MA's), (55, 47106), (59, 47088), (69, 47028), (70, 47019), (71, 47013), (74, 46995), (84, 46914),

Gene: LilTurb\_80 Start: 46995, Stop: 46675, Start Num: 31

Candidate Starts for LilTurb\_80:

(Start: 31 @46995 has 58 MA's), (Start: 50 @46941 has 1 MA's), (55, 46920), (59, 46902), (69, 46842), (70, 46833), (71, 46827), (74, 46809), (84, 46728),

Gene: Lilith\_81 Start: 46264, Stop: 46034, Start Num: 56

Candidate Starts for Lilith\_81:

(43, 46306), (Start: 56 @46264 has 94 MA's), (60, 46255), (61, 46243), (62, 46237), (73, 46171),

Gene: LittleCherry\_70 Start: 44070, Stop: 43825, Start Num: 41

Candidate Starts for LittleCherry\_70:

(Start: 41 @44070 has 29 MA's), (Start: 56 @44040 has 94 MA's), (68, 43983), (78, 43926),

Gene: Lokk\_74 Start: 45070, Stop: 44786, Start Num: 30

Candidate Starts for Lokk\_74:

(6, 45265), (10, 45217), (28, 45079), (Start: 30 @45070 has 2 MA's), (Start: 31 @45067 has 58 MA's), (62, 45001), (76, 44920), (80, 44896), (84, 44845), (87, 44797),

Gene: Loser\_83 Start: 47509, Stop: 47237, Start Num: 31

Candidate Starts for Loser\_83:

(Start: 31 @47509 has 58 MA's), (Start: 33 @47503 has 1 MA's), (62, 47446), (73, 47380), (79, 47353), (84, 47290),

Gene: Louie6\_82 Start: 46302, Stop: 46072, Start Num: 56

Candidate Starts for Louie6\_82:

(43, 46344), (Start: 56 @46302 has 94 MA's), (61, 46281), (62, 46275), (73, 46209), (74, 46200),

Gene: Lucivia\_81 Start: 46015, Stop: 45740, Start Num: 44

Candidate Starts for Lucivia\_81:

(8, 46255), (11, 46192), (Start: 44 @46015 has 21 MA's), (62, 45946), (66, 45925), (69, 45904), (73, 45880), (75, 45868), (84, 45790),

Gene: LugYA\_86 Start: 46275, Stop: 46045, Start Num: 56

Candidate Starts for LugYA\_86:

(43, 46317), (Start: 56 @46275 has 94 MA's), (60, 46266), (61, 46254), (62, 46248), (73, 46182),

Gene: MaCh\_80 Start: 45979, Stop: 45704, Start Num: 44

Candidate Starts for MaCh\_80:

(8, 46219), (11, 46156), (Start: 44 @45979 has 21 MA's), (62, 45910), (66, 45889), (69, 45868), (73, 45844), (75, 45832), (84, 45754),

Gene: Mabel\_80 Start: 45980, Stop: 45705, Start Num: 44

Candidate Starts for Mabel\_80:

(8, 46220), (11, 46157), (Start: 44 @45980 has 21 MA's), (62, 45911), (66, 45890), (69, 45869), (73, 45845), (75, 45833), (84, 45755),

Gene: MadMarie\_81 Start: 46272, Stop: 46042, Start Num: 56

Candidate Starts for MadMarie\_81:

(43, 46314), (Start: 56 @46272 has 94 MA's), (60, 46263), (61, 46251), (62, 46245), (73, 46179),

Gene: Mainiac\_82 Start: 46264, Stop: 46034, Start Num: 56

Candidate Starts for Mainiac\_82:

(43, 46306), (Start: 56 @46264 has 94 MA's), (60, 46255), (61, 46243), (62, 46237), (73, 46171),

Gene: Malec\_78 Start: 47105, Stop: 46776, Start Num: 31

Candidate Starts for Malec\_78:

(Start: 31 @47105 has 58 MA's), (37, 47072), (Start: 50 @47042 has 1 MA's), (59, 47003), (62, 46985), (70, 46934), (71, 46928), (74, 46910), (83, 46868), (84, 46829),

Gene: Malinsilva\_86 Start: 46263, Stop: 46033, Start Num: 56

Candidate Starts for Malinsilva\_86:

(43, 46305), (Start: 56 @46263 has 94 MA's), (60, 46254), (61, 46242), (62, 46236), (73, 46170),

Gene: Manu\_82 Start: 46086, Stop: 45856, Start Num: 56

Candidate Starts for Manu\_82:

(22, 46236), (43, 46128), (52, 46110), (Start: 56 @46086 has 94 MA's), (69, 46017), (73, 45993), (84, 45906),

Gene: MarQuardt\_83 Start: 46273, Stop: 46043, Start Num: 56

Candidate Starts for MarQuardt\_83:

(43, 46315), (Start: 56 @46273 has 94 MA's), (60, 46264), (61, 46252), (62, 46246), (73, 46180),

Gene: Marie\_81 Start: 46274, Stop: 46044, Start Num: 56

Candidate Starts for Marie\_81:

(43, 46316), (Start: 56 @46274 has 94 MA's), (60, 46265), (61, 46253), (62, 46247), (73, 46181),

Gene: Marius\_83 Start: 46079, Stop: 45849, Start Num: 56

Candidate Starts for Marius\_83:

(22, 46229), (43, 46121), (52, 46103), (Start: 56 @46079 has 94 MA's), (69, 46010), (73, 45986), (84, 45899),

Gene: MarysWell\_71 Start: 44740, Stop: 44498, Start Num: 41

Candidate Starts for MarysWell\_71:

(Start: 41 @44740 has 29 MA's), (58, 44707), (60, 44704), (68, 44656), (70, 44635), (78, 44599), (82, 44575),

Gene: McFly\_81 Start: 45491, Stop: 45270, Start Num: 56

Candidate Starts for McFly\_81:

(Start: 56 @45491 has 94 MA's), (60, 45479),

Gene: Methuselah\_76 Start: 46295, Stop: 46065, Start Num: 56

Candidate Starts for Methuselah\_76:

(43, 46337), (Start: 56 @46295 has 94 MA's), (60, 46286), (61, 46274), (62, 46268), (73, 46202),

Gene: Micasa\_69 Start: 44462, Stop: 44220, Start Num: 41

Candidate Starts for Micasa\_69:

(Start: 41 @44462 has 29 MA's), (58, 44429), (60, 44426), (68, 44378), (70, 44357), (78, 44321), (82, 44297),

Gene: Microwolf\_79 Start: 46287, Stop: 46057, Start Num: 56

Candidate Starts for Microwolf\_79:

(43, 46329), (Start: 56 @46287 has 94 MA's), (60, 46278), (61, 46266), (62, 46260), (73, 46194),

Gene: MiculUcigas\_79 Start: 46268, Stop: 45948, Start Num: 31

Candidate Starts for MiculUcigas\_79:

(Start: 31 @46268 has 58 MA's), (Start: 50 @46214 has 1 MA's), (62, 46157), (70, 46106), (71, 46100), (74, 46082), (83, 46040), (84, 46001),

Gene: Midas2\_68 Start: 44365, Stop: 44123, Start Num: 41

Candidate Starts for Midas2\_68:

(Start: 41 @44365 has 29 MA's), (58, 44332), (60, 44329), (70, 44260), (78, 44224), (82, 44200),

Gene: Miko\_74 Start: 45841, Stop: 45563, Start Num: 31

Candidate Starts for Miko\_74:

(5, 46138), (Start: 31 @45841 has 58 MA's), (34, 45835), (62, 45778), (76, 45697), (80, 45673), (84, 45622), (87, 45574),

Gene: Milcery\_71 Start: 44253, Stop: 44008, Start Num: 41

Candidate Starts for Milcery\_71:

(Start: 41 @44253 has 29 MA's), (Start: 56 @44223 has 94 MA's), (68, 44166), (78, 44109),

Gene: MissWhite\_74 Start: 43643, Stop: 43320, Start Num: 45

Candidate Starts for MissWhite\_74:

(18, 43754), (20, 43748), (Start: 45 @43643 has 1 MA's), (48, 43637), (62, 43577), (66, 43556), (73, 43511), (86, 43373),

Gene: MoneyMay\_83 Start: 46274, Stop: 46044, Start Num: 56

Candidate Starts for MoneyMay\_83:

(43, 46316), (Start: 56 @46274 has 94 MA's), (60, 46265), (61, 46253), (62, 46247), (73, 46181),

Gene: MuchMore\_86 Start: 46260, Stop: 46030, Start Num: 56

Candidate Starts for MuchMore\_86:

(43, 46302), (Start: 56 @46260 has 94 MA's), (60, 46251), (61, 46239), (62, 46233), (73, 46167),

Gene: Mulciber\_78 Start: 45521, Stop: 45246, Start Num: 44

Candidate Starts for Mulciber\_78:

(8, 45761), (11, 45698), (Start: 44 @45521 has 21 MA's), (62, 45452), (66, 45431), (69, 45410), (73, 45386), (75, 45374), (84, 45296),

Gene: Munch\_80 Start: 45984, Stop: 45709, Start Num: 44

Candidate Starts for Munch\_80:

(8, 46224), (11, 46161), (Start: 44 @45984 has 21 MA's), (62, 45915), (66, 45894), (69, 45873), (73, 45849), (75, 45837), (84, 45759),

Gene: MyraDee\_74 Start: 43043, Stop: 42735, Start Num: 35

Candidate Starts for MyraDee\_74:

(1, 43406), (3, 43385), (Start: 35 @43043 has 2 MA's), (Start: 39 @43022 has 3 MA's), (40, 43019), (54, 42980), (62, 42941), (84, 42788),

Gene: NaSiaTalie\_80 Start: 46561, Stop: 46298, Start Num: 31

Candidate Starts for NaSiaTalie\_80:

(Start: 31 @46561 has 58 MA's), (36, 46540), (64, 46489), (75, 46426),

Gene: Naca\_74 Start: 45642, Stop: 45400, Start Num: 42

Candidate Starts for Naca\_74:

(Start: 42 @45642 has 8 MA's),

Gene: NearlyHeadless\_87 Start: 46723, Stop: 46481, Start Num: 51



Candidate Starts for NearlyHeadless\_87:  
(Start: 51 @46723 has 8 MA's), (73, 46612), (74, 46603),

Gene: Neeharika16\_79 Start: 45241, Stop: 45020, Start Num: 56  
Candidate Starts for Neeharika16\_79:  
(14, 45445), (25, 45355), (Start: 56 @45241 has 94 MA's), (60, 45229),

Gene: Newrala\_80 Start: 45577, Stop: 45356, Start Num: 56  
Candidate Starts for Newrala\_80:  
(14, 45781), (25, 45691), (Start: 56 @45577 has 94 MA's), (60, 45565),

Gene: NicoleTera\_77 Start: 46504, Stop: 46226, Start Num: 31  
Candidate Starts for NicoleTera\_77:  
(Start: 31 @46504 has 58 MA's), (34, 46498), (62, 46441), (73, 46375), (80, 46336), (84, 46285), (87, 46237),

Gene: NothingSpecial\_73 Start: 46180, Stop: 45911, Start Num: 46  
Candidate Starts for NothingSpecial\_73:  
(Start: 46 @46180 has 6 MA's), (49, 46174), (59, 46135), (62, 46117), (71, 46060), (74, 46042), (84, 45961),

Gene: OlanP\_81 Start: 46258, Stop: 46028, Start Num: 56  
Candidate Starts for OlanP\_81:  
(17, 46432), (22, 46408), (43, 46300), (52, 46282), (Start: 56 @46258 has 94 MA's), (69, 46189), (73, 46165), (84, 46078),

Gene: Ollie\_83 Start: 46142, Stop: 45912, Start Num: 56  
Candidate Starts for Ollie\_83:  
(43, 46184), (Start: 56 @46142 has 94 MA's), (60, 46133), (61, 46121), (62, 46115), (73, 46049),

Gene: Orange\_80 Start: 45534, Stop: 45259, Start Num: 44  
Candidate Starts for Orange\_80:  
(8, 45774), (11, 45711), (Start: 44 @45534 has 21 MA's), (62, 45465), (66, 45444), (69, 45423), (73, 45399), (75, 45387), (84, 45309),

Gene: P28Green\_83 Start: 46277, Stop: 46047, Start Num: 56  
Candidate Starts for P28Green\_83:  
(43, 46319), (Start: 56 @46277 has 94 MA's), (60, 46268), (61, 46256), (62, 46250), (73, 46184),

Gene: PGHhamlin\_85 Start: 46263, Stop: 46033, Start Num: 56  
Candidate Starts for PGHhamlin\_85:  
(43, 46305), (Start: 56 @46263 has 94 MA's), (60, 46254), (61, 46242), (62, 46236), (73, 46170),

Gene: Pawn\_81 Start: 46086, Stop: 45856, Start Num: 56  
Candidate Starts for Pawn\_81:  
(22, 46236), (43, 46128), (52, 46110), (Start: 56 @46086 has 94 MA's), (69, 46017), (73, 45993), (84, 45906),

Gene: Pembroke\_83 Start: 46272, Stop: 46042, Start Num: 56  
Candidate Starts for Pembroke\_83:  
(43, 46314), (Start: 56 @46272 has 94 MA's), (60, 46263), (61, 46251), (62, 46245), (73, 46179),

Gene: Penny1\_83 Start: 46275, Stop: 46045, Start Num: 56

Candidate Starts for Penny1\_83:

(43, 46317), (Start: 56 @46275 has 94 MA's), (60, 46266), (61, 46254), (62, 46248), (73, 46182),

Gene: Petersenfast\_74 Start: 44415, Stop: 44140, Start Num: 44

Candidate Starts for Petersenfast\_74:

(8, 44655), (11, 44592), (Start: 44 @44415 has 21 MA's), (62, 44346), (66, 44325), (69, 44304), (73, 44280), (75, 44268), (84, 44190),

Gene: PetterN\_79 Start: 45429, Stop: 45187, Start Num: 42

Candidate Starts for PetterN\_79:

(Start: 42 @45429 has 8 MA's),

Gene: Phillis\_83 Start: 45739, Stop: 45497, Start Num: 51

Candidate Starts for Phillis\_83:

(Start: 51 @45739 has 8 MA's), (62, 45694), (73, 45628), (77, 45610),

Gene: PhishRPhriends\_79 Start: 45266, Stop: 45036, Start Num: 56

Candidate Starts for PhishRPhriends\_79:

(22, 45416), (43, 45308), (52, 45290), (Start: 56 @45266 has 94 MA's), (69, 45197), (73, 45173), (84, 45086),

Gene: Phlorence\_70 Start: 44259, Stop: 44014, Start Num: 41

Candidate Starts for Phlorence\_70:

(Start: 41 @44259 has 29 MA's), (58, 44223), (68, 44172), (70, 44151), (78, 44115),

Gene: Phoebe\_84 Start: 46267, Stop: 46037, Start Num: 56

Candidate Starts for Phoebe\_84:

(43, 46309), (Start: 56 @46267 has 94 MA's), (60, 46258), (61, 46246), (62, 46240), (73, 46174),

Gene: Phoxy\_83 Start: 46296, Stop: 46066, Start Num: 56

Candidate Starts for Phoxy\_83:

(43, 46338), (Start: 56 @46296 has 94 MA's), (60, 46287), (61, 46275), (62, 46269), (73, 46203),

Gene: PickleBack\_72 Start: 44434, Stop: 44189, Start Num: 41

Candidate Starts for PickleBack\_72:

(Start: 41 @44434 has 29 MA's), (58, 44398), (68, 44347), (70, 44326), (78, 44290),

Gene: Piro94\_78 Start: 46509, Stop: 46189, Start Num: 31

Candidate Starts for Piro94\_78:

(Start: 31 @46509 has 58 MA's), (59, 46416), (62, 46398), (71, 46341), (74, 46323), (84, 46242),

Gene: Pistachio\_83 Start: 46575, Stop: 46339, Start Num: 56

Candidate Starts for Pistachio\_83:

(Start: 53 @46596 has 4 MA's), (Start: 56 @46575 has 94 MA's), (69, 46506), (74, 46473), (84, 46395),

Gene: Pmask\_80 Start: 45778, Stop: 45557, Start Num: 56

Candidate Starts for Pmask\_80:

(14, 45982), (25, 45892), (Start: 56 @45778 has 94 MA's), (60, 45766),

Gene: Pomar16\_80 Start: 46631, Stop: 46359, Start Num: 31

Candidate Starts for Pomar16\_80:

(Start: 31 @46631 has 58 MA's), (62, 46568), (73, 46502), (84, 46412),

Gene: PotatoSplit\_84 Start: 46275, Stop: 46045, Start Num: 56

Candidate Starts for PotatoSplit\_84:

(43, 46317), (Start: 56 @46275 has 94 MA's), (60, 46266), (61, 46254), (62, 46248), (73, 46182),

Gene: Power\_79 Start: 47033, Stop: 46716, Start Num: 31

Candidate Starts for Power\_79:

(Start: 31 @47033 has 58 MA's), (62, 46922), (70, 46871), (71, 46865), (74, 46847), (83, 46805), (84, 46766),

Gene: Priamo\_82 Start: 45237, Stop: 44977, Start Num: 31

Candidate Starts for Priamo\_82:

(Start: 31 @45237 has 58 MA's), (62, 45177), (64, 45162), (75, 45099), (84, 45021), (85, 44982),

Gene: Puppy\_84 Start: 46645, Stop: 46409, Start Num: 56

Candidate Starts for Puppy\_84:

(Start: 53 @46666 has 4 MA's), (Start: 56 @46645 has 94 MA's), (69, 46576), (74, 46543),

Gene: QueenBeesly\_79 Start: 46830, Stop: 46513, Start Num: 31

Candidate Starts for QueenBeesly\_79:

(Start: 31 @46830 has 58 MA's), (62, 46719), (70, 46668), (71, 46662), (74, 46644), (83, 46602), (84, 46563),

Gene: Rachaly\_76 Start: 45987, Stop: 45709, Start Num: 31

Candidate Starts for Rachaly\_76:

(5, 46284), (Start: 31 @45987 has 58 MA's), (34, 45981), (59, 45942), (62, 45924), (71, 45867), (74, 45849), (83, 45807), (84, 45768), (87, 45720),

Gene: Reba\_78 Start: 44922, Stop: 44692, Start Num: 56

Candidate Starts for Reba\_78:

(22, 45072), (43, 44964), (52, 44946), (Start: 56 @44922 has 94 MA's), (69, 44853), (73, 44829), (84, 44742),

Gene: RedRock\_79 Start: 47115, Stop: 46849, Start Num: 33

Candidate Starts for RedRock\_79:

(2, 47439), (3, 47433), (Start: 31 @47121 has 58 MA's), (Start: 33 @47115 has 1 MA's), (62, 47058), (73, 46992), (79, 46965), (84, 46902),

Gene: Roary\_88 Start: 46911, Stop: 46669, Start Num: 51

Candidate Starts for Roary\_88:

(Start: 51 @46911 has 8 MA's), (73, 46800), (74, 46791), (78, 46779),

Gene: Rummer\_82 Start: 46299, Stop: 46069, Start Num: 56

Candidate Starts for Rummer\_82:

(43, 46341), (Start: 56 @46299 has 94 MA's), (60, 46290), (61, 46278), (62, 46272), (73, 46206),

Gene: Sabia\_81 Start: 46279, Stop: 46049, Start Num: 56

Candidate Starts for Sabia\_81:

(43, 46321), (Start: 56 @46279 has 94 MA's), (60, 46270), (61, 46258), (62, 46252), (73, 46186),

Gene: Sabinator\_81 Start: 46273, Stop: 46043, Start Num: 56

Candidate Starts for Sabinator\_81:

(43, 46315), (Start: 56 @46273 has 94 MA's), (60, 46264), (61, 46252), (62, 46246), (73, 46180),

Gene: Saintus\_82 Start: 43589, Stop: 43317, Start Num: 39

Candidate Starts for Saintus\_82:

(27, 43649), (Start: 39 @43589 has 3 MA's), (Start: 56 @43541 has 94 MA's), (73, 43448), (74, 43439),

Gene: Salz\_75 Start: 44330, Stop: 44055, Start Num: 44

Candidate Starts for Salz\_75:

(8, 44570), (11, 44507), (Start: 44 @44330 has 21 MA's), (62, 44261), (66, 44240), (69, 44219), (73, 44195), (75, 44183), (84, 44105),

Gene: SaturnRing\_84 Start: 47028, Stop: 46792, Start Num: 56

Candidate Starts for SaturnRing\_84:

(Start: 53 @47049 has 4 MA's), (Start: 56 @47028 has 94 MA's), (69, 46959), (74, 46926), (84, 46848),

Gene: Scorpia\_74 Start: 45000, Stop: 44758, Start Num: 42

Candidate Starts for Scorpia\_74:

(Start: 42 @45000 has 8 MA's),

Gene: Scout\_82 Start: 46209, Stop: 45973, Start Num: 56

Candidate Starts for Scout\_82:

(Start: 53 @46230 has 4 MA's), (Start: 56 @46209 has 94 MA's), (69, 46140), (74, 46107),

Gene: SemperFi\_79 Start: 46718, Stop: 46401, Start Num: 31

Candidate Starts for SemperFi\_79:

(Start: 31 @46718 has 58 MA's), (62, 46607), (70, 46556), (71, 46550), (74, 46532), (83, 46490), (84, 46451),

Gene: Sham4\_76 Start: 44413, Stop: 44138, Start Num: 44

Candidate Starts for Sham4\_76:

(8, 44653), (11, 44590), (Start: 44 @44413 has 21 MA's), (62, 44344), (66, 44323), (69, 44302), (73, 44278), (75, 44266), (84, 44188),

Gene: Smeadley\_86 Start: 46775, Stop: 46533, Start Num: 51

Candidate Starts for Smeadley\_86:

(Start: 51 @46775 has 8 MA's), (73, 46664), (74, 46655), (78, 46643),

Gene: Smeagan\_82 Start: 47272, Stop: 46952, Start Num: 31

Candidate Starts for Smeagan\_82:

(Start: 31 @47272 has 58 MA's), (Start: 50 @47218 has 1 MA's), (55, 47197), (59, 47179), (69, 47119), (70, 47110), (71, 47104), (74, 47086), (84, 47005),

Gene: SmellyB\_81 Start: 45136, Stop: 44915, Start Num: 56

Candidate Starts for SmellyB\_81:

(Start: 56 @45136 has 94 MA's), (60, 45124),

Gene: SnapTap\_79 Start: 46689, Stop: 46372, Start Num: 31

Candidate Starts for SnapTap\_79:

(Start: 31 @46689 has 58 MA's), (62, 46578), (70, 46527), (71, 46521), (74, 46503), (83, 46461), (84, 46422),

Gene: Snape\_80 Start: 45523, Stop: 45248, Start Num: 44

Candidate Starts for Snape\_80:

(8, 45763), (11, 45700), (Start: 44 @45523 has 21 MA's), (62, 45454), (66, 45433), (69, 45412), (73, 45388), (75, 45376), (84, 45298),

Gene: Snickers\_79 Start: 46244, Stop: 46014, Start Num: 56

Candidate Starts for Snickers\_79:

(43, 46286), (Start: 56 @46244 has 94 MA's), (60, 46235), (61, 46223), (62, 46217), (73, 46151),

Gene: SoYo\_80 Start: 46187, Stop: 45957, Start Num: 56

Candidate Starts for SoYo\_80:

(43, 46229), (Start: 56 @46187 has 94 MA's), (60, 46178), (61, 46166), (62, 46160), (73, 46094),

Gene: SoilDragon\_83 Start: 45714, Stop: 45484, Start Num: 56

Candidate Starts for SoilDragon\_83:

(43, 45756), (Start: 56 @45714 has 94 MA's), (60, 45705), (61, 45693), (62, 45687), (73, 45621), (84, 45534),

Gene: Spike509\_83 Start: 46296, Stop: 46066, Start Num: 56

Candidate Starts for Spike509\_83:

(43, 46338), (Start: 56 @46296 has 94 MA's), (60, 46287), (61, 46275), (62, 46269), (73, 46203),

Gene: Stagni\_80 Start: 46274, Stop: 46044, Start Num: 56

Candidate Starts for Stagni\_80:

(43, 46316), (Start: 56 @46274 has 94 MA's), (60, 46265), (61, 46253), (62, 46247), (73, 46181),

Gene: StarStuff\_80 Start: 46596, Stop: 46324, Start Num: 31

Candidate Starts for StarStuff\_80:

(Start: 31 @46596 has 58 MA's), (62, 46533), (73, 46467), (84, 46377),

Gene: Stephig9\_85 Start: 46744, Stop: 46472, Start Num: 39

Candidate Starts for Stephig9\_85:

(27, 46804), (Start: 39 @46744 has 3 MA's), (Start: 56 @46696 has 94 MA's), (73, 46603), (74, 46594),

Gene: SuperAwesome\_81 Start: 45817, Stop: 45596, Start Num: 56

Candidate Starts for SuperAwesome\_81:

(14, 46021), (25, 45931), (Start: 56 @45817 has 94 MA's), (60, 45805),

Gene: SuperCallie99\_78 Start: 45658, Stop: 45437, Start Num: 56

Candidate Starts for SuperCallie99\_78:

(Start: 56 @45658 has 94 MA's), (60, 45646),

Gene: SweetiePie\_79 Start: 46821, Stop: 46504, Start Num: 31

Candidate Starts for SweetiePie\_79:

(Start: 31 @46821 has 58 MA's), (62, 46710), (70, 46659), (71, 46653), (74, 46635), (83, 46593), (84, 46554),

Gene: Swirley\_71 Start: 44403, Stop: 44158, Start Num: 41

Candidate Starts for Swirley\_71:

(Start: 41 @44403 has 29 MA's), (Start: 56 @44373 has 94 MA's), (68, 44316), (70, 44295), (78, 44259),

Gene: SydNat\_71 Start: 44601, Stop: 44359, Start Num: 41

Candidate Starts for SydNat\_71:

(Start: 41 @44601 has 29 MA's), (58, 44568), (60, 44565), (61, 44553), (68, 44517), (70, 44496), (78, 44460), (82, 44436),

Gene: TNguyen7\_84 Start: 47007, Stop: 46750, Start Num: 53

Candidate Starts for TNguyen7\_84:

(Start: 53 @47007 has 4 MA's), (Start: 56 @46986 has 94 MA's), (69, 46917), (74, 46884), (84, 46806),

Gene: TarsusIV\_79 Start: 46873, Stop: 46601, Start Num: 46

Candidate Starts for TarsusIV\_79:

(Start: 46 @46873 has 6 MA's), (49, 46867), (59, 46828), (62, 46810), (70, 46759), (71, 46753), (74, 46735), (84, 46654),

Gene: Tarynearal\_70 Start: 44239, Stop: 43994, Start Num: 41

Candidate Starts for Tarynearal\_70:

(Start: 41 @44239 has 29 MA's), (Start: 56 @44209 has 94 MA's), (68, 44152), (78, 44095),

Gene: Taurus\_84 Start: 46274, Stop: 46044, Start Num: 56

Candidate Starts for Taurus\_84:

(43, 46316), (Start: 56 @46274 has 94 MA's), (60, 46265), (61, 46253), (62, 46247), (73, 46181),

Gene: Theia\_70 Start: 44724, Stop: 44482, Start Num: 41

Candidate Starts for Theia\_70:

(Start: 41 @44724 has 29 MA's), (58, 44691), (60, 44688), (68, 44640), (70, 44619), (78, 44583), (82, 44559),

Gene: Tiffany\_82 Start: 46159, Stop: 45929, Start Num: 56

Candidate Starts for Tiffany\_82:

(43, 46201), (Start: 56 @46159 has 94 MA's), (60, 46150), (61, 46138), (62, 46132), (73, 46066),

Gene: Tiger\_70 Start: 44180, Stop: 43935, Start Num: 41

Candidate Starts for Tiger\_70:

(Start: 41 @44180 has 29 MA's), (58, 44144), (68, 44093), (70, 44072), (78, 44036),

Gene: Timothy\_80 Start: 45500, Stop: 45225, Start Num: 44

Candidate Starts for Timothy\_80:

(8, 45740), (11, 45677), (Start: 44 @45500 has 21 MA's), (62, 45431), (66, 45410), (69, 45389), (73, 45365), (75, 45353), (84, 45275),

Gene: TinyTimmy\_78 Start: 45229, Stop: 44954, Start Num: 44

Candidate Starts for TinyTimmy\_78:

(8, 45469), (11, 45406), (Start: 44 @45229 has 21 MA's), (62, 45160), (66, 45139), (69, 45118), (73, 45094), (75, 45082), (84, 45004),

Gene: Tomathan\_80 Start: 46674, Stop: 46402, Start Num: 31

Candidate Starts for Tomathan\_80:

(Start: 31 @46674 has 58 MA's), (62, 46611), (73, 46545), (84, 46455),

Gene: Trixie\_80 Start: 47546, Stop: 47271, Start Num: 31

Candidate Starts for Trixie\_80:

(Start: 31 @47546 has 58 MA's), (62, 47480), (74, 47405), (79, 47387), (84, 47324),

Gene: Trooper\_79 Start: 46430, Stop: 46158, Start Num: 46  
Candidate Starts for Trooper\_79:  
(19, 46544), (Start: 46 @46430 has 6 MA's), (49, 46424), (59, 46385), (62, 46367), (71, 46310), (74, 46292), (83, 46250), (84, 46211),

Gene: Turbido\_80 Start: 46993, Stop: 46673, Start Num: 31  
Candidate Starts for Turbido\_80:  
(Start: 31 @46993 has 58 MA's), (Start: 50 @46939 has 1 MA's), (55, 46918), (59, 46900), (69, 46840), (70, 46831), (71, 46825), (74, 46807), (84, 46726),

Gene: UnionJack\_75 Start: 44664, Stop: 44422, Start Num: 42  
Candidate Starts for UnionJack\_75:  
(Start: 42 @44664 has 8 MA's), (58, 44631),

Gene: Updawg\_80 Start: 46550, Stop: 46230, Start Num: 31  
Candidate Starts for Updawg\_80:  
(Start: 31 @46550 has 58 MA's), (Start: 50 @46496 has 1 MA's), (62, 46439), (70, 46388), (71, 46382), (74, 46364), (83, 46322), (84, 46283),

Gene: VA6\_79 Start: 46565, Stop: 46284, Start Num: 31  
Candidate Starts for VA6\_79:  
(Start: 31 @46565 has 58 MA's), (Start: 32 @46559 has 2 MA's), (59, 46511), (62, 46493), (65, 46475), (71, 46436), (74, 46418), (83, 46376), (84, 46337),

Gene: VC3\_78 Start: 45517, Stop: 45221, Start Num: 31  
Candidate Starts for VC3\_78:  
(Start: 31 @45517 has 58 MA's), (73, 45385), (84, 45295),

Gene: Vix\_79 Start: 46354, Stop: 46124, Start Num: 56  
Candidate Starts for Vix\_79:  
(43, 46396), (Start: 56 @46354 has 94 MA's), (61, 46333), (62, 46327), (73, 46261),

Gene: VohminGhazi\_81 Start: 45137, Stop: 44916, Start Num: 56  
Candidate Starts for VohminGhazi\_81:  
(Start: 56 @45137 has 94 MA's), (60, 45125),

Gene: Watson\_82 Start: 46263, Stop: 46033, Start Num: 56  
Candidate Starts for Watson\_82:  
(43, 46305), (Start: 56 @46263 has 94 MA's), (60, 46254), (61, 46242), (62, 46236), (73, 46170),

Gene: Whabigail7\_79 Start: 46991, Stop: 46671, Start Num: 31  
Candidate Starts for Whabigail7\_79:  
(Start: 31 @46991 has 58 MA's), (Start: 50 @46937 has 1 MA's), (55, 46916), (59, 46898), (69, 46838), (70, 46829), (71, 46823), (74, 46805), (84, 46724),

Gene: WideWale\_80 Start: 46550, Stop: 46230, Start Num: 31  
Candidate Starts for WideWale\_80:  
(Start: 31 @46550 has 58 MA's), (Start: 50 @46496 has 1 MA's), (62, 46439), (70, 46388), (71, 46382), (74, 46364), (83, 46322), (84, 46283),

Gene: Wooldri\_85 Start: 46180, Stop: 45950, Start Num: 56  
Candidate Starts for Wooldri\_85:  
(43, 46222), (Start: 56 @46180 has 94 MA's), (60, 46171), (61, 46159), (62, 46153), (73, 46087),

Gene: XianYue\_78 Start: 46882, Stop: 46607, Start Num: 31

Candidate Starts for XianYue\_78:

(13, 46996), (Start: 31 @46882 has 58 MA's), (62, 46813), (73, 46747), (74, 46738), (80, 46708), (84, 46657),

Gene: Zolita\_70 Start: 44584, Stop: 44342, Start Num: 41

Candidate Starts for Zolita\_70:

(Start: 41 @44584 has 29 MA's), (58, 44551), (60, 44548), (61, 44536), (68, 44500), (70, 44479), (78, 44443), (82, 44419),