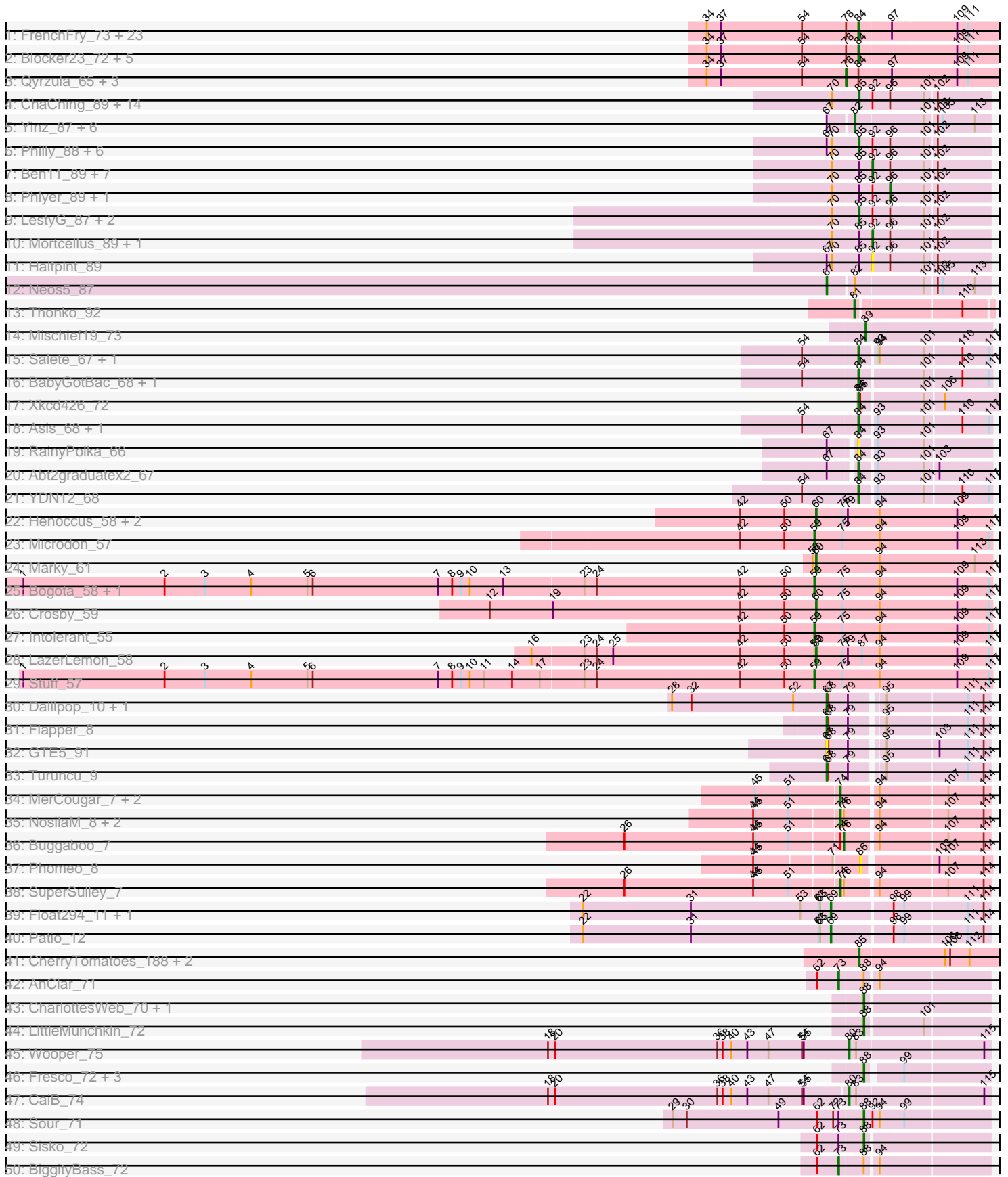
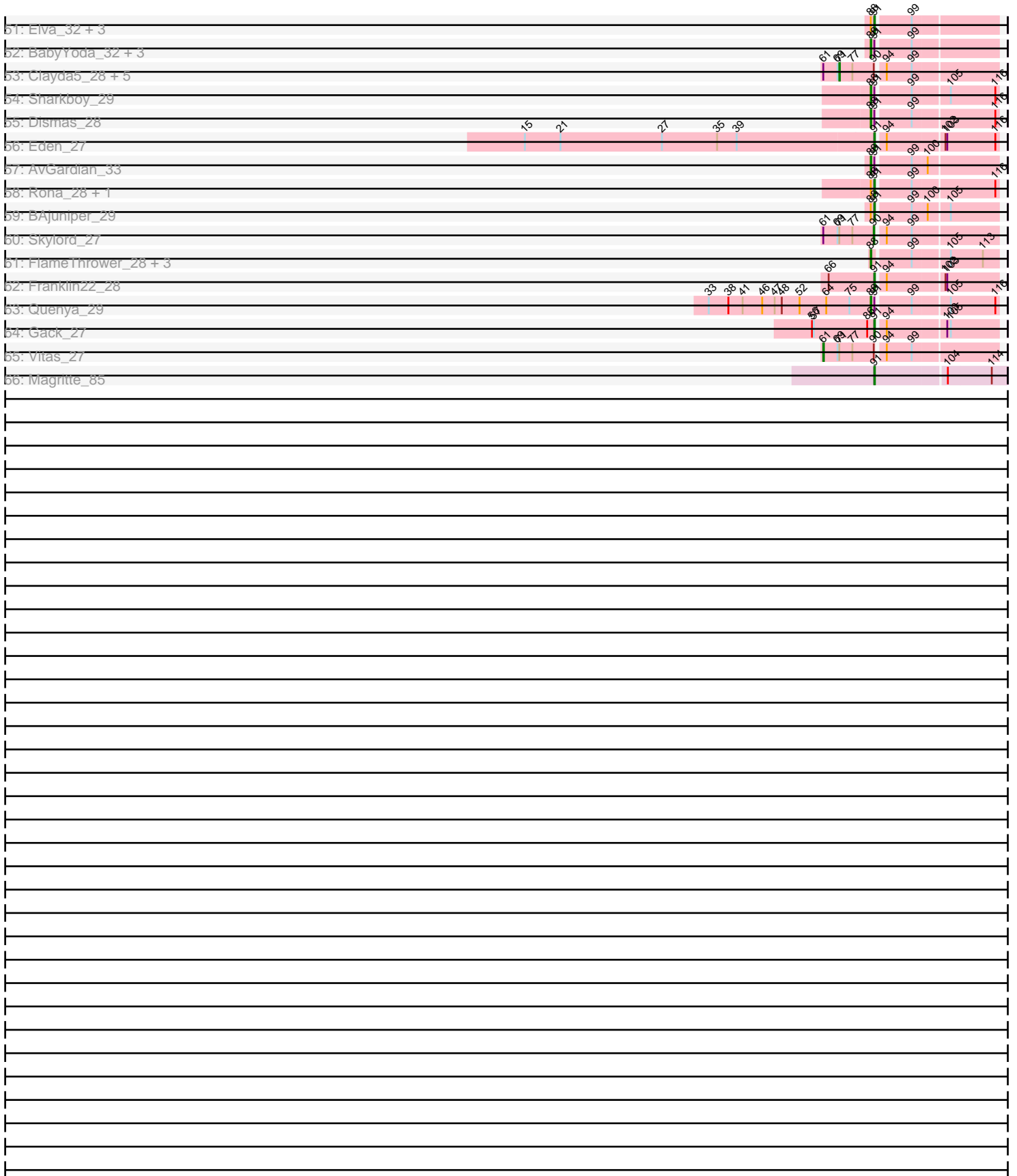


Pham 168013



Pham 168013



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 168013 Report

This analysis was run 07/09/24 on database version 566.

Pham number 168013 has 167 members, 12 are drafts.

Phages represented in each track:

- Track 1 : FrenchFry\_73, Rhinoforte\_72, Ares\_72, Tinciduntolum\_73, TA17A\_72, Lars\_73, Allegro\_72, Sabella\_72, Kheth\_72, MasterPo\_73, Faze9\_71, Lephleur\_72, Godines\_73, Glass\_74, Eaglehorse\_72, Brownie5\_72, Boyle\_72, Calamitous\_73, LizLemon\_72, Rosebush\_70, Kaleb\_73, Coffee\_72, Laurie\_73, Phantasmagoria\_71
- Track 2 : Blocker23\_72, Bananafish\_73, Tres\_72, ItsyBitsy1\_70, Holeinone\_72, West99\_72
- Track 3 : Qyrzula\_65, Hedgerow\_72, Opia\_73, Arbiter\_69
- Track 4 : ChaChing\_89, Gervas\_90, RagingRooster\_88, Corofin\_89, Audrey\_89, SynergyX\_89, GlenHope\_90, Briakila\_89, Baloo\_88, Devonte\_87, Deenasa\_89, Yahalom\_87, OrangeOswald\_88, MmasiCarm\_90, RomaT\_89
- Track 5 : Yinz\_87, HarveySr\_86, Marley1013\_88, Phayeta\_92, Gadget\_87, Morty007\_86, Bernardo\_87
- Track 6 : Philly\_88, Kronus\_89, Rita1961\_90, Nozo\_89, Compostia\_88, Casbah\_89, Jackstina\_83
- Track 7 : Ben11\_89, Heathcliff\_89, Akoma\_89, SlippinJimmy\_92, Chandler\_89, Daisy\_88, Phaedrus\_84, Kamiyu\_89
- Track 8 : Phlyer\_89, Athena\_91
- Track 9 : LestyG\_87, Obutu\_91, Abinghost\_89
- Track 10 : Mortcellus\_89, Tydolla\_85
- Track 11 : Halfpint\_89
- Track 12 : Neos5\_87
- Track 13 : Thonko\_92
- Track 14 : Mischief19\_73
- Track 15 : Salete\_67, BayC\_67
- Track 16 : BabyGotBac\_68, TP1604\_67
- Track 17 : Xkcd426\_72
- Track 18 : Asis\_68, Maih\_66
- Track 19 : RainyPolka\_66
- Track 20 : Abt2graduatex2\_67
- Track 21 : YDN12\_68
- Track 22 : Henoccus\_58, JackieB\_58, Araceli\_57
- Track 23 : Microdon\_57
- Track 24 : Marky\_61
- Track 25 : Bogota\_58, UNTPL\_59
- Track 26 : Crosby\_59
- Track 27 : Intolerant\_55
- Track 28 : LazerLemon\_58

- Track 29 : Stuff\_57
- Track 30 : Dalilpop\_10, GRU1\_92
- Track 31 : Flapper\_8
- Track 32 : GTE5\_91
- Track 33 : Turuncu\_9
- Track 34 : MerCougar\_7, Outis\_7, StarStruck\_7
- Track 35 : NosilaM\_8, Kabluna\_8, Bonum\_8
- Track 36 : Buggaboo\_7
- Track 37 : Phomeo\_8
- Track 38 : SuperSulley\_7
- Track 39 : Float294\_11, Skysand\_11
- Track 40 : Patio\_12
- Track 41 : CherryTomatoes\_188, SCentae\_185, Pupper\_186
- Track 42 : AnClar\_71
- Track 43 : CharlottesWeb\_70, Mariokart\_70
- Track 44 : LittleMunchkin\_72
- Track 45 : Wooper\_75
- Track 46 : Fresco\_72, Ligma\_72, Axumite\_72, Shatter\_72
- Track 47 : CaiB\_74
- Track 48 : Sour\_71
- Track 49 : Sisko\_72
- Track 50 : BiggityBass\_72
- Track 51 : Elva\_32, Icarian\_34, Stoor\_32, Stromboli\_32
- Track 52 : BabyYoda\_32, SanaSana\_34, Loviatar\_56, DirtyBubble\_31
- Track 53 : Clayda5\_28, Coltrane\_27, Rollins\_27, Bernstein\_27, Brahms\_27, Armstrong\_27
- Track 54 : Sharkboy\_29
- Track 55 : Dismas\_28
- Track 56 : Eden\_27
- Track 57 : AvGardian\_33
- Track 58 : Rona\_28, Kieran\_28
- Track 59 : BAjuniper\_29
- Track 60 : Skylord\_27
- Track 61 : FlameThrower\_28, Katzastrophic\_28, Celaena\_28, Bachaco\_28
- Track 62 : Franklin22\_28
- Track 63 : Quenya\_29
- Track 64 : Gack\_27
- Track 65 : Vitas\_27
- Track 66 : Magritte\_85

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

The start number called the most often in the published annotations is 84, it was called in 37 of the 155 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

• Abt2graduatex2\_67, Allegro\_72, Ares\_72, Asis\_68, BabyGotBac\_68, Bananafish\_73, BayC\_67, Blocker23\_72, Boyle\_72, Brownie5\_72, Calamitous\_73, Coffee\_72, Eaglehorse\_72, Faze9\_71, FrenchFry\_73, Glass\_74, Godines\_73, Holeinone\_72, ItsyBitsy1\_70, Kaleb\_73, Kheth\_72, Lars\_73, Laurie\_73, Lephleur\_72,

LizLemon\_72, Maih\_66, MasterPo\_73, Phantasmagoria\_71, RainyPolka\_66, Rhinoforte\_72, Rosebush\_70, Sabella\_72, Salete\_67, TA17A\_72, TP1604\_67, Tinciduntolum\_73, Tres\_72, West99\_72, Xkcd426\_72, YDN12\_68,

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

- Arbiter\_69, Hedgerow\_72, Opia\_73, Qyrzula\_65,

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

- Abinghost\_89, Akoma\_89, AnClar\_71, Araceli\_57, Armstrong\_27, Athena\_91, Audrey\_89, AvGuardian\_33, Axumite\_72, BAjuniper\_29, BabyYoda\_32, Bachaco\_28, Baloo\_88, Ben11\_89, Bernardo\_87, Bernstein\_27, BiggityBass\_72, Bogota\_58, Bonum\_8, Brahms\_27, Briakila\_89, Buggaboo\_7, CaiB\_74, Casbah\_89, Celaena\_28, ChaChing\_89, Chandler\_89, CharlottesWeb\_70, CherryTomatoes\_188, Clayda5\_28, Coltrane\_27, Compostia\_88, Corofin\_89, Crosby\_59, Daisy\_88, Dalilpop\_10, Deenasa\_89, Devonte\_87, DirtyBubble\_31, Dismas\_28, Eden\_27, Elva\_32, FlameThrower\_28, Flapper\_8, Float294\_11, Franklin22\_28, Fresco\_72, GRU1\_92, GTE5\_91, Gack\_27, Gadget\_87, Gervas\_90, GlenHope\_90, Halfpint\_89, HarveySr\_86, Heathcliff\_89, Henoccus\_58, Icarian\_34, Intolerant\_55, JackieB\_58, Jackstina\_83, Kabluna\_8, Kamiyu\_89, Katzastrophic\_28, Kieran\_28, Kronus\_89, LazerLemon\_58, LestyG\_87, Ligma\_72, LittleMunchkin\_72, Loviatar\_56, Magritte\_85, Mariokart\_70, Marky\_61, Marley1013\_88, MerCougar\_7, Microdon\_57, Mischief19\_73, MmasiCarm\_90, Mortcellus\_89, Morty007\_86, Neos5\_87, NosilaM\_8, Nozo\_89, Obutu\_91, OrangeOswald\_88, Outis\_7, Patio\_12, Phaedrus\_84, Phayeta\_92, Philly\_88, Phlyer\_89, Phomeo\_8, Pupper\_186, Quenya\_29, RagingRooster\_88, Rita1961\_90, Rollins\_27, RomaT\_89, Rona\_28, SCentae\_185, SanaSana\_34, Sharkboy\_29, Shatter\_72, Sisko\_72, Skylord\_27, Skysand\_11, SlippinJimmy\_92, Sour\_71, StarStruck\_7, Stoor\_32, Stromboli\_32, Stuff\_57, SuperSulley\_7, SynergyX\_89, Thonko\_92, Turuncu\_9, Tydolla\_85, UNTPL\_59, Vitas\_27, Wooper\_75, Yahalom\_87, Yinz\_87,

### Summary by start number:

Start 59:

- Found in 6 of 167 ( 3.6% ) of genes in pham
- Manual Annotations of this start: 5 of 155
- Called 83.3% of time when present
- Phage (with cluster) where this start called: Bogota\_58 (BH), Intolerant\_55 (BH), Microdon\_57 (BH), Stuff\_57 (BH), UNTPL\_59 (BH),

Start 60:

- Found in 6 of 167 ( 3.6% ) of genes in pham
- Manual Annotations of this start: 6 of 155
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Araceli\_57 (BH), Crosby\_59 (BH), Henoccus\_58 (BH), JackieB\_58 (BH), LazerLemon\_58 (BH), Marky\_61 (BH),

Start 61:

- Found in 8 of 167 ( 4.8% ) of genes in pham
- Manual Annotations of this start: 1 of 155
- Called 12.5% of time when present
- Phage (with cluster) where this start called: Vitas\_27 (EB),

Start 67:

- Found in 23 of 167 ( 13.8% ) of genes in pham
- Manual Annotations of this start: 4 of 155
- Called 26.1% of time when present
- Phage (with cluster) where this start called: Dalilpop\_10 (CR1), Flapper\_8 (CR1), GRU1\_92 (CR1), GTE5\_91 (CR1), Neos5\_87 (B3), Turuncu\_9 (CR1),

#### Start 69:

- Found in 11 of 167 ( 6.6% ) of genes in pham
- Manual Annotations of this start: 3 of 155
- Called 27.3% of time when present
- Phage (with cluster) where this start called: Float294\_11 (CR3), Patio\_12 (CR3), Skysand\_11 (CR3),

#### Start 71:

- Found in 9 of 167 ( 5.4% ) of genes in pham
- Manual Annotations of this start: 6 of 155
- Called 66.7% of time when present
- Phage (with cluster) where this start called: Armstrong\_27 (EB), Bernstein\_27 (EB), Brahms\_27 (EB), Clayda5\_28 (EB), Coltrane\_27 (EB), Rollins\_27 (EB),

#### Start 73:

- Found in 4 of 167 ( 2.4% ) of genes in pham
- Manual Annotations of this start: 2 of 155
- Called 50.0% of time when present
- Phage (with cluster) where this start called: AnClar\_71 (DR), BiggityBass\_72 (DR),

#### Start 74:

- Found in 8 of 167 ( 4.8% ) of genes in pham
- Manual Annotations of this start: 7 of 155
- Called 87.5% of time when present
- Phage (with cluster) where this start called: Bonum\_8 (CR2), Kabluna\_8 (CR2), MerCougar\_7 (CR2), NosilaM\_8 (CR2), Outis\_7 (CR2), StarStruck\_7 (CR2), SuperSulley\_7 (CR2),

#### Start 76:

- Found in 5 of 167 ( 3.0% ) of genes in pham
- Manual Annotations of this start: 1 of 155
- Called 20.0% of time when present
- Phage (with cluster) where this start called: Buggaboo\_7 (CR2),

#### Start 78:

- Found in 34 of 167 ( 20.4% ) of genes in pham
- Manual Annotations of this start: 4 of 155
- Called 11.8% of time when present
- Phage (with cluster) where this start called: Arbiter\_69 (B2), Hedgerow\_72 (B2), Opia\_73 (B2), Qyrzula\_65 (B2),

#### Start 80:

- Found in 2 of 167 ( 1.2% ) of genes in pham
- Manual Annotations of this start: 2 of 155
- Called 100.0% of time when present
- Phage (with cluster) where this start called: CaiB\_74 (DR), Wooper\_75 (DR),

Start 81:

- Found in 1 of 167 ( 0.6% ) of genes in pham
- Manual Annotations of this start: 1 of 155
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Thonko\_92 (B8),

Start 82:

- Found in 8 of 167 ( 4.8% ) of genes in pham
- Manual Annotations of this start: 7 of 155
- Called 87.5% of time when present
- Phage (with cluster) where this start called: Bernardo\_87 (B3), Gadget\_87 (B3), HarveySr\_86 (B3), Marley1013\_88 (B3), Morty007\_86 (B3), Phayeta\_92 (B3), Yinz\_87 (B3),

Start 84:

- Found in 44 of 167 ( 26.3% ) of genes in pham
- Manual Annotations of this start: 37 of 155
- Called 90.9% of time when present
- Phage (with cluster) where this start called: Abt2graduatex2\_67 (BG), Allegro\_72 (B2), Ares\_72 (B2), Asis\_68 (BG), BabyGotBac\_68 (BG), Bananafish\_73 (B2), BayC\_67 (BG), Blocker23\_72 (B2), Boyle\_72 (B2), Brownie5\_72 (B2), Calamitous\_73 (B2), Coffee\_72 (B2), Eaglehorse\_72 (B2), Faze9\_71 (B2), FrenchFry\_73 (B2), Glass\_74 (B2), Godines\_73 (B2), Holeinone\_72 (B2), ItsyBitsy1\_70 (B2), Kaleb\_73 (B2), Kheth\_72 (B2), Lars\_73 (B2), Laurie\_73 (B2), Lephleur\_72 (B2), LizLemon\_72 (B2), Maih\_66 (BG), MasterPo\_73 (B2), Phantasmagoria\_71 (B2), RainyPolka\_66 (BG), Rhinoforte\_72 (B2), Rosebush\_70 (B2), Sabella\_72 (B2), Salete\_67 (BG), TA17A\_72 (B2), TP1604\_67 (BG), Tinciduntolum\_73 (B2), Tres\_72 (B2), West99\_72 (B2), Xkcd426\_72 (BG), YDN12\_68 (BG),

Start 85:

- Found in 41 of 167 ( 24.6% ) of genes in pham
- Manual Annotations of this start: 28 of 155
- Called 68.3% of time when present
- Phage (with cluster) where this start called: Abinghost\_89 (B3), Audrey\_89 (B3), Baloo\_88 (B3), Briakila\_89 (B3), Casbah\_89 (B3), ChaChing\_89 (B3), CherryTomatoes\_188 (DO), Compostia\_88 (B3), Corofin\_89 (B3), Deenasa\_89 (B3), Devonte\_87 (B3), Gervas\_90 (B3), GlenHope\_90 (B3), Jackstina\_83 (B3), Kronus\_89 (B3), LestyG\_87 (B3), MmasiCarm\_90 (B3), Nozo\_89 (B3), Obutu\_91 (B3), OrangeOswald\_88 (B3), Philly\_88 (B3), Pupper\_186 (DO), RagingRooster\_88 (B3), Rita1961\_90 (B3), RomaT\_89 (B3), SCentae\_185 (DO), SynergyX\_89 (B3), Yahalom\_87 (B3),

Start 86:

- Found in 3 of 167 ( 1.8% ) of genes in pham
- No Manual Annotations of this start.
- Called 33.3% of time when present
- Phage (with cluster) where this start called: Phomeo\_8 (CR2),

Start 88:

- Found in 30 of 167 ( 18.0% ) of genes in pham
- Manual Annotations of this start: 18 of 155
- Called 70.0% of time when present

- Phage (with cluster) where this start called: AvGardian\_33 (EB), Axumite\_72 (DR), BabyYoda\_32 (EB), Bachaco\_28 (EB), Celaena\_28 (EB), CharlottesWeb\_70 (DR), DirtyBubble\_31 (EB), Dismas\_28 (EB), FlameThrower\_28 (EB), Fresco\_72 (DR), Katzastrophic\_28 (EB), Ligma\_72 (DR), LittleMunchkin\_72 (DR), Loviatar\_56 (EB), Mariokart\_70 (DR), Quenya\_29 (EB), SanaSana\_34 (EB), Sharkboy\_29 (EB), Shatter\_72 (DR), Sisko\_72 (DR), Sour\_71 (DR),

Start 89:

- Found in 1 of 167 ( 0.6% ) of genes in pham
- Manual Annotations of this start: 1 of 155
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Mischief19\_73 (BG),

Start 90:

- Found in 8 of 167 ( 4.8% ) of genes in pham
- Manual Annotations of this start: 1 of 155
- Called 12.5% of time when present
- Phage (with cluster) where this start called: Skylord\_27 (EB),

Start 91:

- Found in 19 of 167 ( 11.4% ) of genes in pham
- Manual Annotations of this start: 11 of 155
- Called 57.9% of time when present
- Phage (with cluster) where this start called: BAjuniper\_29 (EB), Eden\_27 (EB), Elva\_32 (EB), Franklin22\_28 (EB), Gack\_27 (EB), Icarian\_34 (EB), Kieran\_28 (EB), Magritte\_85 (singleton), Rona\_28 (EB), Stoor\_32 (EB), Stromboli\_32 (EB),

Start 92:

- Found in 39 of 167 ( 23.4% ) of genes in pham
- Manual Annotations of this start: 8 of 155
- Called 28.2% of time when present
- Phage (with cluster) where this start called: Akoma\_89 (B3), Ben11\_89 (B3), Chandler\_89 (B3), Daisy\_88 (B3), Halfpint\_89 (B3), Heathcliff\_89 (B3), Kamiyu\_89 (B3), Mortcellus\_89 (B3), Phaedrus\_84 (B3), SlippinJimmy\_92 (B3), Tydolla\_85 (B3),

Start 96:

- Found in 38 of 167 ( 22.8% ) of genes in pham
- Manual Annotations of this start: 2 of 155
- Called 5.3% of time when present
- Phage (with cluster) where this start called: Athena\_91 (B3), Phlyer\_89 (B3),

### Summary by clusters:

There are 12 clusters represented in this pham: CR2, CR3, singleton, BG, DO, B8, BH, EB, CR1, B2, B3, DR,

Info for manual annotations of cluster B2:

- Start number 78 was manually annotated 4 times for cluster B2.
- Start number 84 was manually annotated 28 times for cluster B2.

Info for manual annotations of cluster B3:

- Start number 67 was manually annotated 1 time for cluster B3.
- Start number 82 was manually annotated 7 times for cluster B3.



- Start number 85 was manually annotated 25 times for cluster B3.
- Start number 92 was manually annotated 8 times for cluster B3.
- Start number 96 was manually annotated 2 times for cluster B3.

Info for manual annotations of cluster B8:

- Start number 81 was manually annotated 1 time for cluster B8.

Info for manual annotations of cluster BG:

- Start number 84 was manually annotated 9 times for cluster BG.
- Start number 89 was manually annotated 1 time for cluster BG.

Info for manual annotations of cluster BH:

- Start number 59 was manually annotated 5 times for cluster BH.
- Start number 60 was manually annotated 6 times for cluster BH.

Info for manual annotations of cluster CR1:

- Start number 67 was manually annotated 3 times for cluster CR1.

Info for manual annotations of cluster CR2:

- Start number 74 was manually annotated 7 times for cluster CR2.
- Start number 76 was manually annotated 1 time for cluster CR2.

Info for manual annotations of cluster CR3:

- Start number 69 was manually annotated 3 times for cluster CR3.

Info for manual annotations of cluster DO:

- Start number 85 was manually annotated 3 times for cluster DO.

Info for manual annotations of cluster DR:

- Start number 73 was manually annotated 2 times for cluster DR.
- Start number 80 was manually annotated 2 times for cluster DR.
- Start number 88 was manually annotated 8 times for cluster DR.

Info for manual annotations of cluster EB:

- Start number 61 was manually annotated 1 time for cluster EB.
- Start number 71 was manually annotated 6 times for cluster EB.
- Start number 88 was manually annotated 10 times for cluster EB.
- Start number 90 was manually annotated 1 time for cluster EB.
- Start number 91 was manually annotated 10 times for cluster EB.

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

Gene: Abinghost\_89 Start: 63262, Stop: 63050, Start Num: 85

Candidate Starts for Abinghost\_89:

(70, 63307), (Start: 85 @63262 has 28 MA's), (Start: 92 @63244 has 8 MA's), (Start: 96 @63214 has 2 MA's), (101, 63157), (102, 63139),

Gene: Abt2graduatex2\_67 Start: 52651, Stop: 52863, Start Num: 84

Candidate Starts for Abt2graduatex2\_67:

(Start: 67 @52615 has 4 MA's), (Start: 84 @52651 has 37 MA's), (93, 52675), (101, 52753), (103, 52774),

Gene: Akoma\_89 Start: 63284, Stop: 63090, Start Num: 92

Candidate Starts for Akoma\_89:

(70, 63347), (Start: 85 @63302 has 28 MA's), (Start: 92 @63284 has 8 MA's), (Start: 96 @63254 has 2 MA's), (101, 63197), (102, 63179),

Gene: Allegro\_72 Start: 59331, Stop: 59107, Start Num: 84

Candidate Starts for Allegro\_72:

(34, 59589), (37, 59565), (54, 59427), (Start: 78 @59352 has 4 MA's), (Start: 84 @59331 has 37 MA's), (97, 59277), (109, 59172), (111, 59157),

Gene: AnClar\_71 Start: 57138, Stop: 56902, Start Num: 73

Candidate Starts for AnClar\_71:

(62, 57174), (Start: 73 @57138 has 2 MA's), (Start: 88 @57102 has 18 MA's), (94, 57084),

Gene: Araceli\_57 Start: 42438, Stop: 42737, Start Num: 60

Candidate Starts for Araceli\_57:

(42, 42309), (50, 42384), (Start: 60 @42438 has 6 MA's), (75, 42483), (79, 42492), (94, 42546), (109, 42678),

Gene: Arbiter\_69 Start: 59393, Stop: 59148, Start Num: 78

Candidate Starts for Arbiter\_69:

(34, 59630), (37, 59606), (54, 59468), (Start: 78 @59393 has 4 MA's), (Start: 84 @59372 has 37 MA's), (97, 59318), (109, 59213), (111, 59198),

Gene: Ares\_72 Start: 59337, Stop: 59113, Start Num: 84

Candidate Starts for Ares\_72:

(34, 59595), (37, 59571), (54, 59433), (Start: 78 @59358 has 4 MA's), (Start: 84 @59337 has 37 MA's), (97, 59283), (109, 59178), (111, 59163),

Gene: Armstrong\_27 Start: 20896, Stop: 20648, Start Num: 71

Candidate Starts for Armstrong\_27:

(Start: 61 @20923 has 1 MA's), (Start: 69 @20899 has 3 MA's), (Start: 71 @20896 has 6 MA's), (77, 20875), (Start: 90 @20839 has 1 MA's), (94, 20827), (99, 20785),

Gene: Asis\_68 Start: 52546, Stop: 52758, Start Num: 84

Candidate Starts for Asis\_68:

(54, 52453), (Start: 84 @52546 has 37 MA's), (93, 52570), (101, 52648), (110, 52708), (117, 52753),

Gene: Athena\_91 Start: 63989, Stop: 63825, Start Num: 96

Candidate Starts for Athena\_91:

(70, 64082), (Start: 85 @64037 has 28 MA's), (Start: 92 @64019 has 8 MA's), (Start: 96 @63989 has 2 MA's), (101, 63932), (102, 63914),

Gene: Audrey\_89 Start: 63291, Stop: 63079, Start Num: 85

Candidate Starts for Audrey\_89:

(70, 63336), (Start: 85 @63291 has 28 MA's), (Start: 92 @63273 has 8 MA's), (Start: 96 @63243 has 2 MA's), (101, 63186), (102, 63168),

Gene: AvGardian\_33 Start: 23504, Stop: 23307, Start Num: 88

Candidate Starts for AvGardian\_33:

(Start: 88 @23504 has 18 MA's), (Start: 91 @23498 has 11 MA's), (99, 23444), (100, 23420),

Gene: Axumite\_72 Start: 54547, Stop: 54353, Start Num: 88

Candidate Starts for Axumite\_72:

(Start: 88 @54547 has 18 MA's), (99, 54493),

Gene: BAjuniper\_29 Start: 23728, Stop: 23537, Start Num: 91

Candidate Starts for BAjuniper\_29:

(Start: 88 @23734 has 18 MA's), (Start: 91 @23728 has 11 MA's), (99, 23674), (100, 23650), (105, 23617),

Gene: BabyGotBac\_68 Start: 52472, Stop: 52684, Start Num: 84

Candidate Starts for BabyGotBac\_68:

(54, 52379), (Start: 84 @52472 has 37 MA's), (101, 52574), (110, 52634), (117, 52679),

Gene: BabyYoda\_32 Start: 24023, Stop: 23826, Start Num: 88

Candidate Starts for BabyYoda\_32:

(Start: 88 @24023 has 18 MA's), (Start: 91 @24017 has 11 MA's), (99, 23963),

Gene: Bachaco\_28 Start: 23946, Stop: 23749, Start Num: 88

Candidate Starts for Bachaco\_28:

(Start: 88 @23946 has 18 MA's), (99, 23886), (105, 23829), (113, 23775),

Gene: Baloo\_88 Start: 63143, Stop: 62931, Start Num: 85

Candidate Starts for Baloo\_88:

(70, 63188), (Start: 85 @63143 has 28 MA's), (Start: 92 @63125 has 8 MA's), (Start: 96 @63095 has 2 MA's), (101, 63038), (102, 63020),

Gene: Bananafish\_73 Start: 59267, Stop: 59043, Start Num: 84

Candidate Starts for Bananafish\_73:

(34, 59525), (37, 59501), (54, 59363), (Start: 78 @59288 has 4 MA's), (Start: 84 @59267 has 37 MA's), (109, 59108), (111, 59093),

Gene: BayC\_67 Start: 52550, Stop: 52762, Start Num: 84

Candidate Starts for BayC\_67:

(54, 52457), (Start: 84 @52550 has 37 MA's), (93, 52574), (94, 52577), (101, 52652), (110, 52712), (117, 52757),

Gene: Ben11\_89 Start: 63500, Stop: 63306, Start Num: 92

Candidate Starts for Ben11\_89:

(70, 63563), (Start: 85 @63518 has 28 MA's), (Start: 92 @63500 has 8 MA's), (Start: 96 @63470 has 2 MA's), (101, 63413), (102, 63395),

Gene: Bernardo\_87 Start: 62697, Stop: 62485, Start Num: 82

Candidate Starts for Bernardo\_87:

(Start: 67 @62736 has 4 MA's), (Start: 82 @62697 has 7 MA's), (101, 62592), (102, 62574), (105, 62565), (113, 62511),

Gene: Bernstein\_27 Start: 20951, Stop: 20703, Start Num: 71

Candidate Starts for Bernstein\_27:

(Start: 61 @20978 has 1 MA's), (Start: 69 @20954 has 3 MA's), (Start: 71 @20951 has 6 MA's), (77, 20930), (Start: 90 @20894 has 1 MA's), (94, 20882), (99, 20840),

Gene: BiggityBass\_72 Start: 56910, Stop: 56674, Start Num: 73

Candidate Starts for BiggityBass\_72:

(62, 56946), (Start: 73 @56910 has 2 MA's), (Start: 88 @56874 has 18 MA's), (94, 56856),

Gene: Blocker23\_72 Start: 59332, Stop: 59108, Start Num: 84

Candidate Starts for Blocker23\_72:

(34, 59590), (37, 59566), (54, 59428), (Start: 78 @59353 has 4 MA's), (Start: 84 @59332 has 37 MA's), (109, 59173), (111, 59158),

Gene: Bogota\_58 Start: 42749, Stop: 43051, Start Num: 59

Candidate Starts for Bogota\_58:

(1, 41420), (2, 41660), (3, 41729), (4, 41807), (5, 41903), (6, 41912), (7, 42125), (8, 42149), (9, 42164), (10, 42179), (13, 42236), (23, 42365), (24, 42383), (42, 42623), (50, 42698), (Start: 59 @42749 has 5 MA's), (75, 42797), (94, 42860), (109, 42992), (117, 43046),

Gene: Bonum\_8 Start: 5088, Stop: 5327, Start Num: 74

Candidate Starts for Bonum\_8:

(44, 4953), (45, 4956), (51, 5010), (Start: 74 @5088 has 7 MA's), (Start: 76 @5094 has 1 MA's), (94, 5145), (107, 5256), (114, 5316),

Gene: Boyle\_72 Start: 59376, Stop: 59152, Start Num: 84

Candidate Starts for Boyle\_72:

(34, 59634), (37, 59610), (54, 59472), (Start: 78 @59397 has 4 MA's), (Start: 84 @59376 has 37 MA's), (97, 59322), (109, 59217), (111, 59202),

Gene: Brahms\_27 Start: 20898, Stop: 20650, Start Num: 71

Candidate Starts for Brahms\_27:

(Start: 61 @20925 has 1 MA's), (Start: 69 @20901 has 3 MA's), (Start: 71 @20898 has 6 MA's), (77, 20877), (Start: 90 @20841 has 1 MA's), (94, 20829), (99, 20787),

Gene: Briakila\_89 Start: 63489, Stop: 63277, Start Num: 85

Candidate Starts for Briakila\_89:

(70, 63534), (Start: 85 @63489 has 28 MA's), (Start: 92 @63471 has 8 MA's), (Start: 96 @63441 has 2 MA's), (101, 63384), (102, 63366),

Gene: Brownie5\_72 Start: 59377, Stop: 59153, Start Num: 84

Candidate Starts for Brownie5\_72:

(34, 59635), (37, 59611), (54, 59473), (Start: 78 @59398 has 4 MA's), (Start: 84 @59377 has 37 MA's), (97, 59323), (109, 59218), (111, 59203),

Gene: Buggaboo\_7 Start: 4613, Stop: 4846, Start Num: 76

Candidate Starts for Buggaboo\_7:

(26, 4253), (44, 4472), (45, 4475), (51, 4529), (Start: 74 @4607 has 7 MA's), (Start: 76 @4613 has 1 MA's), (94, 4664), (107, 4775), (114, 4835),

Gene: CaiB\_74 Start: 56451, Stop: 56221, Start Num: 80

Candidate Starts for CaiB\_74:

(18, 56955), (20, 56943), (36, 56667), (38, 56658), (40, 56643), (43, 56616), (47, 56580), (54, 56523), (55, 56520), (Start: 80 @56451 has 2 MA's), (83, 56439), (115, 56232),

Gene: Calamitous\_73 Start: 59266, Stop: 59042, Start Num: 84

Candidate Starts for Calamitous\_73:

(34, 59524), (37, 59500), (54, 59362), (Start: 78 @59287 has 4 MA's), (Start: 84 @59266 has 37 MA's), (97, 59212), (109, 59107), (111, 59092),

Gene: Casbah\_89 Start: 63602, Stop: 63390, Start Num: 85  
Candidate Starts for Casbah\_89:  
(Start: 67 @63656 has 4 MA's), (70, 63647), (Start: 85 @63602 has 28 MA's), (Start: 92 @63584 has 8 MA's), (Start: 96 @63554 has 2 MA's), (101, 63497), (102, 63479),

Gene: Celaena\_28 Start: 23631, Stop: 23434, Start Num: 88  
Candidate Starts for Celaena\_28:  
(Start: 88 @23631 has 18 MA's), (99, 23571), (105, 23514), (113, 23460),

Gene: ChaChing\_89 Start: 63304, Stop: 63092, Start Num: 85  
Candidate Starts for ChaChing\_89:  
(70, 63349), (Start: 85 @63304 has 28 MA's), (Start: 92 @63286 has 8 MA's), (Start: 96 @63256 has 2 MA's), (101, 63199), (102, 63181),

Gene: Chandler\_89 Start: 64060, Stop: 63866, Start Num: 92  
Candidate Starts for Chandler\_89:  
(70, 64123), (Start: 85 @64078 has 28 MA's), (Start: 92 @64060 has 8 MA's), (Start: 96 @64030 has 2 MA's), (101, 63973), (102, 63955),

Gene: CharlottesWeb\_70 Start: 53821, Stop: 53621, Start Num: 88  
Candidate Starts for CharlottesWeb\_70:  
(Start: 88 @53821 has 18 MA's),

Gene: CherryTomatoes\_188 Start: 133666, Stop: 133899, Start Num: 85  
Candidate Starts for CherryTomatoes\_188:  
(Start: 85 @133666 has 28 MA's), (106, 133807), (108, 133816), (112, 133849),

Gene: Clayda5\_28 Start: 20885, Stop: 20637, Start Num: 71  
Candidate Starts for Clayda5\_28:  
(Start: 61 @20912 has 1 MA's), (Start: 69 @20888 has 3 MA's), (Start: 71 @20885 has 6 MA's), (77, 20864), (Start: 90 @20828 has 1 MA's), (94, 20816), (99, 20774),

Gene: Coffee\_72 Start: 59370, Stop: 59146, Start Num: 84  
Candidate Starts for Coffee\_72:  
(34, 59628), (37, 59604), (54, 59466), (Start: 78 @59391 has 4 MA's), (Start: 84 @59370 has 37 MA's), (97, 59316), (109, 59211), (111, 59196),

Gene: Coltrane\_27 Start: 20898, Stop: 20650, Start Num: 71  
Candidate Starts for Coltrane\_27:  
(Start: 61 @20925 has 1 MA's), (Start: 69 @20901 has 3 MA's), (Start: 71 @20898 has 6 MA's), (77, 20877), (Start: 90 @20841 has 1 MA's), (94, 20829), (99, 20787),

Gene: Compostia\_88 Start: 63744, Stop: 63532, Start Num: 85  
Candidate Starts for Compostia\_88:  
(Start: 67 @63798 has 4 MA's), (70, 63789), (Start: 85 @63744 has 28 MA's), (Start: 92 @63726 has 8 MA's), (Start: 96 @63696 has 2 MA's), (101, 63639), (102, 63621),

Gene: Corofin\_89 Start: 63313, Stop: 63101, Start Num: 85  
Candidate Starts for Corofin\_89:  
(70, 63358), (Start: 85 @63313 has 28 MA's), (Start: 92 @63295 has 8 MA's), (Start: 96 @63265 has 2 MA's), (101, 63208), (102, 63190),

Gene: Crosby\_59 Start: 42804, Stop: 43103, Start Num: 60

Candidate Starts for Crosby\_59:

(12, 42252), (19, 42360), (42, 42675), (50, 42750), (Start: 60 @42804 has 6 MA's), (75, 42849), (94, 42912), (109, 43044), (117, 43098),

Gene: Daisy\_88 Start: 62846, Stop: 62652, Start Num: 92

Candidate Starts for Daisy\_88:

(70, 62909), (Start: 85 @62864 has 28 MA's), (Start: 92 @62846 has 8 MA's), (Start: 96 @62816 has 2 MA's), (101, 62759), (102, 62741),

Gene: Dalilpop\_10 Start: 5833, Stop: 6087, Start Num: 67

Candidate Starts for Dalilpop\_10:

(28, 5575), (32, 5608), (52, 5776), (Start: 67 @5833 has 4 MA's), (68, 5836), (79, 5869), (95, 5917), (111, 6049), (114, 6076),

Gene: Deenasa\_89 Start: 64213, Stop: 64001, Start Num: 85

Candidate Starts for Deenasa\_89:

(70, 64258), (Start: 85 @64213 has 28 MA's), (Start: 92 @64195 has 8 MA's), (Start: 96 @64165 has 2 MA's), (101, 64108), (102, 64090),

Gene: Devonte\_87 Start: 62930, Stop: 62718, Start Num: 85

Candidate Starts for Devonte\_87:

(70, 62975), (Start: 85 @62930 has 28 MA's), (Start: 92 @62912 has 8 MA's), (Start: 96 @62882 has 2 MA's), (101, 62825), (102, 62807),

Gene: DirtyBubble\_31 Start: 23650, Stop: 23453, Start Num: 88

Candidate Starts for DirtyBubble\_31:

(Start: 88 @23650 has 18 MA's), (Start: 91 @23644 has 11 MA's), (99, 23590),

Gene: Dismas\_28 Start: 23310, Stop: 23113, Start Num: 88

Candidate Starts for Dismas\_28:

(Start: 88 @23310 has 18 MA's), (Start: 91 @23304 has 11 MA's), (99, 23250), (116, 23118),

Gene: Eaglehorse\_72 Start: 59256, Stop: 59032, Start Num: 84

Candidate Starts for Eaglehorse\_72:

(34, 59514), (37, 59490), (54, 59352), (Start: 78 @59277 has 4 MA's), (Start: 84 @59256 has 37 MA's), (97, 59202), (109, 59097), (111, 59082),

Gene: Eden\_27 Start: 21061, Stop: 20870, Start Num: 91

Candidate Starts for Eden\_27:

(15, 21646), (21, 21586), (27, 21415), (35, 21322), (39, 21289), (Start: 91 @21061 has 11 MA's), (94, 21049), (102, 20959), (103, 20956), (116, 20875),

Gene: Elva\_32 Start: 23679, Stop: 23488, Start Num: 91

Candidate Starts for Elva\_32:

(Start: 88 @23685 has 18 MA's), (Start: 91 @23679 has 11 MA's), (99, 23625),

Gene: Faze9\_71 Start: 59394, Stop: 59170, Start Num: 84

Candidate Starts for Faze9\_71:

(34, 59652), (37, 59628), (54, 59490), (Start: 78 @59415 has 4 MA's), (Start: 84 @59394 has 37 MA's), (97, 59340), (109, 59235), (111, 59220),

Gene: FlameThrower\_28 Start: 23117, Stop: 22920, Start Num: 88

Candidate Starts for FlameThrower\_28:

(Start: 88 @23117 has 18 MA's), (99, 23057), (105, 23000), (113, 22946),

Gene: Flapper\_8 Start: 4720, Stop: 4974, Start Num: 67

Candidate Starts for Flapper\_8:

(Start: 67 @4720 has 4 MA's), (68, 4723), (79, 4756), (95, 4804), (111, 4936), (114, 4963),

Gene: Float294\_11 Start: 6342, Stop: 6596, Start Num: 69

Candidate Starts for Float294\_11:

(22, 5922), (31, 6105), (53, 6291), (63, 6321), (65, 6324), (Start: 69 @6342 has 3 MA's), (98, 6438), (99, 6456), (111, 6558), (114, 6585),

Gene: Franklin22\_28 Start: 21221, Stop: 21030, Start Num: 91

Candidate Starts for Franklin22\_28:

(66, 21296), (Start: 91 @21221 has 11 MA's), (94, 21209), (102, 21119), (103, 21116),

Gene: FrenchFry\_73 Start: 59381, Stop: 59157, Start Num: 84

Candidate Starts for FrenchFry\_73:

(34, 59639), (37, 59615), (54, 59477), (Start: 78 @59402 has 4 MA's), (Start: 84 @59381 has 37 MA's), (97, 59327), (109, 59222), (111, 59207),

Gene: Fresco\_72 Start: 54553, Stop: 54359, Start Num: 88

Candidate Starts for Fresco\_72:

(Start: 88 @54553 has 18 MA's), (99, 54499),

Gene: GRU1\_92 Start: 64016, Stop: 64270, Start Num: 67

Candidate Starts for GRU1\_92:

(28, 63758), (32, 63791), (52, 63959), (Start: 67 @64016 has 4 MA's), (68, 64019), (79, 64052), (95, 64100), (111, 64232), (114, 64259),

Gene: GTE5\_91 Start: 64905, Stop: 65159, Start Num: 67

Candidate Starts for GTE5\_91:

(Start: 67 @64905 has 4 MA's), (68, 64908), (79, 64941), (95, 64989), (103, 65073), (111, 65121), (114, 65148),

Gene: Gack\_27 Start: 21104, Stop: 20913, Start Num: 91

Candidate Starts for Gack\_27:

(56, 21206), (57, 21203), (86, 21116), (Start: 91 @21104 has 11 MA's), (94, 21092), (103, 20999), (105, 20993),

Gene: Gadget\_87 Start: 62880, Stop: 62668, Start Num: 82

Candidate Starts for Gadget\_87:

(Start: 67 @62919 has 4 MA's), (Start: 82 @62880 has 7 MA's), (101, 62775), (102, 62757), (105, 62748), (113, 62694),

Gene: Gervas\_90 Start: 63758, Stop: 63546, Start Num: 85

Candidate Starts for Gervas\_90:

(70, 63803), (Start: 85 @63758 has 28 MA's), (Start: 92 @63740 has 8 MA's), (Start: 96 @63710 has 2 MA's), (101, 63653), (102, 63635),

Gene: Glass\_74 Start: 59382, Stop: 59158, Start Num: 84

Candidate Starts for Glass\_74:

(34, 59640), (37, 59616), (54, 59478), (Start: 78 @59403 has 4 MA's), (Start: 84 @59382 has 37 MA's), (97, 59328), (109, 59223), (111, 59208),

Gene: GlenHope\_90 Start: 63334, Stop: 63122, Start Num: 85

Candidate Starts for GlenHope\_90:

(70, 63379), (Start: 85 @63334 has 28 MA's), (Start: 92 @63316 has 8 MA's), (Start: 96 @63286 has 2 MA's), (101, 63229), (102, 63211),

Gene: Godines\_73 Start: 59635, Stop: 59411, Start Num: 84

Candidate Starts for Godines\_73:

(34, 59893), (37, 59869), (54, 59731), (Start: 78 @59656 has 4 MA's), (Start: 84 @59635 has 37 MA's), (97, 59581), (109, 59476), (111, 59461),

Gene: Halfpint\_89 Start: 63058, Stop: 62864, Start Num: 92

Candidate Starts for Halfpint\_89:

(Start: 67 @63130 has 4 MA's), (70, 63121), (Start: 85 @63076 has 28 MA's), (Start: 92 @63058 has 8 MA's), (Start: 96 @63028 has 2 MA's), (101, 62971), (102, 62953),

Gene: HarveySr\_86 Start: 62323, Stop: 62111, Start Num: 82

Candidate Starts for HarveySr\_86:

(Start: 67 @62362 has 4 MA's), (Start: 82 @62323 has 7 MA's), (101, 62218), (102, 62200), (105, 62191), (113, 62137),

Gene: Heathcliff\_89 Start: 63240, Stop: 63046, Start Num: 92

Candidate Starts for Heathcliff\_89:

(70, 63303), (Start: 85 @63258 has 28 MA's), (Start: 92 @63240 has 8 MA's), (Start: 96 @63210 has 2 MA's), (101, 63153), (102, 63135),

Gene: Hedgerow\_72 Start: 59353, Stop: 59108, Start Num: 78

Candidate Starts for Hedgerow\_72:

(34, 59590), (37, 59566), (54, 59428), (Start: 78 @59353 has 4 MA's), (Start: 84 @59332 has 37 MA's), (97, 59278), (109, 59173), (111, 59158),

Gene: Henoccus\_58 Start: 42450, Stop: 42749, Start Num: 60

Candidate Starts for Henoccus\_58:

(42, 42321), (50, 42396), (Start: 60 @42450 has 6 MA's), (75, 42495), (79, 42504), (94, 42558), (109, 42690),

Gene: Holeinone\_72 Start: 59237, Stop: 59013, Start Num: 84

Candidate Starts for Holeinone\_72:

(34, 59495), (37, 59471), (54, 59333), (Start: 78 @59258 has 4 MA's), (Start: 84 @59237 has 37 MA's), (109, 59078), (111, 59063),

Gene: Icarian\_34 Start: 24278, Stop: 24087, Start Num: 91

Candidate Starts for Icarian\_34:

(Start: 88 @24284 has 18 MA's), (Start: 91 @24278 has 11 MA's), (99, 24224),

Gene: Intolerant\_55 Start: 42453, Stop: 42755, Start Num: 59

Candidate Starts for Intolerant\_55:

(42, 42327), (50, 42402), (Start: 59 @42453 has 5 MA's), (75, 42501), (94, 42564), (109, 42696), (117, 42750),

Gene: ItsyBitsy1\_70 Start: 59473, Stop: 59249, Start Num: 84

Candidate Starts for ItsyBitsy1\_70:



(34, 59731), (37, 59707), (54, 59569), (Start: 78 @59494 has 4 MA's), (Start: 84 @59473 has 37 MA's), (109, 59314), (111, 59299),

Gene: JackieB\_58 Start: 42282, Stop: 42581, Start Num: 60

Candidate Starts for JackieB\_58:

(42, 42153), (50, 42228), (Start: 60 @42282 has 6 MA's), (75, 42327), (79, 42336), (94, 42390), (109, 42522),

Gene: Jackstina\_83 Start: 63172, Stop: 62960, Start Num: 85

Candidate Starts for Jackstina\_83:

(Start: 67 @63226 has 4 MA's), (70, 63217), (Start: 85 @63172 has 28 MA's), (Start: 92 @63154 has 8 MA's), (Start: 96 @63124 has 2 MA's), (101, 63067), (102, 63049),

Gene: Kabluna\_8 Start: 4479, Stop: 4718, Start Num: 74

Candidate Starts for Kabluna\_8:

(44, 4344), (45, 4347), (51, 4401), (Start: 74 @4479 has 7 MA's), (Start: 76 @4485 has 1 MA's), (94, 4536), (107, 4647), (114, 4707),

Gene: Kaleb\_73 Start: 59388, Stop: 59164, Start Num: 84

Candidate Starts for Kaleb\_73:

(34, 59646), (37, 59622), (54, 59484), (Start: 78 @59409 has 4 MA's), (Start: 84 @59388 has 37 MA's), (97, 59334), (109, 59229), (111, 59214),

Gene: Kamiyu\_89 Start: 63243, Stop: 63049, Start Num: 92

Candidate Starts for Kamiyu\_89:

(70, 63306), (Start: 85 @63261 has 28 MA's), (Start: 92 @63243 has 8 MA's), (Start: 96 @63213 has 2 MA's), (101, 63156), (102, 63138),

Gene: Katzastrophic\_28 Start: 23235, Stop: 23038, Start Num: 88

Candidate Starts for Katzastrophic\_28:

(Start: 88 @23235 has 18 MA's), (99, 23175), (105, 23118), (113, 23064),

Gene: Kheth\_72 Start: 59299, Stop: 59075, Start Num: 84

Candidate Starts for Kheth\_72:

(34, 59557), (37, 59533), (54, 59395), (Start: 78 @59320 has 4 MA's), (Start: 84 @59299 has 37 MA's), (97, 59245), (109, 59140), (111, 59125),

Gene: Kieran\_28 Start: 23307, Stop: 23116, Start Num: 91

Candidate Starts for Kieran\_28:

(Start: 88 @23313 has 18 MA's), (Start: 91 @23307 has 11 MA's), (99, 23253), (116, 23121),

Gene: Kronus\_89 Start: 64345, Stop: 64133, Start Num: 85

Candidate Starts for Kronus\_89:

(Start: 67 @64399 has 4 MA's), (70, 64390), (Start: 85 @64345 has 28 MA's), (Start: 92 @64327 has 8 MA's), (Start: 96 @64297 has 2 MA's), (101, 64240), (102, 64222),

Gene: Lars\_73 Start: 59360, Stop: 59136, Start Num: 84

Candidate Starts for Lars\_73:

(34, 59618), (37, 59594), (54, 59456), (Start: 78 @59381 has 4 MA's), (Start: 84 @59360 has 37 MA's), (97, 59306), (109, 59201), (111, 59186),

Gene: Laurie\_73 Start: 59044, Stop: 58820, Start Num: 84

Candidate Starts for Laurie\_73:

(34, 59302), (37, 59278), (54, 59140), (Start: 78 @59065 has 4 MA's), (Start: 84 @59044 has 37 MA's), (97, 58990), (109, 58885), (111, 58870),

Gene: LazerLemon\_58 Start: 42972, Stop: 43271, Start Num: 60

Candidate Starts for LazerLemon\_58:

(16, 42498), (23, 42582), (24, 42600), (25, 42627), (42, 42843), (50, 42918), (Start: 59 @42969 has 5 MA's), (Start: 60 @42972 has 6 MA's), (75, 43017), (79, 43026), (87, 43050), (94, 43080), (109, 43212), (117, 43266),

Gene: Lephleur\_72 Start: 59222, Stop: 58998, Start Num: 84

Candidate Starts for Lephleur\_72:

(34, 59480), (37, 59456), (54, 59318), (Start: 78 @59243 has 4 MA's), (Start: 84 @59222 has 37 MA's), (97, 59168), (109, 59063), (111, 59048),

Gene: LestyG\_87 Start: 62831, Stop: 62619, Start Num: 85

Candidate Starts for LestyG\_87:

(70, 62876), (Start: 85 @62831 has 28 MA's), (Start: 92 @62813 has 8 MA's), (Start: 96 @62783 has 2 MA's), (101, 62726), (102, 62708),

Gene: Ligma\_72 Start: 54547, Stop: 54353, Start Num: 88

Candidate Starts for Ligma\_72:

(Start: 88 @54547 has 18 MA's), (99, 54493),

Gene: LittleMunchkin\_72 Start: 57116, Stop: 56916, Start Num: 88

Candidate Starts for LittleMunchkin\_72:

(Start: 88 @57116 has 18 MA's), (101, 57023),

Gene: LizLemon\_72 Start: 59387, Stop: 59163, Start Num: 84

Candidate Starts for LizLemon\_72:

(34, 59645), (37, 59621), (54, 59483), (Start: 78 @59408 has 4 MA's), (Start: 84 @59387 has 37 MA's), (97, 59333), (109, 59228), (111, 59213),

Gene: Loviatar\_56 Start: 24836, Stop: 24639, Start Num: 88

Candidate Starts for Loviatar\_56:

(Start: 88 @24836 has 18 MA's), (Start: 91 @24830 has 11 MA's), (99, 24776),

Gene: Magritte\_85 Start: 68142, Stop: 68354, Start Num: 91

Candidate Starts for Magritte\_85:

(Start: 91 @68142 has 11 MA's), (104, 68256), (114, 68328),

Gene: Maih\_66 Start: 52563, Stop: 52775, Start Num: 84

Candidate Starts for Maih\_66:

(54, 52470), (Start: 84 @52563 has 37 MA's), (93, 52587), (101, 52665), (110, 52725), (117, 52770),

Gene: Mariokart\_70 Start: 54105, Stop: 53905, Start Num: 88

Candidate Starts for Mariokart\_70:

(Start: 88 @54105 has 18 MA's),

Gene: Marky\_61 Start: 43378, Stop: 43677, Start Num: 60

Candidate Starts for Marky\_61:

(58, 43372), (Start: 60 @43378 has 6 MA's), (94, 43486), (113, 43648),

Gene: Marley1013\_88 Start: 63672, Stop: 63460, Start Num: 82

Candidate Starts for Marley1013\_88:

(Start: 67 @63711 has 4 MA's), (Start: 82 @63672 has 7 MA's), (101, 63567), (102, 63549), (105, 63540), (113, 63486),

Gene: MasterPo\_73 Start: 59254, Stop: 59030, Start Num: 84

Candidate Starts for MasterPo\_73:

(34, 59512), (37, 59488), (54, 59350), (Start: 78 @59275 has 4 MA's), (Start: 84 @59254 has 37 MA's), (97, 59200), (109, 59095), (111, 59080),

Gene: MerCougar\_7 Start: 4830, Stop: 5069, Start Num: 74

Candidate Starts for MerCougar\_7:

(45, 4692), (51, 4746), (Start: 74 @4830 has 7 MA's), (94, 4887), (107, 4998), (114, 5058),

Gene: Microdon\_57 Start: 42516, Stop: 42818, Start Num: 59

Candidate Starts for Microdon\_57:

(42, 42390), (50, 42465), (Start: 59 @42516 has 5 MA's), (75, 42564), (94, 42627), (109, 42759), (117, 42813),

Gene: Mischief19\_73 Start: 61963, Stop: 62172, Start Num: 89

Candidate Starts for Mischief19\_73:

(Start: 89 @61963 has 1 MA's),

Gene: MmasiCarm\_90 Start: 63688, Stop: 63476, Start Num: 85

Candidate Starts for MmasiCarm\_90:

(70, 63733), (Start: 85 @63688 has 28 MA's), (Start: 92 @63670 has 8 MA's), (Start: 96 @63640 has 2 MA's), (101, 63583), (102, 63565),

Gene: Mortcellus\_89 Start: 64408, Stop: 64214, Start Num: 92

Candidate Starts for Mortcellus\_89:

(70, 64471), (Start: 85 @64426 has 28 MA's), (Start: 92 @64408 has 8 MA's), (Start: 96 @64378 has 2 MA's), (101, 64321), (102, 64303),

Gene: Morty007\_86 Start: 63672, Stop: 63460, Start Num: 82

Candidate Starts for Morty007\_86:

(Start: 67 @63711 has 4 MA's), (Start: 82 @63672 has 7 MA's), (101, 63567), (102, 63549), (105, 63540), (113, 63486),

Gene: Neos5\_87 Start: 63173, Stop: 62922, Start Num: 67

Candidate Starts for Neos5\_87:

(Start: 67 @63173 has 4 MA's), (Start: 82 @63134 has 7 MA's), (101, 63029), (102, 63011), (105, 63002), (113, 62948),

Gene: NosilaM\_8 Start: 5367, Stop: 5606, Start Num: 74

Candidate Starts for NosilaM\_8:

(44, 5232), (45, 5235), (51, 5289), (Start: 74 @5367 has 7 MA's), (Start: 76 @5373 has 1 MA's), (94, 5424), (107, 5535), (114, 5595),

Gene: Nozo\_89 Start: 64068, Stop: 63856, Start Num: 85

Candidate Starts for Nozo\_89:

(Start: 67 @64122 has 4 MA's), (70, 64113), (Start: 85 @64068 has 28 MA's), (Start: 92 @64050 has 8 MA's), (Start: 96 @64020 has 2 MA's), (101, 63963), (102, 63945),

Gene: Obutu\_91 Start: 63871, Stop: 63659, Start Num: 85

Candidate Starts for Obutu\_91:

(70, 63916), (Start: 85 @63871 has 28 MA's), (Start: 92 @63853 has 8 MA's), (Start: 96 @63823 has 2 MA's), (101, 63766), (102, 63748),

Gene: Opia\_73 Start: 59301, Stop: 59056, Start Num: 78

Candidate Starts for Opia\_73:

(34, 59538), (37, 59514), (54, 59376), (Start: 78 @59301 has 4 MA's), (Start: 84 @59280 has 37 MA's), (97, 59226), (109, 59121), (111, 59106),

Gene: OrangeOswald\_88 Start: 63303, Stop: 63091, Start Num: 85

Candidate Starts for OrangeOswald\_88:

(70, 63348), (Start: 85 @63303 has 28 MA's), (Start: 92 @63285 has 8 MA's), (Start: 96 @63255 has 2 MA's), (101, 63198), (102, 63180),

Gene: Outis\_7 Start: 4521, Stop: 4760, Start Num: 74

Candidate Starts for Outis\_7:

(45, 4383), (51, 4437), (Start: 74 @4521 has 7 MA's), (94, 4578), (107, 4689), (114, 4749),

Gene: Patio\_12 Start: 7018, Stop: 7272, Start Num: 69

Candidate Starts for Patio\_12:

(22, 6598), (31, 6781), (63, 6997), (65, 7000), (Start: 69 @7018 has 3 MA's), (98, 7114), (99, 7132), (111, 7234), (114, 7261),

Gene: Phaedrus\_84 Start: 62701, Stop: 62507, Start Num: 92

Candidate Starts for Phaedrus\_84:

(70, 62764), (Start: 85 @62719 has 28 MA's), (Start: 92 @62701 has 8 MA's), (Start: 96 @62671 has 2 MA's), (101, 62614), (102, 62596),

Gene: Phantasmagoria\_71 Start: 59269, Stop: 59045, Start Num: 84

Candidate Starts for Phantasmagoria\_71:

(34, 59527), (37, 59503), (54, 59365), (Start: 78 @59290 has 4 MA's), (Start: 84 @59269 has 37 MA's), (97, 59215), (109, 59110), (111, 59095),

Gene: Phayeta\_92 Start: 63775, Stop: 63563, Start Num: 82

Candidate Starts for Phayeta\_92:

(Start: 67 @63814 has 4 MA's), (Start: 82 @63775 has 7 MA's), (101, 63670), (102, 63652), (105, 63643), (113, 63589),

Gene: Philly\_88 Start: 63149, Stop: 62937, Start Num: 85

Candidate Starts for Philly\_88:

(Start: 67 @63203 has 4 MA's), (70, 63194), (Start: 85 @63149 has 28 MA's), (Start: 92 @63131 has 8 MA's), (Start: 96 @63101 has 2 MA's), (101, 63044), (102, 63026),

Gene: Phlyer\_89 Start: 63966, Stop: 63802, Start Num: 96

Candidate Starts for Phlyer\_89:

(70, 64059), (Start: 85 @64014 has 28 MA's), (Start: 92 @63996 has 8 MA's), (Start: 96 @63966 has 2 MA's), (101, 63909), (102, 63891),

Gene: Phomeo\_8 Start: 5406, Stop: 5609, Start Num: 86

Candidate Starts for Phomeo\_8:

(44, 5244), (45, 5247), (Start: 71 @5364 has 6 MA's), (86, 5406), (103, 5520), (107, 5535), (114, 5595),

Gene: Pupper\_186 Start: 133528, Stop: 133761, Start Num: 85  
Candidate Starts for Pupper\_186:  
(Start: 85 @133528 has 28 MA's), (106, 133669), (108, 133678), (112, 133711),

Gene: Quenya\_29 Start: 23125, Stop: 22928, Start Num: 88  
Candidate Starts for Quenya\_29:  
(33, 23398), (38, 23365), (41, 23341), (46, 23308), (47, 23287), (48, 23275), (52, 23245), (64, 23200),  
(75, 23161), (Start: 88 @23125 has 18 MA's), (Start: 91 @23119 has 11 MA's), (99, 23065), (105,  
23008), (116, 22933),

Gene: Qyrzula\_65 Start: 59423, Stop: 59178, Start Num: 78  
Candidate Starts for Qyrzula\_65:  
(34, 59660), (37, 59636), (54, 59498), (Start: 78 @59423 has 4 MA's), (Start: 84 @59402 has 37  
MA's), (97, 59348), (109, 59243), (111, 59228),

Gene: RagingRooster\_88 Start: 62994, Stop: 62782, Start Num: 85  
Candidate Starts for RagingRooster\_88:  
(70, 63039), (Start: 85 @62994 has 28 MA's), (Start: 92 @62976 has 8 MA's), (Start: 96 @62946 has  
2 MA's), (101, 62889), (102, 62871),

Gene: RainyPolka\_66 Start: 52034, Stop: 52246, Start Num: 84  
Candidate Starts for RainyPolka\_66:  
(Start: 67 @51998 has 4 MA's), (Start: 84 @52034 has 37 MA's), (93, 52058), (101, 52136),

Gene: Rhinoforte\_72 Start: 59307, Stop: 59083, Start Num: 84  
Candidate Starts for Rhinoforte\_72:  
(34, 59565), (37, 59541), (54, 59403), (Start: 78 @59328 has 4 MA's), (Start: 84 @59307 has 37  
MA's), (97, 59253), (109, 59148), (111, 59133),

Gene: Rita1961\_90 Start: 63645, Stop: 63433, Start Num: 85  
Candidate Starts for Rita1961\_90:  
(Start: 67 @63699 has 4 MA's), (70, 63690), (Start: 85 @63645 has 28 MA's), (Start: 92 @63627 has  
8 MA's), (Start: 96 @63597 has 2 MA's), (101, 63540), (102, 63522),

Gene: Rollins\_27 Start: 20951, Stop: 20703, Start Num: 71  
Candidate Starts for Rollins\_27:  
(Start: 61 @20978 has 1 MA's), (Start: 69 @20954 has 3 MA's), (Start: 71 @20951 has 6 MA's), (77,  
20930), (Start: 90 @20894 has 1 MA's), (94, 20882), (99, 20840),

Gene: RomaT\_89 Start: 63868, Stop: 63656, Start Num: 85  
Candidate Starts for RomaT\_89:  
(70, 63913), (Start: 85 @63868 has 28 MA's), (Start: 92 @63850 has 8 MA's), (Start: 96 @63820 has  
2 MA's), (101, 63763), (102, 63745),

Gene: Rona\_28 Start: 23304, Stop: 23113, Start Num: 91  
Candidate Starts for Rona\_28:  
(Start: 88 @23310 has 18 MA's), (Start: 91 @23304 has 11 MA's), (99, 23250), (116, 23118),

Gene: Rosebush\_70 Start: 59374, Stop: 59150, Start Num: 84  
Candidate Starts for Rosebush\_70:  
(34, 59632), (37, 59608), (54, 59470), (Start: 78 @59395 has 4 MA's), (Start: 84 @59374 has 37  
MA's), (97, 59320), (109, 59215), (111, 59200),

Gene: SCentae\_185 Start: 133720, Stop: 133953, Start Num: 85  
Candidate Starts for SCentae\_185:  
(Start: 85 @133720 has 28 MA's), (106, 133861), (108, 133870), (112, 133903),

Gene: Sabella\_72 Start: 59209, Stop: 58985, Start Num: 84  
Candidate Starts for Sabella\_72:  
(34, 59467), (37, 59443), (54, 59305), (Start: 78 @59230 has 4 MA's), (Start: 84 @59209 has 37 MA's), (97, 59155), (109, 59050), (111, 59035),

Gene: Salete\_67 Start: 52550, Stop: 52762, Start Num: 84  
Candidate Starts for Salete\_67:  
(54, 52457), (Start: 84 @52550 has 37 MA's), (93, 52574), (94, 52577), (101, 52652), (110, 52712), (117, 52757),

Gene: SanaSana\_34 Start: 24486, Stop: 24289, Start Num: 88  
Candidate Starts for SanaSana\_34:  
(Start: 88 @24486 has 18 MA's), (Start: 91 @24480 has 11 MA's), (99, 24426),

Gene: Sharkboy\_29 Start: 23394, Stop: 23197, Start Num: 88  
Candidate Starts for Sharkboy\_29:  
(Start: 88 @23394 has 18 MA's), (Start: 91 @23388 has 11 MA's), (99, 23334), (105, 23277), (116, 23202),

Gene: Shatter\_72 Start: 54547, Stop: 54353, Start Num: 88  
Candidate Starts for Shatter\_72:  
(Start: 88 @54547 has 18 MA's), (99, 54493),

Gene: Sisko\_72 Start: 55626, Stop: 55426, Start Num: 88  
Candidate Starts for Sisko\_72:  
(62, 55698), (Start: 73 @55662 has 2 MA's), (Start: 88 @55626 has 18 MA's),

Gene: Skylord\_27 Start: 20825, Stop: 20634, Start Num: 90  
Candidate Starts for Skylord\_27:  
(Start: 61 @20909 has 1 MA's), (Start: 69 @20885 has 3 MA's), (Start: 71 @20882 has 6 MA's), (77, 20861), (Start: 90 @20825 has 1 MA's), (94, 20813), (99, 20771),

Gene: Skysand\_11 Start: 6344, Stop: 6598, Start Num: 69  
Candidate Starts for Skysand\_11:  
(22, 5924), (31, 6107), (53, 6293), (63, 6323), (65, 6326), (Start: 69 @6344 has 3 MA's), (98, 6440), (99, 6458), (111, 6560), (114, 6587),

Gene: SlippinJimmy\_92 Start: 64660, Stop: 64466, Start Num: 92  
Candidate Starts for SlippinJimmy\_92:  
(70, 64723), (Start: 85 @64678 has 28 MA's), (Start: 92 @64660 has 8 MA's), (Start: 96 @64630 has 2 MA's), (101, 64573), (102, 64555),

Gene: Sour\_71 Start: 56576, Stop: 56373, Start Num: 88  
Candidate Starts for Sour\_71:  
(29, 56897), (30, 56873), (49, 56717), (62, 56651), (72, 56624), (Start: 73 @56615 has 2 MA's), (Start: 88 @56576 has 18 MA's), (Start: 92 @56564 has 8 MA's), (94, 56552), (99, 56510),

Gene: StarStruck\_7 Start: 4521, Stop: 4760, Start Num: 74  
Candidate Starts for StarStruck\_7:

(45, 4383), (51, 4437), (Start: 74 @4521 has 7 MA's), (94, 4578), (107, 4689), (114, 4749),

Gene: Stoor\_32 Start: 24148, Stop: 23957, Start Num: 91

Candidate Starts for Stoor\_32:

(Start: 88 @24154 has 18 MA's), (Start: 91 @24148 has 11 MA's), (99, 24094),

Gene: Stromboli\_32 Start: 24014, Stop: 23823, Start Num: 91

Candidate Starts for Stromboli\_32:

(Start: 88 @24020 has 18 MA's), (Start: 91 @24014 has 11 MA's), (99, 23960),

Gene: Stuff\_57 Start: 42753, Stop: 43055, Start Num: 59

Candidate Starts for Stuff\_57:

(1, 41424), (2, 41664), (3, 41733), (4, 41811), (5, 41907), (6, 41916), (7, 42129), (8, 42153), (9, 42168), (10, 42183), (11, 42207), (14, 42255), (17, 42300), (23, 42369), (24, 42387), (42, 42627), (50, 42702), (Start: 59 @42753 has 5 MA's), (75, 42801), (94, 42864), (109, 42996), (117, 43050),

Gene: SuperSulley\_7 Start: 4607, Stop: 4846, Start Num: 74

Candidate Starts for SuperSulley\_7:

(26, 4253), (44, 4472), (45, 4475), (51, 4529), (Start: 74 @4607 has 7 MA's), (Start: 76 @4613 has 1 MA's), (94, 4664), (107, 4775), (114, 4835),

Gene: SynergyX\_89 Start: 63305, Stop: 63093, Start Num: 85

Candidate Starts for SynergyX\_89:

(70, 63350), (Start: 85 @63305 has 28 MA's), (Start: 92 @63287 has 8 MA's), (Start: 96 @63257 has 2 MA's), (101, 63200), (102, 63182),

Gene: TA17A\_72 Start: 59217, Stop: 58993, Start Num: 84

Candidate Starts for TA17A\_72:

(34, 59475), (37, 59451), (54, 59313), (Start: 78 @59238 has 4 MA's), (Start: 84 @59217 has 37 MA's), (97, 59163), (109, 59058), (111, 59043),

Gene: TP1604\_67 Start: 52475, Stop: 52687, Start Num: 84

Candidate Starts for TP1604\_67:

(54, 52382), (Start: 84 @52475 has 37 MA's), (101, 52577), (110, 52637), (117, 52682),

Gene: Thonko\_92 Start: 64640, Stop: 64431, Start Num: 81

Candidate Starts for Thonko\_92:

(Start: 81 @64640 has 1 MA's), (110, 64478),

Gene: Tinciduntolum\_73 Start: 59376, Stop: 59152, Start Num: 84

Candidate Starts for Tinciduntolum\_73:

(34, 59634), (37, 59610), (54, 59472), (Start: 78 @59397 has 4 MA's), (Start: 84 @59376 has 37 MA's), (97, 59322), (109, 59217), (111, 59202),

Gene: Tres\_72 Start: 59230, Stop: 59006, Start Num: 84

Candidate Starts for Tres\_72:

(34, 59488), (37, 59464), (54, 59326), (Start: 78 @59251 has 4 MA's), (Start: 84 @59230 has 37 MA's), (109, 59071), (111, 59056),

Gene: Turuncu\_9 Start: 4891, Stop: 5145, Start Num: 67

Candidate Starts for Turuncu\_9:

(Start: 67 @4891 has 4 MA's), (68, 4894), (79, 4927), (95, 4975), (111, 5107), (114, 5134),

Gene: Tydolla\_85 Start: 63266, Stop: 63072, Start Num: 92

Candidate Starts for Tydolla\_85:

(70, 63329), (Start: 85 @63284 has 28 MA's), (Start: 92 @63266 has 8 MA's), (Start: 96 @63236 has 2 MA's), (101, 63179), (102, 63161),

Gene: UNTPL\_59 Start: 42784, Stop: 43086, Start Num: 59

Candidate Starts for UNTPL\_59:

(1, 41455), (2, 41695), (3, 41764), (4, 41842), (5, 41938), (6, 41947), (7, 42160), (8, 42184), (9, 42199), (10, 42214), (13, 42271), (23, 42400), (24, 42418), (42, 42658), (50, 42733), (Start: 59 @42784 has 5 MA's), (75, 42832), (94, 42895), (109, 43027), (117, 43081),

Gene: Vitas\_27 Start: 20918, Stop: 20643, Start Num: 61

Candidate Starts for Vitas\_27:

(Start: 61 @20918 has 1 MA's), (Start: 69 @20894 has 3 MA's), (Start: 71 @20891 has 6 MA's), (77, 20870), (Start: 90 @20834 has 1 MA's), (94, 20822), (99, 20780),

Gene: West99\_72 Start: 59407, Stop: 59183, Start Num: 84

Candidate Starts for West99\_72:

(34, 59665), (37, 59641), (54, 59503), (Start: 78 @59428 has 4 MA's), (Start: 84 @59407 has 37 MA's), (109, 59248), (111, 59233),

Gene: Wooper\_75 Start: 55974, Stop: 55744, Start Num: 80

Candidate Starts for Wooper\_75:

(18, 56484), (20, 56472), (36, 56196), (38, 56187), (40, 56172), (43, 56145), (47, 56109), (54, 56052), (55, 56049), (Start: 80 @55974 has 2 MA's), (83, 55962), (115, 55755),

Gene: Xkcd426\_72 Start: 59054, Stop: 59275, Start Num: 84

Candidate Starts for Xkcd426\_72:

(Start: 84 @59054 has 37 MA's), (86, 59057), (101, 59153), (106, 59183),

Gene: YDN12\_68 Start: 52246, Stop: 52458, Start Num: 84

Candidate Starts for YDN12\_68:

(54, 52153), (Start: 84 @52246 has 37 MA's), (93, 52270), (101, 52348), (110, 52408), (117, 52453),

Gene: Yahalom\_87 Start: 63111, Stop: 62899, Start Num: 85

Candidate Starts for Yahalom\_87:

(70, 63156), (Start: 85 @63111 has 28 MA's), (Start: 92 @63093 has 8 MA's), (Start: 96 @63063 has 2 MA's), (101, 63006), (102, 62988),

Gene: Yinz\_87 Start: 62651, Stop: 62439, Start Num: 82

Candidate Starts for Yinz\_87:

(Start: 67 @62690 has 4 MA's), (Start: 82 @62651 has 7 MA's), (101, 62546), (102, 62528), (105, 62519), (113, 62465),