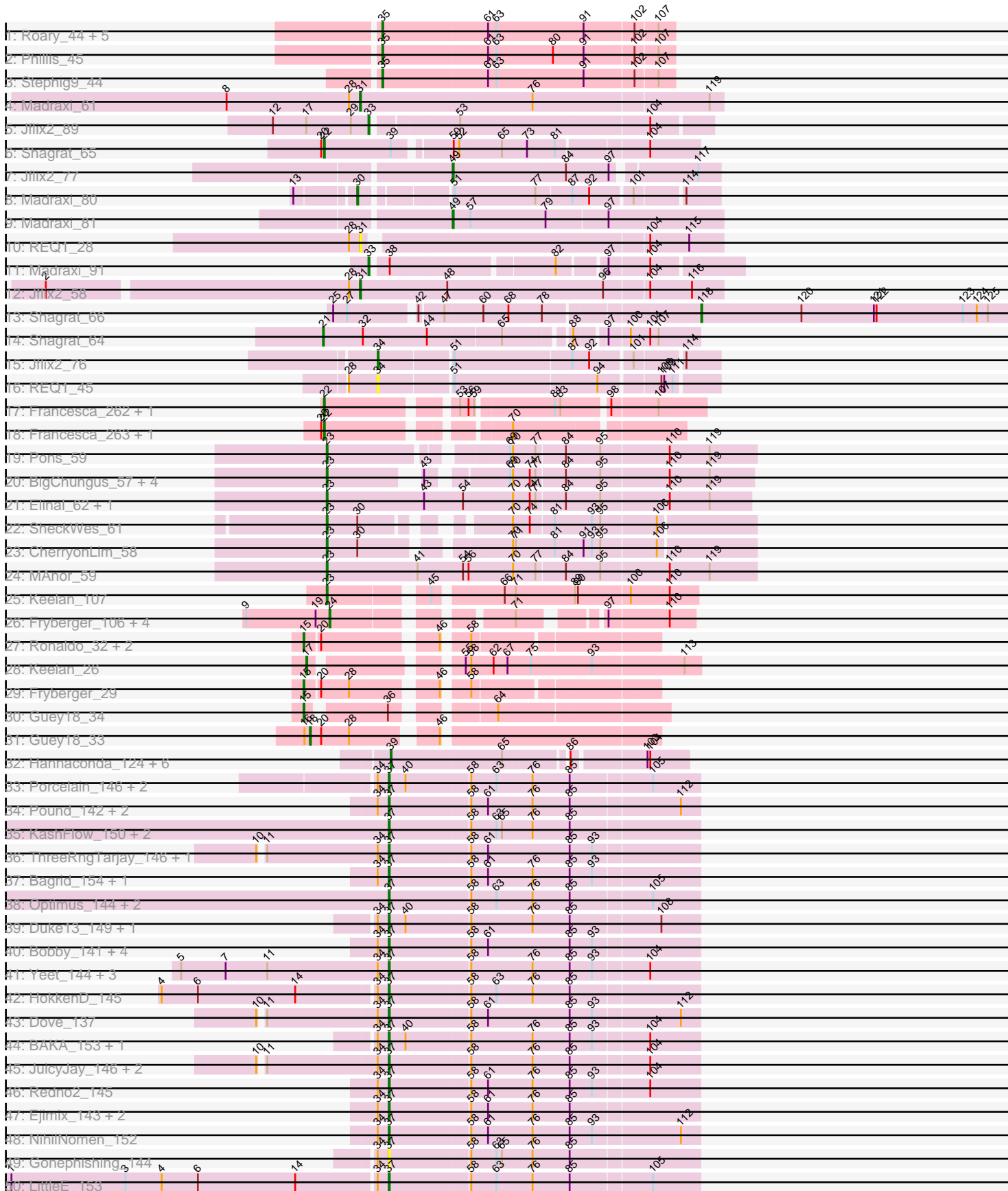


Pham 192467





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 192467 Report

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

Pham number 192467 has 100 members, 7 are drafts.

Phages represented in each track:

- Track 1 : Roary\_44, Smeadley\_44, Astro\_43, Danforth\_43, Groundhog\_42, Expelliarmus\_43
- Track 2 : Phillis\_45
- Track 3 : Stephig9\_44
- Track 4 : Madraxi\_61
- Track 5 : Jflix2\_89
- Track 6 : Shagrat\_65
- Track 7 : Jflix2\_77
- Track 8 : Madraxi\_80
- Track 9 : Madraxi\_81
- Track 10 : REQ1\_28
- Track 11 : Madraxi\_91
- Track 12 : Jflix2\_58
- Track 13 : Shagrat\_66
- Track 14 : Shagrat\_64
- Track 15 : Jflix2\_76
- Track 16 : REQ1\_45
- Track 17 : Francesca\_262, Dorin\_262
- Track 18 : Francesca\_263, Dorin\_263
- Track 19 : Pons\_59
- Track 20 : BigChungus\_57, SummitAcademy\_57, Feastonyeet\_57, Vine\_60, PotPie\_57
- Track 21 : Elinal\_62, KayGee\_60
- Track 22 : SheckWes\_61
- Track 23 : CherryonLim\_58
- Track 24 : MAnor\_59
- Track 25 : Keelan\_107
- Track 26 : Fryberger\_106, Ronaldo\_108, Ziko\_109, Guey18\_111, Volt\_110
- Track 27 : Ronaldo\_32, Ziko\_32, Volt\_31
- Track 28 : Keelan\_26
- Track 29 : Fryberger\_29
- Track 30 : Guey18\_34
- Track 31 : Guey18\_33
- Track 32 : Hannaconda\_124, Odette\_135, HokkenD\_123, Yeet\_125, Gonephishing\_125, Superphikiman\_128, Courthouse\_126
- Track 33 : Porcelain\_146, MiaZeal\_149, Lucky2013\_142
- Track 34 : Pound\_142, Schatzie\_146, DmpstrDiver\_151

- Track 35 : KashFlow\_150, Squint\_142, Hannaconda\_144
- Track 36 : ThreeRngTarjay\_146, Phoebus\_151
- Track 37 : Bagrid\_154, Constella\_144
- Track 38 : Optimus\_144, Omega\_157, Odette\_156
- Track 39 : Duke13\_149, EricMillard\_145
- Track 40 : Bobby\_141, Wanda\_150, Zelink\_145, Kalah2\_142, Minerva\_150
- Track 41 : Yeet\_144, Superphikiman\_147, Ariel\_149, Courthouse\_145
- Track 42 : HokkenD\_145
- Track 43 : Dove\_137
- Track 44 : BAKA\_153, Klein\_150
- Track 45 : JuicyJay\_146, Beem\_153, Bombitas\_138
- Track 46 : Redno2\_145
- Track 47 : Ejimix\_143, Halley\_152, Dallas\_151
- Track 48 : NihilNomen\_152
- Track 49 : Gonephishing\_144
- Track 50 : LittleE\_153
- Track 51 : Thibault\_134
- Track 52 : Hughesyang\_150
- Track 53 : Sleepyhead\_43

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

The start number called the most often in the published annotations is 37, it was called in 40 of the 93 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Ariel\_149, BAKA\_153, Bagrid\_154, Beem\_153, Bobby\_141, Bombitas\_138, Constella\_144, Courthouse\_145, Dallas\_151, DmpstrDiver\_151, Dove\_137, Duke13\_149, Ejimix\_143, EricMillard\_145, Gonephishing\_144, Halley\_152, Hannaconda\_144, HokkenD\_145, Hughesyang\_150, JuicyJay\_146, Kalah2\_142, KashFlow\_150, Klein\_150, LittleE\_153, Lucky2013\_142, MiaZeal\_149, Minerva\_150, NihilNomen\_152, Odette\_156, Omega\_157, Optimus\_144, Phoebus\_151, Porcelain\_146, Pound\_142, Redno2\_145, Schatzie\_146, Squint\_142, Superphikiman\_147, Thibault\_134, ThreeRngTarjay\_146, Wanda\_150, Yeet\_144, Zelink\_145,

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

- 

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

- Astro\_43, BigChungus\_57, CherryonLim\_58, Courthouse\_126, Danforth\_43, Dorin\_262, Dorin\_263, Elinal\_62, Expelliarmus\_43, Feastonyet\_57, Francesca\_262, Francesca\_263, Fryberger\_106, Fryberger\_29, Gonephishing\_125, Groundhog\_42, Guey18\_111, Guey18\_33, Guey18\_34, Hannaconda\_124, HokkenD\_123, Jflix2\_58, Jflix2\_76, Jflix2\_77, Jflix2\_89, KayGee\_60, Keelan\_107, Keelan\_26, MAnor\_59, Madraxi\_61, Madraxi\_80, Madraxi\_81, Madraxi\_91, Odette\_135, Phillis\_45, Pons\_59, PotPie\_57, REQ1\_28, REQ1\_45, Roary\_44, Ronaldo\_108, Ronaldo\_32, Shagrat\_64, Shagrat\_65, Shagrat\_66, SheckWes\_61, Sleepyhead\_43, Smeadley\_44, Stephig9\_44, SummitAcademy\_57, Superphikiman\_128, Vine\_60, Volt\_110, Volt\_31, Yeet\_125, Ziko\_109, Ziko\_32,

## Summary by start number:

### Start 15:

- Found in 5 of 100 ( 5.0% ) of genes in pham
- Manual Annotations of this start: 5 of 93
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Fryberger\_29 (DP), Guey18\_34 (DP), Ronaldo\_32 (DP), Volt\_31 (DP), Ziko\_32 (DP),

### Start 17:

- Found in 2 of 100 ( 2.0% ) of genes in pham
- Manual Annotations of this start: 1 of 93
- Called 50.0% of time when present
- Phage (with cluster) where this start called: Keelan\_26 (DP),

### Start 18:

- Found in 1 of 100 ( 1.0% ) of genes in pham
- Manual Annotations of this start: 1 of 93
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Guey18\_33 (DP),

### Start 21:

- Found in 1 of 100 ( 1.0% ) of genes in pham
- Manual Annotations of this start: 1 of 93
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Shagrat\_64 (CF),

### Start 22:

- Found in 5 of 100 ( 5.0% ) of genes in pham
- Manual Annotations of this start: 5 of 93
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Dorin\_262 (CG), Dorin\_263 (CG), Francesca\_262 (CG), Francesca\_263 (CG), Shagrat\_65 (CF),

### Start 23:

- Found in 12 of 100 ( 12.0% ) of genes in pham
- Manual Annotations of this start: 12 of 93
- Called 100.0% of time when present
- Phage (with cluster) where this start called: BigChungus\_57 (CT), CherryonLim\_58 (CT), Elinal\_62 (CT), Feastonyeet\_57 (CT), KayGee\_60 (CT), Keelan\_107 (DP), MAnor\_59 (CT), Pons\_59 (CT), PotPie\_57 (CT), SheckWes\_61 (CT), SummitAcademy\_57 (CT), Vine\_60 (CT),

### Start 24:

- Found in 5 of 100 ( 5.0% ) of genes in pham
- Manual Annotations of this start: 5 of 93
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Fryberger\_106 (DP), Guey18\_111 (DP), Ronaldo\_108 (DP), Volt\_110 (DP), Ziko\_109 (DP),

### Start 26:

- Found in 1 of 100 ( 1.0% ) of genes in pham

- Manual Annotations of this start: 1 of 93
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Sleepyhead\_43 (singleton),

#### Start 30:

- Found in 3 of 100 ( 3.0% ) of genes in pham
- Manual Annotations of this start: 1 of 93
- Called 33.3% of time when present
- Phage (with cluster) where this start called: Madraxi\_80 (CF),

#### Start 31:

- Found in 3 of 100 ( 3.0% ) of genes in pham
- Manual Annotations of this start: 2 of 93
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Jflix2\_58 (CF), Madraxi\_61 (CF), REQ1\_28 (CF),

#### Start 33:

- Found in 2 of 100 ( 2.0% ) of genes in pham
- Manual Annotations of this start: 2 of 93
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Jflix2\_89 (CF), Madraxi\_91 (CF),

#### Start 34:

- Found in 39 of 100 ( 39.0% ) of genes in pham
- Manual Annotations of this start: 1 of 93
- Called 5.1% of time when present
- Phage (with cluster) where this start called: Jflix2\_76 (CF), REQ1\_45 (CF),

#### Start 35:

- Found in 8 of 100 ( 8.0% ) of genes in pham
- Manual Annotations of this start: 8 of 93
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Astro\_43 (A8), Danforth\_43 (A8), Expelliarmus\_43 (A8), Groundhog\_42 (A8), Phillis\_45 (A8), Roary\_44 (A8), Smeadley\_44 (A8), StepHig9\_44 (A8),

#### Start 37:

- Found in 43 of 100 ( 43.0% ) of genes in pham
- Manual Annotations of this start: 40 of 93
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Ariel\_149 (J), BAKA\_153 (J), Bagrid\_154 (J), Beem\_153 (J), Bobby\_141 (J), Bombitas\_138 (J), Constella\_144 (J), Courthouse\_145 (J), Dallas\_151 (J), DmpstrDiver\_151 (J), Dove\_137 (J), Duke13\_149 (J), Ejimix\_143 (J), EricMillard\_145 (J), Gonephishing\_144 (J), Halley\_152 (J), Hannaconda\_144 (J), HokkenD\_145 (J), Hughesyang\_150 (J), JuicyJay\_146 (J), Kalah2\_142 (J), KashFlow\_150 (J), Klein\_150 (J), LittleE\_153 (J), Lucky2013\_142 (J), MiaZeal\_149 (J), Minerva\_150 (J), NihilNomen\_152 (J), Odette\_156 (J), Omega\_157 (J), Optimus\_144 (J), Phoebus\_151 (J), Porcelain\_146 (J), Pound\_142 (J), Redno2\_145 (J), Schatzie\_146 (J), Squint\_142 (J), Superphikiman\_147 (J), Thibault\_134 (J), ThreeRngTarjay\_146 (J), Wanda\_150 (J), Yeet\_144 (J), Zelink\_145 (J),

Start 39:

- Found in 8 of 100 ( 8.0% ) of genes in pham
- Manual Annotations of this start: 5 of 93
- Called 87.5% of time when present
- Phage (with cluster) where this start called: Courthouse\_126 (J), Gonephishing\_125 (J), Hannaconda\_124 (J), HokkenD\_123 (J), Odette\_135 (J), Superphikiman\_128 (J), Yeet\_125 (J),

Start 49:

- Found in 2 of 100 ( 2.0% ) of genes in pham
- Manual Annotations of this start: 2 of 93
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Jflix2\_77 (CF), Madraxi\_81 (CF),

Start 118:

- Found in 1 of 100 ( 1.0% ) of genes in pham
- Manual Annotations of this start: 1 of 93
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Shagrat\_66 (CF),

**Summary by clusters:**

There are 7 clusters represented in this pham: singleton, J, CG, CF, A8, DP, CT,

Info for manual annotations of cluster A8:

- Start number 35 was manually annotated 8 times for cluster A8.

Info for manual annotations of cluster CF:

- Start number 21 was manually annotated 1 time for cluster CF.
- Start number 22 was manually annotated 1 time for cluster CF.
- Start number 30 was manually annotated 1 time for cluster CF.
- Start number 31 was manually annotated 2 times for cluster CF.
- Start number 33 was manually annotated 2 times for cluster CF.
- Start number 34 was manually annotated 1 time for cluster CF.
- Start number 49 was manually annotated 2 times for cluster CF.
- Start number 118 was manually annotated 1 time for cluster CF.

Info for manual annotations of cluster CG:

- Start number 22 was manually annotated 4 times for cluster CG.

Info for manual annotations of cluster CT:

- Start number 23 was manually annotated 11 times for cluster CT.

Info for manual annotations of cluster DP:

- Start number 15 was manually annotated 5 times for cluster DP.
- Start number 17 was manually annotated 1 time for cluster DP.
- Start number 18 was manually annotated 1 time for cluster DP.
- Start number 23 was manually annotated 1 time for cluster DP.
- Start number 24 was manually annotated 5 times for cluster DP.

Info for manual annotations of cluster J:

- Start number 37 was manually annotated 40 times for cluster J.
- Start number 39 was manually annotated 5 times for cluster J.

**Gene Information:**

Gene: Ariel\_149 Start: 76661, Stop: 76984, Start Num: 37

Candidate Starts for Ariel\_149:

(5, 76439), (7, 76487), (11, 76532), (Start: 34 @76649 has 1 MA's), (Start: 37 @76661 has 40 MA's), (58, 76745), (76, 76811), (85, 76850), (93, 76874), (104, 76931),

Gene: Astro\_43 Start: 30852, Stop: 30550, Start Num: 35

Candidate Starts for Astro\_43:

(Start: 35 @30852 has 8 MA's), (61, 30741), (63, 30732), (91, 30639), (102, 30588), (107, 30567),

Gene: BAKA\_153 Start: 81330, Stop: 81653, Start Num: 37

Candidate Starts for BAKA\_153:

(Start: 34 @81318 has 1 MA's), (Start: 37 @81330 has 40 MA's), (40, 81348), (58, 81414), (76, 81480), (85, 81519), (93, 81543), (104, 81600),

Gene: Bagrid\_154 Start: 82037, Stop: 82360, Start Num: 37

Candidate Starts for Bagrid\_154:

(Start: 34 @82025 has 1 MA's), (Start: 37 @82037 has 40 MA's), (58, 82121), (61, 82139), (76, 82187), (85, 82226), (93, 82250),

Gene: Beem\_153 Start: 81458, Stop: 81781, Start Num: 37

Candidate Starts for Beem\_153:

(10, 81326), (11, 81329), (Start: 34 @81446 has 1 MA's), (Start: 37 @81458 has 40 MA's), (58, 81542), (76, 81608), (85, 81647), (104, 81728),

Gene: BigChungus\_57 Start: 40681, Stop: 40280, Start Num: 23

Candidate Starts for BigChungus\_57:

(Start: 23 @40681 has 12 MA's), (43, 40603), (69, 40531), (70, 40528), (74, 40510), (77, 40504), (84, 40474), (95, 40441), (110, 40369), (119, 40327),

Gene: Bobby\_141 Start: 81455, Stop: 81778, Start Num: 37

Candidate Starts for Bobby\_141:

(Start: 34 @81443 has 1 MA's), (Start: 37 @81455 has 40 MA's), (58, 81539), (61, 81557), (85, 81644), (93, 81668),

Gene: Bombitas\_138 Start: 78311, Stop: 78634, Start Num: 37

Candidate Starts for Bombitas\_138:

(10, 78179), (11, 78182), (Start: 34 @78299 has 1 MA's), (Start: 37 @78311 has 40 MA's), (58, 78395), (76, 78461), (85, 78500), (104, 78581),

Gene: CherryonLim\_58 Start: 42157, Stop: 41738, Start Num: 23

Candidate Starts for CherryonLim\_58:

(Start: 23 @42157 has 12 MA's), (Start: 30 @42124 has 1 MA's), (70, 41986), (71, 41983), (81, 41941), (91, 41914), (93, 41905), (95, 41896), (106, 41839),

Gene: Constella\_144 Start: 79520, Stop: 79843, Start Num: 37

Candidate Starts for Constella\_144:

(Start: 34 @79508 has 1 MA's), (Start: 37 @79520 has 40 MA's), (58, 79604), (61, 79622), (76, 79670), (85, 79709), (93, 79733),



Gene: Courthouse\_145 Start: 76519, Stop: 76842, Start Num: 37  
Candidate Starts for Courthouse\_145:  
(5, 76297), (7, 76345), (11, 76390), (Start: 34 @76507 has 1 MA's), (Start: 37 @76519 has 40 MA's),  
(58, 76603), (76, 76669), (85, 76708), (93, 76732), (104, 76789),

Gene: Courthouse\_126 Start: 68736, Stop: 69029, Start Num: 39  
Candidate Starts for Courthouse\_126:  
(Start: 39 @68736 has 5 MA's), (65, 68853), (86, 68913), (103, 68985), (104, 68988),

Gene: Dallas\_151 Start: 80367, Stop: 80690, Start Num: 37  
Candidate Starts for Dallas\_151:  
(Start: 34 @80355 has 1 MA's), (Start: 37 @80367 has 40 MA's), (58, 80451), (61, 80469), (76,  
80517), (85, 80556),

Gene: Danforth\_43 Start: 30881, Stop: 30579, Start Num: 35  
Candidate Starts for Danforth\_43:  
(Start: 35 @30881 has 8 MA's), (61, 30770), (63, 30761), (91, 30668), (102, 30617), (107, 30596),

Gene: DmpstrDiver\_151 Start: 80286, Stop: 80609, Start Num: 37  
Candidate Starts for DmpstrDiver\_151:  
(Start: 34 @80274 has 1 MA's), (Start: 37 @80286 has 40 MA's), (58, 80370), (61, 80388), (76,  
80436), (85, 80475), (112, 80589),

Gene: Dorin\_262 Start: 128550, Stop: 128915, Start Num: 22  
Candidate Starts for Dorin\_262:  
(Start: 22 @128550 has 5 MA's), (53, 128673), (56, 128682), (59, 128688), (81, 128766), (83,  
128772), (98, 128817), (107, 128865),

Gene: Dorin\_263 Start: 128893, Stop: 129231, Start Num: 22  
Candidate Starts for Dorin\_263:  
(20, 128890), (Start: 22 @128893 has 5 MA's), (70, 129061),

Gene: Dove\_137 Start: 76474, Stop: 76797, Start Num: 37  
Candidate Starts for Dove\_137:  
(10, 76342), (11, 76345), (Start: 34 @76462 has 1 MA's), (Start: 37 @76474 has 40 MA's), (58,  
76558), (61, 76576), (85, 76663), (93, 76687), (112, 76777),

Gene: Duke13\_149 Start: 79615, Stop: 79938, Start Num: 37  
Candidate Starts for Duke13\_149:  
(Start: 34 @79603 has 1 MA's), (Start: 37 @79615 has 40 MA's), (40, 79633), (58, 79699), (76,  
79765), (85, 79804), (108, 79897),

Gene: Ejimix\_143 Start: 80435, Stop: 80758, Start Num: 37  
Candidate Starts for Ejimix\_143:  
(Start: 34 @80423 has 1 MA's), (Start: 37 @80435 has 40 MA's), (58, 80519), (61, 80537), (76,  
80585), (85, 80624),

Gene: Elinal\_62 Start: 41462, Stop: 41016, Start Num: 23  
Candidate Starts for Elinal\_62:  
(Start: 23 @41462 has 12 MA's), (43, 41357), (54, 41315), (70, 41261), (74, 41243), (77, 41237), (84,  
41207), (95, 41174), (110, 41102), (119, 41060),

Gene: EricMillard\_145 Start: 80967, Stop: 81290, Start Num: 37  
Candidate Starts for EricMillard\_145:  
(Start: 34 @80955 has 1 MA's), (Start: 37 @80967 has 40 MA's), (40, 80985), (58, 81051), (76, 81117), (85, 81156), (108, 81249),

Gene: Expelliarmus\_43 Start: 30910, Stop: 30608, Start Num: 35  
Candidate Starts for Expelliarmus\_43:  
(Start: 35 @30910 has 8 MA's), (61, 30799), (63, 30790), (91, 30697), (102, 30646), (107, 30625),

Gene: Feastonyeet\_57 Start: 40681, Stop: 40280, Start Num: 23  
Candidate Starts for Feastonyeet\_57:  
(Start: 23 @40681 has 12 MA's), (43, 40603), (69, 40531), (70, 40528), (74, 40510), (77, 40504), (84, 40474), (95, 40441), (110, 40369), (119, 40327),

Gene: Francesca\_262 Start: 129192, Stop: 129557, Start Num: 22  
Candidate Starts for Francesca\_262:  
(Start: 22 @129192 has 5 MA's), (53, 129315), (56, 129324), (59, 129330), (81, 129408), (83, 129414), (98, 129459), (107, 129507),

Gene: Francesca\_263 Start: 129535, Stop: 129873, Start Num: 22  
Candidate Starts for Francesca\_263:  
(20, 129532), (Start: 22 @129535 has 5 MA's), (70, 129703),

Gene: Fryberger\_106 Start: 52384, Stop: 52698, Start Num: 24  
Candidate Starts for Fryberger\_106:  
(9, 52294), (19, 52369), (Start: 24 @52384 has 5 MA's), (71, 52540), (97, 52609), (110, 52672),

Gene: Fryberger\_29 Start: 8784, Stop: 8455, Start Num: 15  
Candidate Starts for Fryberger\_29:  
(Start: 15 @8784 has 5 MA's), (20, 8769), (28, 8739), (46, 8658), (58, 8637),

Gene: Gonephishing\_125 Start: 68379, Stop: 68672, Start Num: 39  
Candidate Starts for Gonephishing\_125:  
(Start: 39 @68379 has 5 MA's), (65, 68496), (86, 68556), (103, 68628), (104, 68631),

Gene: Gonephishing\_144 Start: 78607, Stop: 78930, Start Num: 37  
Candidate Starts for Gonephishing\_144:  
(Start: 34 @78595 has 1 MA's), (Start: 37 @78607 has 40 MA's), (58, 78691), (63, 78718), (65, 78724), (76, 78757), (85, 78796),

Gene: Groundhog\_42 Start: 30817, Stop: 30515, Start Num: 35  
Candidate Starts for Groundhog\_42:  
(Start: 35 @30817 has 8 MA's), (61, 30706), (63, 30697), (91, 30604), (102, 30553), (107, 30532),

Gene: Guey18\_34 Start: 9973, Stop: 9644, Start Num: 15  
Candidate Starts for Guey18\_34:  
(Start: 15 @9973 has 5 MA's), (36, 9898), (64, 9814),

Gene: Guey18\_33 Start: 9651, Stop: 9316, Start Num: 18  
Candidate Starts for Guey18\_33:  
(16, 9657), (Start: 18 @9651 has 1 MA's), (20, 9639), (28, 9609), (46, 9531),

Gene: Guey18\_111 Start: 53707, Stop: 54021, Start Num: 24

Candidate Starts for Guey18\_111:

(9, 53617), (19, 53692), (Start: 24 @53707 has 5 MA's), (71, 53863), (97, 53932), (110, 53995),

Gene: Halley\_152 Start: 80751, Stop: 81074, Start Num: 37

Candidate Starts for Halley\_152:

(Start: 34 @80739 has 1 MA's), (Start: 37 @80751 has 40 MA's), (58, 80835), (61, 80853), (76, 80901), (85, 80940),

Gene: Hannaconda\_124 Start: 69032, Stop: 69325, Start Num: 39

Candidate Starts for Hannaconda\_124:

(Start: 39 @69032 has 5 MA's), (65, 69149), (86, 69209), (103, 69281), (104, 69284),

Gene: Hannaconda\_144 Start: 79540, Stop: 79863, Start Num: 37

Candidate Starts for Hannaconda\_144:

(Start: 37 @79540 has 40 MA's), (58, 79624), (63, 79651), (65, 79657), (76, 79690), (85, 79729),

Gene: HokkenD\_123 Start: 71913, Stop: 72206, Start Num: 39

Candidate Starts for HokkenD\_123:

(Start: 39 @71913 has 5 MA's), (65, 72030), (86, 72090), (103, 72162), (104, 72165),

Gene: HokkenD\_145 Start: 81876, Stop: 82199, Start Num: 37

Candidate Starts for HokkenD\_145:

(4, 81639), (6, 81678), (14, 81783), (Start: 34 @81864 has 1 MA's), (Start: 37 @81876 has 40 MA's), (58, 81960), (63, 81987), (76, 82026), (85, 82065),

Gene: Hughesyang\_150 Start: 81110, Stop: 81433, Start Num: 37

Candidate Starts for Hughesyang\_150:

(10, 80978), (11, 80981), (Start: 34 @81098 has 1 MA's), (Start: 37 @81110 has 40 MA's), (58, 81194), (76, 81260), (85, 81299),

Gene: Jflix2\_89 Start: 50660, Stop: 51001, Start Num: 33

Candidate Starts for Jflix2\_89:

(12, 50558), (Start: 17 @50594 has 1 MA's), (29, 50642), (Start: 33 @50660 has 2 MA's), (53, 50741), (104, 50939),

Gene: Jflix2\_77 Start: 46906, Stop: 47172, Start Num: 49

Candidate Starts for Jflix2\_77:

(Start: 49 @46906 has 2 MA's), (84, 47026), (97, 47071), (117, 47149),

Gene: Jflix2\_58 Start: 39721, Stop: 40101, Start Num: 31

Candidate Starts for Jflix2\_58:

(2, 39397), (28, 39709), (Start: 31 @39721 has 2 MA's), (48, 39814), (96, 39979), (104, 40024), (116, 40069),

Gene: Jflix2\_76 Start: 46571, Stop: 46909, Start Num: 34

Candidate Starts for Jflix2\_76:

(Start: 34 @46571 has 1 MA's), (51, 46643), (87, 46766), (92, 46784), (101, 46826), (114, 46874),

Gene: JuicyJay\_146 Start: 82036, Stop: 82359, Start Num: 37

Candidate Starts for JuicyJay\_146:

(10, 81904), (11, 81907), (Start: 34 @82024 has 1 MA's), (Start: 37 @82036 has 40 MA's), (58, 82120), (76, 82186), (85, 82225), (104, 82306),

Gene: Kalah2\_142 Start: 80240, Stop: 80563, Start Num: 37

Candidate Starts for Kalah2\_142:

(Start: 34 @80228 has 1 MA's), (Start: 37 @80240 has 40 MA's), (58, 80324), (61, 80342), (85, 80429), (93, 80453),

Gene: KashFlow\_150 Start: 79539, Stop: 79862, Start Num: 37

Candidate Starts for KashFlow\_150:

(Start: 37 @79539 has 40 MA's), (58, 79623), (63, 79650), (65, 79656), (76, 79689), (85, 79728),

Gene: KayGee\_60 Start: 41462, Stop: 41016, Start Num: 23

Candidate Starts for KayGee\_60:

(Start: 23 @41462 has 12 MA's), (43, 41357), (54, 41315), (70, 41261), (74, 41243), (77, 41237), (84, 41207), (95, 41174), (110, 41102), (119, 41060),

Gene: Keelan\_107 Start: 53290, Stop: 53652, Start Num: 23

Candidate Starts for Keelan\_107:

(Start: 23 @53290 has 12 MA's), (45, 53383), (66, 53449), (71, 53461), (89, 53524), (90, 53527), (100, 53581), (110, 53623),

Gene: Keelan\_26 Start: 8252, Stop: 7875, Start Num: 17

Candidate Starts for Keelan\_26:

(Start: 17 @8252 has 1 MA's), (55, 8120), (58, 8114), (62, 8090), (67, 8075), (75, 8051), (93, 7988), (113, 7892),

Gene: Klein\_150 Start: 80105, Stop: 80428, Start Num: 37

Candidate Starts for Klein\_150:

(Start: 34 @80093 has 1 MA's), (Start: 37 @80105 has 40 MA's), (40, 80123), (58, 80189), (76, 80255), (85, 80294), (93, 80318), (104, 80375),

Gene: LittleE\_153 Start: 80985, Stop: 81308, Start Num: 37

Candidate Starts for LittleE\_153:

(1, 80586), (3, 80709), (4, 80748), (6, 80787), (14, 80892), (Start: 34 @80973 has 1 MA's), (Start: 37 @80985 has 40 MA's), (58, 81069), (63, 81096), (76, 81135), (85, 81174), (105, 81258),

Gene: Lucky2013\_142 Start: 75897, Stop: 76220, Start Num: 37

Candidate Starts for Lucky2013\_142:

(Start: 34 @75885 has 1 MA's), (Start: 37 @75897 has 40 MA's), (40, 75915), (58, 75981), (63, 76008), (76, 76047), (85, 76086), (105, 76170),

Gene: MAnor\_59 Start: 41593, Stop: 41144, Start Num: 23

Candidate Starts for MAnor\_59:

(Start: 23 @41593 has 12 MA's), (41, 41497), (54, 41449), (56, 41443), (70, 41395), (77, 41371), (84, 41341), (95, 41308), (110, 41236), (119, 41194),

Gene: Madraxi\_61 Start: 42224, Stop: 42604, Start Num: 31

Candidate Starts for Madraxi\_61:

(8, 42083), (28, 42212), (Start: 31 @42224 has 2 MA's), (76, 42407), (119, 42590),

Gene: Madraxi\_80 Start: 49350, Stop: 49697, Start Num: 30

Candidate Starts for Madraxi\_80:

(13, 49296), (Start: 30 @49350 has 1 MA's), (51, 49431), (77, 49518), (87, 49554), (92, 49572), (101, 49614), (114, 49662),

Gene: Madraxi\_81 Start: 49694, Stop: 49978, Start Num: 49  
Candidate Starts for Madraxi\_81:  
(Start: 49 @49694 has 2 MA's), (57, 49712), (79, 49793), (97, 49856),

Gene: Madraxi\_91 Start: 52811, Stop: 53170, Start Num: 33  
Candidate Starts for Madraxi\_91:  
(Start: 33 @52811 has 2 MA's), (38, 52826), (82, 52988), (97, 53033), (104, 53075),

Gene: MiaZeal\_149 Start: 77044, Stop: 77367, Start Num: 37  
Candidate Starts for MiaZeal\_149:  
(Start: 34 @77032 has 1 MA's), (Start: 37 @77044 has 40 MA's), (40, 77062), (58, 77128), (63, 77155), (76, 77194), (85, 77233), (105, 77317),

Gene: Minerva\_150 Start: 80059, Stop: 80382, Start Num: 37  
Candidate Starts for Minerva\_150:  
(Start: 34 @80047 has 1 MA's), (Start: 37 @80059 has 40 MA's), (58, 80143), (61, 80161), (85, 80248), (93, 80272),

Gene: NihilNomen\_152 Start: 79960, Stop: 80283, Start Num: 37  
Candidate Starts for NihilNomen\_152:  
(Start: 34 @79948 has 1 MA's), (Start: 37 @79960 has 40 MA's), (58, 80044), (61, 80062), (76, 80110), (85, 80149), (93, 80173), (112, 80263),

Gene: Odette\_135 Start: 73830, Stop: 74123, Start Num: 39  
Candidate Starts for Odette\_135:  
(Start: 39 @73830 has 5 MA's), (65, 73947), (86, 74007), (103, 74079), (104, 74082),

Gene: Odette\_156 Start: 82653, Stop: 82976, Start Num: 37  
Candidate Starts for Odette\_156:  
(Start: 37 @82653 has 40 MA's), (58, 82737), (63, 82764), (76, 82803), (85, 82842), (105, 82926),

Gene: Omega\_157 Start: 82149, Stop: 82472, Start Num: 37  
Candidate Starts for Omega\_157:  
(Start: 37 @82149 has 40 MA's), (58, 82233), (63, 82260), (76, 82299), (85, 82338), (105, 82422),

Gene: Optimus\_144 Start: 79658, Stop: 79981, Start Num: 37  
Candidate Starts for Optimus\_144:  
(Start: 37 @79658 has 40 MA's), (58, 79742), (63, 79769), (76, 79808), (85, 79847), (105, 79931),

Gene: Phillis\_45 Start: 31235, Stop: 30933, Start Num: 35  
Candidate Starts for Phillis\_45:  
(Start: 35 @31235 has 8 MA's), (61, 31124), (63, 31115), (80, 31055), (91, 31022), (102, 30971), (107, 30950),

Gene: Phoebus\_151 Start: 82464, Stop: 82787, Start Num: 37  
Candidate Starts for Phoebus\_151:  
(10, 82332), (11, 82335), (Start: 34 @82452 has 1 MA's), (Start: 37 @82464 has 40 MA's), (58, 82548), (61, 82566), (85, 82653), (93, 82677),

Gene: Pons\_59 Start: 41198, Stop: 40776, Start Num: 23  
Candidate Starts for Pons\_59:  
(Start: 23 @41198 has 12 MA's), (69, 41030), (70, 41027), (77, 41003), (84, 40973), (95, 40940), (110, 40868), (119, 40826),

Gene: Porcelain\_146 Start: 76843, Stop: 77166, Start Num: 37

Candidate Starts for Porcelain\_146:

(Start: 34 @76831 has 1 MA's), (Start: 37 @76843 has 40 MA's), (40, 76861), (58, 76927), (63, 76954), (76, 76993), (85, 77032), (105, 77116),

Gene: PotPie\_57 Start: 41716, Stop: 41315, Start Num: 23

Candidate Starts for PotPie\_57:

(Start: 23 @41716 has 12 MA's), (43, 41638), (69, 41566), (70, 41563), (74, 41545), (77, 41539), (84, 41509), (95, 41476), (110, 41404), (119, 41362),

Gene: Pound\_142 Start: 79694, Stop: 80017, Start Num: 37

Candidate Starts for Pound\_142:

(Start: 34 @79682 has 1 MA's), (Start: 37 @79694 has 40 MA's), (58, 79778), (61, 79796), (76, 79844), (85, 79883), (112, 79997),

Gene: REQ1\_28 Start: 11269, Stop: 11631, Start Num: 31

Candidate Starts for REQ1\_28:

(28, 11257), (Start: 31 @11269 has 2 MA's), (104, 11554), (115, 11596),

Gene: REQ1\_45 Start: 18020, Stop: 18358, Start Num: 34

Candidate Starts for REQ1\_45:

(28, 17999), (Start: 34 @18020 has 1 MA's), (51, 18092), (94, 18242), (108, 18302), (109, 18305), (111, 18314),

Gene: Redno2\_145 Start: 77962, Stop: 78285, Start Num: 37

Candidate Starts for Redno2\_145:

(Start: 34 @77950 has 1 MA's), (Start: 37 @77962 has 40 MA's), (58, 78046), (61, 78064), (76, 78112), (85, 78151), (93, 78175), (104, 78232),

Gene: Roary\_44 Start: 30866, Stop: 30564, Start Num: 35

Candidate Starts for Roary\_44:

(Start: 35 @30866 has 8 MA's), (61, 30755), (63, 30746), (91, 30653), (102, 30602), (107, 30581),

Gene: Ronaldo\_32 Start: 9713, Stop: 9384, Start Num: 15

Candidate Starts for Ronaldo\_32:

(Start: 15 @9713 has 5 MA's), (20, 9698), (46, 9587), (58, 9566),

Gene: Ronaldo\_108 Start: 53289, Stop: 53603, Start Num: 24

Candidate Starts for Ronaldo\_108:

(9, 53199), (19, 53274), (Start: 24 @53289 has 5 MA's), (71, 53445), (97, 53514), (110, 53577),

Gene: Schatzie\_146 Start: 80543, Stop: 80866, Start Num: 37

Candidate Starts for Schatzie\_146:

(Start: 34 @80531 has 1 MA's), (Start: 37 @80543 has 40 MA's), (58, 80627), (61, 80645), (76, 80693), (85, 80732), (112, 80846),

Gene: Shagrat\_65 Start: 40539, Stop: 40913, Start Num: 22

Candidate Starts for Shagrat\_65:

(20, 40536), (Start: 22 @40539 has 5 MA's), (Start: 39 @40611 has 5 MA's), (50, 40662), (52, 40668), (65, 40713), (73, 40740), (81, 40770), (104, 40860),

Gene: Shagrat\_66 Start: 40915, Stop: 41250, Start Num: 118

Candidate Starts for Shagrat\_66:

(25, 40549), (27, 40564), (42, 40630), (47, 40654), (60, 40693), (68, 40720), (78, 40756), (Start: 118 @40915 has 1 MA's), (120, 41023), (121, 41101), (122, 41104), (123, 41197), (124, 41212), (125, 41224),

Gene: Shagrat\_64 Start: 40165, Stop: 40536, Start Num: 21

Candidate Starts for Shagrat\_64:

(Start: 21 @40165 has 1 MA's), (32, 40207), (44, 40276), (65, 40351), (88, 40414), (97, 40441), (100, 40462), (104, 40483), (107, 40492),

Gene: SheckWes\_61 Start: 40759, Stop: 40364, Start Num: 23

Candidate Starts for SheckWes\_61:

(Start: 23 @40759 has 12 MA's), (Start: 30 @40726 has 1 MA's), (70, 40609), (74, 40591), (81, 40567), (93, 40531), (95, 40522), (106, 40465),

Gene: Sleepyhead\_43 Start: 31028, Stop: 31363, Start Num: 26

Candidate Starts for Sleepyhead\_43:

(Start: 26 @31028 has 1 MA's), (72, 31199), (99, 31295),

Gene: Smeadley\_44 Start: 31032, Stop: 30730, Start Num: 35

Candidate Starts for Smeadley\_44:

(Start: 35 @31032 has 8 MA's), (61, 30921), (63, 30912), (91, 30819), (102, 30768), (107, 30747),

Gene: Squint\_142 Start: 76328, Stop: 76651, Start Num: 37

Candidate Starts for Squint\_142:

(Start: 37 @76328 has 40 MA's), (58, 76412), (63, 76439), (65, 76445), (76, 76478), (85, 76517),

Gene: Stephig9\_44 Start: 30891, Stop: 30589, Start Num: 35

Candidate Starts for Stephig9\_44:

(Start: 35 @30891 has 8 MA's), (61, 30780), (63, 30771), (91, 30678), (102, 30627), (107, 30606),

Gene: SummitAcademy\_57 Start: 40859, Stop: 40458, Start Num: 23

Candidate Starts for SummitAcademy\_57:

(Start: 23 @40859 has 12 MA's), (43, 40781), (69, 40709), (70, 40706), (74, 40688), (77, 40682), (84, 40652), (95, 40619), (110, 40547), (119, 40505),

Gene: Superphikiman\_147 Start: 76801, Stop: 77124, Start Num: 37

Candidate Starts for Superphikiman\_147:

(5, 76579), (7, 76627), (11, 76672), (Start: 34 @76789 has 1 MA's), (Start: 37 @76801 has 40 MA's), (58, 76885), (76, 76951), (85, 76990), (93, 77014), (104, 77071),

Gene: Superphikiman\_128 Start: 69018, Stop: 69311, Start Num: 39

Candidate Starts for Superphikiman\_128:

(Start: 39 @69018 has 5 MA's), (65, 69135), (86, 69195), (103, 69267), (104, 69270),

Gene: Thibault\_134 Start: 77417, Stop: 77740, Start Num: 37

Candidate Starts for Thibault\_134:

(5, 77204), (10, 77285), (11, 77288), (Start: 34 @77405 has 1 MA's), (Start: 37 @77417 has 40 MA's), (58, 77501), (76, 77567), (85, 77606), (108, 77699),

Gene: ThreeRngTarjay\_146 Start: 81055, Stop: 81378, Start Num: 37

Candidate Starts for ThreeRngTarjay\_146:

(10, 80923), (11, 80926), (Start: 34 @81043 has 1 MA's), (Start: 37 @81055 has 40 MA's), (58, 81139), (61, 81157), (85, 81244), (93, 81268),

Gene: Vine\_60 Start: 41482, Stop: 41081, Start Num: 23

Candidate Starts for Vine\_60:

(Start: 23 @41482 has 12 MA's), (43, 41404), (69, 41332), (70, 41329), (74, 41311), (77, 41305), (84, 41275), (95, 41242), (110, 41170), (119, 41128),

Gene: Volt\_31 Start: 9713, Stop: 9384, Start Num: 15

Candidate Starts for Volt\_31:

(Start: 15 @9713 has 5 MA's), (20, 9698), (46, 9587), (58, 9566),

Gene: Volt\_110 Start: 53453, Stop: 53767, Start Num: 24

Candidate Starts for Volt\_110:

(9, 53363), (19, 53438), (Start: 24 @53453 has 5 MA's), (71, 53609), (97, 53678), (110, 53741),

Gene: Wanda\_150 Start: 78530, Stop: 78853, Start Num: 37

Candidate Starts for Wanda\_150:

(Start: 34 @78518 has 1 MA's), (Start: 37 @78530 has 40 MA's), (58, 78614), (61, 78632), (85, 78719), (93, 78743),

Gene: Yeet\_125 Start: 71942, Stop: 72235, Start Num: 39

Candidate Starts for Yeet\_125:

(Start: 39 @71942 has 5 MA's), (65, 72059), (86, 72119), (103, 72191), (104, 72194),

Gene: Yeet\_144 Start: 79906, Stop: 80229, Start Num: 37

Candidate Starts for Yeet\_144:

(5, 79684), (7, 79732), (11, 79777), (Start: 34 @79894 has 1 MA's), (Start: 37 @79906 has 40 MA's), (58, 79990), (76, 80056), (85, 80095), (93, 80119), (104, 80176),

Gene: Zelink\_145 Start: 81372, Stop: 81695, Start Num: 37

Candidate Starts for Zelink\_145:

(Start: 34 @81360 has 1 MA's), (Start: 37 @81372 has 40 MA's), (58, 81456), (61, 81474), (85, 81561), (93, 81585),

Gene: Ziko\_32 Start: 9653, Stop: 9324, Start Num: 15

Candidate Starts for Ziko\_32:

(Start: 15 @9653 has 5 MA's), (20, 9638), (46, 9527), (58, 9506),

Gene: Ziko\_109 Start: 53295, Stop: 53609, Start Num: 24

Candidate Starts for Ziko\_109:

(9, 53205), (19, 53280), (Start: 24 @53295 has 5 MA's), (71, 53451), (97, 53520), (110, 53583),