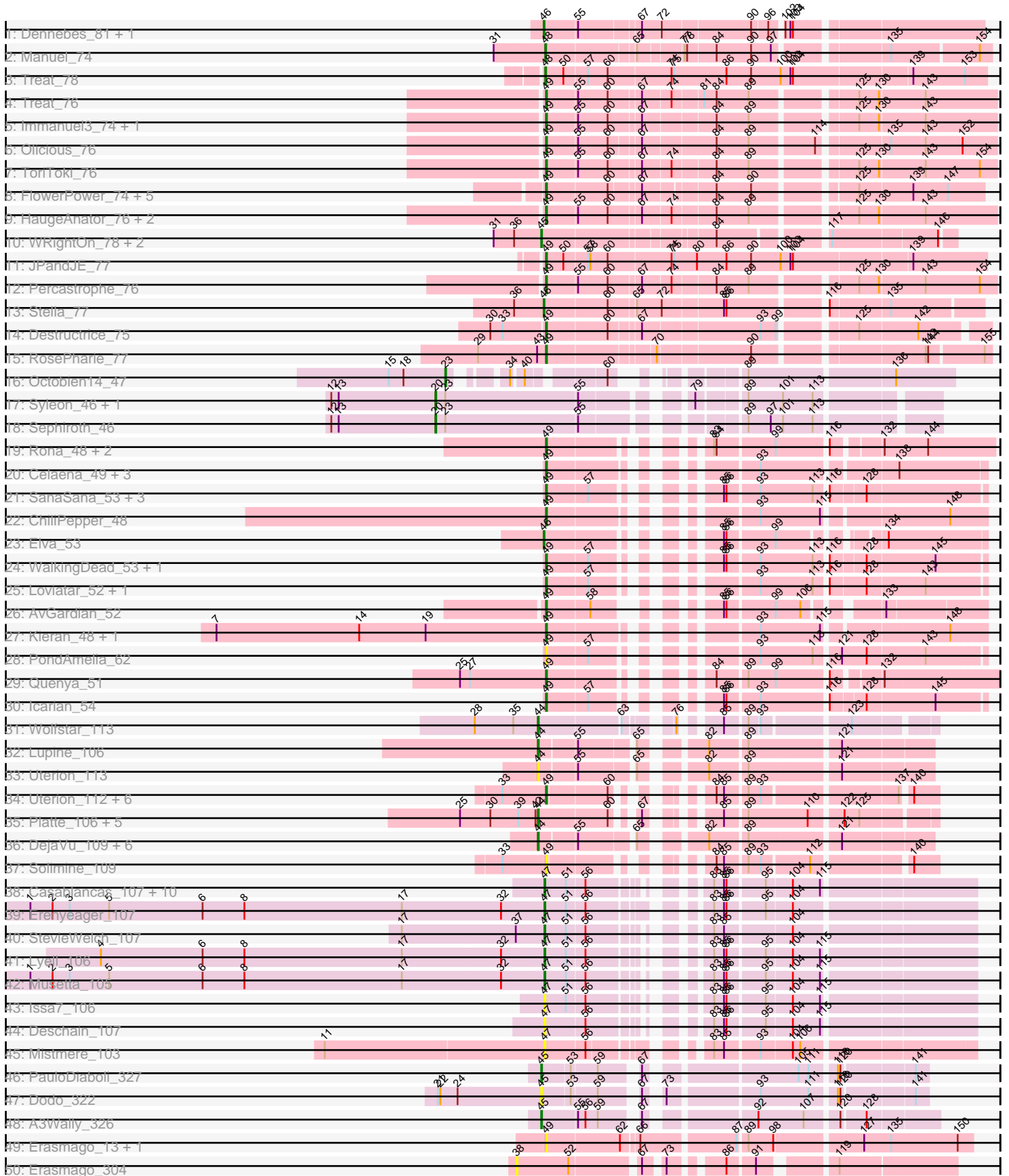
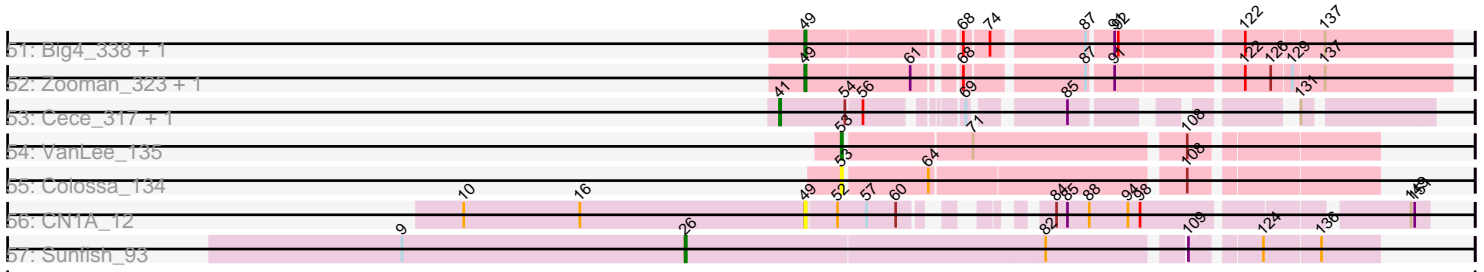


Pham 292654



Pham 292654



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 292654 Report

This analysis was run 04/18/26 on database version 643.

Pham number 292654 has 111 members, 22 are drafts.

Phages represented in each track:

- Track 1 : Dennebes\_81, Rideau\_80
- Track 2 : Manuel\_74
- Track 3 : Treat\_78
- Track 4 : Treat\_76
- Track 5 : Immanuel3\_74, Romero\_76
- Track 6 : Olicious\_76
- Track 7 : ToriToki\_76
- Track 8 : FlowerPower\_74, Fabian\_73, Geostin\_69, RetrieverFever\_74, Gremlin23\_74, Vorvolakos\_75
- Track 9 : HaugeAnator\_76, JPandJE\_75, ZooBear\_76
- Track 10 : WRightOn\_78, Kumquat\_74, Zeigle\_74
- Track 11 : JPandJE\_77
- Track 12 : Percastrophe\_76
- Track 13 : Stella\_77
- Track 14 : Destructrice\_75
- Track 15 : RosePharie\_77
- Track 16 : Octobien14\_47
- Track 17 : Syleon\_46, Kudrefre\_45
- Track 18 : Sephiroth\_46
- Track 19 : Rona\_48, Sharkboy\_49, Dismas\_48
- Track 20 : Celaena\_49, Bachaco\_49, Katzastrophic\_50, FlameThrower\_48
- Track 21 : SanaSana\_53, BabyYoda\_51, DirtyBubble\_50, Stromboli\_51
- Track 22 : ChiliPepper\_48
- Track 23 : Elva\_53
- Track 24 : WalkingDead\_53, Stoor\_51
- Track 25 : Loviatar\_52, Akino08\_52
- Track 26 : AvGardian\_52
- Track 27 : Kieran\_48, Kamdara\_48
- Track 28 : PondAmelia\_62
- Track 29 : Quenya\_51
- Track 30 : Icarian\_54
- Track 31 : Wolfstar\_113
- Track 32 : Lupine\_106
- Track 33 : Uterion\_113
- Track 34 : Uterion\_112, DejaVu\_108, Pavlo\_108, Roman\_109, Saradis\_109, PhillyPhilly\_105, Hubbs\_107

- Track 35 : Platte\_106, OlinDD\_107, Hortus1\_107, Alleb\_103, Tandem\_107, Pioneer3\_107
- Track 36 : DejaVu\_109, Pavlo\_109, Solimine\_110, Roman\_110, Saradis\_110, PhillyPhilly\_106, Hubbs\_108
- Track 37 : Solimine\_109
- Track 38 : Casablanca\_107, DustyDino\_110, HollowPurple\_108, Yuma\_105, Fork\_103, Welcome\_109, Necrophoxinus\_109, ASegato\_105, Shroomer\_110, RunningBrook\_108, SteakFry\_106
- Track 39 : Erenyeager\_107
- Track 40 : StevieWelch\_107
- Track 41 : Lyell\_106
- Track 42 : Musetta\_105
- Track 43 : Issa7\_106
- Track 44 : Deschain\_107
- Track 45 : Mistmere\_103
- Track 46 : PauloDiaboli\_327
- Track 47 : Dodo\_322
- Track 48 : A3Wally\_326
- Track 49 : Erasmago\_13, Erasmago\_351
- Track 50 : Erasmago\_304
- Track 51 : Big4\_338, Big4\_12
- Track 52 : Zooman\_323, Zooman\_10
- Track 53 : Cece\_317, Cece\_15
- Track 54 : VanLee\_135
- Track 55 : Colossa\_134
- Track 56 : CN1A\_12
- Track 57 : Sunfish\_93

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

The start number called the most often in the published annotations is 49, it was called in 46 of the 89 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Akino08\_52, AvGardian\_52, BabyYoda\_51, Bachaco\_49, Big4\_12, Big4\_338, CN1A\_12, Celaena\_49, ChiliPepper\_48, DejaVu\_108, Destructrice\_75, DirtyBubble\_50, Dismas\_48, Erasmago\_13, Erasmago\_351, Fabian\_73, FlameThrower\_48, FlowerPower\_74, Geostin\_69, Gremlin23\_74, HaugeAnator\_76, Hubbs\_107, Icarian\_54, Immanuel3\_74, JPandJE\_75, JPandJE\_77, Kamdara\_48, Katzastrophic\_50, Kieran\_48, Loviatar\_52, Olicious\_76, Pavlo\_108, Percastrophe\_76, PhillyPhilly\_105, PondAmelia\_62, Quenya\_51, RetrieverFever\_74, Roman\_109, Romero\_76, Rona\_48, RosePharie\_77, SanaSana\_53, Saradis\_109, Sharkboy\_49, Solimine\_109, Stoor\_51, Stromboli\_51, ToriToki\_76, Treat\_76, Uterion\_112, Vorvolakos\_75, WalkingDead\_53, ZooBear\_76, Zooman\_10, Zooman\_323,

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

- 

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

- A3Wally\_326, ASegato\_105, Alleb\_103, Casablanacas\_107, Cece\_15, Cece\_317, Colossa\_134, DejaVu\_109, Dennebes\_81, Deschain\_107, Dodo\_322, DustyDino\_110, Elva\_53, Erasmago\_304, Erenyeager\_107, Fork\_103, HollowPurple\_108, Hortus1\_107, Hubbs\_108, Issa7\_106, Kudefre\_45, Kumquat\_74, Lupine\_106, Lyell\_106, Manuel\_74, Mistmere\_103, Musetta\_105, Necrophoxinus\_109, Octobien14\_47, OlinDD\_107, PauloDiaboli\_327, Pavlo\_109, PhillyPhilly\_106, Pioneer3\_107, Platte\_106, Rideau\_80, Roman\_110, RunningBrook\_108, Saradis\_110, Sephiroth\_46, Shroomer\_110, Solimine\_110, SteakFry\_106, Stella\_77, StevieWelch\_107, Sunfish\_93, Syleon\_46, Tandem\_107, Treat\_78, Uterion\_113, VanLee\_135, WRightOn\_78, Welcome\_109, Wolfstar\_113, Yuma\_105, Zeigle\_74,

### Summary by start number:

#### Start 20:

- Found in 3 of 111 ( 2.7% ) of genes in pham
- Manual Annotations of this start: 3 of 89
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Kudefre\_45 (DU1), Sephiroth\_46 (DU1), Syleon\_46 (DU1),

#### Start 23:

- Found in 4 of 111 ( 3.6% ) of genes in pham
- Manual Annotations of this start: 1 of 89
- Called 25.0% of time when present
- Phage (with cluster) where this start called: Octobien14\_47 (DU1),

#### Start 26:

- Found in 1 of 111 ( 0.9% ) of genes in pham
- Manual Annotations of this start: 1 of 89
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Sunfish\_93 (singleton),

#### Start 38:

- Found in 1 of 111 ( 0.9% ) of genes in pham
- No Manual Annotations of this start.
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Erasmago\_304 (GD2),

#### Start 41:

- Found in 2 of 111 ( 1.8% ) of genes in pham
- Manual Annotations of this start: 2 of 89
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Cece\_15 (GD3), Cece\_317 (GD3),

#### Start 44:

- Found in 16 of 111 ( 14.4% ) of genes in pham
- Manual Annotations of this start: 13 of 89
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Alleb\_103 (ED1), DejaVu\_109 (ED1), Hortus1\_107 (ED1), Hubbs\_108 (ED1), Lupine\_106 (ED1), OlinDD\_107 (ED1), Pavlo\_109 (ED1), PhillyPhilly\_106 (ED1), Pioneer3\_107 (ED1), Platte\_106 (ED1), Roman\_110 (ED1), Saradis\_110 (ED1), Solimine\_110 (ED1), Tandem\_107 (ED1),

Uterion\_113 (ED1), Wolfstar\_113 (ED),

Start 45:

- Found in 6 of 111 ( 5.4% ) of genes in pham
- Manual Annotations of this start: 5 of 89
- Called 100.0% of time when present
- Phage (with cluster) where this start called: A3Wally\_326 (GD1), Dodo\_322 (GD1), Kumquat\_74 (BF), PauloDiaboli\_327 (GD1), WRightOn\_78 (BF), Zeigle\_74 (BF),

Start 46:

- Found in 4 of 111 ( 3.6% ) of genes in pham
- Manual Annotations of this start: 3 of 89
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Dennebes\_81 (BF), Elva\_53 (EB), Rideau\_80 (BF), Stella\_77 (BF),

Start 47:

- Found in 18 of 111 ( 16.2% ) of genes in pham
- Manual Annotations of this start: 12 of 89
- Called 100.0% of time when present
- Phage (with cluster) where this start called: ASegato\_105 (ED2), Casablanacas\_107 (ED2), Deschain\_107 (ED2), DustyDino\_110 (ED2), Erenyeager\_107 (ED2), Fork\_103 (ED2), HollowPurple\_108 (ED2), Issa7\_106 (ED2), Lyell\_106 (ED2), Mistmere\_103 (ED3), Musetta\_105 (ED2), Necrophoxinus\_109 (ED2), RunningBrook\_108 (ED2), Shroomer\_110 (ED2), SteakFry\_106 (ED2), StevieWelch\_107 (ED2), Welcome\_109 (ED2), Yuma\_105 (ED2),

Start 48:

- Found in 2 of 111 ( 1.8% ) of genes in pham
- Manual Annotations of this start: 2 of 89
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Manuel\_74 (BF), Treat\_78 (BF),

Start 49:

- Found in 55 of 111 ( 49.5% ) of genes in pham
- Manual Annotations of this start: 46 of 89
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Akino08\_52 (EB), AvGardian\_52 (EB), BabyYoda\_51 (EB), Bachaco\_49 (EB), Big4\_12 (GD2), Big4\_338 (GD2), CN1A\_12 (singleton), Celaena\_49 (EB), ChiliPepper\_48 (EB), DejaVu\_108 (ED1), Destructrice\_75 (BF), DirtyBubble\_50 (EB), Dismas\_48 (EB), Erasmago\_13 (GD2), Erasmago\_351 (GD2), Fabian\_73 (BF), FlameThrower\_48 (EB), FlowerPower\_74 (BF), Geostin\_69 (BF), Gremlin23\_74 (BF), HaugeAnator\_76 (BF), Hubbs\_107 (ED1), Icarian\_54 (EB), Immanuel3\_74 (BF), JPandJE\_75 (BF), JPandJE\_77 (BF), Kamdara\_48 (EB), Katzastrophic\_50 (EB), Kieran\_48 (EB), Loviatar\_52 (EB), Olicious\_76 (BF), Pavlo\_108 (ED1), Percastrophe\_76 (BF), PhillyPhilly\_105 (ED1), PondAmelia\_62 (EB), Quenya\_51 (EB), RetrieverFever\_74 (BF), Roman\_109 (ED1), Romero\_76 (BF), Rona\_48 (EB), RosePharie\_77 (BF), SanaSana\_53 (EB), Saradis\_109 (ED1), Sharkboy\_49 (EB), Solimine\_109 (ED1), Stoor\_51 (EB), Stromboli\_51 (EB), ToriToki\_76 (BF), Treat\_76 (BF), Uterion\_112 (ED1), Vorvolakos\_75 (BF), WalkingDead\_53 (EB), ZooBear\_76 (BF), Zooman\_10 (GD2), Zooman\_323 (GD2),

Start 53:

- Found in 4 of 111 ( 3.6% ) of genes in pham
- Manual Annotations of this start: 1 of 89
- Called 50.0% of time when present
- Phage (with cluster) where this start called: Colossa\_134 (KA), VanLee\_135 (KA),

### **Summary by clusters:**

There are 12 clusters represented in this pham: GD1, BF, GD3, ED, GD2, EB, ED2, ED3, ED1, DU1, singleton, KA,

Info for manual annotations of cluster BF:

- Start number 45 was manually annotated 3 times for cluster BF.
- Start number 46 was manually annotated 2 times for cluster BF.
- Start number 48 was manually annotated 2 times for cluster BF.
- Start number 49 was manually annotated 18 times for cluster BF.

Info for manual annotations of cluster DU1:

- Start number 20 was manually annotated 3 times for cluster DU1.
- Start number 23 was manually annotated 1 time for cluster DU1.

Info for manual annotations of cluster EB:

- Start number 46 was manually annotated 1 time for cluster EB.
- Start number 49 was manually annotated 19 times for cluster EB.

Info for manual annotations of cluster ED:

- Start number 44 was manually annotated 1 time for cluster ED.

Info for manual annotations of cluster ED1:

- Start number 44 was manually annotated 12 times for cluster ED1.
- Start number 49 was manually annotated 5 times for cluster ED1.

Info for manual annotations of cluster ED2:

- Start number 47 was manually annotated 12 times for cluster ED2.

Info for manual annotations of cluster GD1:

- Start number 45 was manually annotated 2 times for cluster GD1.

Info for manual annotations of cluster GD2:

- Start number 49 was manually annotated 4 times for cluster GD2.

Info for manual annotations of cluster GD3:

- Start number 41 was manually annotated 2 times for cluster GD3.

Info for manual annotations of cluster KA:

- Start number 53 was manually annotated 1 time for cluster KA.

### **Gene Information:**

Gene: A3Wally\_326 Start: 170993, Stop: 171403, Start Num: 45

Candidate Starts for A3Wally\_326:

(Start: 45 @170993 has 5 MA's), (55, 171035), (56, 171044), (59, 171059), (67, 171095), (92, 171203), (107, 171257), (120, 171293), (128, 171320),

Gene: ASegato\_105 Start: 56034, Stop: 55597, Start Num: 47

Candidate Starts for ASegato\_105:

(Start: 47 @56034 has 12 MA's), (51, 56010), (56, 55989), (83, 55893), (85, 55881), (86, 55878), (95, 55836), (104, 55806), (115, 55773),

Gene: Akino08\_52 Start: 36189, Stop: 36629, Start Num: 49

Candidate Starts for Akino08\_52:

(Start: 49 @36189 has 46 MA's), (57, 36237), (93, 36375), (113, 36438), (116, 36450), (128, 36492), (143, 36561),

Gene: Alleb\_103 Start: 57500, Stop: 57114, Start Num: 44

Candidate Starts for Alleb\_103:

(25, 57593), (30, 57557), (39, 57524), (42, 57503), (Start: 44 @57500 has 13 MA's), (60, 57419), (67, 57401), (85, 57347), (89, 57323), (110, 57251), (122, 57215), (125, 57197),

Gene: AvGardian\_52 Start: 34737, Stop: 35147, Start Num: 49

Candidate Starts for AvGardian\_52:

(Start: 49 @34737 has 46 MA's), (58, 34788), (85, 34878), (86, 34881), (99, 34935), (106, 34965), (133, 35037),

Gene: BabyYoda\_51 Start: 35131, Stop: 35568, Start Num: 49

Candidate Starts for BabyYoda\_51:

(Start: 49 @35131 has 46 MA's), (57, 35179), (85, 35278), (86, 35281), (93, 35317), (113, 35380), (116, 35392), (128, 35431),

Gene: Bachaco\_49 Start: 35861, Stop: 36301, Start Num: 49

Candidate Starts for Bachaco\_49:

(Start: 49 @35861 has 46 MA's), (93, 36050), (138, 36200),

Gene: Big4\_338 Start: 180229, Stop: 180705, Start Num: 49

Candidate Starts for Big4\_338:

(Start: 49 @180229 has 46 MA's), (68, 180340), (74, 180358), (87, 180427), (91, 180445), (92, 180448), (122, 180541), (137, 180601),

Gene: Big4\_12 Start: 5535, Stop: 6011, Start Num: 49

Candidate Starts for Big4\_12:

(Start: 49 @5535 has 46 MA's), (68, 5646), (74, 5664), (87, 5733), (91, 5751), (92, 5754), (122, 5847), (137, 5907),

Gene: CN1A\_12 Start: 5964, Stop: 6377, Start Num: 49

Candidate Starts for CN1A\_12:

(10, 5682), (16, 5778), (Start: 49 @5964 has 46 MA's), (52, 5988), (57, 6012), (60, 6036), (84, 6102), (85, 6111), (88, 6129), (94, 6159), (98, 6168), (149, 6363), (151, 6366),

Gene: Casablancas\_107 Start: 55664, Stop: 55227, Start Num: 47

Candidate Starts for Casablancas\_107:

(Start: 47 @55664 has 12 MA's), (51, 55640), (56, 55619), (83, 55523), (85, 55511), (86, 55508), (95, 55466), (104, 55436), (115, 55403),

Gene: Cece\_317 Start: 173852, Stop: 174274, Start Num: 41  
Candidate Starts for Cece\_317:  
(Start: 41 @173852 has 2 MA's), (54, 173906), (56, 173918), (69, 173978), (85, 174041), (131, 174176),

Gene: Cece\_15 Start: 5418, Stop: 5840, Start Num: 41  
Candidate Starts for Cece\_15:  
(Start: 41 @5418 has 2 MA's), (54, 5472), (56, 5484), (69, 5544), (85, 5607), (131, 5742),

Gene: Celaena\_49 Start: 35623, Stop: 36063, Start Num: 49  
Candidate Starts for Celaena\_49:  
(Start: 49 @35623 has 46 MA's), (93, 35812), (138, 35962),

Gene: ChiliPepper\_48 Start: 34921, Stop: 35364, Start Num: 49  
Candidate Starts for ChiliPepper\_48:  
(Start: 49 @34921 has 46 MA's), (93, 35110), (115, 35182), (148, 35320),

Gene: Colossa\_134 Start: 73240, Stop: 72845, Start Num: 53  
Candidate Starts for Colossa\_134:  
(Start: 53 @73240 has 1 MA's), (64, 73177), (108, 72985),

Gene: DejaVu\_108 Start: 57205, Stop: 56840, Start Num: 49  
Candidate Starts for DejaVu\_108:  
(33, 57256), (Start: 49 @57205 has 46 MA's), (60, 57136), (84, 57076), (85, 57067), (89, 57043), (93, 57028), (137, 56878), (140, 56869),

Gene: DejaVu\_109 Start: 57612, Stop: 57202, Start Num: 44  
Candidate Starts for DejaVu\_109:  
(Start: 44 @57612 has 13 MA's), (55, 57570), (65, 57510), (82, 57450), (89, 57408), (121, 57306),

Gene: Dennebes\_81 Start: 39474, Stop: 38989, Start Num: 46  
Candidate Starts for Dennebes\_81:  
(Start: 46 @39474 has 3 MA's), (55, 39435), (67, 39366), (72, 39345), (90, 39243), (96, 39225), (102, 39213), (103, 39207), (104, 39204),

Gene: Deschain\_107 Start: 56328, Stop: 55891, Start Num: 47  
Candidate Starts for Deschain\_107:  
(Start: 47 @56328 has 12 MA's), (56, 56283), (83, 56187), (85, 56175), (86, 56172), (95, 56130), (104, 56100), (115, 56067),

Gene: Destructrice\_75 Start: 38837, Stop: 38355, Start Num: 49  
Candidate Starts for Destructrice\_75:  
(30, 38900), (33, 38885), (Start: 49 @38837 has 46 MA's), (60, 38765), (67, 38732), (93, 38597), (99, 38579), (125, 38501), (142, 38432),

Gene: DirtyBubble\_50 Start: 34799, Stop: 35236, Start Num: 49  
Candidate Starts for DirtyBubble\_50:  
(Start: 49 @34799 has 46 MA's), (57, 34847), (85, 34946), (86, 34949), (93, 34985), (113, 35048), (116, 35060), (128, 35099),

Gene: Dismas\_48 Start: 34843, Stop: 35286, Start Num: 49  
Candidate Starts for Dismas\_48:

(Start: 49 @34843 has 46 MA's), (83, 34978), (84, 34981), (99, 35047), (116, 35104), (132, 35155), (144, 35206),

Gene: Dodo\_322 Start: 170077, Stop: 170469, Start Num: 45

Candidate Starts for Dodo\_322:

(21, 169951), (22, 169954), (24, 169975), (Start: 45 @170077 has 5 MA's), (Start: 53 @170110 has 1 MA's), (59, 170140), (67, 170176), (73, 170188), (93, 170287), (111, 170344), (118, 170371), (120, 170374), (141, 170455),

Gene: DustyDino\_110 Start: 56887, Stop: 56450, Start Num: 47

Candidate Starts for DustyDino\_110:

(Start: 47 @56887 has 12 MA's), (51, 56863), (56, 56842), (83, 56746), (85, 56734), (86, 56731), (95, 56689), (104, 56659), (115, 56626),

Gene: Elva\_53 Start: 35217, Stop: 35639, Start Num: 46

Candidate Starts for Elva\_53:

(Start: 46 @35217 has 3 MA's), (85, 35367), (86, 35370), (99, 35424), (134, 35523),

Gene: Erasmago\_13 Start: 4541, Stop: 5020, Start Num: 49

Candidate Starts for Erasmago\_13:

(Start: 49 @4541 has 46 MA's), (62, 4628), (66, 4646), (87, 4751), (89, 4760), (98, 4790), (127, 4889), (135, 4922), (150, 5003),

Gene: Erasmago\_304 Start: 162654, Stop: 163103, Start Num: 38

Candidate Starts for Erasmago\_304:

(38, 162654), (52, 162717), (67, 162792), (73, 162810), (86, 162861), (91, 162891), (119, 162966),

Gene: Erasmago\_351 Start: 179050, Stop: 179529, Start Num: 49

Candidate Starts for Erasmago\_351:

(Start: 49 @179050 has 46 MA's), (62, 179137), (66, 179155), (87, 179260), (89, 179269), (98, 179299), (127, 179398), (135, 179431), (150, 179512),

Gene: Erenyeager\_107 Start: 55997, Stop: 55551, Start Num: 47

Candidate Starts for Erenyeager\_107:

(1, 56621), (2, 56594), (3, 56573), (5, 56525), (6, 56411), (8, 56360), (17, 56168), (32, 56048), (Start: 47 @55997 has 12 MA's), (51, 55973), (56, 55952), (83, 55847), (85, 55835), (86, 55832), (95, 55790), (104, 55760),

Gene: Fabian\_73 Start: 38951, Stop: 38469, Start Num: 49

Candidate Starts for Fabian\_73:

(Start: 49 @38951 has 46 MA's), (60, 38879), (67, 38846), (84, 38768), (90, 38726), (125, 38618), (139, 38555), (147, 38513),

Gene: FlameThrower\_48 Start: 34660, Stop: 35100, Start Num: 49

Candidate Starts for FlameThrower\_48:

(Start: 49 @34660 has 46 MA's), (93, 34849), (138, 34999),

Gene: FlowerPower\_74 Start: 38621, Stop: 38139, Start Num: 49

Candidate Starts for FlowerPower\_74:

(Start: 49 @38621 has 46 MA's), (60, 38549), (67, 38516), (84, 38438), (90, 38396), (125, 38288), (139, 38225), (147, 38183),

Gene: Fork\_103 Start: 55912, Stop: 55475, Start Num: 47

Candidate Starts for Fork\_103:

(Start: 47 @55912 has 12 MA's), (51, 55888), (56, 55867), (83, 55771), (85, 55759), (86, 55756), (95, 55714), (104, 55684), (115, 55651),

Gene: Geostin\_69 Start: 38621, Stop: 38139, Start Num: 49

Candidate Starts for Geostin\_69:

(Start: 49 @38621 has 46 MA's), (60, 38549), (67, 38516), (84, 38438), (90, 38396), (125, 38288), (139, 38225), (147, 38183),

Gene: Gremlin23\_74 Start: 38621, Stop: 38139, Start Num: 49

Candidate Starts for Gremlin23\_74:

(Start: 49 @38621 has 46 MA's), (60, 38549), (67, 38516), (84, 38438), (90, 38396), (125, 38288), (139, 38225), (147, 38183),

Gene: HaugeAnator\_76 Start: 38999, Stop: 38496, Start Num: 49

Candidate Starts for HaugeAnator\_76:

(Start: 49 @38999 has 46 MA's), (55, 38963), (60, 38927), (67, 38891), (74, 38858), (84, 38810), (89, 38771), (125, 38660), (130, 38636), (143, 38582),

Gene: HollowPurple\_108 Start: 56575, Stop: 56138, Start Num: 47

Candidate Starts for HollowPurple\_108:

(Start: 47 @56575 has 12 MA's), (51, 56551), (56, 56530), (83, 56434), (85, 56422), (86, 56419), (95, 56377), (104, 56347), (115, 56314),

Gene: Hortus1\_107 Start: 58256, Stop: 57870, Start Num: 44

Candidate Starts for Hortus1\_107:

(25, 58349), (30, 58313), (39, 58280), (42, 58259), (Start: 44 @58256 has 13 MA's), (60, 58175), (67, 58157), (85, 58103), (89, 58079), (110, 58007), (122, 57971), (125, 57953),

Gene: Hubbs\_108 Start: 57876, Stop: 57466, Start Num: 44

Candidate Starts for Hubbs\_108:

(Start: 44 @57876 has 13 MA's), (55, 57834), (65, 57774), (82, 57714), (89, 57672), (121, 57570),

Gene: Hubbs\_107 Start: 57469, Stop: 57104, Start Num: 49

Candidate Starts for Hubbs\_107:

(33, 57520), (Start: 49 @57469 has 46 MA's), (60, 57400), (84, 57340), (85, 57331), (89, 57307), (93, 57292), (137, 57142), (140, 57133),

Gene: Icarian\_54 Start: 35804, Stop: 36241, Start Num: 49

Candidate Starts for Icarian\_54:

(Start: 49 @35804 has 46 MA's), (57, 35852), (85, 35951), (86, 35954), (93, 35990), (116, 36065), (128, 36104), (145, 36185),

Gene: Immanuel3\_74 Start: 39005, Stop: 38502, Start Num: 49

Candidate Starts for Immanuel3\_74:

(Start: 49 @39005 has 46 MA's), (55, 38969), (60, 38933), (67, 38897), (84, 38816), (89, 38777), (125, 38666), (130, 38642), (143, 38588),

Gene: Issa7\_106 Start: 55958, Stop: 55521, Start Num: 47

Candidate Starts for Issa7\_106:

(Start: 47 @55958 has 12 MA's), (51, 55934), (56, 55913), (83, 55817), (85, 55805), (86, 55802), (95, 55760), (104, 55730), (115, 55697),

Gene: JPandJE\_75 Start: 39350, Stop: 38847, Start Num: 49

Candidate Starts for JPandJE\_75:

(Start: 49 @39350 has 46 MA's), (55, 39314), (60, 39278), (67, 39242), (74, 39209), (84, 39161), (89, 39122), (125, 39011), (130, 38987), (143, 38933),

Gene: JPandJE\_77 Start: 40528, Stop: 40007, Start Num: 49

Candidate Starts for JPandJE\_77:

(Start: 49 @40528 has 46 MA's), (50, 40507), (57, 40480), (58, 40477), (60, 40456), (74, 40381), (75, 40378), (80, 40351), (86, 40315), (90, 40285), (100, 40249), (103, 40237), (104, 40234), (139, 40096),

Gene: Kamdara\_48 Start: 34881, Stop: 35324, Start Num: 49

Candidate Starts for Kamdara\_48:

(7, 34479), (14, 34653), (19, 34734), (Start: 49 @34881 has 46 MA's), (93, 35070), (115, 35142), (148, 35280),

Gene: Katzastrophic\_50 Start: 35170, Stop: 35610, Start Num: 49

Candidate Starts for Katzastrophic\_50:

(Start: 49 @35170 has 46 MA's), (93, 35359), (138, 35509),

Gene: Kieran\_48 Start: 34884, Stop: 35327, Start Num: 49

Candidate Starts for Kieran\_48:

(7, 34482), (14, 34656), (19, 34737), (Start: 49 @34884 has 46 MA's), (93, 35073), (115, 35145), (148, 35283),

Gene: Kudrefre\_45 Start: 34124, Stop: 34657, Start Num: 20

Candidate Starts for Kudrefre\_45:

(12, 33998), (13, 34007), (Start: 20 @34124 has 3 MA's), (Start: 23 @34136 has 1 MA's), (55, 34295), (79, 34397), (89, 34448), (101, 34490), (113, 34526),

Gene: Kumquat\_74 Start: 38229, Stop: 37786, Start Num: 45

Candidate Starts for Kumquat\_74:

(31, 38286), (36, 38262), (Start: 45 @38229 has 5 MA's), (84, 38040), (117, 37926), (146, 37803),

Gene: Loviatar\_52 Start: 36204, Stop: 36644, Start Num: 49

Candidate Starts for Loviatar\_52:

(Start: 49 @36204 has 46 MA's), (57, 36252), (93, 36390), (113, 36453), (116, 36465), (128, 36507), (143, 36576),

Gene: Lupine\_106 Start: 57058, Stop: 56648, Start Num: 44

Candidate Starts for Lupine\_106:

(Start: 44 @57058 has 13 MA's), (55, 57016), (65, 56956), (82, 56896), (89, 56854), (121, 56752),

Gene: Lyell\_106 Start: 55834, Stop: 55397, Start Num: 47

Candidate Starts for Lyell\_106:

(4, 56371), (6, 56248), (8, 56197), (17, 56005), (32, 55885), (Start: 47 @55834 has 12 MA's), (51, 55810), (56, 55789), (83, 55693), (85, 55681), (86, 55678), (95, 55636), (104, 55606), (115, 55573),

Gene: Manuel\_74 Start: 38664, Stop: 38179, Start Num: 48

Candidate Starts for Manuel\_74:

(31, 38724), (Start: 48 @38664 has 2 MA's), (65, 38565), (77, 38517), (78, 38514), (84, 38481), (90, 38439), (97, 38415), (135, 38295), (154, 38193),

Gene: Mistmere\_103 Start: 54853, Stop: 54416, Start Num: 47

Candidate Starts for Mistmere\_103:

(11, 55114), (Start: 47 @54853 has 12 MA's), (56, 54808), (83, 54709), (85, 54697), (93, 54658), (104, 54622), (106, 54613),

Gene: Musetta\_105 Start: 56187, Stop: 55750, Start Num: 47

Candidate Starts for Musetta\_105:

(1, 56811), (2, 56784), (3, 56763), (5, 56715), (6, 56601), (8, 56550), (17, 56358), (32, 56238), (Start: 47 @56187 has 12 MA's), (51, 56163), (56, 56142), (83, 56046), (85, 56034), (86, 56031), (95, 55989), (104, 55959), (115, 55926),

Gene: Necrophoxinus\_109 Start: 56843, Stop: 56406, Start Num: 47

Candidate Starts for Necrophoxinus\_109:

(Start: 47 @56843 has 12 MA's), (51, 56819), (56, 56798), (83, 56702), (85, 56690), (86, 56687), (95, 56645), (104, 56615), (115, 56582),

Gene: Octobien14\_47 Start: 34822, Stop: 35292, Start Num: 23

Candidate Starts for Octobien14\_47:

(15, 34765), (18, 34783), (Start: 23 @34822 has 1 MA's), (34, 34867), (40, 34879), (60, 34957), (89, 35053), (136, 35221),

Gene: Olicious\_76 Start: 39002, Stop: 38499, Start Num: 49

Candidate Starts for Olicious\_76:

(Start: 49 @39002 has 46 MA's), (55, 38966), (60, 38930), (67, 38897), (84, 38813), (89, 38774), (114, 38702), (135, 38627), (143, 38585), (152, 38540),

Gene: OlinDD\_107 Start: 58261, Stop: 57875, Start Num: 44

Candidate Starts for OlinDD\_107:

(25, 58354), (30, 58318), (39, 58285), (42, 58264), (Start: 44 @58261 has 13 MA's), (60, 58180), (67, 58162), (85, 58108), (89, 58084), (110, 58012), (122, 57976), (125, 57958),

Gene: PauloDiaboli\_327 Start: 168500, Stop: 168892, Start Num: 45

Candidate Starts for PauloDiaboli\_327:

(Start: 45 @168500 has 5 MA's), (Start: 53 @168533 has 1 MA's), (59, 168563), (67, 168599), (105, 168755), (111, 168767), (118, 168794), (120, 168797), (141, 168878),

Gene: Pavlo\_108 Start: 57864, Stop: 57499, Start Num: 49

Candidate Starts for Pavlo\_108:

(33, 57915), (Start: 49 @57864 has 46 MA's), (60, 57795), (84, 57735), (85, 57726), (89, 57702), (93, 57687), (137, 57537), (140, 57528),

Gene: Pavlo\_109 Start: 58271, Stop: 57861, Start Num: 44

Candidate Starts for Pavlo\_109:

(Start: 44 @58271 has 13 MA's), (55, 58229), (65, 58169), (82, 58109), (89, 58067), (121, 57965),

Gene: Percastrophe\_76 Start: 38934, Stop: 38431, Start Num: 49

Candidate Starts for Percastrophe\_76:

(Start: 49 @38934 has 46 MA's), (55, 38898), (60, 38862), (67, 38826), (74, 38793), (84, 38745), (89, 38706), (125, 38595), (130, 38571), (143, 38517), (154, 38451),

Gene: PhillyPhilly\_105 Start: 56853, Stop: 56488, Start Num: 49

Candidate Starts for PhillyPhilly\_105:

(33, 56904), (Start: 49 @56853 has 46 MA's), (60, 56784), (84, 56724), (85, 56715), (89, 56691), (93, 56676), (137, 56526), (140, 56517),

Gene: PhillyPhilly\_106 Start: 57260, Stop: 56850, Start Num: 44  
Candidate Starts for PhillyPhilly\_106:  
(Start: 44 @57260 has 13 MA's), (55, 57218), (65, 57158), (82, 57098), (89, 57056), (121, 56954),

Gene: Pioneer3\_107 Start: 58059, Stop: 57673, Start Num: 44  
Candidate Starts for Pioneer3\_107:  
(25, 58152), (30, 58116), (39, 58083), (42, 58062), (Start: 44 @58059 has 13 MA's), (60, 57978), (67, 57960), (85, 57906), (89, 57882), (110, 57810), (122, 57774), (125, 57756),

Gene: Platte\_106 Start: 57843, Stop: 57457, Start Num: 44  
Candidate Starts for Platte\_106:  
(25, 57936), (30, 57900), (39, 57867), (42, 57846), (Start: 44 @57843 has 13 MA's), (60, 57762), (67, 57744), (85, 57690), (89, 57666), (110, 57594), (122, 57558), (125, 57540),

Gene: PondAmelia\_62 Start: 35004, Stop: 35447, Start Num: 49  
Candidate Starts for PondAmelia\_62:  
(Start: 49 @35004 has 46 MA's), (57, 35052), (93, 35190), (113, 35253), (121, 35280), (128, 35310), (143, 35379),

Gene: Quenya\_51 Start: 35296, Stop: 35745, Start Num: 49  
Candidate Starts for Quenya\_51:  
(25, 35191), (27, 35203), (Start: 49 @35296 has 46 MA's), (84, 35434), (89, 35467), (99, 35500), (116, 35557), (132, 35608),

Gene: RetrieverFever\_74 Start: 38621, Stop: 38139, Start Num: 49  
Candidate Starts for RetrieverFever\_74:  
(Start: 49 @38621 has 46 MA's), (60, 38549), (67, 38516), (84, 38438), (90, 38396), (125, 38288), (139, 38225), (147, 38183),

Gene: Rideau\_80 Start: 39365, Stop: 38880, Start Num: 46  
Candidate Starts for Rideau\_80:  
(Start: 46 @39365 has 3 MA's), (55, 39326), (67, 39257), (72, 39236), (90, 39134), (96, 39116), (102, 39104), (103, 39098), (104, 39095),

Gene: Roman\_109 Start: 57913, Stop: 57548, Start Num: 49  
Candidate Starts for Roman\_109:  
(33, 57964), (Start: 49 @57913 has 46 MA's), (60, 57844), (84, 57784), (85, 57775), (89, 57751), (93, 57736), (137, 57586), (140, 57577),

Gene: Roman\_110 Start: 58320, Stop: 57910, Start Num: 44  
Candidate Starts for Roman\_110:  
(Start: 44 @58320 has 13 MA's), (55, 58278), (65, 58218), (82, 58158), (89, 58116), (121, 58014),

Gene: Romero\_76 Start: 38995, Stop: 38492, Start Num: 49  
Candidate Starts for Romero\_76:  
(Start: 49 @38995 has 46 MA's), (55, 38959), (60, 38923), (67, 38887), (84, 38806), (89, 38767), (125, 38656), (130, 38632), (143, 38578),

Gene: Rona\_48 Start: 34834, Stop: 35277, Start Num: 49  
Candidate Starts for Rona\_48:  
(Start: 49 @34834 has 46 MA's), (83, 34969), (84, 34972), (99, 35038), (116, 35095), (132, 35146), (144, 35197),

Gene: RosePharie\_77 Start: 39114, Stop: 38629, Start Num: 49

Candidate Starts for RosePharie\_77:

(29, 39192), (43, 39123), (Start: 49 @39114 has 46 MA's), (70, 38994), (90, 38889), (143, 38703), (144, 38700), (155, 38637),

Gene: RunningBrook\_108 Start: 56887, Stop: 56450, Start Num: 47

Candidate Starts for RunningBrook\_108:

(Start: 47 @56887 has 12 MA's), (51, 56863), (56, 56842), (83, 56746), (85, 56734), (86, 56731), (95, 56689), (104, 56659), (115, 56626),

Gene: SanaSana\_53 Start: 35511, Stop: 35948, Start Num: 49

Candidate Starts for SanaSana\_53:

(Start: 49 @35511 has 46 MA's), (57, 35559), (85, 35658), (86, 35661), (93, 35697), (113, 35760), (116, 35772), (128, 35811),

Gene: Saradis\_109 Start: 56880, Stop: 56515, Start Num: 49

Candidate Starts for Saradis\_109:

(33, 56931), (Start: 49 @56880 has 46 MA's), (60, 56811), (84, 56751), (85, 56742), (89, 56718), (93, 56703), (137, 56553), (140, 56544),

Gene: Saradis\_110 Start: 57287, Stop: 56877, Start Num: 44

Candidate Starts for Saradis\_110:

(Start: 44 @57287 has 13 MA's), (55, 57245), (65, 57185), (82, 57125), (89, 57083), (121, 56981),

Gene: Sephiroth\_46 Start: 34293, Stop: 34826, Start Num: 20

Candidate Starts for Sephiroth\_46:

(12, 34167), (13, 34176), (Start: 20 @34293 has 3 MA's), (Start: 23 @34305 has 1 MA's), (55, 34464), (89, 34617), (97, 34644), (101, 34659), (113, 34695),

Gene: Sharkboy\_49 Start: 34933, Stop: 35376, Start Num: 49

Candidate Starts for Sharkboy\_49:

(Start: 49 @34933 has 46 MA's), (83, 35068), (84, 35071), (99, 35137), (116, 35194), (132, 35245), (144, 35296),

Gene: Shroomer\_110 Start: 56444, Stop: 56007, Start Num: 47

Candidate Starts for Shroomer\_110:

(Start: 47 @56444 has 12 MA's), (51, 56420), (56, 56399), (83, 56303), (85, 56291), (86, 56288), (95, 56246), (104, 56216), (115, 56183),

Gene: Solimine\_110 Start: 58195, Stop: 57785, Start Num: 44

Candidate Starts for Solimine\_110:

(Start: 44 @58195 has 13 MA's), (55, 58153), (65, 58093), (82, 58033), (89, 57991), (121, 57889),

Gene: Solimine\_109 Start: 57788, Stop: 57423, Start Num: 49

Candidate Starts for Solimine\_109:

(33, 57839), (Start: 49 @57788 has 46 MA's), (84, 57659), (85, 57650), (89, 57626), (93, 57611), (112, 57557), (140, 57452),

Gene: SteakFry\_106 Start: 56575, Stop: 56138, Start Num: 47

Candidate Starts for SteakFry\_106:

(Start: 47 @56575 has 12 MA's), (51, 56551), (56, 56530), (83, 56434), (85, 56422), (86, 56419), (95, 56377), (104, 56347), (115, 56314),

Gene: Stella\_77 Start: 39604, Stop: 39116, Start Num: 46

Candidate Starts for Stella\_77:

(36, 39637), (Start: 46 @39604 has 3 MA's), (60, 39529), (65, 39499), (72, 39469), (85, 39400), (86, 39397), (116, 39292), (135, 39223),

Gene: StevieWelch\_107 Start: 56127, Stop: 55690, Start Num: 47

Candidate Starts for StevieWelch\_107:

(17, 56298), (37, 56160), (Start: 47 @56127 has 12 MA's), (51, 56103), (56, 56082), (83, 55986), (85, 55974), (104, 55899),

Gene: Stoor\_51 Start: 35304, Stop: 35735, Start Num: 49

Candidate Starts for Stoor\_51:

(Start: 49 @35304 has 46 MA's), (57, 35352), (85, 35451), (86, 35454), (93, 35490), (113, 35553), (116, 35565), (128, 35598), (145, 35679),

Gene: Stromboli\_51 Start: 35169, Stop: 35606, Start Num: 49

Candidate Starts for Stromboli\_51:

(Start: 49 @35169 has 46 MA's), (57, 35217), (85, 35316), (86, 35319), (93, 35355), (113, 35418), (116, 35430), (128, 35469),

Gene: Sunfish\_93 Start: 53322, Stop: 52789, Start Num: 26

Candidate Starts for Sunfish\_93:

(9, 53556), (Start: 26 @53322 has 1 MA's), (82, 53031), (109, 52929), (124, 52881), (136, 52836),

Gene: Syleon\_46 Start: 34218, Stop: 34751, Start Num: 20

Candidate Starts for Syleon\_46:

(12, 34092), (13, 34101), (Start: 20 @34218 has 3 MA's), (Start: 23 @34230 has 1 MA's), (55, 34389), (79, 34491), (89, 34542), (101, 34584), (113, 34620),

Gene: Tandem\_107 Start: 58139, Stop: 57753, Start Num: 44

Candidate Starts for Tandem\_107:

(25, 58232), (30, 58196), (39, 58163), (42, 58142), (Start: 44 @58139 has 13 MA's), (60, 58058), (67, 58040), (85, 57986), (89, 57962), (110, 57890), (122, 57854), (125, 57836),

Gene: ToriToki\_76 Start: 38998, Stop: 38495, Start Num: 49

Candidate Starts for ToriToki\_76:

(Start: 49 @38998 has 46 MA's), (55, 38962), (60, 38926), (67, 38890), (74, 38857), (84, 38809), (89, 38770), (125, 38659), (130, 38635), (143, 38581), (154, 38515),

Gene: Treat\_78 Start: 40051, Stop: 39530, Start Num: 48

Candidate Starts for Treat\_78:

(Start: 48 @40051 has 2 MA's), (50, 40030), (57, 40003), (60, 39979), (74, 39904), (75, 39901), (86, 39838), (90, 39808), (100, 39772), (103, 39760), (104, 39757), (139, 39619), (153, 39556),

Gene: Treat\_76 Start: 38873, Stop: 38370, Start Num: 49

Candidate Starts for Treat\_76:

(Start: 49 @38873 has 46 MA's), (55, 38837), (60, 38801), (67, 38765), (74, 38732), (81, 38699), (84, 38684), (89, 38645), (125, 38534), (130, 38510), (143, 38456),

Gene: Uterion\_113 Start: 57717, Stop: 57307, Start Num: 44

Candidate Starts for Uterion\_113:

(Start: 44 @57717 has 13 MA's), (55, 57675), (65, 57615), (82, 57555), (89, 57513), (121, 57411),

Gene: Uterion\_112 Start: 57310, Stop: 56945, Start Num: 49

Candidate Starts for Uterion\_112:

(33, 57361), (Start: 49 @57310 has 46 MA's), (60, 57241), (84, 57181), (85, 57172), (89, 57148), (93, 57133), (137, 56983), (140, 56974),

Gene: VanLee\_135 Start: 73104, Stop: 72706, Start Num: 53

Candidate Starts for VanLee\_135:

(Start: 53 @73104 has 1 MA's), (71, 73008), (108, 72846),

Gene: Vorvolakos\_75 Start: 38620, Stop: 38138, Start Num: 49

Candidate Starts for Vorvolakos\_75:

(Start: 49 @38620 has 46 MA's), (60, 38548), (67, 38515), (84, 38437), (90, 38395), (125, 38287), (139, 38224), (147, 38182),

Gene: WRightOn\_78 Start: 38385, Stop: 37942, Start Num: 45

Candidate Starts for WRightOn\_78:

(31, 38442), (36, 38418), (Start: 45 @38385 has 5 MA's), (84, 38196), (117, 38082), (146, 37959),

Gene: WalkingDead\_53 Start: 35918, Stop: 36355, Start Num: 49

Candidate Starts for WalkingDead\_53:

(Start: 49 @35918 has 46 MA's), (57, 35966), (85, 36065), (86, 36068), (93, 36104), (113, 36167), (116, 36179), (128, 36218), (145, 36299),

Gene: Welcome\_109 Start: 56727, Stop: 56290, Start Num: 47

Candidate Starts for Welcome\_109:

(Start: 47 @56727 has 12 MA's), (51, 56703), (56, 56682), (83, 56586), (85, 56574), (86, 56571), (95, 56529), (104, 56499), (115, 56466),

Gene: Wolfstar\_113 Start: 59574, Stop: 59188, Start Num: 44

Candidate Starts for Wolfstar\_113:

(28, 59646), (35, 59601), (Start: 44 @59574 has 13 MA's), (63, 59481), (76, 59442), (85, 59409), (89, 59385), (93, 59373), (123, 59277),

Gene: Yuma\_105 Start: 55848, Stop: 55411, Start Num: 47

Candidate Starts for Yuma\_105:

(Start: 47 @55848 has 12 MA's), (51, 55824), (56, 55803), (83, 55707), (85, 55695), (86, 55692), (95, 55650), (104, 55620), (115, 55587),

Gene: Zeigle\_74 Start: 38229, Stop: 37786, Start Num: 45

Candidate Starts for Zeigle\_74:

(31, 38286), (36, 38262), (Start: 45 @38229 has 5 MA's), (84, 38040), (117, 37926), (146, 37803),

Gene: ZooBear\_76 Start: 38999, Stop: 38496, Start Num: 49

Candidate Starts for ZooBear\_76:

(Start: 49 @38999 has 46 MA's), (55, 38963), (60, 38927), (67, 38891), (74, 38858), (84, 38810), (89, 38771), (125, 38660), (130, 38636), (143, 38582),

Gene: Zooman\_323 Start: 180374, Stop: 180850, Start Num: 49

Candidate Starts for Zooman\_323:

(Start: 49 @180374 has 46 MA's), (61, 180458), (68, 180485), (87, 180572), (91, 180590), (122, 180686), (126, 180707), (129, 180722), (137, 180746),

Gene: Zooman\_10 Start: 4723, Stop: 5199, Start Num: 49

Candidate Starts for Zooman\_10:

(Start: 49 @4723 has 46 MA's), (61, 4807), (68, 4834), (87, 4921), (91, 4939), (122, 5035), (126, 5056),  
(129, 5071), (137, 5095),