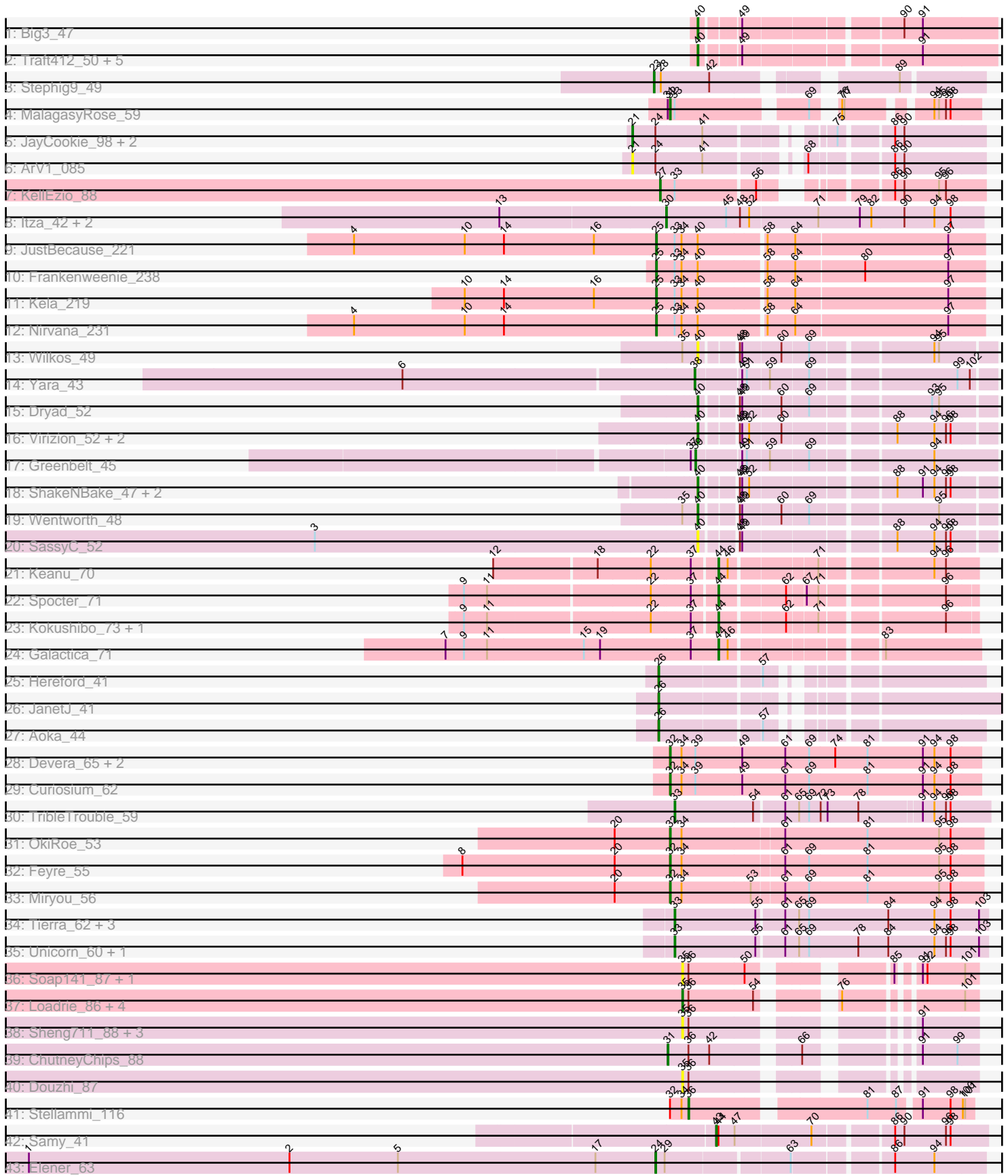


Pham 304988



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 304988 Report

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

Pham number 304988 has 71 members, 14 are drafts.

Phages represented in each track:

- Track 1 : Big3\_47
- Track 2 : Traft412\_50, Pelly\_47, Dexes\_48, Michley\_47, Fushigi\_46, MrGordo\_47
- Track 3 : Stephig9\_49
- Track 4 : MalagasyRose\_59
- Track 5 : JayCookie\_98, Conboy\_96, MoyaNatalis\_97
- Track 6 : ArV1\_085
- Track 7 : Kellezio\_88
- Track 8 : Itza\_42, Celia\_42, Urza\_42
- Track 9 : JustBecause\_221
- Track 10 : Frankenweenie\_238
- Track 11 : Kela\_219
- Track 12 : Nirvana\_231
- Track 13 : Wilkos\_49
- Track 14 : Yara\_43
- Track 15 : Dryad\_52
- Track 16 : Virizion\_52, Rooney\_47, Gibson\_47
- Track 17 : Greenbelt\_45
- Track 18 : ShakeNBake\_47, PHTowN\_47, Lizz\_47
- Track 19 : Wentworth\_48
- Track 20 : SassyC\_52
- Track 21 : Keanu\_70
- Track 22 : Spocter\_71
- Track 23 : Kokushibo\_73, Hiyaa\_72
- Track 24 : Galactica\_71
- Track 25 : Hereford\_41
- Track 26 : JanetJ\_41
- Track 27 : Aoka\_44
- Track 28 : Devera\_65, Dole\_63, Illumine\_63
- Track 29 : Curiosium\_62
- Track 30 : TribbleTrouble\_59
- Track 31 : OkiRoe\_53
- Track 32 : Feyre\_55
- Track 33 : Miryou\_56
- Track 34 : Tierra\_62, Cain\_62, Phrank\_62, Bryler\_62
- Track 35 : Unicorn\_60, PhelpsODU\_60
- Track 36 : Soap141\_87, Sarshaun\_88
- Track 37 : Loadrie\_86, Zakai\_88, MkaliMitinis3\_89, Wigglewiggle\_87, OverPar\_89

- Track 38 : Sheng711\_88, BrainDrainer\_88, FarmResident\_88, PYPDinur\_87
- Track 39 : ChutneyChips\_88
- Track 40 : Douzhi\_87
- Track 41 : Stellammi\_116
- Track 42 : Samy\_41
- Track 43 : Elener\_63

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

The start number called the most often in the published annotations is 40, it was called in 14 of the 57 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Big3\_47, Dexes\_48, Dryad\_52, Fushigi\_46, Gibson\_47, Lizz\_47, Michley\_47, MrGordo\_47, PHTowN\_47, Pelly\_47, Rooney\_47, SassyC\_52, ShakeNBake\_47, Traft412\_50, Virizion\_52, Wentworth\_48, Wilkos\_49,

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

- Frankenweenie\_238, JustBecause\_221, Kela\_219, Nirvana\_231,

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

- Aoka\_44, ArV1\_085, BrainDrainer\_88, Bryler\_62, Cain\_62, Celia\_42, ChutneyChips\_88, Conboy\_96, Curiosium\_62, Devera\_65, Dole\_63, Douzhi\_87, Elener\_63, FarmResident\_88, Feyre\_55, Galactica\_71, Greenbelt\_45, Hereford\_41, Hiyaa\_72, Illumine\_63, Itza\_42, JanetJ\_41, JayCookie\_98, Keanu\_70, KellEzio\_88, Kokushibo\_73, Loadrie\_86, MalagasyRose\_59, Miryou\_56, MkaliMitinis3\_89, MoyaNatalis\_97, OkiRoe\_53, OverPar\_89, PYPDinur\_87, PhelpsODU\_60, Phrank\_62, Samy\_41, Sarshaun\_88, Sheng711\_88, Soap141\_87, Spocter\_71, Stellammi\_116, Stephig9\_49, Tierra\_62, TribbleTrouble\_59, Unicorn\_60, Urza\_42, Wigglewiggles\_87, Yara\_43, Zakai\_88,

**Summary by start number:**

Start 21:

- Found in 4 of 71 ( 5.6% ) of genes in pham
- Manual Annotations of this start: 2 of 57
- Called 100.0% of time when present
- Phage (with cluster) where this start called: ArV1\_085 (AR), Conboy\_96 (AR), JayCookie\_98 (AR), MoyaNatalis\_97 (AR),

Start 23:

- Found in 1 of 71 ( 1.4% ) of genes in pham
- Manual Annotations of this start: 1 of 57
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Stephig9\_49 (A8),

Start 24:

- Found in 5 of 71 ( 7.0% ) of genes in pham
- Manual Annotations of this start: 1 of 57
- Called 20.0% of time when present

- Phage (with cluster) where this start called: Elener\_63 (singleton),

Start 25:

- Found in 4 of 71 ( 5.6% ) of genes in pham
- Manual Annotations of this start: 4 of 57
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Frankenweenie\_238 (BM), JustBecause\_221 (BM), Kela\_219 (BM), Nirvana\_231 (BM),

Start 26:

- Found in 3 of 71 ( 4.2% ) of genes in pham
- Manual Annotations of this start: 3 of 57
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Aoka\_44 (FO), Hereford\_41 (FO), JanetJ\_41 (FO),

Start 27:

- Found in 1 of 71 ( 1.4% ) of genes in pham
- Manual Annotations of this start: 1 of 57
- Called 100.0% of time when present
- Phage (with cluster) where this start called: KellEzio\_88 (AT),

Start 30:

- Found in 3 of 71 ( 4.2% ) of genes in pham
- Manual Annotations of this start: 3 of 57
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Celia\_42 (BD6), Itza\_42 (BD6), Urza\_42 (BD6),

Start 31:

- Found in 2 of 71 ( 2.8% ) of genes in pham
- Manual Annotations of this start: 1 of 57
- Called 50.0% of time when present
- Phage (with cluster) where this start called: ChutneyChips\_88 (L4),

Start 32:

- Found in 9 of 71 ( 12.7% ) of genes in pham
- Manual Annotations of this start: 8 of 57
- Called 88.9% of time when present
- Phage (with cluster) where this start called: Curiosium\_62 (K1), Devera\_65 (K1), Dole\_63 (K1), Feyre\_55 (K5), Illumine\_63 (K1), MalagasyRose\_59 (AG), Miryou\_56 (K5), OkiRoe\_53 (K5),

Start 33:

- Found in 13 of 71 ( 18.3% ) of genes in pham
- Manual Annotations of this start: 7 of 57
- Called 53.8% of time when present
- Phage (with cluster) where this start called: Bryler\_62 (K6), Cain\_62 (K6), PhelpsODU\_60 (K6), Phrank\_62 (K6), Tierra\_62 (K6), TripleTrouble\_59 (K3), Unicorn\_60 (K6),

Start 35:

- Found in 14 of 71 ( 19.7% ) of genes in pham

- Manual Annotations of this start: 4 of 57
- Called 85.7% of time when present
- Phage (with cluster) where this start called: BrainDrainer\_88 (L4), Douzhi\_87 (L4), FarmResident\_88 (L4), Loadrie\_86 (L2), MkaliMitinis3\_89 (L2), OverPar\_89 (L2), PYPDinur\_87 (L4), Sarshaun\_88 (L2), Sheng711\_88 (L4), Soap141\_87 (L2), Wigglewiggles\_87 (L2), Zakai\_88 (L2),

#### Start 36:

- Found in 14 of 71 ( 19.7% ) of genes in pham
- Manual Annotations of this start: 1 of 57
- Called 7.1% of time when present
- Phage (with cluster) where this start called: Stellammi\_116 (UNK),

#### Start 38:

- Found in 1 of 71 ( 1.4% ) of genes in pham
- Manual Annotations of this start: 1 of 57
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Yara\_43 (BN),

#### Start 39:

- Found in 5 of 71 ( 7.0% ) of genes in pham
- Manual Annotations of this start: 1 of 57
- Called 20.0% of time when present
- Phage (with cluster) where this start called: Greenbelt\_45 (BN),

#### Start 40:

- Found in 21 of 71 ( 29.6% ) of genes in pham
- Manual Annotations of this start: 14 of 57
- Called 81.0% of time when present
- Phage (with cluster) where this start called: Big3\_47 (A1), Dexes\_48 (A1), Dryad\_52 (BN), Fushigi\_46 (A1), Gibson\_47 (BN), Lizz\_47 (BN), Michley\_47 (A1), MrGordo\_47 (A1), PHTown\_47 (BN), Pelly\_47 (A1), Rooney\_47 (BN), SassyC\_52 (BN), ShakeNBake\_47 (BN), Traft412\_50 (A1), Virizion\_52 (BN), Wentworth\_48 (BN), Wilkos\_49 (BN),

#### Start 43:

- Found in 1 of 71 ( 1.4% ) of genes in pham
- Manual Annotations of this start: 1 of 57
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Samy\_41 (singleton),

#### Start 44:

- Found in 6 of 71 ( 8.5% ) of genes in pham
- Manual Annotations of this start: 4 of 57
- Called 83.3% of time when present
- Phage (with cluster) where this start called: Galactica\_71 (BQ), Hiyaa\_72 (BQ), Keanu\_70 (BQ), Kokushibo\_73 (BQ), Spocter\_71 (BQ),

### Summary by clusters:

There are 18 clusters represented in this pham: K3, singleton, K6, AG, BM, BN, K1, A1, L4, BD6, L2, BQ, K5, A8, AT, UNK, AR, FO,

Info for manual annotations of cluster A1:

- Start number 40 was manually annotated 7 times for cluster A1.

Info for manual annotations of cluster A8:

- Start number 23 was manually annotated 1 time for cluster A8.

Info for manual annotations of cluster AG:

- Start number 32 was manually annotated 1 time for cluster AG.

Info for manual annotations of cluster AR:

- Start number 21 was manually annotated 2 times for cluster AR.

Info for manual annotations of cluster AT:

- Start number 27 was manually annotated 1 time for cluster AT.

Info for manual annotations of cluster BD6:

- Start number 30 was manually annotated 3 times for cluster BD6.

Info for manual annotations of cluster BM:

- Start number 25 was manually annotated 4 times for cluster BM.

Info for manual annotations of cluster BN:

- Start number 38 was manually annotated 1 time for cluster BN.
- Start number 39 was manually annotated 1 time for cluster BN.
- Start number 40 was manually annotated 7 times for cluster BN.

Info for manual annotations of cluster BQ:

- Start number 44 was manually annotated 4 times for cluster BQ.

Info for manual annotations of cluster FO:

- Start number 26 was manually annotated 3 times for cluster FO.

Info for manual annotations of cluster K1:

- Start number 32 was manually annotated 4 times for cluster K1.

Info for manual annotations of cluster K3:

- Start number 33 was manually annotated 1 time for cluster K3.

Info for manual annotations of cluster K5:

- Start number 32 was manually annotated 3 times for cluster K5.

Info for manual annotations of cluster K6:

- Start number 33 was manually annotated 6 times for cluster K6.

Info for manual annotations of cluster L2:

- Start number 35 was manually annotated 4 times for cluster L2.

Info for manual annotations of cluster L4:

- Start number 31 was manually annotated 1 time for cluster L4.

Info for manual annotations of cluster UNK:

- Start number 36 was manually annotated 1 time for cluster UNK.

**Gene Information:**

Gene: Aoka\_44 Start: 31288, Stop: 31638, Start Num: 26

Candidate Starts for Aoka\_44:

(Start: 26 @31288 has 3 MA's), (57, 31408),

Gene: ArV1\_085 Start: 61509, Stop: 61898, Start Num: 21

Candidate Starts for ArV1\_085:

(Start: 21 @61509 has 2 MA's), (Start: 24 @61539 has 1 MA's), (41, 61599), (68, 61695), (86, 61785), (90, 61797),

Gene: Big3\_47 Start: 35903, Stop: 35556, Start Num: 40

Candidate Starts for Big3\_47:

(Start: 40 @35903 has 14 MA's), (49, 35861), (90, 35675), (91, 35651),

Gene: BrainDrainer\_88 Start: 55558, Stop: 55860, Start Num: 35

Candidate Starts for BrainDrainer\_88:

(Start: 35 @55558 has 4 MA's), (Start: 36 @55564 has 1 MA's), (91, 55789),

Gene: Bryler\_62 Start: 40362, Stop: 40757, Start Num: 33

Candidate Starts for Bryler\_62:

(Start: 33 @40362 has 7 MA's), (55, 40464), (61, 40497), (65, 40515), (69, 40527), (84, 40629), (94, 40689), (98, 40710), (103, 40746),

Gene: Cain\_62 Start: 40350, Stop: 40745, Start Num: 33

Candidate Starts for Cain\_62:

(Start: 33 @40350 has 7 MA's), (55, 40452), (61, 40485), (65, 40503), (69, 40515), (84, 40617), (94, 40677), (98, 40698), (103, 40734),

Gene: Celia\_42 Start: 29394, Stop: 29801, Start Num: 30

Candidate Starts for Celia\_42:

(13, 29181), (Start: 30 @29394 has 3 MA's), (45, 29472), (48, 29490), (52, 29502), (71, 29589), (79, 29643), (82, 29658), (90, 29700), (94, 29739), (98, 29760),

Gene: ChutneyChips\_88 Start: 55420, Stop: 55743, Start Num: 31

Candidate Starts for ChutneyChips\_88:

(Start: 31 @55420 has 1 MA's), (Start: 36 @55447 has 1 MA's), (42, 55474), (66, 55567), (91, 55672), (99, 55717),

Gene: Conboy\_96 Start: 62664, Stop: 63050, Start Num: 21

Candidate Starts for Conboy\_96:

(Start: 21 @62664 has 2 MA's), (Start: 24 @62694 has 1 MA's), (41, 62754), (75, 62877), (86, 62937), (90, 62949),

Gene: Curiosium\_62 Start: 40040, Stop: 40438, Start Num: 32

Candidate Starts for Curiosium\_62:

(Start: 32 @40040 has 8 MA's), (34, 40055), (Start: 39 @40073 has 1 MA's), (49, 40133), (61, 40187), (69, 40217), (81, 40292), (91, 40364), (94, 40379), (98, 40400),

Gene: Devera\_65 Start: 41933, Stop: 42331, Start Num: 32

Candidate Starts for Devera\_65:

(Start: 32 @41933 has 8 MA's), (34, 41948), (Start: 39 @41966 has 1 MA's), (49, 42026), (61, 42080), (69, 42110), (74, 42143), (81, 42185), (91, 42257), (94, 42272), (98, 42293),

Gene: Dexes\_48 Start: 36500, Stop: 36153, Start Num: 40  
Candidate Starts for Dexes\_48:  
(Start: 40 @36500 has 14 MA's), (49, 36458), (91, 36248),

Gene: Dole\_63 Start: 41936, Stop: 42334, Start Num: 32  
Candidate Starts for Dole\_63:  
(Start: 32 @41936 has 8 MA's), (34, 41951), (Start: 39 @41969 has 1 MA's), (49, 42029), (61, 42083), (69, 42113), (74, 42146), (81, 42188), (91, 42260), (94, 42275), (98, 42296),

Gene: Douzhi\_87 Start: 55217, Stop: 55519, Start Num: 35  
Candidate Starts for Douzhi\_87:  
(Start: 35 @55217 has 4 MA's), (Start: 36 @55223 has 1 MA's),

Gene: Dryad\_52 Start: 35720, Stop: 35379, Start Num: 40  
Candidate Starts for Dryad\_52:  
(Start: 40 @35720 has 14 MA's), (48, 35681), (49, 35678), (60, 35630), (69, 35597), (93, 35456), (95, 35447),

Gene: Elener\_63 Start: 36486, Stop: 36878, Start Num: 24  
Candidate Starts for Elener\_63:  
(1, 35673), (2, 36012), (5, 36153), (17, 36408), (Start: 24 @36486 has 1 MA's), (29, 36498), (63, 36648), (86, 36762), (94, 36813),

Gene: FarmResident\_88 Start: 54956, Stop: 55258, Start Num: 35  
Candidate Starts for FarmResident\_88:  
(Start: 35 @54956 has 4 MA's), (Start: 36 @54962 has 1 MA's), (91, 55187),

Gene: Feyre\_55 Start: 41389, Stop: 41784, Start Num: 32  
Candidate Starts for Feyre\_55:  
(8, 41119), (20, 41317), (Start: 32 @41389 has 8 MA's), (34, 41404), (61, 41530), (69, 41560), (81, 41635), (95, 41728), (98, 41743),

Gene: Frankenweenie\_238 Start: 141929, Stop: 142342, Start Num: 25  
Candidate Starts for Frankenweenie\_238:  
(Start: 25 @141929 has 4 MA's), (Start: 33 @141953 has 7 MA's), (34, 141962), (Start: 40 @141983 has 14 MA's), (58, 142064), (64, 142100), (80, 142187), (97, 142295),

Gene: Fushigi\_46 Start: 33901, Stop: 33554, Start Num: 40  
Candidate Starts for Fushigi\_46:  
(Start: 40 @33901 has 14 MA's), (49, 33859), (91, 33649),

Gene: Galactica\_71 Start: 52489, Stop: 52794, Start Num: 44  
Candidate Starts for Galactica\_71:  
(7, 52147), (9, 52171), (11, 52201), (15, 52321), (19, 52342), (37, 52453), (Start: 44 @52489 has 4 MA's), (46, 52501), (83, 52672),

Gene: Gibson\_47 Start: 34722, Stop: 34381, Start Num: 40  
Candidate Starts for Gibson\_47:  
(Start: 40 @34722 has 14 MA's), (48, 34683), (49, 34680), (52, 34671), (60, 34632), (88, 34503), (94, 34455), (96, 34440), (98, 34434),

Gene: Greenbelt\_45 Start: 31434, Stop: 31075, Start Num: 39

Candidate Starts for Greenbelt\_45:

(37, 31440), (Start: 39 @31434 has 1 MA's), (49, 31380), (51, 31374), (59, 31347), (69, 31299), (94, 31155),

Gene: Hereford\_41 Start: 30404, Stop: 30754, Start Num: 26

Candidate Starts for Hereford\_41:

(Start: 26 @30404 has 3 MA's), (57, 30524),

Gene: Hiyaa\_72 Start: 53798, Stop: 54097, Start Num: 44

Candidate Starts for Hiyaa\_72:

(9, 53492), (11, 53522), (22, 53720), (37, 53768), (Start: 44 @53798 has 4 MA's), (62, 53876), (71, 53912), (96, 54059),

Gene: Illumine\_63 Start: 41935, Stop: 42333, Start Num: 32

Candidate Starts for Illumine\_63:

(Start: 32 @41935 has 8 MA's), (34, 41950), (Start: 39 @41968 has 1 MA's), (49, 42028), (61, 42082), (69, 42112), (74, 42145), (81, 42187), (91, 42259), (94, 42274), (98, 42295),

Gene: Itza\_42 Start: 29308, Stop: 29715, Start Num: 30

Candidate Starts for Itza\_42:

(13, 29095), (Start: 30 @29308 has 3 MA's), (45, 29386), (48, 29404), (52, 29416), (71, 29503), (79, 29557), (82, 29572), (90, 29614), (94, 29653), (98, 29674),

Gene: JanetJ\_41 Start: 31595, Stop: 31966, Start Num: 26

Candidate Starts for JanetJ\_41:

(Start: 26 @31595 has 3 MA's),

Gene: JayCookie\_98 Start: 63408, Stop: 63794, Start Num: 21

Candidate Starts for JayCookie\_98:

(Start: 21 @63408 has 2 MA's), (Start: 24 @63438 has 1 MA's), (41, 63498), (75, 63621), (86, 63681), (90, 63693),

Gene: JustBecause\_221 Start: 129596, Stop: 130009, Start Num: 25

Candidate Starts for JustBecause\_221:

(4, 129203), (10, 129347), (14, 129398), (16, 129515), (Start: 25 @129596 has 4 MA's), (Start: 33 @129620 has 7 MA's), (34, 129629), (Start: 40 @129650 has 14 MA's), (58, 129731), (64, 129767), (97, 129962),

Gene: Keanu\_70 Start: 53661, Stop: 53963, Start Num: 44

Candidate Starts for Keanu\_70:

(12, 53391), (18, 53517), (22, 53583), (37, 53631), (Start: 44 @53661 has 4 MA's), (46, 53673), (71, 53775), (94, 53907), (96, 53922),

Gene: Kela\_219 Start: 129441, Stop: 129854, Start Num: 25

Candidate Starts for Kela\_219:

(10, 129192), (14, 129243), (16, 129360), (Start: 25 @129441 has 4 MA's), (Start: 33 @129465 has 7 MA's), (34, 129474), (Start: 40 @129495 has 14 MA's), (58, 129576), (64, 129612), (97, 129807),

Gene: KellEzio\_88 Start: 52796, Stop: 53146, Start Num: 27

Candidate Starts for KellEzio\_88:

(Start: 27 @52796 has 1 MA's), (Start: 33 @52814 has 7 MA's), (56, 52913), (86, 53030), (90, 53042), (95, 53087), (96, 53096),

Gene: Kokushibo\_73 Start: 53830, Stop: 54129, Start Num: 44

Candidate Starts for Kokushibo\_73:

(9, 53524), (11, 53554), (22, 53752), (37, 53800), (Start: 44 @53830 has 4 MA's), (62, 53908), (71, 53944), (96, 54091),

Gene: Lizz\_47 Start: 34536, Stop: 34195, Start Num: 40

Candidate Starts for Lizz\_47:

(Start: 40 @34536 has 14 MA's), (48, 34497), (49, 34494), (52, 34485), (88, 34317), (91, 34284), (94, 34269), (96, 34254), (98, 34248),

Gene: Loadrie\_86 Start: 56068, Stop: 56370, Start Num: 35

Candidate Starts for Loadrie\_86:

(Start: 35 @56068 has 4 MA's), (Start: 36 @56074 has 1 MA's), (54, 56155), (76, 56221), (101, 56353),

Gene: MalagasyRose\_59 Start: 39738, Stop: 40061, Start Num: 32

Candidate Starts for MalagasyRose\_59:

(Start: 31 @39735 has 1 MA's), (Start: 32 @39738 has 8 MA's), (Start: 33 @39744 has 7 MA's), (69, 39891), (76, 39909), (77, 39912), (94, 40002), (95, 40008), (96, 40017), (98, 40023),

Gene: Michley\_47 Start: 35355, Stop: 35008, Start Num: 40

Candidate Starts for Michley\_47:

(Start: 40 @35355 has 14 MA's), (49, 35313), (91, 35103),

Gene: Miryou\_56 Start: 42105, Stop: 42500, Start Num: 32

Candidate Starts for Miryou\_56:

(20, 42033), (Start: 32 @42105 has 8 MA's), (34, 42120), (53, 42207), (61, 42246), (69, 42276), (81, 42351), (95, 42444), (98, 42459),

Gene: MkaliMitinis3\_89 Start: 56052, Stop: 56354, Start Num: 35

Candidate Starts for MkaliMitinis3\_89:

(Start: 35 @56052 has 4 MA's), (Start: 36 @56058 has 1 MA's), (54, 56139), (76, 56205), (101, 56337),

Gene: MoyaNatalis\_97 Start: 62854, Stop: 63240, Start Num: 21

Candidate Starts for MoyaNatalis\_97:

(Start: 21 @62854 has 2 MA's), (Start: 24 @62884 has 1 MA's), (41, 62944), (75, 63067), (86, 63127), (90, 63139),

Gene: MrGordo\_47 Start: 35149, Stop: 34802, Start Num: 40

Candidate Starts for MrGordo\_47:

(Start: 40 @35149 has 14 MA's), (49, 35107), (91, 34897),

Gene: Nirvana\_231 Start: 140165, Stop: 140578, Start Num: 25

Candidate Starts for Nirvana\_231:

(4, 139772), (10, 139916), (14, 139967), (Start: 25 @140165 has 4 MA's), (Start: 33 @140189 has 7 MA's), (34, 140198), (Start: 40 @140219 has 14 MA's), (58, 140300), (64, 140336), (97, 140531),

Gene: OkiRoe\_53 Start: 39776, Stop: 40171, Start Num: 32

Candidate Starts for OkiRoe\_53:

(20, 39704), (Start: 32 @39776 has 8 MA's), (34, 39791), (61, 39917), (81, 40022), (95, 40115), (98, 40130),

Gene: OverPar\_89 Start: 56068, Stop: 56370, Start Num: 35

Candidate Starts for OverPar\_89:

(Start: 35 @56068 has 4 MA's), (Start: 36 @56074 has 1 MA's), (54, 56155), (76, 56221), (101, 56353),

Gene: PHTowN\_47 Start: 34534, Stop: 34193, Start Num: 40

Candidate Starts for PHTowN\_47:

(Start: 40 @34534 has 14 MA's), (48, 34495), (49, 34492), (52, 34483), (88, 34315), (91, 34282), (94, 34267), (96, 34252), (98, 34246),

Gene: PYPDinur\_87 Start: 55810, Stop: 56112, Start Num: 35

Candidate Starts for PYPDinur\_87:

(Start: 35 @55810 has 4 MA's), (Start: 36 @55816 has 1 MA's), (91, 56041),

Gene: Pelly\_47 Start: 35989, Stop: 35642, Start Num: 40

Candidate Starts for Pelly\_47:

(Start: 40 @35989 has 14 MA's), (49, 35947), (91, 35737),

Gene: PhelpsODU\_60 Start: 40279, Stop: 40674, Start Num: 33

Candidate Starts for PhelpsODU\_60:

(Start: 33 @40279 has 7 MA's), (55, 40381), (61, 40414), (65, 40432), (69, 40444), (78, 40507), (84, 40546), (94, 40606), (96, 40621), (98, 40627), (103, 40663),

Gene: Phrank\_62 Start: 40340, Stop: 40735, Start Num: 33

Candidate Starts for Phrank\_62:

(Start: 33 @40340 has 7 MA's), (55, 40442), (61, 40475), (65, 40493), (69, 40505), (84, 40607), (94, 40667), (98, 40688), (103, 40724),

Gene: Rooney\_47 Start: 34719, Stop: 34378, Start Num: 40

Candidate Starts for Rooney\_47:

(Start: 40 @34719 has 14 MA's), (48, 34680), (49, 34677), (52, 34668), (60, 34629), (88, 34500), (94, 34452), (96, 34437), (98, 34431),

Gene: Samy\_41 Start: 29540, Stop: 29869, Start Num: 43

Candidate Starts for Samy\_41:

(Start: 43 @29540 has 1 MA's), (Start: 44 @29543 has 4 MA's), (47, 29564), (70, 29660), (86, 29750), (90, 29762), (96, 29816), (98, 29822),

Gene: Sarshaun\_88 Start: 56296, Stop: 56598, Start Num: 35

Candidate Starts for Sarshaun\_88:

(Start: 35 @56296 has 4 MA's), (Start: 36 @56302 has 1 MA's), (50, 56374), (85, 56509), (91, 56527), (92, 56533), (101, 56581),

Gene: SassyC\_52 Start: 35289, Stop: 34948, Start Num: 40

Candidate Starts for SassyC\_52:

(3, 35778), (Start: 40 @35289 has 14 MA's), (48, 35250), (49, 35247), (88, 35070), (94, 35022), (96, 35007), (98, 35001),

Gene: ShakeNBake\_47 Start: 34552, Stop: 34211, Start Num: 40

Candidate Starts for ShakeNBake\_47:

(Start: 40 @34552 has 14 MA's), (48, 34513), (49, 34510), (52, 34501), (88, 34333), (91, 34300), (94, 34285), (96, 34270), (98, 34264),

Gene: Sheng711\_88 Start: 55286, Stop: 55588, Start Num: 35  
Candidate Starts for Sheng711\_88:  
(Start: 35 @55286 has 4 MA's), (Start: 36 @55292 has 1 MA's), (91, 55517),

Gene: Soap141\_87 Start: 56296, Stop: 56598, Start Num: 35  
Candidate Starts for Soap141\_87:  
(Start: 35 @56296 has 4 MA's), (Start: 36 @56302 has 1 MA's), (50, 56374), (85, 56509), (91, 56527),  
(92, 56533), (101, 56581),

Gene: Spocter\_71 Start: 53893, Stop: 54192, Start Num: 44  
Candidate Starts for Spocter\_71:  
(9, 53587), (11, 53617), (22, 53815), (37, 53863), (Start: 44 @53893 has 4 MA's), (62, 53971), (67,  
53992), (71, 54007), (96, 54154),

Gene: Stellammi\_116 Start: 57480, Stop: 57809, Start Num: 36  
Candidate Starts for Stellammi\_116:  
(Start: 32 @57456 has 8 MA's), (34, 57471), (Start: 36 @57480 has 1 MA's), (81, 57684), (87, 57720),  
(91, 57744), (98, 57780), (100, 57795), (101, 57798),

Gene: Stephig9\_49 Start: 34347, Stop: 33979, Start Num: 23  
Candidate Starts for Stephig9\_49:  
(Start: 23 @34347 has 1 MA's), (28, 34338), (42, 34275), (89, 34080),

Gene: Tierra\_62 Start: 41151, Stop: 41546, Start Num: 33  
Candidate Starts for Tierra\_62:  
(Start: 33 @41151 has 7 MA's), (55, 41253), (61, 41286), (65, 41304), (69, 41316), (84, 41418), (94,  
41478), (98, 41499), (103, 41535),

Gene: Traft412\_50 Start: 36788, Stop: 36441, Start Num: 40  
Candidate Starts for Traft412\_50:  
(Start: 40 @36788 has 14 MA's), (49, 36746), (91, 36536),

Gene: TribelTrouble\_59 Start: 41359, Stop: 41751, Start Num: 33  
Candidate Starts for TribelTrouble\_59:  
(Start: 33 @41359 has 7 MA's), (54, 41458), (61, 41494), (65, 41512), (69, 41524), (72, 41539), (73,  
41548), (78, 41587), (91, 41665), (94, 41680), (96, 41695), (98, 41701),

Gene: Unicorn\_60 Start: 40279, Stop: 40674, Start Num: 33  
Candidate Starts for Unicorn\_60:  
(Start: 33 @40279 has 7 MA's), (55, 40381), (61, 40414), (65, 40432), (69, 40444), (78, 40507), (84,  
40546), (94, 40606), (96, 40621), (98, 40627), (103, 40663),

Gene: Urza\_42 Start: 29329, Stop: 29736, Start Num: 30  
Candidate Starts for Urza\_42:  
(13, 29116), (Start: 30 @29329 has 3 MA's), (45, 29407), (48, 29425), (52, 29437), (71, 29524), (79,  
29578), (82, 29593), (90, 29635), (94, 29674), (98, 29695),

Gene: Virizion\_52 Start: 34918, Stop: 34577, Start Num: 40  
Candidate Starts for Virizion\_52:  
(Start: 40 @34918 has 14 MA's), (48, 34879), (49, 34876), (52, 34867), (60, 34828), (88, 34699), (94,  
34651), (96, 34636), (98, 34630),

Gene: Wentworth\_48 Start: 35004, Stop: 34663, Start Num: 40

Candidate Starts for Wentworth\_48:

(Start: 35 @35022 has 4 MA's), (Start: 40 @35004 has 14 MA's), (48, 34965), (49, 34962), (60, 34914), (69, 34881), (95, 34731),

Gene: Wigglewigggle\_87 Start: 55845, Stop: 56147, Start Num: 35

Candidate Starts for Wigglewigggle\_87:

(Start: 35 @55845 has 4 MA's), (Start: 36 @55851 has 1 MA's), (54, 55932), (76, 55998), (101, 56130),

Gene: Wilkos\_49 Start: 34825, Stop: 34484, Start Num: 40

Candidate Starts for Wilkos\_49:

(Start: 35 @34843 has 4 MA's), (Start: 40 @34825 has 14 MA's), (48, 34786), (49, 34783), (60, 34735), (69, 34702), (94, 34558), (95, 34552),

Gene: Yara\_43 Start: 33601, Stop: 33248, Start Num: 38

Candidate Starts for Yara\_43:

(6, 33967), (Start: 38 @33601 has 1 MA's), (49, 33547), (51, 33541), (59, 33514), (69, 33466), (99, 33292), (102, 33277),

Gene: Zakai\_88 Start: 56309, Stop: 56611, Start Num: 35

Candidate Starts for Zakai\_88:

(Start: 35 @56309 has 4 MA's), (Start: 36 @56315 has 1 MA's), (54, 56396), (76, 56462), (101, 56594),