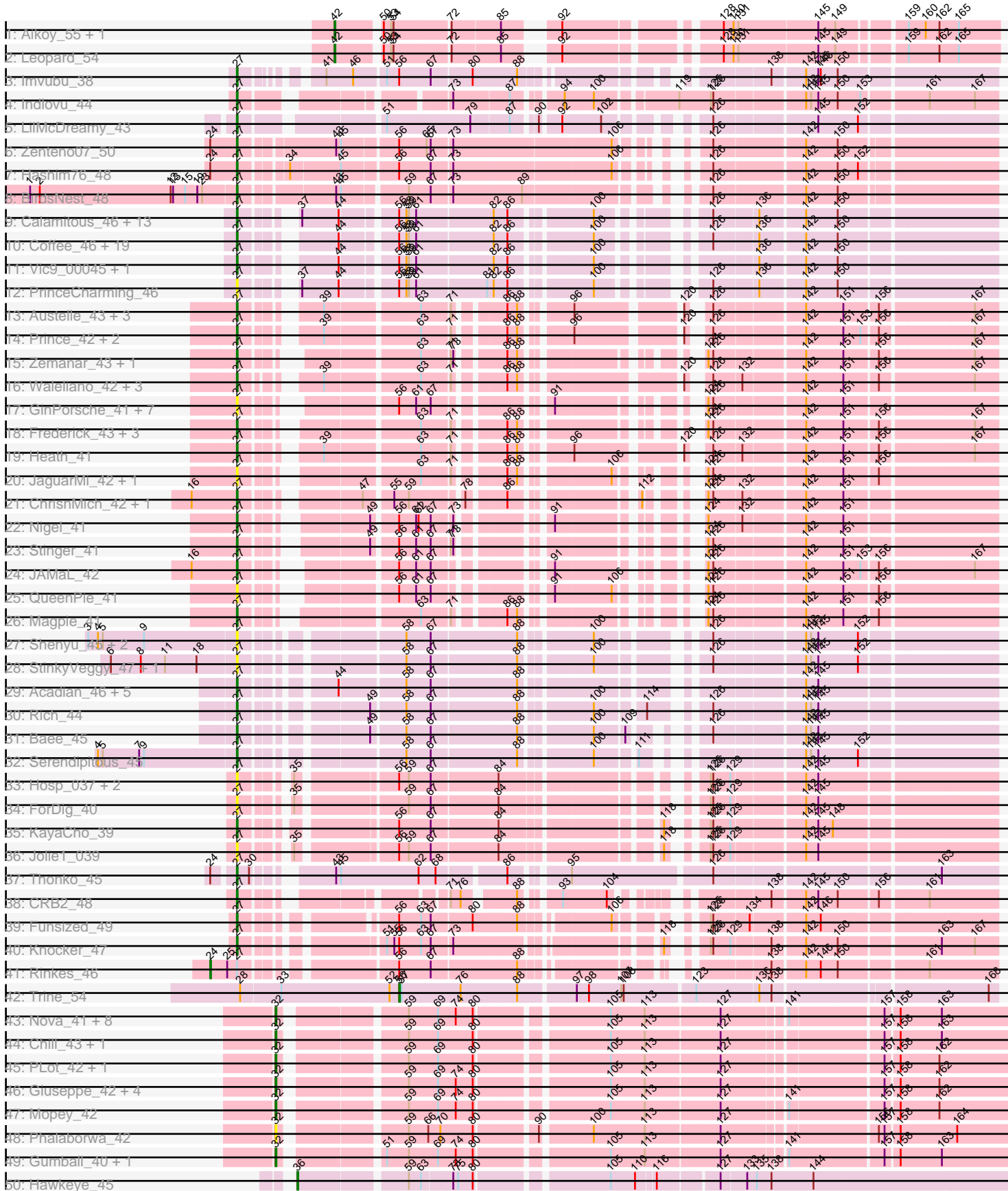
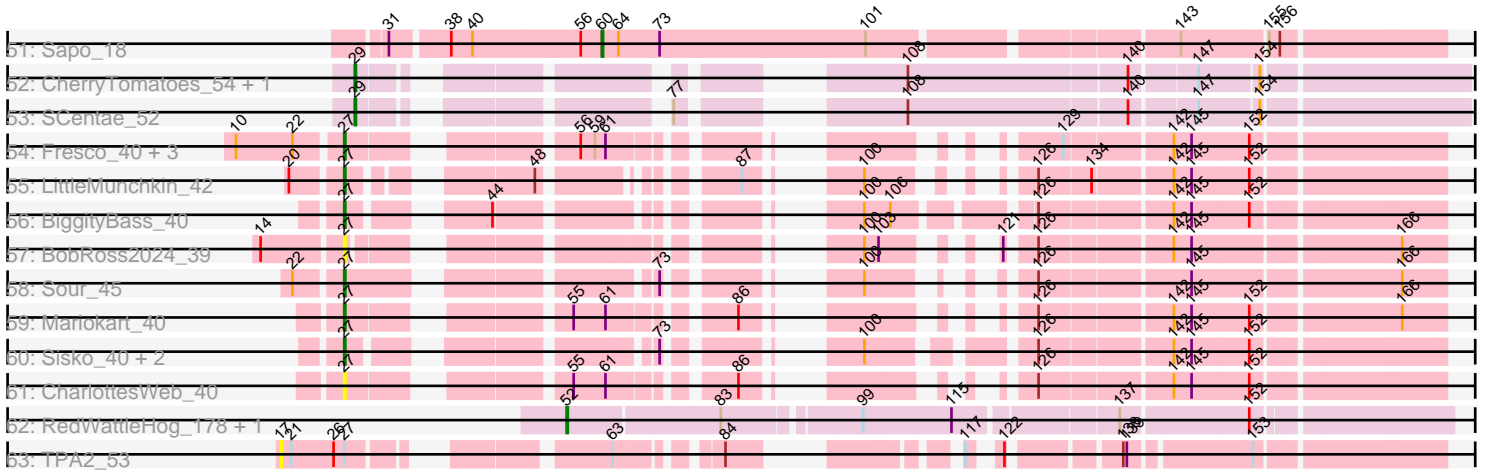


Pham 224359



Pham 224359



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 224359 Report

This analysis was run 03/28/25 on database version 593.

Pham number 224359 has 150 members, 32 are drafts.

Phages represented in each track:

- Track 1 : Aikoy\_55, Onyinye\_55
- Track 2 : Leopard\_54
- Track 3 : Imvubu\_38
- Track 4 : Indlovu\_44
- Track 5 : LilMcDreamy\_43
- Track 6 : Zenteno07\_50
- Track 7 : Hashim76\_48
- Track 8 : BirdsNest\_48
- Track 9 : Calamitous\_46, Lars\_46, Allegro\_46, Faze9\_45, Kaleb\_46, TA17A\_47, Kheth\_46, Blocker23\_46, MasterPo\_46, Holeinone\_46, Phantasmagoria\_46, Rhinoforte\_46, Godines\_46, Arbitrator\_45
- Track 10 : Coffee\_46, Lephleur\_46, ItsyBitsy1\_46, FrenchFry\_46, Tinciduntolum\_47, Bananafish\_46, Hedgerow\_46, West99\_46, Tres\_46, LizLemon\_46, Kolhan\_46, Sabella\_45, LilSmirk\_46, Ares\_46, Brownie5\_46, Boyle\_46, Eaglehorse\_46, Rosebush\_45, Opia\_46, Glass\_46
- Track 11 : Vic9\_00045, Laurie\_45
- Track 12 : PrinceCharming\_46
- Track 13 : Austelle\_43, Mudslide\_42, Fortunato\_43, RawrgerThat\_43
- Track 14 : Prince\_42, Apex\_43, VioletZ\_44
- Track 15 : Zemanar\_43, Lolalove\_43
- Track 16 : Waleliano\_42, BrownCNA\_44, Hangman\_42, Hydro\_42
- Track 17 : GinPorsche\_41, Ahwei\_41, Poster\_41, Hally898\_41, Antihero\_41, Lambano\_41, Nanao\_41, Epah\_41
- Track 18 : Frederick\_43, Mithril\_42, Fanaw\_41, BobbyK\_43
- Track 19 : Heath\_41
- Track 20 : JaguarMi\_42, Xincheng\_41
- Track 21 : ChrisnMich\_42, Cooper\_43
- Track 22 : Nigel\_41
- Track 23 : Stinger\_41
- Track 24 : JAMaL\_42
- Track 25 : QueenPie\_41
- Track 26 : Magpie\_41
- Track 27 : Shenyu\_45, DigitDog\_45, Nangang\_45
- Track 28 : StinkyVeggy\_47, KarasumaRum\_47
- Track 29 : Acadian\_46, EastView9101\_44, Suigeneris\_46, Donny\_46, SirJeffery\_46, Rita130\_46
- Track 30 : Rich\_44

- Track 31 : Bae\_45
- Track 32 : Serendipitous\_45
- Track 33 : Hosp\_037, 40BC\_039, 39HC\_039
- Track 34 : ForDig\_40
- Track 35 : KayaCho\_39
- Track 36 : Jolie1\_039
- Track 37 : Thonko\_45
- Track 38 : CRB2\_48
- Track 39 : Funsized\_49
- Track 40 : Knocker\_47
- Track 41 : Rinkes\_46
- Track 42 : Trine\_54
- Track 43 : Nova\_41, Butterscotch\_41, PBI1\_41, Prager\_42, Penelope2018\_42, Adjutor\_42, KandZ\_42, BigMama\_40, Thoth\_42
- Track 44 : Chill\_43, WaldoWhy\_43
- Track 45 : PLOT\_42, Erk16\_41
- Track 46 : Giuseppe\_42, Troll4\_42, Helpful\_43, Visconti\_42, Delton\_42
- Track 47 : Mopey\_42
- Track 48 : Phalaborwa\_42
- Track 49 : Gumball\_40, SirHarley\_41
- Track 50 : Hawkeye\_45
- Track 51 : Sapo\_18
- Track 52 : CherryTomatoes\_54, Pupper\_52
- Track 53 : SCentae\_52
- Track 54 : Fresco\_40, Axumite\_40, Shatter\_40, Ligma\_40
- Track 55 : LittleMunchkin\_42
- Track 56 : BiggityBass\_40
- Track 57 : BobRoss2024\_39
- Track 58 : Sour\_45
- Track 59 : Mariokart\_40
- Track 60 : Sisko\_40, Yago84\_40, AnClar\_41
- Track 61 : CharlottesWeb\_40
- Track 62 : RedWattleHog\_178, Stormageddon\_179
- Track 63 : TPA2\_53

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

The start number called the most often in the published annotations is 27, it was called in 85 of the 118 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- 39HC\_039, 40BC\_039, Acadian\_46, Ahwei\_41, Allegro\_46, AnClar\_41, Antihero\_41, Apex\_43, Arbiter\_45, Ares\_46, Austelle\_43, Axumite\_40, Bae\_45, Bananafish\_46, BiggityBass\_40, BirdsNest\_48, Blocker23\_46, BobRoss2024\_39, BobbyK\_43, Boyle\_46, BrownCNA\_44, Brownie5\_46, CRB2\_48, Calamitous\_46, CharlottesWeb\_40, ChrisnMich\_42, Coffee\_46, Cooper\_43, DigitDog\_45, Donny\_46, Eaglehorse\_46, EastView9101\_44, Epah\_41, Fanaw\_41, Faze9\_45, ForDig\_40, Fortunato\_43, Frederick\_43, FrenchFry\_46, Fresco\_40, Funsized\_49, GinPorsche\_41, Glass\_46, Godines\_46, Hally898\_41, Hangman\_42, Hashim76\_48, Heath\_41, Hedgerow\_46, Holeinone\_46, Hosp\_037, Hydro\_42, Imvubu\_38,

Indlovu\_44, ItsyBitsy1\_46, JAMaL\_42, JaguarMi\_42, Jolie1\_039, Kaleb\_46, KarasumaRum\_47, KayaCho\_39, Kheth\_46, Knocker\_47, Kolhan\_46, Lambano\_41, Lars\_46, Laurie\_45, Lephleur\_46, Ligma\_40, LilMcDreamy\_43, LilSmirk\_46, LittleMunchkin\_42, LizLemon\_46, Lolalove\_43, Magpie\_41, Mariokart\_40, MasterPo\_46, Mithril\_42, Mudslide\_42, Nanao\_41, Nangang\_45, Nigel\_41, Opia\_46, Phantasmagoria\_46, Poster\_41, PrinceCharming\_46, Prince\_42, QueenPie\_41, RawrgerThat\_43, Rhinoforte\_46, Rich\_44, Rita130\_46, Rosebush\_45, Sabella\_45, Serendipitous\_45, Shatter\_40, Shenyu\_45, SirJeffery\_46, Sisko\_40, Sour\_45, Stinger\_41, StinkyVeggy\_47, Suigeneris\_46, TA17A\_47, Thonko\_45, Tinciduntolum\_47, Tres\_46, Vic9\_00045, VioletZ\_44, Waleliano\_42, West99\_46, Xincheng\_41, Yago84\_40, Zemanar\_43, Zenteno07\_50,

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

- Rinke\_46, TPA2\_53,

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

- Adjutor\_42, Aikoy\_55, BigMama\_40, Butterscotch\_41, CherryTomatoes\_54, Chill\_43, Delton\_42, Erk16\_41, Giuseppe\_42, Gumball\_40, Hawkeye\_45, Helpful\_43, KandZ\_42, Leopard\_54, Mopey\_42, Nova\_41, Onyinye\_55, PBI1\_41, PLOT\_42, Penelope2018\_42, Phalaborwa\_42, Prager\_42, Pupper\_52, RedWattleHog\_178, SCentae\_52, Sapo\_18, SirHarley\_41, Stormageddon\_179, Thoth\_42, Trine\_54, Troll4\_42, Visconti\_42, WaldoWhy\_43,

### Summary by start number:

Start 17:

- Found in 1 of 150 ( 0.7% ) of genes in pham
- No Manual Annotations of this start.
- Called 100.0% of time when present
- Phage (with cluster) where this start called: TPA2\_53 (singleton),

Start 24:

- Found in 4 of 150 ( 2.7% ) of genes in pham
- Manual Annotations of this start: 1 of 118
- Called 25.0% of time when present
- Phage (with cluster) where this start called: Rinke\_46 (B9),

Start 27:

- Found in 117 of 150 ( 78.0% ) of genes in pham
- Manual Annotations of this start: 85 of 118
- Called 98.3% of time when present
- Phage (with cluster) where this start called: 39HC\_039 (B6), 40BC\_039 (B6), Acadian\_46 (B5), Ahwei\_41 (B4), Allegro\_46 (B2), AnClar\_41 (DR), Antihero\_41 (B4), Apex\_43 (B4), Arbiter\_45 (B2), Ares\_46 (B2), Austelle\_43 (B4), Axumite\_40 (DR), Bae\_45 (B5), Bananafish\_46 (B2), BiggityBass\_40 (DR), BirdsNest\_48 (B13), Blocker23\_46 (B2), BobRoss2024\_39 (DR), BobbyK\_43 (B4), Boyle\_46 (B2), BrownCNA\_44 (B4), Brownie5\_46 (B2), CRB2\_48 (B9), Calamitous\_46 (B2), CharlottesWeb\_40 (DR), ChrisnMich\_42 (B4), Coffee\_46 (B2), Cooper\_43 (B4), DigitDog\_45 (B5), Donny\_46 (B5), Eaglehorse\_46 (B2), EastView9101\_44 (B5), Epah\_41 (B4), Fanaw\_41 (B4), Faze9\_45 (B2), ForDig\_40 (B6), Fortunato\_43 (B4), Frederick\_43 (B4), FrenchFry\_46 (B2), Fresco\_40 (DR), Funsized\_49 (B9), GinPorsche\_41 (B4), Glass\_46 (B2), Godines\_46 (B2), Hally898\_41 (B4), Hangman\_42 (B4), Hashim76\_48 (B13), Heath\_41 (B4), Hedgerow\_46 (B2),

Holeinone\_46 (B2), Hosp\_037 (B6), Hydro\_42 (B4), Imvubu\_38 (B10), Indlovu\_44 (B11), ItsyBitsy1\_46 (B2), JAMaL\_42 (B4), JaguarMi\_42 (B4), Jolie1\_039 (B6), Kaleb\_46 (B2), KarasumaRum\_47 (B5), KayaCho\_39 (B6), Kheth\_46 (B2), Knocker\_47 (B9), Kolhan\_46 (B2), Lambano\_41 (B4), Lars\_46 (B2), Laurie\_45 (B2), Lephleur\_46 (B2), Ligma\_40 (DR), LilMcDreamy\_43 (B12), LilSmirk\_46 (B2), LittleMunchkin\_42 (DR), LizLemon\_46 (B2), Lolalove\_43 (B4), Magpie\_41 (B4), Mariokart\_40 (DR), MasterPo\_46 (B2), Mithril\_42 (B4), Mudslide\_42 (B4), Nanao\_41 (B4), Nangang\_45 (B5), Nigel\_41 (B4), Opia\_46 (B2), Phantasmagoria\_46 (B2), Poster\_41 (B4), PrinceCharming\_46 (B2), Prince\_42 (B4), QueenPie\_41 (B4), RawrgerThat\_43 (B4), Rhinoforte\_46 (B2), Rich\_44 (B5), Rita130\_46 (B5), Rosebush\_45 (B2), Sabella\_45 (B2), Serendipitous\_45 (B5), Shatter\_40 (DR), Shenyu\_45 (B5), SirJeffery\_46 (B5), Sisko\_40 (DR), Sour\_45 (DR), Stinger\_41 (B4), StinkyVeggy\_47 (B5), Suigeneris\_46 (B5), TA17A\_47 (B2), Thonko\_45 (B8), Tinciduntolum\_47 (B2), Tres\_46 (B2), Vic9\_00045 (B2), VioletZ\_44 (B4), Waleliano\_42 (B4), West99\_46 (B2), Xincheng\_41 (B4), Yago84\_40 (DR), Zemanar\_43 (B4), Zenteno07\_50 (B13),

#### Start 29:

- Found in 3 of 150 ( 2.0% ) of genes in pham
- Manual Annotations of this start: 3 of 118
- Called 100.0% of time when present
- Phage (with cluster) where this start called: CherryTomatoes\_54 (DO), Pupper\_52 (DO), SCentae\_52 (DO),

#### Start 32:

- Found in 22 of 150 ( 14.7% ) of genes in pham
- Manual Annotations of this start: 21 of 118
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Adjutor\_42 (D1), BigMama\_40 (D1), Butterscotch\_41 (D1), Chill\_43 (D1), Delton\_42 (D1), Erk16\_41 (D1), Giuseppe\_42 (D1), Gumball\_40 (D1), Helpful\_43 (D1), KandZ\_42 (D1), Mopey\_42 (D1), Nova\_41 (D1), PBI1\_41 (D1), PLOT\_42 (D1), Penelope2018\_42 (D1), Phalaborwa\_42 (D1), Prager\_42 (D1), SirHarley\_41 (D1), Thoth\_42 (D1), Troll4\_42 (D1), Visconti\_42 (D1), WaldoWhy\_43 (D1),

#### Start 36:

- Found in 1 of 150 ( 0.7% ) of genes in pham
- Manual Annotations of this start: 1 of 118
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Hawkeye\_45 (D2),

#### Start 42:

- Found in 3 of 150 ( 2.0% ) of genes in pham
- Manual Annotations of this start: 3 of 118
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Aikoy\_55 (AE), Leopard\_54 (AE), Onyinye\_55 (AE),

#### Start 52:

- Found in 3 of 150 ( 2.0% ) of genes in pham
- Manual Annotations of this start: 2 of 118
- Called 66.7% of time when present

- Phage (with cluster) where this start called: RedWattleHog\_178 (DX), Stormageddon\_179 (DX),

Start 56:

- Found in 66 of 150 ( 44.0% ) of genes in pham
- Manual Annotations of this start: 1 of 118
- Called 1.5% of time when present
- Phage (with cluster) where this start called: Trine\_54 (CD),

Start 60:

- Found in 1 of 150 ( 0.7% ) of genes in pham
- Manual Annotations of this start: 1 of 118
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Sapo\_18 (DA),

### **Summary by clusters:**

There are 19 clusters represented in this pham: DO, singleton, AE, DX, B10, D2, DA, B4, B5, B6, B12, B13, B2, B11, CD, DR, B9, B8, D1,

Info for manual annotations of cluster AE:

- Start number 42 was manually annotated 3 times for cluster AE.

Info for manual annotations of cluster B10:

- Start number 27 was manually annotated 1 time for cluster B10.

Info for manual annotations of cluster B11:

- Start number 27 was manually annotated 1 time for cluster B11.

Info for manual annotations of cluster B12:

- Start number 27 was manually annotated 1 time for cluster B12.

Info for manual annotations of cluster B13:

- Start number 27 was manually annotated 3 times for cluster B13.

Info for manual annotations of cluster B2:

- Start number 27 was manually annotated 33 times for cluster B2.

Info for manual annotations of cluster B4:

- Start number 27 was manually annotated 23 times for cluster B4.

Info for manual annotations of cluster B5:

- Start number 27 was manually annotated 7 times for cluster B5.

Info for manual annotations of cluster B6:

- Start number 27 was manually annotated 1 time for cluster B6.

Info for manual annotations of cluster B8:

- Start number 27 was manually annotated 1 time for cluster B8.

Info for manual annotations of cluster B9:

- Start number 24 was manually annotated 1 time for cluster B9.
- Start number 27 was manually annotated 3 times for cluster B9.

Info for manual annotations of cluster CD:

- Start number 56 was manually annotated 1 time for cluster CD.

Info for manual annotations of cluster D1:

- Start number 32 was manually annotated 21 times for cluster D1.

Info for manual annotations of cluster D2:

- Start number 36 was manually annotated 1 time for cluster D2.

Info for manual annotations of cluster DA:

- Start number 60 was manually annotated 1 time for cluster DA.

Info for manual annotations of cluster DO:

- Start number 29 was manually annotated 3 times for cluster DO.

Info for manual annotations of cluster DR:

- Start number 27 was manually annotated 11 times for cluster DR.

Info for manual annotations of cluster DX:

- Start number 52 was manually annotated 2 times for cluster DX.

### **Gene Information:**

Gene: 39HC\_039 Start: 38257, Stop: 37487, Start Num: 27

Candidate Starts for 39HC\_039:

(Start: 27 @38257 has 85 MA's), (35, 38218), (Start: 56 @38110 has 1 MA's), (59, 38098), (67, 38074), (84, 37996), (125, 37810), (126, 37807), (129, 37786), (142, 37705), (145, 37690),

Gene: 40BC\_039 Start: 38257, Stop: 37487, Start Num: 27

Candidate Starts for 40BC\_039:

(Start: 27 @38257 has 85 MA's), (35, 38218), (Start: 56 @38110 has 1 MA's), (59, 38098), (67, 38074), (84, 37996), (125, 37810), (126, 37807), (129, 37786), (142, 37705), (145, 37690),

Gene: Acadian\_46 Start: 40902, Stop: 40117, Start Num: 27

Candidate Starts for Acadian\_46:

(Start: 27 @40902 has 85 MA's), (44, 40815), (58, 40740), (67, 40713), (88, 40614), (142, 40335), (145, 40320),

Gene: Adjutor\_42 Start: 35432, Stop: 34551, Start Num: 32

Candidate Starts for Adjutor\_42:

(Start: 32 @35432 has 21 MA's), (59, 35300), (69, 35264), (74, 35243), (80, 35222), (105, 35078), (113, 35036), (127, 34946), (141, 34874), (157, 34766), (158, 34751), (163, 34700),

Gene: Ahwei\_41 Start: 39395, Stop: 38667, Start Num: 27

Candidate Starts for Ahwei\_41:

(Start: 27 @39395 has 85 MA's), (Start: 56 @39254 has 1 MA's), (61, 39233), (67, 39218), (91, 39113), (124, 38993), (126, 38987), (142, 38885), (151, 38840),

Gene: Aikoy\_55 Start: 40551, Stop: 41255, Start Num: 42

Candidate Starts for Aikoy\_55:



(Start: 42 @40551 has 3 MA's), (50, 40599), (53, 40608), (54, 40611), (72, 40677), (85, 40734), (92, 40779), (128, 40938), (130, 40950), (131, 40956), (145, 41052), (149, 41073), (159, 41145), (160, 41166), (162, 41181), (165, 41205),

Gene: Allegro\_46 Start: 40703, Stop: 39927, Start Num: 27

Candidate Starts for Allegro\_46:

(Start: 27 @40703 has 85 MA's), (37, 40649), (44, 40604), (Start: 56 @40547 has 1 MA's), (58, 40538), (59, 40535), (61, 40526), (82, 40439), (86, 40424), (100, 40340), (126, 40247), (136, 40196), (142, 40145), (150, 40106),

Gene: AnClar\_41 Start: 36812, Stop: 36102, Start Num: 27

Candidate Starts for AnClar\_41:

(Start: 27 @36812 has 85 MA's), (73, 36614), (100, 36521), (126, 36416), (142, 36314), (145, 36299), (152, 36251),

Gene: Antihero\_41 Start: 39395, Stop: 38667, Start Num: 27

Candidate Starts for Antihero\_41:

(Start: 27 @39395 has 85 MA's), (Start: 56 @39254 has 1 MA's), (61, 39233), (67, 39218), (91, 39113), (124, 38993), (126, 38987), (142, 38885), (151, 38840),

Gene: Apex\_43 Start: 40637, Stop: 39879, Start Num: 27

Candidate Starts for Apex\_43:

(Start: 27 @40637 has 85 MA's), (39, 40568), (63, 40460), (71, 40430), (86, 40382), (88, 40370), (96, 40325), (120, 40214), (126, 40199), (142, 40097), (151, 40052), (153, 40031), (156, 40013), (167, 39905),

Gene: Arbiter\_45 Start: 40777, Stop: 40013, Start Num: 27

Candidate Starts for Arbiter\_45:

(Start: 27 @40777 has 85 MA's), (37, 40735), (44, 40690), (Start: 56 @40633 has 1 MA's), (58, 40624), (59, 40621), (61, 40612), (82, 40525), (86, 40510), (100, 40426), (126, 40333), (136, 40282), (142, 40231), (150, 40192),

Gene: Ares\_46 Start: 40761, Stop: 39997, Start Num: 27

Candidate Starts for Ares\_46:

(Start: 27 @40761 has 85 MA's), (44, 40674), (Start: 56 @40617 has 1 MA's), (58, 40608), (59, 40605), (61, 40596), (82, 40509), (86, 40494), (100, 40410), (126, 40317), (136, 40266), (142, 40215), (150, 40176),

Gene: Austelle\_43 Start: 41087, Stop: 40329, Start Num: 27

Candidate Starts for Austelle\_43:

(Start: 27 @41087 has 85 MA's), (39, 41018), (63, 40910), (71, 40880), (86, 40832), (88, 40820), (96, 40775), (120, 40664), (126, 40649), (142, 40547), (151, 40502), (156, 40463), (167, 40355),

Gene: Axumite\_40 Start: 34038, Stop: 33349, Start Num: 27

Candidate Starts for Axumite\_40:

(10, 34119), (22, 34071), (Start: 27 @34038 has 85 MA's), (Start: 56 @33888 has 1 MA's), (59, 33876), (61, 33867), (129, 33642), (142, 33561), (145, 33546), (152, 33498),

Gene: Bae\_45 Start: 40787, Stop: 40020, Start Num: 27

Candidate Starts for Bae\_45:

(Start: 27 @40787 has 85 MA's), (49, 40664), (58, 40625), (67, 40598), (88, 40499), (100, 40424), (109, 40391), (126, 40340), (142, 40238), (143, 40232), (145, 40223),

Gene: Bananafish\_46 Start: 40697, Stop: 39933, Start Num: 27

Candidate Starts for Bananafish\_46:

(Start: 27 @40697 has 85 MA's), (44, 40610), (Start: 56 @40553 has 1 MA's), (58, 40544), (59, 40541), (61, 40532), (82, 40445), (86, 40430), (100, 40346), (126, 40253), (136, 40202), (142, 40151), (150, 40112),

Gene: BigMama\_40 Start: 35508, Stop: 34627, Start Num: 32

Candidate Starts for BigMama\_40:

(Start: 32 @35508 has 21 MA's), (59, 35376), (69, 35340), (74, 35319), (80, 35298), (105, 35154), (113, 35112), (127, 35022), (141, 34950), (157, 34842), (158, 34827), (163, 34776),

Gene: BiggityBass\_40 Start: 36280, Stop: 35564, Start Num: 27

Candidate Starts for BiggityBass\_40:

(Start: 27 @36280 has 85 MA's), (44, 36193), (100, 35992), (106, 35971), (126, 35878), (142, 35776), (145, 35761), (152, 35713),

Gene: BirdsNest\_48 Start: 39192, Stop: 38389, Start Num: 27

Candidate Starts for BirdsNest\_48:

(1, 39444), (2, 39432), (12, 39270), (13, 39267), (15, 39252), (19, 39237), (23, 39231), (Start: 27 @39192 has 85 MA's), (43, 39087), (45, 39081), (59, 39009), (67, 38985), (73, 38961), (89, 38880), (126, 38709), (142, 38604), (150, 38565),

Gene: Blocker23\_46 Start: 40815, Stop: 40051, Start Num: 27

Candidate Starts for Blocker23\_46:

(Start: 27 @40815 has 85 MA's), (37, 40773), (44, 40728), (Start: 56 @40671 has 1 MA's), (58, 40662), (59, 40659), (61, 40650), (82, 40563), (86, 40548), (100, 40464), (126, 40371), (136, 40320), (142, 40269), (150, 40230),

Gene: BobRoss2024\_39 Start: 34120, Stop: 33434, Start Num: 27

Candidate Starts for BobRoss2024\_39:

(14, 34183), (Start: 27 @34120 has 85 MA's), (100, 33823), (103, 33811), (121, 33766), (126, 33748), (142, 33646), (145, 33631), (166, 33469),

Gene: BobbyK\_43 Start: 40432, Stop: 39698, Start Num: 27

Candidate Starts for BobbyK\_43:

(Start: 27 @40432 has 85 MA's), (63, 40258), (71, 40228), (86, 40180), (88, 40168), (124, 40024), (126, 40018), (142, 39916), (151, 39871), (156, 39832), (167, 39724),

Gene: Boyle\_46 Start: 40816, Stop: 40052, Start Num: 27

Candidate Starts for Boyle\_46:

(Start: 27 @40816 has 85 MA's), (44, 40729), (Start: 56 @40672 has 1 MA's), (58, 40663), (59, 40660), (61, 40651), (82, 40564), (86, 40549), (100, 40465), (126, 40372), (136, 40321), (142, 40270), (150, 40231),

Gene: BrownCNA\_44 Start: 40717, Stop: 39959, Start Num: 27

Candidate Starts for BrownCNA\_44:

(Start: 27 @40717 has 85 MA's), (39, 40648), (63, 40540), (71, 40510), (86, 40462), (88, 40450), (120, 40294), (126, 40279), (132, 40246), (142, 40177), (151, 40132), (156, 40093), (167, 39985),

Gene: Brownie5\_46 Start: 40828, Stop: 40058, Start Num: 27

Candidate Starts for Brownie5\_46:

(Start: 27 @40828 has 85 MA's), (44, 40735), (Start: 56 @40678 has 1 MA's), (58, 40669), (59, 40666), (61, 40657), (82, 40570), (86, 40555), (100, 40471), (126, 40378), (136, 40327), (142, 40276), (150,

40237),

Gene: Butterscotch\_41 Start: 35492, Stop: 34611, Start Num: 32

Candidate Starts for Butterscotch\_41:

(Start: 32 @35492 has 21 MA's), (59, 35360), (69, 35324), (74, 35303), (80, 35282), (105, 35138), (113, 35096), (127, 35006), (141, 34934), (157, 34826), (158, 34811), (163, 34760),

Gene: CRB2\_48 Start: 42937, Stop: 42212, Start Num: 27

Candidate Starts for CRB2\_48:

(Start: 27 @42937 has 85 MA's), (71, 42748), (76, 42736), (88, 42685), (93, 42652), (104, 42601), (138, 42466), (142, 42430), (145, 42415), (150, 42391), (156, 42346), (161, 42292),

Gene: Calamitous\_46 Start: 40702, Stop: 39938, Start Num: 27

Candidate Starts for Calamitous\_46:

(Start: 27 @40702 has 85 MA's), (37, 40660), (44, 40615), (Start: 56 @40558 has 1 MA's), (58, 40549), (59, 40546), (61, 40537), (82, 40450), (86, 40435), (100, 40351), (126, 40258), (136, 40207), (142, 40156), (150, 40117),

Gene: CharlottesWeb\_40 Start: 33924, Stop: 33235, Start Num: 27

Candidate Starts for CharlottesWeb\_40:

(Start: 27 @33924 has 85 MA's), (55, 33780), (61, 33753), (86, 33675), (126, 33549), (142, 33447), (145, 33432), (152, 33384),

Gene: CherryTomatoes\_54 Start: 17569, Stop: 18327, Start Num: 29

Candidate Starts for CherryTomatoes\_54:

(Start: 29 @17569 has 3 MA's), (108, 17890), (140, 18070), (147, 18118), (154, 18166),

Gene: Chill\_43 Start: 35498, Stop: 34617, Start Num: 32

Candidate Starts for Chill\_43:

(Start: 32 @35498 has 21 MA's), (59, 35366), (69, 35330), (80, 35288), (105, 35144), (113, 35102), (127, 35012), (157, 34832), (158, 34817), (163, 34766),

Gene: ChrisnMich\_42 Start: 39396, Stop: 38659, Start Num: 27

Candidate Starts for ChrisnMich\_42:

(16, 39450), (Start: 27 @39396 has 85 MA's), (47, 39282), (55, 39252), (59, 39234), (78, 39180), (86, 39141), (112, 39021), (124, 38985), (126, 38979), (132, 38946), (142, 38877), (151, 38832),

Gene: Coffee\_46 Start: 40805, Stop: 40041, Start Num: 27

Candidate Starts for Coffee\_46:

(Start: 27 @40805 has 85 MA's), (44, 40718), (Start: 56 @40661 has 1 MA's), (58, 40652), (59, 40649), (61, 40640), (82, 40553), (86, 40538), (100, 40454), (126, 40361), (136, 40310), (142, 40259), (150, 40220),

Gene: Cooper\_43 Start: 39615, Stop: 38878, Start Num: 27

Candidate Starts for Cooper\_43:

(16, 39669), (Start: 27 @39615 has 85 MA's), (47, 39501), (55, 39471), (59, 39453), (78, 39399), (86, 39360), (112, 39240), (124, 39204), (126, 39198), (132, 39165), (142, 39096), (151, 39051),

Gene: Delton\_42 Start: 35504, Stop: 34623, Start Num: 32

Candidate Starts for Delton\_42:

(Start: 32 @35504 has 21 MA's), (59, 35372), (69, 35336), (74, 35315), (80, 35294), (105, 35150), (113, 35108), (127, 35018), (157, 34838), (158, 34823), (162, 34775),

Gene: DigitDog\_45 Start: 40602, Stop: 39817, Start Num: 27

Candidate Starts for DigitDog\_45:

(3, 40782), (4, 40770), (5, 40764), (9, 40713), (Start: 27 @40602 has 85 MA's), (58, 40440), (67, 40413), (88, 40314), (100, 40239), (126, 40137), (142, 40035), (143, 40029), (145, 40020), (152, 39972),

Gene: Donny\_46 Start: 40907, Stop: 40122, Start Num: 27

Candidate Starts for Donny\_46:

(Start: 27 @40907 has 85 MA's), (44, 40820), (58, 40745), (67, 40718), (88, 40619), (142, 40340), (145, 40325),

Gene: Eaglehorse\_46 Start: 40729, Stop: 39965, Start Num: 27

Candidate Starts for Eaglehorse\_46:

(Start: 27 @40729 has 85 MA's), (44, 40642), (Start: 56 @40585 has 1 MA's), (58, 40576), (59, 40573), (61, 40564), (82, 40477), (86, 40462), (100, 40378), (126, 40285), (136, 40234), (142, 40183), (150, 40144),

Gene: EastView9101\_44 Start: 40557, Stop: 39772, Start Num: 27

Candidate Starts for EastView9101\_44:

(Start: 27 @40557 has 85 MA's), (44, 40470), (58, 40395), (67, 40368), (88, 40269), (142, 39990), (145, 39975),

Gene: Epah\_41 Start: 39395, Stop: 38667, Start Num: 27

Candidate Starts for Epah\_41:

(Start: 27 @39395 has 85 MA's), (Start: 56 @39254 has 1 MA's), (61, 39233), (67, 39218), (91, 39113), (124, 38993), (126, 38987), (142, 38885), (151, 38840),

Gene: Erk16\_41 Start: 35489, Stop: 34620, Start Num: 32

Candidate Starts for Erk16\_41:

(Start: 32 @35489 has 21 MA's), (59, 35357), (69, 35321), (80, 35279), (105, 35135), (113, 35093), (127, 35003), (157, 34823), (158, 34808), (162, 34760),

Gene: Fanaw\_41 Start: 40092, Stop: 39364, Start Num: 27

Candidate Starts for Fanaw\_41:

(Start: 27 @40092 has 85 MA's), (63, 39924), (71, 39894), (86, 39846), (88, 39834), (124, 39690), (126, 39684), (142, 39582), (151, 39537), (156, 39498), (167, 39390),

Gene: Faze9\_45 Start: 40825, Stop: 40061, Start Num: 27

Candidate Starts for Faze9\_45:

(Start: 27 @40825 has 85 MA's), (37, 40783), (44, 40738), (Start: 56 @40681 has 1 MA's), (58, 40672), (59, 40669), (61, 40660), (82, 40573), (86, 40558), (100, 40474), (126, 40381), (136, 40330), (142, 40279), (150, 40240),

Gene: ForDig\_40 Start: 38242, Stop: 37472, Start Num: 27

Candidate Starts for ForDig\_40:

(Start: 27 @38242 has 85 MA's), (35, 38203), (59, 38083), (67, 38059), (84, 37981), (125, 37795), (126, 37792), (129, 37771), (142, 37690), (145, 37675),

Gene: Fortunato\_43 Start: 40450, Stop: 39692, Start Num: 27

Candidate Starts for Fortunato\_43:

(Start: 27 @40450 has 85 MA's), (39, 40381), (63, 40273), (71, 40243), (86, 40195), (88, 40183), (96, 40138), (120, 40027), (126, 40012), (142, 39910), (151, 39865), (156, 39826), (167, 39718),

Gene: Frederick\_43 Start: 40432, Stop: 39698, Start Num: 27

Candidate Starts for Frederick\_43:

(Start: 27 @40432 has 85 MA's), (63, 40258), (71, 40228), (86, 40180), (88, 40168), (124, 40024), (126, 40018), (142, 39916), (151, 39871), (156, 39832), (167, 39724),

Gene: FrenchFry\_46 Start: 40819, Stop: 40055, Start Num: 27

Candidate Starts for FrenchFry\_46:

(Start: 27 @40819 has 85 MA's), (44, 40732), (Start: 56 @40675 has 1 MA's), (58, 40666), (59, 40663), (61, 40654), (82, 40567), (86, 40552), (100, 40468), (126, 40375), (136, 40324), (142, 40273), (150, 40234),

Gene: Fresco\_40 Start: 34038, Stop: 33349, Start Num: 27

Candidate Starts for Fresco\_40:

(10, 34119), (22, 34071), (Start: 27 @34038 has 85 MA's), (Start: 56 @33888 has 1 MA's), (59, 33876), (61, 33867), (129, 33642), (142, 33561), (145, 33546), (152, 33498),

Gene: Funsized\_49 Start: 43198, Stop: 42434, Start Num: 27

Candidate Starts for Funsized\_49:

(Start: 27 @43198 has 85 MA's), (Start: 56 @43051 has 1 MA's), (63, 43024), (67, 43015), (80, 42967), (88, 42916), (106, 42823), (125, 42757), (126, 42754), (134, 42712), (142, 42652), (146, 42634),

Gene: GinPorsche\_41 Start: 39395, Stop: 38667, Start Num: 27

Candidate Starts for GinPorsche\_41:

(Start: 27 @39395 has 85 MA's), (Start: 56 @39254 has 1 MA's), (61, 39233), (67, 39218), (91, 39113), (124, 38993), (126, 38987), (142, 38885), (151, 38840),

Gene: Giuseppe\_42 Start: 35481, Stop: 34612, Start Num: 32

Candidate Starts for Giuseppe\_42:

(Start: 32 @35481 has 21 MA's), (59, 35349), (69, 35313), (74, 35292), (80, 35271), (105, 35127), (113, 35085), (127, 34995), (157, 34815), (158, 34800), (162, 34752),

Gene: Glass\_46 Start: 40819, Stop: 40055, Start Num: 27

Candidate Starts for Glass\_46:

(Start: 27 @40819 has 85 MA's), (44, 40732), (Start: 56 @40675 has 1 MA's), (58, 40666), (59, 40663), (61, 40654), (82, 40567), (86, 40552), (100, 40468), (126, 40375), (136, 40324), (142, 40273), (150, 40234),

Gene: Godines\_46 Start: 40761, Stop: 39997, Start Num: 27

Candidate Starts for Godines\_46:

(Start: 27 @40761 has 85 MA's), (37, 40719), (44, 40674), (Start: 56 @40617 has 1 MA's), (58, 40608), (59, 40605), (61, 40596), (82, 40509), (86, 40494), (100, 40410), (126, 40317), (136, 40266), (142, 40215), (150, 40176),

Gene: Gumball\_40 Start: 35445, Stop: 34561, Start Num: 32

Candidate Starts for Gumball\_40:

(Start: 32 @35445 has 21 MA's), (51, 35340), (59, 35313), (69, 35277), (74, 35256), (80, 35235), (105, 35091), (113, 35049), (127, 34959), (141, 34887), (157, 34776), (158, 34761), (163, 34710),

Gene: Hally898\_41 Start: 39407, Stop: 38679, Start Num: 27

Candidate Starts for Hally898\_41:

(Start: 27 @39407 has 85 MA's), (Start: 56 @39266 has 1 MA's), (61, 39245), (67, 39230), (91, 39125), (124, 39005), (126, 38999), (142, 38897), (151, 38852),

Gene: Hangman\_42 Start: 40448, Stop: 39690, Start Num: 27

Candidate Starts for Hangman\_42:

(Start: 27 @40448 has 85 MA's), (39, 40379), (63, 40271), (71, 40241), (86, 40193), (88, 40181), (120, 40025), (126, 40010), (132, 39977), (142, 39908), (151, 39863), (156, 39824), (167, 39716),

Gene: Hashim76\_48 Start: 39661, Stop: 38867, Start Num: 27

Candidate Starts for Hashim76\_48:

(Start: 24 @39691 has 1 MA's), (Start: 27 @39661 has 85 MA's), (34, 39613), (45, 39553), (Start: 56 @39490 has 1 MA's), (67, 39454), (73, 39430), (106, 39244), (126, 39187), (142, 39082), (150, 39043), (152, 39019),

Gene: Hawkeye\_45 Start: 35438, Stop: 34584, Start Num: 36

Candidate Starts for Hawkeye\_45:

(Start: 36 @35438 has 1 MA's), (59, 35315), (63, 35300), (73, 35264), (75, 35258), (80, 35240), (105, 35096), (110, 35066), (116, 35045), (127, 34976), (133, 34946), (135, 34934), (138, 34916), (144, 34865),

Gene: Heath\_41 Start: 40055, Stop: 39297, Start Num: 27

Candidate Starts for Heath\_41:

(Start: 27 @40055 has 85 MA's), (39, 39986), (63, 39878), (71, 39848), (86, 39800), (88, 39788), (96, 39743), (120, 39632), (126, 39617), (132, 39584), (142, 39515), (151, 39470), (156, 39431), (167, 39323),

Gene: Hedgerow\_46 Start: 40801, Stop: 40037, Start Num: 27

Candidate Starts for Hedgerow\_46:

(Start: 27 @40801 has 85 MA's), (44, 40714), (Start: 56 @40657 has 1 MA's), (58, 40648), (59, 40645), (61, 40636), (82, 40549), (86, 40534), (100, 40450), (126, 40357), (136, 40306), (142, 40255), (150, 40216),

Gene: Helpful\_43 Start: 35480, Stop: 34611, Start Num: 32

Candidate Starts for Helpful\_43:

(Start: 32 @35480 has 21 MA's), (59, 35348), (69, 35312), (74, 35291), (80, 35270), (105, 35126), (113, 35084), (127, 34994), (157, 34814), (158, 34799), (162, 34751),

Gene: Holeinone\_46 Start: 40681, Stop: 39917, Start Num: 27

Candidate Starts for Holeinone\_46:

(Start: 27 @40681 has 85 MA's), (37, 40639), (44, 40594), (Start: 56 @40537 has 1 MA's), (58, 40528), (59, 40525), (61, 40516), (82, 40429), (86, 40414), (100, 40330), (126, 40237), (136, 40186), (142, 40135), (150, 40096),

Gene: Hosp\_037 Start: 36449, Stop: 35679, Start Num: 27

Candidate Starts for Hosp\_037:

(Start: 27 @36449 has 85 MA's), (35, 36410), (Start: 56 @36302 has 1 MA's), (59, 36290), (67, 36266), (84, 36188), (125, 36002), (126, 35999), (129, 35978), (142, 35897), (145, 35882),

Gene: Hydro\_42 Start: 40465, Stop: 39707, Start Num: 27

Candidate Starts for Hydro\_42:

(Start: 27 @40465 has 85 MA's), (39, 40396), (63, 40288), (71, 40258), (86, 40210), (88, 40198), (120, 40042), (126, 40027), (132, 39994), (142, 39925), (151, 39880), (156, 39841), (167, 39733),

Gene: Imvubu\_38 Start: 37209, Stop: 36445, Start Num: 27

Candidate Starts for Imvubu\_38:

(Start: 27 @37209 has 85 MA's), (41, 37146), (46, 37113), (51, 37077), (Start: 56 @37062 has 1 MA's), (67, 37026), (80, 36978), (88, 36927), (138, 36699), (142, 36663), (145, 36648), (146, 36645), (150, 36624),

Gene: Indlovu\_44 Start: 39795, Stop: 38992, Start Num: 27

Candidate Starts for Indlovu\_44:

(Start: 27 @39795 has 85 MA's), (73, 39591), (87, 39525), (94, 39477), (100, 39441), (119, 39354), (125, 39315), (126, 39312), (142, 39210), (143, 39204), (145, 39195), (150, 39171), (153, 39144), (161, 39072), (167, 39018),

Gene: ItsyBitsy1\_46 Start: 40683, Stop: 39919, Start Num: 27

Candidate Starts for ItsyBitsy1\_46:

(Start: 27 @40683 has 85 MA's), (44, 40596), (Start: 56 @40539 has 1 MA's), (58, 40530), (59, 40527), (61, 40518), (82, 40431), (86, 40416), (100, 40332), (126, 40239), (136, 40188), (142, 40137), (150, 40098),

Gene: JAMaL\_42 Start: 40606, Stop: 39878, Start Num: 27

Candidate Starts for JAMaL\_42:

(16, 40660), (Start: 27 @40606 has 85 MA's), (Start: 56 @40465 has 1 MA's), (61, 40444), (67, 40429), (91, 40324), (124, 40204), (126, 40198), (142, 40096), (151, 40051), (153, 40030), (156, 40012), (167, 39904),

Gene: JaguarMi\_42 Start: 39908, Stop: 39174, Start Num: 27

Candidate Starts for JaguarMi\_42:

(Start: 27 @39908 has 85 MA's), (63, 39734), (71, 39704), (86, 39656), (88, 39644), (106, 39554), (124, 39500), (126, 39494), (142, 39392), (151, 39347), (156, 39308),

Gene: Jolie1\_039 Start: 38233, Stop: 37463, Start Num: 27

Candidate Starts for Jolie1\_039:

(Start: 27 @38233 has 85 MA's), (35, 38194), (Start: 56 @38086 has 1 MA's), (59, 38074), (67, 38050), (84, 37972), (118, 37813), (125, 37786), (126, 37783), (129, 37762), (142, 37681), (145, 37666),

Gene: Kaleb\_46 Start: 40816, Stop: 40052, Start Num: 27

Candidate Starts for Kaleb\_46:

(Start: 27 @40816 has 85 MA's), (37, 40774), (44, 40729), (Start: 56 @40672 has 1 MA's), (58, 40663), (59, 40660), (61, 40651), (82, 40564), (86, 40549), (100, 40465), (126, 40372), (136, 40321), (142, 40270), (150, 40231),

Gene: KandZ\_42 Start: 35592, Stop: 34711, Start Num: 32

Candidate Starts for KandZ\_42:

(Start: 32 @35592 has 21 MA's), (59, 35460), (69, 35424), (74, 35403), (80, 35382), (105, 35238), (113, 35196), (127, 35106), (141, 35034), (157, 34926), (158, 34911), (163, 34860),

Gene: KarasumaRum\_47 Start: 41044, Stop: 40259, Start Num: 27

Candidate Starts for KarasumaRum\_47:

(6, 41194), (8, 41158), (11, 41128), (18, 41089), (Start: 27 @41044 has 85 MA's), (58, 40882), (67, 40855), (88, 40756), (100, 40681), (126, 40579), (142, 40477), (143, 40471), (145, 40462), (152, 40414),

Gene: KayaCho\_39 Start: 38235, Stop: 37462, Start Num: 27

Candidate Starts for KayaCho\_39:

(Start: 27 @38235 has 85 MA's), (Start: 56 @38085 has 1 MA's), (67, 38049), (84, 37971), (118, 37812), (125, 37785), (126, 37782), (129, 37761), (142, 37680), (145, 37665), (148, 37647),

Gene: Kheth\_46 Start: 40734, Stop: 39940, Start Num: 27

Candidate Starts for Kheth\_46:

(Start: 27 @40734 has 85 MA's), (37, 40662), (44, 40617), (Start: 56 @40560 has 1 MA's), (58, 40551), (59, 40548), (61, 40539), (82, 40452), (86, 40437), (100, 40353), (126, 40260), (136, 40209), (142, 40158), (150, 40119),

Gene: Knocker\_47 Start: 42121, Stop: 41354, Start Num: 27

Candidate Starts for Knocker\_47:

(Start: 27 @42121 has 85 MA's), (51, 41983), (55, 41974), (Start: 56 @41968 has 1 MA's), (63, 41941), (67, 41932), (73, 41908), (118, 41704), (125, 41677), (126, 41674), (129, 41653), (138, 41608), (142, 41572), (150, 41533), (163, 41419), (167, 41380),

Gene: Kolhan\_46 Start: 40689, Stop: 39931, Start Num: 27

Candidate Starts for Kolhan\_46:

(Start: 27 @40689 has 85 MA's), (44, 40608), (Start: 56 @40551 has 1 MA's), (58, 40542), (59, 40539), (61, 40530), (82, 40443), (86, 40428), (100, 40344), (126, 40251), (136, 40200), (142, 40149), (150, 40110),

Gene: Lambano\_41 Start: 39407, Stop: 38679, Start Num: 27

Candidate Starts for Lambano\_41:

(Start: 27 @39407 has 85 MA's), (Start: 56 @39266 has 1 MA's), (61, 39245), (67, 39230), (91, 39125), (124, 39005), (126, 38999), (142, 38897), (151, 38852),

Gene: Lars\_46 Start: 40806, Stop: 40042, Start Num: 27

Candidate Starts for Lars\_46:

(Start: 27 @40806 has 85 MA's), (37, 40764), (44, 40719), (Start: 56 @40662 has 1 MA's), (58, 40653), (59, 40650), (61, 40641), (82, 40554), (86, 40539), (100, 40455), (126, 40362), (136, 40311), (142, 40260), (150, 40221),

Gene: Laurie\_45 Start: 40205, Stop: 39441, Start Num: 27

Candidate Starts for Laurie\_45:

(Start: 27 @40205 has 85 MA's), (44, 40118), (Start: 56 @40061 has 1 MA's), (58, 40052), (59, 40049), (61, 40040), (82, 39953), (86, 39938), (100, 39854), (136, 39710), (142, 39659), (150, 39620),

Gene: Leopard\_54 Start: 40836, Stop: 41540, Start Num: 42

Candidate Starts for Leopard\_54:

(Start: 42 @40836 has 3 MA's), (50, 40884), (53, 40893), (54, 40896), (72, 40962), (85, 41019), (92, 41064), (128, 41223), (130, 41235), (131, 41241), (145, 41337), (149, 41358), (159, 41430), (162, 41466), (165, 41490),

Gene: Lephleur\_46 Start: 40699, Stop: 39935, Start Num: 27

Candidate Starts for Lephleur\_46:

(Start: 27 @40699 has 85 MA's), (44, 40612), (Start: 56 @40555 has 1 MA's), (58, 40546), (59, 40543), (61, 40534), (82, 40447), (86, 40432), (100, 40348), (126, 40255), (136, 40204), (142, 40153), (150, 40114),

Gene: Ligma\_40 Start: 34038, Stop: 33349, Start Num: 27

Candidate Starts for Ligma\_40:

(10, 34119), (22, 34071), (Start: 27 @34038 has 85 MA's), (Start: 56 @33888 has 1 MA's), (59, 33876), (61, 33867), (129, 33642), (142, 33561), (145, 33546), (152, 33498),

Gene: LilMcDreamy\_43 Start: 40014, Stop: 39223, Start Num: 27



Candidate Starts for LilMcDreamy\_43:

(Start: 27 @40014 has 85 MA's), (51, 39864), (79, 39765), (87, 39720), (90, 39696), (92, 39675), (102, 39627), (126, 39543), (145, 39426), (152, 39378),

Gene: LilSmirk\_46 Start: 40693, Stop: 39929, Start Num: 27

Candidate Starts for LilSmirk\_46:

(Start: 27 @40693 has 85 MA's), (44, 40606), (Start: 56 @40549 has 1 MA's), (58, 40540), (59, 40537), (61, 40528), (82, 40441), (86, 40426), (100, 40342), (126, 40249), (136, 40198), (142, 40147), (150, 40108),

Gene: LittleMunchkin\_42 Start: 37302, Stop: 36634, Start Num: 27

Candidate Starts for LittleMunchkin\_42:

(20, 37341), (Start: 27 @37302 has 85 MA's), (48, 37188), (87, 37071), (100, 37023), (126, 36948), (134, 36906), (142, 36846), (145, 36831), (152, 36783),

Gene: LizLemon\_46 Start: 40815, Stop: 40051, Start Num: 27

Candidate Starts for LizLemon\_46:

(Start: 27 @40815 has 85 MA's), (44, 40728), (Start: 56 @40671 has 1 MA's), (58, 40662), (59, 40659), (61, 40650), (82, 40563), (86, 40548), (100, 40464), (126, 40371), (136, 40320), (142, 40269), (150, 40230),

Gene: Lolalove\_43 Start: 40432, Stop: 39704, Start Num: 27

Candidate Starts for Lolalove\_43:

(Start: 27 @40432 has 85 MA's), (63, 40264), (71, 40234), (73, 40231), (86, 40186), (88, 40174), (124, 40030), (126, 40024), (142, 39922), (151, 39877), (156, 39838), (167, 39730),

Gene: Magpie\_41 Start: 40274, Stop: 39540, Start Num: 27

Candidate Starts for Magpie\_41:

(Start: 27 @40274 has 85 MA's), (63, 40100), (71, 40070), (86, 40022), (88, 40010), (124, 39866), (126, 39860), (142, 39758), (151, 39713), (156, 39674),

Gene: Mariokart\_40 Start: 33941, Stop: 33252, Start Num: 27

Candidate Starts for Mariokart\_40:

(Start: 27 @33941 has 85 MA's), (55, 33797), (61, 33770), (86, 33692), (126, 33566), (142, 33464), (145, 33449), (152, 33401), (166, 33287),

Gene: MasterPo\_46 Start: 40702, Stop: 39938, Start Num: 27

Candidate Starts for MasterPo\_46:

(Start: 27 @40702 has 85 MA's), (37, 40660), (44, 40615), (Start: 56 @40558 has 1 MA's), (58, 40549), (59, 40546), (61, 40537), (82, 40450), (86, 40435), (100, 40351), (126, 40258), (136, 40207), (142, 40156), (150, 40117),

Gene: Mithril\_42 Start: 40442, Stop: 39708, Start Num: 27

Candidate Starts for Mithril\_42:

(Start: 27 @40442 has 85 MA's), (63, 40268), (71, 40238), (86, 40190), (88, 40178), (124, 40034), (126, 40028), (142, 39926), (151, 39881), (156, 39842), (167, 39734),

Gene: Mopey\_42 Start: 35492, Stop: 34611, Start Num: 32

Candidate Starts for Mopey\_42:

(Start: 32 @35492 has 21 MA's), (59, 35360), (69, 35324), (74, 35303), (80, 35282), (105, 35138), (113, 35096), (127, 35006), (141, 34934), (157, 34826), (158, 34811), (162, 34763),

Gene: Mudslide\_42 Start: 40698, Stop: 39940, Start Num: 27

Candidate Starts for Mudslide\_42:

(Start: 27 @40698 has 85 MA's), (39, 40629), (63, 40521), (71, 40491), (86, 40443), (88, 40431), (96, 40386), (120, 40275), (126, 40260), (142, 40158), (151, 40113), (156, 40074), (167, 39966),

Gene: Nanao\_41 Start: 39394, Stop: 38666, Start Num: 27

Candidate Starts for Nanao\_41:

(Start: 27 @39394 has 85 MA's), (Start: 56 @39253 has 1 MA's), (61, 39232), (67, 39217), (91, 39112), (124, 38992), (126, 38986), (142, 38884), (151, 38839),

Gene: Nangang\_45 Start: 40967, Stop: 40182, Start Num: 27

Candidate Starts for Nangang\_45:

(3, 41147), (4, 41135), (5, 41129), (9, 41078), (Start: 27 @40967 has 85 MA's), (58, 40805), (67, 40778), (88, 40679), (100, 40604), (126, 40502), (142, 40400), (143, 40394), (145, 40385), (152, 40337),

Gene: Nigel\_41 Start: 39313, Stop: 38579, Start Num: 27

Candidate Starts for Nigel\_41:

(Start: 27 @39313 has 85 MA's), (49, 39193), (Start: 56 @39166 has 1 MA's), (61, 39145), (62, 39142), (67, 39130), (73, 39106), (91, 39025), (124, 38905), (132, 38866), (142, 38797), (151, 38752),

Gene: Nova\_41 Start: 35918, Stop: 35037, Start Num: 32

Candidate Starts for Nova\_41:

(Start: 32 @35918 has 21 MA's), (59, 35786), (69, 35750), (74, 35729), (80, 35708), (105, 35564), (113, 35522), (127, 35432), (141, 35360), (157, 35252), (158, 35237), (163, 35186),

Gene: Onyinye\_55 Start: 40718, Stop: 41422, Start Num: 42

Candidate Starts for Onyinye\_55:

(Start: 42 @40718 has 3 MA's), (50, 40766), (53, 40775), (54, 40778), (72, 40844), (85, 40901), (92, 40946), (128, 41105), (130, 41117), (131, 41123), (145, 41219), (149, 41240), (159, 41312), (160, 41333), (162, 41348), (165, 41372),

Gene: Opia\_46 Start: 40688, Stop: 39924, Start Num: 27

Candidate Starts for Opia\_46:

(Start: 27 @40688 has 85 MA's), (44, 40601), (Start: 56 @40544 has 1 MA's), (58, 40535), (59, 40532), (61, 40523), (82, 40436), (86, 40421), (100, 40337), (126, 40244), (136, 40193), (142, 40142), (150, 40103),

Gene: PBI1\_41 Start: 35423, Stop: 34542, Start Num: 32

Candidate Starts for PBI1\_41:

(Start: 32 @35423 has 21 MA's), (59, 35291), (69, 35255), (74, 35234), (80, 35213), (105, 35069), (113, 35027), (127, 34937), (141, 34865), (157, 34757), (158, 34742), (163, 34691),

Gene: PLOT\_42 Start: 35483, Stop: 34614, Start Num: 32

Candidate Starts for PLOT\_42:

(Start: 32 @35483 has 21 MA's), (59, 35351), (69, 35315), (80, 35273), (105, 35129), (113, 35087), (127, 34997), (157, 34817), (158, 34802), (162, 34754),

Gene: Penelope2018\_42 Start: 35492, Stop: 34611, Start Num: 32

Candidate Starts for Penelope2018\_42:

(Start: 32 @35492 has 21 MA's), (59, 35360), (69, 35324), (74, 35303), (80, 35282), (105, 35138), (113, 35096), (127, 35006), (141, 34934), (157, 34826), (158, 34811), (163, 34760),

Gene: Phalaborwa\_42 Start: 35515, Stop: 34637, Start Num: 32

Candidate Starts for Phalaborwa\_42:

(Start: 32 @35515 has 21 MA's), (59, 35383), (66, 35359), (70, 35344), (80, 35305), (90, 35239), (100, 35182), (113, 35119), (127, 35032), (156, 34858), (157, 34852), (158, 34837), (164, 34768),

Gene: Phantasmagoria\_46 Start: 40700, Stop: 39936, Start Num: 27

Candidate Starts for Phantasmagoria\_46:

(Start: 27 @40700 has 85 MA's), (37, 40658), (44, 40613), (Start: 56 @40556 has 1 MA's), (58, 40547), (59, 40544), (61, 40535), (82, 40448), (86, 40433), (100, 40349), (126, 40256), (136, 40205), (142, 40154), (150, 40115),

Gene: Poster\_41 Start: 39395, Stop: 38667, Start Num: 27

Candidate Starts for Poster\_41:

(Start: 27 @39395 has 85 MA's), (Start: 56 @39254 has 1 MA's), (61, 39233), (67, 39218), (91, 39113), (124, 38993), (126, 38987), (142, 38885), (151, 38840),

Gene: Prager\_42 Start: 35504, Stop: 34623, Start Num: 32

Candidate Starts for Prager\_42:

(Start: 32 @35504 has 21 MA's), (59, 35372), (69, 35336), (74, 35315), (80, 35294), (105, 35150), (113, 35108), (127, 35018), (141, 34946), (157, 34838), (158, 34823), (163, 34772),

Gene: Prince\_42 Start: 40608, Stop: 39850, Start Num: 27

Candidate Starts for Prince\_42:

(Start: 27 @40608 has 85 MA's), (39, 40539), (63, 40431), (71, 40401), (86, 40353), (88, 40341), (96, 40296), (120, 40185), (126, 40170), (142, 40068), (151, 40023), (153, 40002), (156, 39984), (167, 39876),

Gene: PrinceCharming\_46 Start: 40808, Stop: 40044, Start Num: 27

Candidate Starts for PrinceCharming\_46:

(Start: 27 @40808 has 85 MA's), (37, 40766), (44, 40721), (Start: 56 @40664 has 1 MA's), (58, 40655), (59, 40652), (61, 40643), (81, 40562), (82, 40556), (86, 40541), (100, 40457), (126, 40364), (136, 40313), (142, 40262), (150, 40223),

Gene: Pupper\_52 Start: 17408, Stop: 18166, Start Num: 29

Candidate Starts for Pupper\_52:

(Start: 29 @17408 has 3 MA's), (108, 17729), (140, 17909), (147, 17957), (154, 18005),

Gene: QueenPie\_41 Start: 40519, Stop: 39791, Start Num: 27

Candidate Starts for QueenPie\_41:

(Start: 27 @40519 has 85 MA's), (Start: 56 @40378 has 1 MA's), (61, 40357), (67, 40342), (91, 40237), (106, 40171), (124, 40117), (126, 40111), (142, 40009), (151, 39964), (156, 39925),

Gene: RawrgerThat\_43 Start: 40453, Stop: 39695, Start Num: 27

Candidate Starts for RawrgerThat\_43:

(Start: 27 @40453 has 85 MA's), (39, 40384), (63, 40276), (71, 40246), (86, 40198), (88, 40186), (96, 40141), (120, 40030), (126, 40015), (142, 39913), (151, 39868), (156, 39829), (167, 39721),

Gene: RedWattleHog\_178 Start: 112519, Stop: 113199, Start Num: 52

Candidate Starts for RedWattleHog\_178:

(Start: 52 @112519 has 2 MA's), (83, 112642), (99, 112747), (115, 112819), (137, 112945), (152, 113047),

Gene: Rhinoforte\_46 Start: 40821, Stop: 40045, Start Num: 27

Candidate Starts for Rhinoforte\_46:

(Start: 27 @40821 has 85 MA's), (37, 40767), (44, 40722), (Start: 56 @40665 has 1 MA's), (58, 40656), (59, 40653), (61, 40644), (82, 40557), (86, 40542), (100, 40458), (126, 40365), (136, 40314), (142, 40263), (150, 40224),

Gene: Rich\_44 Start: 40775, Stop: 39990, Start Num: 27

Candidate Starts for Rich\_44:

(Start: 27 @40775 has 85 MA's), (49, 40652), (58, 40613), (67, 40586), (88, 40487), (100, 40412), (114, 40361), (126, 40310), (142, 40208), (143, 40202), (145, 40193),

Gene: Rinkes\_46 Start: 41695, Stop: 40898, Start Num: 24

Candidate Starts for Rinkes\_46:

(Start: 24 @41695 has 1 MA's), (25, 41677), (Start: 27 @41665 has 85 MA's), (Start: 56 @41509 has 1 MA's), (67, 41473), (88, 41374), (138, 41152), (142, 41116), (146, 41098), (150, 41077), (161, 40978),

Gene: Rita130\_46 Start: 40905, Stop: 40120, Start Num: 27

Candidate Starts for Rita130\_46:

(Start: 27 @40905 has 85 MA's), (44, 40818), (58, 40743), (67, 40716), (88, 40617), (142, 40338), (145, 40323),

Gene: Rosebush\_45 Start: 40816, Stop: 40052, Start Num: 27

Candidate Starts for Rosebush\_45:

(Start: 27 @40816 has 85 MA's), (44, 40729), (Start: 56 @40672 has 1 MA's), (58, 40663), (59, 40660), (61, 40651), (82, 40564), (86, 40549), (100, 40465), (126, 40372), (136, 40321), (142, 40270), (150, 40231),

Gene: SCentae\_52 Start: 17425, Stop: 18183, Start Num: 29

Candidate Starts for SCentae\_52:

(Start: 29 @17425 has 3 MA's), (77, 17620), (108, 17746), (140, 17926), (147, 17974), (154, 18022),

Gene: Sabella\_45 Start: 40693, Stop: 39929, Start Num: 27

Candidate Starts for Sabella\_45:

(Start: 27 @40693 has 85 MA's), (44, 40606), (Start: 56 @40549 has 1 MA's), (58, 40540), (59, 40537), (61, 40528), (82, 40441), (86, 40426), (100, 40342), (126, 40249), (136, 40198), (142, 40147), (150, 40108),

Gene: Sapo\_18 Start: 17320, Stop: 16661, Start Num: 60

Candidate Starts for Sapo\_18:

(31, 17491), (38, 17446), (40, 17428), (Start: 56 @17338 has 1 MA's), (Start: 60 @17320 has 1 MA's), (64, 17308), (73, 17275), (101, 17101), (143, 16867), (155, 16798), (156, 16789),

Gene: Serendipitous\_45 Start: 40717, Stop: 39950, Start Num: 27

Candidate Starts for Serendipitous\_45:

(4, 40885), (5, 40879), (7, 40834), (9, 40828), (Start: 27 @40717 has 85 MA's), (58, 40555), (67, 40528), (88, 40429), (100, 40354), (111, 40315), (142, 40168), (143, 40162), (145, 40153), (152, 40105),

Gene: Shatter\_40 Start: 34038, Stop: 33349, Start Num: 27

Candidate Starts for Shatter\_40:

(10, 34119), (22, 34071), (Start: 27 @34038 has 85 MA's), (Start: 56 @33888 has 1 MA's), (59, 33876), (61, 33867), (129, 33642), (142, 33561), (145, 33546), (152, 33498),

Gene: Shenyu\_45 Start: 40967, Stop: 40182, Start Num: 27

Candidate Starts for Shenyu\_45:

(3, 41147), (4, 41135), (5, 41129), (9, 41078), (Start: 27 @40967 has 85 MA's), (58, 40805), (67, 40778), (88, 40679), (100, 40604), (126, 40502), (142, 40400), (143, 40394), (145, 40385), (152, 40337),

Gene: SirHarley\_41 Start: 35427, Stop: 34543, Start Num: 32

Candidate Starts for SirHarley\_41:

(Start: 32 @35427 has 21 MA's), (51, 35322), (59, 35295), (69, 35259), (74, 35238), (80, 35217), (105, 35073), (113, 35031), (127, 34941), (141, 34869), (157, 34758), (158, 34743), (163, 34692),

Gene: SirJeffery\_46 Start: 40904, Stop: 40119, Start Num: 27

Candidate Starts for SirJeffery\_46:

(Start: 27 @40904 has 85 MA's), (44, 40817), (58, 40742), (67, 40715), (88, 40616), (142, 40337), (145, 40322),

Gene: Sisko\_40 Start: 34816, Stop: 34106, Start Num: 27

Candidate Starts for Sisko\_40:

(Start: 27 @34816 has 85 MA's), (73, 34618), (100, 34525), (126, 34420), (142, 34318), (145, 34303), (152, 34255),

Gene: Sour\_45 Start: 38694, Stop: 38008, Start Num: 27

Candidate Starts for Sour\_45:

(22, 38730), (Start: 27 @38694 has 85 MA's), (73, 38487), (100, 38394), (126, 38322), (145, 38205), (166, 38043),

Gene: Stinger\_41 Start: 39003, Stop: 38269, Start Num: 27

Candidate Starts for Stinger\_41:

(Start: 27 @39003 has 85 MA's), (49, 38883), (Start: 56 @38856 has 1 MA's), (61, 38835), (67, 38820), (71, 38799), (73, 38796), (124, 38595), (126, 38589), (142, 38487), (151, 38442),

Gene: StinkyVeggy\_47 Start: 41044, Stop: 40259, Start Num: 27

Candidate Starts for StinkyVeggy\_47:

(6, 41194), (8, 41158), (11, 41128), (18, 41089), (Start: 27 @41044 has 85 MA's), (58, 40882), (67, 40855), (88, 40756), (100, 40681), (126, 40579), (142, 40477), (143, 40471), (145, 40462), (152, 40414),

Gene: Stormageddon\_179 Start: 113484, Stop: 114164, Start Num: 52

Candidate Starts for Stormageddon\_179:

(Start: 52 @113484 has 2 MA's), (83, 113607), (99, 113712), (115, 113784), (137, 113910), (152, 114012),

Gene: Suigeneris\_46 Start: 40907, Stop: 40122, Start Num: 27

Candidate Starts for Suigeneris\_46:

(Start: 27 @40907 has 85 MA's), (44, 40820), (58, 40745), (67, 40718), (88, 40619), (142, 40340), (145, 40325),

Gene: TA17A\_47 Start: 40683, Stop: 39919, Start Num: 27

Candidate Starts for TA17A\_47:

(Start: 27 @40683 has 85 MA's), (37, 40641), (44, 40596), (Start: 56 @40539 has 1 MA's), (58, 40530), (59, 40527), (61, 40518), (82, 40431), (86, 40416), (100, 40332), (126, 40239), (136, 40188), (142, 40137), (150, 40098),

Gene: TPA2\_53 Start: 40141, Stop: 39410, Start Num: 17

Candidate Starts for TPA2\_53:

(17, 40141), (21, 40132), (26, 40096), (Start: 27 @40087 has 85 MA's), (63, 39925), (84, 39859), (117, 39742), (122, 39727), (138, 39652), (139, 39649), (153, 39556),

Gene: Thonko\_45 Start: 38227, Stop: 37415, Start Num: 27

Candidate Starts for Thonko\_45:

(Start: 24 @38251 has 1 MA's), (Start: 27 @38227 has 85 MA's), (30, 38212), (43, 38143), (45, 38137), (62, 38041), (68, 38023), (86, 37951), (95, 37897), (126, 37735), (163, 37480),

Gene: Thoth\_42 Start: 35489, Stop: 34608, Start Num: 32

Candidate Starts for Thoth\_42:

(Start: 32 @35489 has 21 MA's), (59, 35357), (69, 35321), (74, 35300), (80, 35279), (105, 35135), (113, 35093), (127, 35003), (141, 34931), (157, 34823), (158, 34808), (163, 34757),

Gene: Tinciduntolum\_47 Start: 40827, Stop: 40057, Start Num: 27

Candidate Starts for Tinciduntolum\_47:

(Start: 27 @40827 has 85 MA's), (44, 40734), (Start: 56 @40677 has 1 MA's), (58, 40668), (59, 40665), (61, 40656), (82, 40569), (86, 40554), (100, 40470), (126, 40377), (136, 40326), (142, 40275), (150, 40236),

Gene: Tres\_46 Start: 40696, Stop: 39932, Start Num: 27

Candidate Starts for Tres\_46:

(Start: 27 @40696 has 85 MA's), (44, 40609), (Start: 56 @40552 has 1 MA's), (58, 40543), (59, 40540), (61, 40531), (82, 40444), (86, 40429), (100, 40345), (126, 40252), (136, 40201), (142, 40150), (150, 40111),

Gene: Trine\_54 Start: 39655, Stop: 38969, Start Num: 56

Candidate Starts for Trine\_54:

(28, 39847), (33, 39799), (Start: 52 @39667 has 2 MA's), (Start: 56 @39655 has 1 MA's), (57, 39652), (76, 39583), (88, 39514), (97, 39448), (98, 39433), (107, 39394), (108, 39391), (123, 39310), (136, 39235), (138, 39220), (168, 38980),

Gene: Troll4\_42 Start: 35493, Stop: 34612, Start Num: 32

Candidate Starts for Troll4\_42:

(Start: 32 @35493 has 21 MA's), (59, 35361), (69, 35325), (74, 35304), (80, 35283), (105, 35139), (113, 35097), (127, 35007), (157, 34827), (158, 34812), (162, 34764),

Gene: Vic9\_00045 Start: 41205, Stop: 40438, Start Num: 27

Candidate Starts for Vic9\_00045:

(Start: 27 @41205 has 85 MA's), (44, 41115), (Start: 56 @41058 has 1 MA's), (58, 41049), (59, 41046), (61, 41037), (82, 40950), (86, 40935), (100, 40851), (136, 40707), (142, 40656), (150, 40617),

Gene: VioletZ\_44 Start: 40524, Stop: 39766, Start Num: 27

Candidate Starts for VioletZ\_44:

(Start: 27 @40524 has 85 MA's), (39, 40455), (63, 40347), (71, 40317), (86, 40269), (88, 40257), (96, 40212), (120, 40101), (126, 40086), (142, 39984), (151, 39939), (153, 39918), (156, 39900), (167, 39792),

Gene: Visconti\_42 Start: 35502, Stop: 34621, Start Num: 32

Candidate Starts for Visconti\_42:

(Start: 32 @35502 has 21 MA's), (59, 35370), (69, 35334), (74, 35313), (80, 35292), (105, 35148), (113, 35106), (127, 35016), (157, 34836), (158, 34821), (162, 34773),

Gene: WaldoWhy\_43 Start: 35498, Stop: 34617, Start Num: 32

Candidate Starts for WaldoWhy\_43:

(Start: 32 @35498 has 21 MA's), (59, 35366), (69, 35330), (80, 35288), (105, 35144), (113, 35102), (127, 35012), (157, 34832), (158, 34817), (163, 34766),

Gene: Waleliano\_42 Start: 40448, Stop: 39693, Start Num: 27

Candidate Starts for Waleliano\_42:

(Start: 27 @40448 has 85 MA's), (39, 40382), (63, 40274), (71, 40244), (86, 40196), (88, 40184), (120, 40028), (126, 40013), (132, 39980), (142, 39911), (151, 39866), (156, 39827), (167, 39719),

Gene: West99\_46 Start: 40816, Stop: 40052, Start Num: 27

Candidate Starts for West99\_46:

(Start: 27 @40816 has 85 MA's), (44, 40729), (Start: 56 @40672 has 1 MA's), (58, 40663), (59, 40660), (61, 40651), (82, 40564), (86, 40549), (100, 40465), (126, 40372), (136, 40321), (142, 40270), (150, 40231),

Gene: Xincheng\_41 Start: 39884, Stop: 39150, Start Num: 27

Candidate Starts for Xincheng\_41:

(Start: 27 @39884 has 85 MA's), (63, 39710), (71, 39680), (86, 39632), (88, 39620), (106, 39530), (124, 39476), (126, 39470), (142, 39368), (151, 39323), (156, 39284),

Gene: Yago84\_40 Start: 34890, Stop: 34180, Start Num: 27

Candidate Starts for Yago84\_40:

(Start: 27 @34890 has 85 MA's), (73, 34692), (100, 34599), (126, 34494), (142, 34392), (145, 34377), (152, 34329),

Gene: Zemanar\_43 Start: 40424, Stop: 39696, Start Num: 27

Candidate Starts for Zemanar\_43:

(Start: 27 @40424 has 85 MA's), (63, 40256), (71, 40226), (73, 40223), (86, 40178), (88, 40166), (124, 40022), (126, 40016), (142, 39914), (151, 39869), (156, 39830), (167, 39722),

Gene: Zenteno07\_50 Start: 39868, Stop: 39071, Start Num: 27

Candidate Starts for Zenteno07\_50:

(Start: 24 @39898 has 1 MA's), (Start: 27 @39868 has 85 MA's), (43, 39763), (45, 39757), (Start: 56 @39694 has 1 MA's), (65, 39661), (67, 39658), (73, 39634), (106, 39448), (126, 39391), (142, 39286), (150, 39247),