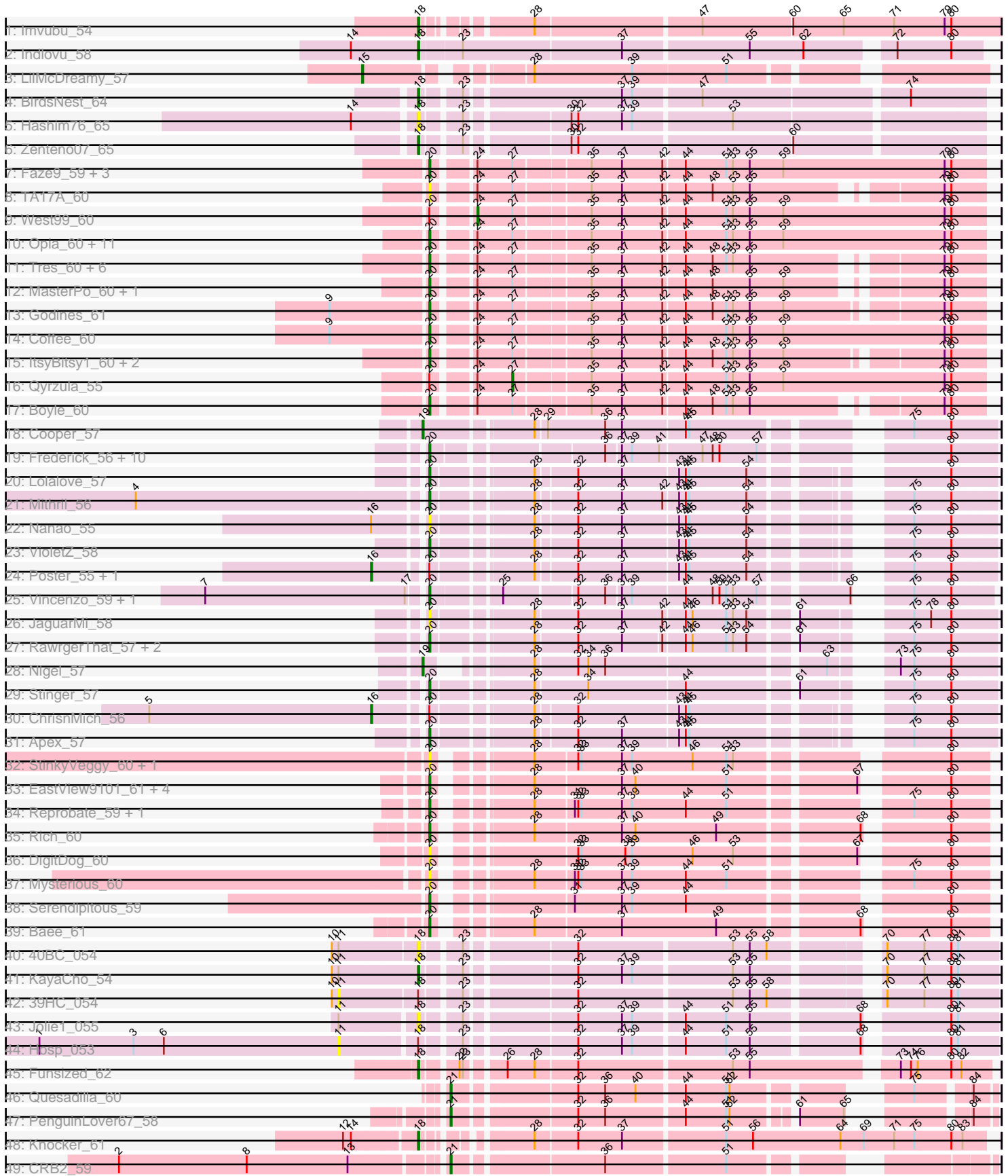


Pham 163512



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 163512 Report

This analysis was run 04/28/24 on database version 559.

Pham number 163512 has 92 members, 19 are drafts.

Phages represented in each track:

- Track 1 : Imvubu\_54
- Track 2 : Indlovu\_58
- Track 3 : LilMcDreamy\_57
- Track 4 : BirdsNest\_64
- Track 5 : Hashim76\_65
- Track 6 : Zenteno07\_65
- Track 7 : Faze9\_59, Allegro\_60, Blocker23\_60, Phantasmagoria\_60
- Track 8 : TA17A\_60
- Track 9 : West99\_60
- Track 10 : Opia\_60, Kheth\_60, Ares\_60, Glass\_60, Calamitous\_60, Lars\_60, Bananafish\_60, Lephleur\_60, FrenchFry\_60, Arbiter\_59, Holeinone\_60, LizLemon\_60
- Track 11 : Tres\_60, Rhinoforte\_60, Brownie5\_60, Sabella\_59, Hedgerow\_60, Rosebush\_59, Tinciduntolum\_61
- Track 12 : MasterPo\_60, Laurie\_60
- Track 13 : Godines\_61
- Track 14 : Coffee\_60
- Track 15 : ItsyBitsy1\_60, Eaglehorse\_60, Kaleb\_60
- Track 16 : Qyrzula\_55
- Track 17 : Boyle\_60
- Track 18 : Cooper\_57
- Track 19 : Frederick\_56, Mudslide\_56, Zemanar\_57, Waleliano\_56, Hangman\_56, BrownCNA\_58, BobbyK\_56, Heath\_55, Prince\_57, Austelle\_57, Hydro\_56
- Track 20 : Lolalove\_57
- Track 21 : Mithril\_56
- Track 22 : Nanao\_55
- Track 23 : VioletZ\_58
- Track 24 : Poster\_55, JAMaL\_56
- Track 25 : Vincenzo\_59, AlanGrant\_60
- Track 26 : JaguarMi\_58
- Track 27 : RawrgerThat\_57, Fortunato\_57, Magpie\_55
- Track 28 : Nigel\_57
- Track 29 : Stinger\_57
- Track 30 : ChrisnMich\_56
- Track 31 : Apex\_57
- Track 32 : StinkyVeggy\_60, Nangang\_60
- Track 33 : EastView9101\_61, SirJeffery\_59, Suigeneris\_61, Acadian\_60, Donny\_61

- Track 34 : Reprobate\_59, Phelemich\_58
- Track 35 : Rich\_60
- Track 36 : DigitDog\_60
- Track 37 : Mysterious\_60
- Track 38 : Serendipitous\_59
- Track 39 : Bae\_61
- Track 40 : 40BC\_054
- Track 41 : KayaCho\_54
- Track 42 : 39HC\_054
- Track 43 : Jolie1\_055
- Track 44 : Hosp\_053
- Track 45 : Funsized\_62
- Track 46 : Quesadilla\_60
- Track 47 : PenguinLover67\_58
- Track 48 : Knocker\_61
- Track 49 : CRB2\_59

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

The start number called the most often in the published annotations is 20, it was called in 56 of the 73 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Acadian\_60, AlanGrant\_60, Allegro\_60, Apex\_57, Arbiter\_59, Ares\_60, Austelle\_57, Bae\_61, Bananafish\_60, Blocker23\_60, BobbyK\_56, Boyle\_60, BrownCNA\_58, Brownie5\_60, Calamitous\_60, Coffee\_60, DigitDog\_60, Donny\_61, Eaglehorse\_60, EastView9101\_61, Faze9\_59, Fortunato\_57, Frederick\_56, FrenchFry\_60, Glass\_60, Godines\_61, Hangman\_56, Heath\_55, Hedgerow\_60, Holeinone\_60, Hydro\_56, ItsyBitsy1\_60, JaguarMi\_58, Kaleb\_60, Kheth\_60, Lars\_60, Laurie\_60, Lephleur\_60, LizLemon\_60, Lolalove\_57, Magpie\_55, MasterPo\_60, Mithril\_56, Mudslide\_56, Mysterious\_60, Nanao\_55, Nangang\_60, Opia\_60, Phantasmagoria\_60, Phelemich\_58, Prince\_57, RawrgerThat\_57, Reprobate\_59, Rhinoforte\_60, Rich\_60, Rosebush\_59, Sabella\_59, Serendipitous\_59, SirJeffery\_59, Stinger\_57, StinkyVeggy\_60, Suigeneris\_61, TA17A\_60, Tinciduntolum\_61, Tres\_60, Vincenzo\_59, VioletZ\_58, Waleliano\_56, Zemanar\_57,

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

- ChrisnMich\_56, JAMaL\_56, Poster\_55, Qyrzula\_55, West99\_60,

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

- 39HC\_054, 40BC\_054, BirdsNest\_64, CRB2\_59, Cooper\_57, Funsized\_62, Hashim76\_65, Hosp\_053, Imvubu\_54, Indlovu\_58, Jolie1\_055, KayaCho\_54, Knocker\_61, LilMcDreamy\_57, Nigel\_57, PenguinLover67\_58, Quesadilla\_60, Zenteno07\_65,

**Summary by start number:**

Start 11:

- Found in 5 of 92 ( 5.4% ) of genes in pham
- No Manual Annotations of this start.

- Called 40.0% of time when present
- Phage (with cluster) where this start called: 39HC\_054 (B6), Hosp\_053 (B6),

#### Start 15:

- Found in 1 of 92 ( 1.1% ) of genes in pham
- Manual Annotations of this start: 1 of 73
- Called 100.0% of time when present
- Phage (with cluster) where this start called: LilMcDreamy\_57 (B12),

#### Start 16:

- Found in 4 of 92 ( 4.3% ) of genes in pham
- Manual Annotations of this start: 2 of 73
- Called 75.0% of time when present
- Phage (with cluster) where this start called: ChrisnMich\_56 (B4), JAMaL\_56 (B4), Poster\_55 (B4),

#### Start 18:

- Found in 12 of 92 ( 13.0% ) of genes in pham
- Manual Annotations of this start: 7 of 73
- Called 83.3% of time when present
- Phage (with cluster) where this start called: 40BC\_054 (B6), BirdsNest\_64 (B13), Funsized\_62 (B9), Hashim76\_65 (B13), Imvubu\_54 (B10), Indlovu\_58 (B11), Jolie1\_055 (B6), KayaCho\_54 (B6), Knocker\_61 (B9), Zenteno07\_65 (B13),

#### Start 19:

- Found in 2 of 92 ( 2.2% ) of genes in pham
- Manual Annotations of this start: 2 of 73
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Cooper\_57 (B4), Nigel\_57 (B4),

#### Start 20:

- Found in 74 of 92 ( 80.4% ) of genes in pham
- Manual Annotations of this start: 56 of 73
- Called 93.2% of time when present
- Phage (with cluster) where this start called: Acadian\_60 (B5), AlanGrant\_60 (B4), Allegro\_60 (B2), Apex\_57 (B4), Arbiter\_59 (B2), Ares\_60 (B2), Austelle\_57 (B4), Bae\_61 (B5), Bananafish\_60 (B2), Blocker23\_60 (B2), BobbyK\_56 (B4), Boyle\_60 (B2), BrownCNA\_58 (B4), Brownie5\_60 (B2), Calamitous\_60 (B2), Coffee\_60 (B2), DigitDog\_60 (B5), Donny\_61 (B5), Eaglehorse\_60 (B2), EastView9101\_61 (B5), Faze9\_59 (B2), Fortunato\_57 (B4), Frederick\_56 (B4), FrenchFry\_60 (B2), Glass\_60 (B2), Godines\_61 (B2), Hangman\_56 (B4), Heath\_55 (B4), Hedgerow\_60 (B2), Holeinone\_60 (B2), Hydro\_56 (B4), ItsyBitsy1\_60 (B2), JaguarMi\_58 (B4), Kaleb\_60 (B2), Kheth\_60 (B2), Lars\_60 (B2), Laurie\_60 (B2), Lephleur\_60 (B2), LizLemon\_60 (B2), Lolalove\_57 (B4), Magpie\_55 (B4), MasterPo\_60 (B2), Mithril\_56 (B4), Mudslide\_56 (B4), Mysterious\_60 (B5), Nanao\_55 (B4), Nangang\_60 (B5), Opia\_60 (B2), Phantasmagoria\_60 (B2), Phelemich\_58 (B5), Prince\_57 (B4), RawrgerThat\_57 (B4), Reprobate\_59 (B5), Rhinoforte\_60 (B2), Rich\_60 (B5), Rosebush\_59 (B2), Sabella\_59 (B2), Serendipitous\_59 (B5), SirJeffery\_59 (B5), Stinger\_57 (B4), StinkyVeggy\_60 (B5), Suigeneris\_61 (B5), TA17A\_60 (B2), Tinciduntolum\_61 (B2), Tres\_60 (B2), Vincenzo\_59 (B4), VioletZ\_58 (B4), Waleliano\_56 (B4), Zemanar\_57 (B4),

#### Start 21:

- Found in 3 of 92 ( 3.3% ) of genes in pham
- Manual Annotations of this start: 3 of 73
- Called 100.0% of time when present
- Phage (with cluster) where this start called: CRB2\_59 (B9), PenguinLover67\_58 (B9), Quesadilla\_60 (B9),

Start 24:

- Found in 34 of 92 ( 37.0% ) of genes in pham
- Manual Annotations of this start: 1 of 73
- Called 2.9% of time when present
- Phage (with cluster) where this start called: West99\_60 (B2),

Start 27:

- Found in 34 of 92 ( 37.0% ) of genes in pham
- Manual Annotations of this start: 1 of 73
- Called 2.9% of time when present
- Phage (with cluster) where this start called: Qyrzula\_55 (B2),

### **Summary by clusters:**

There are 9 clusters represented in this pham: B2, B4, B5, B6, B12, B13, B10, B11, B9,

Info for manual annotations of cluster B10:

- Start number 18 was manually annotated 1 time for cluster B10.

Info for manual annotations of cluster B11:

- Start number 18 was manually annotated 1 time for cluster B11.

Info for manual annotations of cluster B12:

- Start number 15 was manually annotated 1 time for cluster B12.

Info for manual annotations of cluster B13:

- Start number 18 was manually annotated 2 times for cluster B13.

Info for manual annotations of cluster B2:

- Start number 20 was manually annotated 30 times for cluster B2.
- Start number 24 was manually annotated 1 time for cluster B2.
- Start number 27 was manually annotated 1 time for cluster B2.

Info for manual annotations of cluster B4:

- Start number 16 was manually annotated 2 times for cluster B4.
- Start number 19 was manually annotated 2 times for cluster B4.
- Start number 20 was manually annotated 18 times for cluster B4.

Info for manual annotations of cluster B5:

- Start number 20 was manually annotated 8 times for cluster B5.

Info for manual annotations of cluster B6:

- Start number 18 was manually annotated 1 time for cluster B6.

Info for manual annotations of cluster B9:

- Start number 18 was manually annotated 2 times for cluster B9.

- Start number 21 was manually annotated 3 times for cluster B9.

### **Gene Information:**

Gene: 39HC\_054 Start: 53638, Stop: 53117, Start Num: 11

Candidate Starts for 39HC\_054:

(10, 53644), (11, 53638), (Start: 18 @53572 has 7 MA's), (23, 53542), (32, 53455), (53, 53323), (55, 53308), (58, 53293), (70, 53215), (77, 53182), (80, 53158), (81, 53152),

Gene: 40BC\_054 Start: 53572, Stop: 53117, Start Num: 18

Candidate Starts for 40BC\_054:

(10, 53644), (11, 53638), (Start: 18 @53572 has 7 MA's), (23, 53542), (32, 53455), (53, 53323), (55, 53308), (58, 53293), (70, 53215), (77, 53182), (80, 53158), (81, 53152),

Gene: Acadian\_60 Start: 55536, Stop: 55105, Start Num: 20

Candidate Starts for Acadian\_60:

(Start: 20 @55536 has 56 MA's), (28, 55470), (37, 55395), (40, 55383), (51, 55302), (67, 55200), (80, 55137),

Gene: AlanGrant\_60 Start: 56832, Stop: 56401, Start Num: 20

Candidate Starts for AlanGrant\_60:

(7, 57021), (17, 56844), (Start: 20 @56832 has 56 MA's), (25, 56778), (32, 56718), (36, 56694), (37, 56682), (39, 56673), (44, 56628), (48, 56604), (50, 56598), (51, 56592), (53, 56586), (57, 56565), (66, 56496), (75, 56469), (80, 56436),

Gene: Allegro\_60 Start: 53809, Stop: 53339, Start Num: 20

Candidate Starts for Allegro\_60:

(Start: 20 @53809 has 56 MA's), (Start: 24 @53779 has 1 MA's), (Start: 27 @53749 has 1 MA's), (35, 53686), (37, 53659), (42, 53623), (44, 53605), (51, 53569), (53, 53563), (55, 53548), (59, 53518), (79, 53374), (80, 53368),

Gene: Apex\_57 Start: 55933, Stop: 55505, Start Num: 20

Candidate Starts for Apex\_57:

(Start: 20 @55933 has 56 MA's), (28, 55855), (32, 55822), (37, 55783), (43, 55735), (44, 55729), (45, 55726), (75, 55576), (80, 55543),

Gene: Arbiter\_59 Start: 53921, Stop: 53451, Start Num: 20

Candidate Starts for Arbiter\_59:

(Start: 20 @53921 has 56 MA's), (Start: 24 @53891 has 1 MA's), (Start: 27 @53861 has 1 MA's), (35, 53798), (37, 53771), (42, 53735), (44, 53717), (51, 53681), (53, 53675), (55, 53660), (59, 53630), (79, 53486), (80, 53480),

Gene: Ares\_60 Start: 53890, Stop: 53420, Start Num: 20

Candidate Starts for Ares\_60:

(Start: 20 @53890 has 56 MA's), (Start: 24 @53860 has 1 MA's), (Start: 27 @53830 has 1 MA's), (35, 53767), (37, 53740), (42, 53704), (44, 53686), (51, 53650), (53, 53644), (55, 53629), (59, 53599), (79, 53455), (80, 53449),

Gene: Austelle\_57 Start: 56389, Stop: 55958, Start Num: 20

Candidate Starts for Austelle\_57:

(Start: 20 @56389 has 56 MA's), (36, 56254), (37, 56242), (39, 56233), (41, 56209), (47, 56173), (48, 56164), (50, 56158), (57, 56125), (80, 55996),

Gene: Bae\_61 Start: 56597, Stop: 56163, Start Num: 20

Candidate Starts for Bae\_61:

(Start: 20 @56597 has 56 MA's), (28, 56531), (37, 56456), (49, 56372), (68, 56258), (80, 56195),

Gene: Bananafish\_60 Start: 53821, Stop: 53351, Start Num: 20

Candidate Starts for Bananafish\_60:

(Start: 20 @53821 has 56 MA's), (Start: 24 @53791 has 1 MA's), (Start: 27 @53761 has 1 MA's), (35, 53698), (37, 53671), (42, 53635), (44, 53617), (51, 53581), (53, 53575), (55, 53560), (59, 53530), (79, 53386), (80, 53380),

Gene: BirdsNest\_64 Start: 55434, Stop: 54970, Start Num: 18

Candidate Starts for BirdsNest\_64:

(Start: 18 @55434 has 7 MA's), (23, 55404), (37, 55275), (39, 55266), (47, 55209), (74, 55035),

Gene: Blocker23\_60 Start: 53931, Stop: 53461, Start Num: 20

Candidate Starts for Blocker23\_60:

(Start: 20 @53931 has 56 MA's), (Start: 24 @53901 has 1 MA's), (Start: 27 @53871 has 1 MA's), (35, 53808), (37, 53781), (42, 53745), (44, 53727), (51, 53691), (53, 53685), (55, 53670), (59, 53640), (79, 53496), (80, 53490),

Gene: BobbyK\_56 Start: 55699, Stop: 55268, Start Num: 20

Candidate Starts for BobbyK\_56:

(Start: 20 @55699 has 56 MA's), (36, 55564), (37, 55552), (39, 55543), (41, 55519), (47, 55483), (48, 55474), (50, 55468), (57, 55435), (80, 55306),

Gene: Boyle\_60 Start: 53930, Stop: 53490, Start Num: 20

Candidate Starts for Boyle\_60:

(Start: 20 @53930 has 56 MA's), (Start: 24 @53900 has 1 MA's), (Start: 27 @53870 has 1 MA's), (35, 53807), (37, 53780), (42, 53744), (44, 53726), (48, 53702), (51, 53690), (53, 53684), (55, 53669), (79, 53525), (80, 53519),

Gene: BrownCNA\_58 Start: 56056, Stop: 55625, Start Num: 20

Candidate Starts for BrownCNA\_58:

(Start: 20 @56056 has 56 MA's), (36, 55921), (37, 55909), (39, 55900), (41, 55876), (47, 55840), (48, 55831), (50, 55825), (57, 55792), (80, 55663),

Gene: Brownie5\_60 Start: 53940, Stop: 53500, Start Num: 20

Candidate Starts for Brownie5\_60:

(Start: 20 @53940 has 56 MA's), (Start: 24 @53910 has 1 MA's), (Start: 27 @53880 has 1 MA's), (35, 53817), (37, 53790), (42, 53754), (44, 53736), (48, 53712), (51, 53700), (53, 53694), (55, 53679), (79, 53535), (80, 53529),

Gene: CRB2\_59 Start: 56619, Stop: 56215, Start Num: 21

Candidate Starts for CRB2\_59:

(2, 56895), (8, 56781), (13, 56691), (Start: 21 @56619 has 3 MA's), (36, 56499), (51, 56397),

Gene: Calamitous\_60 Start: 53820, Stop: 53350, Start Num: 20

Candidate Starts for Calamitous\_60:

(Start: 20 @53820 has 56 MA's), (Start: 24 @53790 has 1 MA's), (Start: 27 @53760 has 1 MA's), (35, 53697), (37, 53670), (42, 53634), (44, 53616), (51, 53580), (53, 53574), (55, 53559), (59, 53529), (79,

53385), (80, 53379),

Gene: ChrisnMich\_56 Start: 54764, Stop: 54297, Start Num: 16

Candidate Starts for ChrisnMich\_56:

(5, 54962), (Start: 16 @54764 has 2 MA's), (Start: 20 @54725 has 56 MA's), (28, 54647), (32, 54614), (43, 54527), (44, 54521), (45, 54518), (75, 54368), (80, 54335),

Gene: Coffee\_60 Start: 53932, Stop: 53462, Start Num: 20

Candidate Starts for Coffee\_60:

(9, 54016), (Start: 20 @53932 has 56 MA's), (Start: 24 @53902 has 1 MA's), (Start: 27 @53872 has 1 MA's), (35, 53809), (37, 53782), (42, 53746), (44, 53728), (51, 53692), (53, 53686), (55, 53671), (59, 53641), (79, 53497), (80, 53491),

Gene: Cooper\_57 Start: 54888, Stop: 54442, Start Num: 19

Candidate Starts for Cooper\_57:

(Start: 19 @54888 has 2 MA's), (28, 54801), (29, 54792), (36, 54741), (37, 54726), (44, 54672), (45, 54669), (75, 54513), (80, 54480),

Gene: DigitDog\_60 Start: 55479, Stop: 55048, Start Num: 20

Candidate Starts for DigitDog\_60:

(Start: 20 @55479 has 56 MA's), (32, 55377), (33, 55374), (38, 55335), (39, 55329), (46, 55275), (53, 55239), (67, 55143), (80, 55080),

Gene: Donny\_61 Start: 55582, Stop: 55151, Start Num: 20

Candidate Starts for Donny\_61:

(Start: 20 @55582 has 56 MA's), (28, 55516), (37, 55441), (40, 55429), (51, 55348), (67, 55246), (80, 55183),

Gene: Eaglehorse\_60 Start: 53852, Stop: 53400, Start Num: 20

Candidate Starts for Eaglehorse\_60:

(Start: 20 @53852 has 56 MA's), (Start: 24 @53822 has 1 MA's), (Start: 27 @53792 has 1 MA's), (35, 53729), (37, 53702), (42, 53666), (44, 53648), (48, 53624), (51, 53612), (53, 53606), (55, 53591), (59, 53561), (79, 53435), (80, 53429),

Gene: EastView9101\_61 Start: 55391, Stop: 54960, Start Num: 20

Candidate Starts for EastView9101\_61:

(Start: 20 @55391 has 56 MA's), (28, 55325), (37, 55250), (40, 55238), (51, 55157), (67, 55055), (80, 54992),

Gene: Faze9\_59 Start: 53955, Stop: 53485, Start Num: 20

Candidate Starts for Faze9\_59:

(Start: 20 @53955 has 56 MA's), (Start: 24 @53925 has 1 MA's), (Start: 27 @53895 has 1 MA's), (35, 53832), (37, 53805), (42, 53769), (44, 53751), (51, 53715), (53, 53709), (55, 53694), (59, 53664), (79, 53520), (80, 53514),

Gene: Fortunato\_57 Start: 55748, Stop: 55314, Start Num: 20

Candidate Starts for Fortunato\_57:

(Start: 20 @55748 has 56 MA's), (28, 55670), (32, 55634), (37, 55595), (42, 55559), (44, 55541), (46, 55535), (51, 55505), (53, 55499), (54, 55487), (61, 55454), (75, 55385), (80, 55352),

Gene: Frederick\_56 Start: 55642, Stop: 55211, Start Num: 20

Candidate Starts for Frederick\_56:



(Start: 20 @55642 has 56 MA's), (36, 55507), (37, 55495), (39, 55486), (41, 55462), (47, 55426), (48, 55417), (50, 55411), (57, 55378), (80, 55249),

Gene: FrenchFry\_60 Start: 53931, Stop: 53461, Start Num: 20

Candidate Starts for FrenchFry\_60:

(Start: 20 @53931 has 56 MA's), (Start: 24 @53901 has 1 MA's), (Start: 27 @53871 has 1 MA's), (35, 53808), (37, 53781), (42, 53745), (44, 53727), (51, 53691), (53, 53685), (55, 53670), (59, 53640), (79, 53496), (80, 53490),

Gene: Funsized\_62 Start: 57679, Stop: 57218, Start Num: 18

Candidate Starts for Funsized\_62:

(Start: 18 @57679 has 7 MA's), (22, 57652), (23, 57649), (26, 57622), (28, 57598), (32, 57562), (53, 57430), (55, 57415), (73, 57298), (74, 57289), (76, 57283), (80, 57253), (82, 57244),

Gene: Glass\_60 Start: 53933, Stop: 53463, Start Num: 20

Candidate Starts for Glass\_60:

(Start: 20 @53933 has 56 MA's), (Start: 24 @53903 has 1 MA's), (Start: 27 @53873 has 1 MA's), (35, 53810), (37, 53783), (42, 53747), (44, 53729), (51, 53693), (53, 53687), (55, 53672), (59, 53642), (79, 53498), (80, 53492),

Gene: Godines\_61 Start: 54198, Stop: 53746, Start Num: 20

Candidate Starts for Godines\_61:

(9, 54282), (Start: 20 @54198 has 56 MA's), (Start: 24 @54168 has 1 MA's), (Start: 27 @54138 has 1 MA's), (35, 54075), (37, 54048), (42, 54012), (44, 53994), (48, 53970), (51, 53958), (53, 53952), (55, 53937), (59, 53907), (79, 53781), (80, 53775),

Gene: Hangman\_56 Start: 55799, Stop: 55368, Start Num: 20

Candidate Starts for Hangman\_56:

(Start: 20 @55799 has 56 MA's), (36, 55664), (37, 55652), (39, 55643), (41, 55619), (47, 55583), (48, 55574), (50, 55568), (57, 55535), (80, 55406),

Gene: Hashim76\_65 Start: 55719, Stop: 55258, Start Num: 18

Candidate Starts for Hashim76\_65:

(14, 55770), (Start: 18 @55719 has 7 MA's), (23, 55689), (30, 55608), (32, 55602), (37, 55563), (39, 55554), (53, 55470),

Gene: Heath\_55 Start: 55425, Stop: 54994, Start Num: 20

Candidate Starts for Heath\_55:

(Start: 20 @55425 has 56 MA's), (36, 55290), (37, 55278), (39, 55269), (41, 55245), (47, 55209), (48, 55200), (50, 55194), (57, 55161), (80, 55032),

Gene: Hedgerow\_60 Start: 53915, Stop: 53475, Start Num: 20

Candidate Starts for Hedgerow\_60:

(Start: 20 @53915 has 56 MA's), (Start: 24 @53885 has 1 MA's), (Start: 27 @53855 has 1 MA's), (35, 53792), (37, 53765), (42, 53729), (44, 53711), (48, 53687), (51, 53675), (53, 53669), (55, 53654), (79, 53510), (80, 53504),

Gene: Holeinone\_60 Start: 53787, Stop: 53317, Start Num: 20

Candidate Starts for Holeinone\_60:

(Start: 20 @53787 has 56 MA's), (Start: 24 @53757 has 1 MA's), (Start: 27 @53727 has 1 MA's), (35, 53664), (37, 53637), (42, 53601), (44, 53583), (51, 53547), (53, 53541), (55, 53526), (59, 53496), (79, 53352), (80, 53346),

Gene: Hosp\_053 Start: 52031, Stop: 51510, Start Num: 11

Candidate Starts for Hosp\_053:

(1, 52298), (3, 52214), (6, 52187), (11, 52031), (Start: 18 @51968 has 7 MA's), (23, 51938), (32, 51851), (37, 51812), (39, 51803), (44, 51761), (51, 51725), (55, 51704), (68, 51614), (80, 51551), (81, 51545),

Gene: Hydro\_56 Start: 55776, Stop: 55345, Start Num: 20

Candidate Starts for Hydro\_56:

(Start: 20 @55776 has 56 MA's), (36, 55641), (37, 55629), (39, 55620), (41, 55596), (47, 55560), (48, 55551), (50, 55545), (57, 55512), (80, 55383),

Gene: Imvubu\_54 Start: 53064, Stop: 52585, Start Num: 18

Candidate Starts for Imvubu\_54:

(Start: 18 @53064 has 7 MA's), (28, 52989), (47, 52848), (60, 52770), (65, 52725), (71, 52680), (79, 52635), (80, 52629),

Gene: Indlovu\_58 Start: 55544, Stop: 55074, Start Num: 18

Candidate Starts for Indlovu\_58:

(14, 55601), (Start: 18 @55544 has 7 MA's), (23, 55508), (37, 55370), (55, 55262), (62, 55214), (72, 55148), (80, 55100),

Gene: ItsyBitsy1\_60 Start: 54065, Stop: 53613, Start Num: 20

Candidate Starts for ItsyBitsy1\_60:

(Start: 20 @54065 has 56 MA's), (Start: 24 @54035 has 1 MA's), (Start: 27 @54005 has 1 MA's), (35, 53942), (37, 53915), (42, 53879), (44, 53861), (48, 53837), (51, 53825), (53, 53819), (55, 53804), (59, 53774), (79, 53648), (80, 53642),

Gene: JAMaL\_56 Start: 55857, Stop: 55390, Start Num: 16

Candidate Starts for JAMaL\_56:

(Start: 16 @55857 has 2 MA's), (Start: 20 @55818 has 56 MA's), (28, 55740), (32, 55707), (37, 55668), (43, 55620), (44, 55614), (45, 55611), (54, 55560), (75, 55461), (80, 55428),

Gene: JaguarMi\_58 Start: 56843, Stop: 56409, Start Num: 20

Candidate Starts for JaguarMi\_58:

(Start: 20 @56843 has 56 MA's), (28, 56765), (32, 56729), (37, 56690), (42, 56654), (44, 56636), (46, 56630), (51, 56600), (53, 56594), (54, 56582), (61, 56549), (75, 56480), (78, 56465), (80, 56447),

Gene: Jolie1\_055 Start: 53868, Stop: 53410, Start Num: 18

Candidate Starts for Jolie1\_055:

(11, 53931), (Start: 18 @53868 has 7 MA's), (23, 53838), (32, 53751), (37, 53712), (39, 53703), (44, 53661), (51, 53625), (55, 53604), (68, 53514), (80, 53451), (81, 53445),

Gene: Kaleb\_60 Start: 53939, Stop: 53499, Start Num: 20

Candidate Starts for Kaleb\_60:

(Start: 20 @53939 has 56 MA's), (Start: 24 @53909 has 1 MA's), (Start: 27 @53879 has 1 MA's), (35, 53816), (37, 53789), (42, 53753), (44, 53735), (48, 53711), (51, 53699), (53, 53693), (55, 53678), (59, 53648), (79, 53534), (80, 53528),

Gene: KayaCho\_54 Start: 53811, Stop: 53356, Start Num: 18

Candidate Starts for KayaCho\_54:

(10, 53886), (11, 53880), (Start: 18 @53811 has 7 MA's), (23, 53781), (32, 53694), (37, 53655), (39, 53646), (53, 53562), (55, 53547), (70, 53454), (77, 53421), (80, 53397), (81, 53391),

Gene: Kheth\_60 Start: 53852, Stop: 53382, Start Num: 20

Candidate Starts for Kheth\_60:

(Start: 20 @53852 has 56 MA's), (Start: 24 @53822 has 1 MA's), (Start: 27 @53792 has 1 MA's), (35, 53729), (37, 53702), (42, 53666), (44, 53648), (51, 53612), (53, 53606), (55, 53591), (59, 53561), (79, 53417), (80, 53411),

Gene: Knocker\_61 Start: 57083, Stop: 56619, Start Num: 18

Candidate Starts for Knocker\_61:

(12, 57143), (14, 57137), (Start: 18 @57083 has 7 MA's), (28, 57011), (32, 56975), (37, 56936), (51, 56849), (56, 56825), (64, 56747), (69, 56726), (71, 56699), (75, 56681), (80, 56648), (83, 56639),

Gene: Lars\_60 Start: 53917, Stop: 53447, Start Num: 20

Candidate Starts for Lars\_60:

(Start: 20 @53917 has 56 MA's), (Start: 24 @53887 has 1 MA's), (Start: 27 @53857 has 1 MA's), (35, 53794), (37, 53767), (42, 53731), (44, 53713), (51, 53677), (53, 53671), (55, 53656), (59, 53626), (79, 53482), (80, 53476),

Gene: Laurie\_60 Start: 53614, Stop: 53174, Start Num: 20

Candidate Starts for Laurie\_60:

(Start: 20 @53614 has 56 MA's), (Start: 24 @53584 has 1 MA's), (Start: 27 @53554 has 1 MA's), (35, 53491), (37, 53464), (42, 53428), (44, 53410), (48, 53386), (55, 53353), (59, 53323), (79, 53209), (80, 53203),

Gene: Lephleur\_60 Start: 53826, Stop: 53356, Start Num: 20

Candidate Starts for Lephleur\_60:

(Start: 20 @53826 has 56 MA's), (Start: 24 @53796 has 1 MA's), (Start: 27 @53766 has 1 MA's), (35, 53703), (37, 53676), (42, 53640), (44, 53622), (51, 53586), (53, 53580), (55, 53565), (59, 53535), (79, 53391), (80, 53385),

Gene: LilMcDreamy\_57 Start: 54942, Stop: 54460, Start Num: 15

Candidate Starts for LilMcDreamy\_57:

(Start: 15 @54942 has 1 MA's), (28, 54825), (39, 54738), (51, 54657),

Gene: LizLemon\_60 Start: 53942, Stop: 53472, Start Num: 20

Candidate Starts for LizLemon\_60:

(Start: 20 @53942 has 56 MA's), (Start: 24 @53912 has 1 MA's), (Start: 27 @53882 has 1 MA's), (35, 53819), (37, 53792), (42, 53756), (44, 53738), (51, 53702), (53, 53696), (55, 53681), (59, 53651), (79, 53507), (80, 53501),

Gene: Lolalove\_57 Start: 55756, Stop: 55328, Start Num: 20

Candidate Starts for Lolalove\_57:

(Start: 20 @55756 has 56 MA's), (28, 55678), (32, 55645), (37, 55606), (43, 55558), (44, 55552), (45, 55549), (54, 55498), (80, 55366),

Gene: Magpie\_55 Start: 55681, Stop: 55247, Start Num: 20

Candidate Starts for Magpie\_55:

(Start: 20 @55681 has 56 MA's), (28, 55603), (32, 55567), (37, 55528), (42, 55492), (44, 55474), (46, 55468), (51, 55438), (53, 55432), (54, 55420), (61, 55387), (75, 55318), (80, 55285),

Gene: MasterPo\_60 Start: 53808, Stop: 53368, Start Num: 20

Candidate Starts for MasterPo\_60:

(Start: 20 @53808 has 56 MA's), (Start: 24 @53778 has 1 MA's), (Start: 27 @53748 has 1 MA's), (35, 53685), (37, 53658), (42, 53622), (44, 53604), (48, 53580), (55, 53547), (59, 53517), (79, 53403), (80,

53397),

Gene: Mithril\_56 Start: 55751, Stop: 55323, Start Num: 20

Candidate Starts for Mithril\_56:

(4, 56000), (Start: 20 @55751 has 56 MA's), (28, 55673), (32, 55640), (37, 55601), (42, 55565), (43, 55553), (44, 55547), (45, 55544), (54, 55493), (75, 55394), (80, 55361),

Gene: Mudslide\_56 Start: 56021, Stop: 55590, Start Num: 20

Candidate Starts for Mudslide\_56:

(Start: 20 @56021 has 56 MA's), (36, 55886), (37, 55874), (39, 55865), (41, 55841), (47, 55805), (48, 55796), (50, 55790), (57, 55757), (80, 55628),

Gene: Mysterious\_60 Start: 55658, Stop: 55227, Start Num: 20

Candidate Starts for Mysterious\_60:

(Start: 20 @55658 has 56 MA's), (28, 55592), (31, 55559), (32, 55556), (33, 55553), (37, 55517), (39, 55508), (44, 55460), (51, 55424), (75, 55292), (80, 55259),

Gene: Nanao\_55 Start: 54716, Stop: 54288, Start Num: 20

Candidate Starts for Nanao\_55:

(Start: 16 @54755 has 2 MA's), (Start: 20 @54716 has 56 MA's), (28, 54638), (32, 54605), (37, 54566), (43, 54518), (44, 54512), (45, 54509), (54, 54458), (75, 54359), (80, 54326),

Gene: Nangang\_60 Start: 55837, Stop: 55406, Start Num: 20

Candidate Starts for Nangang\_60:

(Start: 20 @55837 has 56 MA's), (28, 55771), (32, 55735), (33, 55732), (37, 55696), (39, 55687), (46, 55633), (51, 55603), (53, 55597), (80, 55438),

Gene: Nigel\_57 Start: 55086, Stop: 54667, Start Num: 19

Candidate Starts for Nigel\_57:

(Start: 19 @55086 has 2 MA's), (28, 55023), (32, 54987), (34, 54978), (36, 54963), (63, 54783), (73, 54750), (75, 54738), (80, 54705),

Gene: Opia\_60 Start: 53832, Stop: 53362, Start Num: 20

Candidate Starts for Opia\_60:

(Start: 20 @53832 has 56 MA's), (Start: 24 @53802 has 1 MA's), (Start: 27 @53772 has 1 MA's), (35, 53709), (37, 53682), (42, 53646), (44, 53628), (51, 53592), (53, 53586), (55, 53571), (59, 53541), (79, 53397), (80, 53391),

Gene: PenguinLover67\_58 Start: 55676, Stop: 55281, Start Num: 21

Candidate Starts for PenguinLover67\_58:

(Start: 21 @55676 has 3 MA's), (32, 55580), (36, 55556), (44, 55490), (51, 55454), (52, 55451), (61, 55406), (65, 55367), (84, 55298),

Gene: Phantasmagoria\_60 Start: 53830, Stop: 53360, Start Num: 20

Candidate Starts for Phantasmagoria\_60:

(Start: 20 @53830 has 56 MA's), (Start: 24 @53800 has 1 MA's), (Start: 27 @53770 has 1 MA's), (35, 53707), (37, 53680), (42, 53644), (44, 53626), (51, 53590), (53, 53584), (55, 53569), (59, 53539), (79, 53395), (80, 53389),

Gene: Phelemich\_58 Start: 55654, Stop: 55223, Start Num: 20

Candidate Starts for Phelemich\_58:

(Start: 20 @55654 has 56 MA's), (28, 55588), (31, 55555), (32, 55552), (33, 55549), (37, 55513), (39, 55504), (44, 55456), (51, 55420), (75, 55288), (80, 55255),

Gene: Poster\_55 Start: 54756, Stop: 54289, Start Num: 16

Candidate Starts for Poster\_55:

(Start: 16 @54756 has 2 MA's), (Start: 20 @54717 has 56 MA's), (28, 54639), (32, 54606), (37, 54567), (43, 54519), (44, 54513), (45, 54510), (54, 54459), (75, 54360), (80, 54327),

Gene: Prince\_57 Start: 55934, Stop: 55503, Start Num: 20

Candidate Starts for Prince\_57:

(Start: 20 @55934 has 56 MA's), (36, 55799), (37, 55787), (39, 55778), (41, 55754), (47, 55718), (48, 55709), (50, 55703), (57, 55670), (80, 55541),

Gene: Quesadilla\_60 Start: 55946, Stop: 55548, Start Num: 21

Candidate Starts for Quesadilla\_60:

(Start: 21 @55946 has 3 MA's), (32, 55850), (36, 55826), (40, 55799), (44, 55760), (51, 55724), (52, 55721), (75, 55607), (84, 55565),

Gene: Qyrzula\_55 Start: 53883, Stop: 53473, Start Num: 27

Candidate Starts for Qyrzula\_55:

(Start: 20 @53943 has 56 MA's), (Start: 24 @53913 has 1 MA's), (Start: 27 @53883 has 1 MA's), (35, 53820), (37, 53793), (42, 53757), (44, 53739), (51, 53703), (53, 53697), (55, 53682), (59, 53652), (79, 53508), (80, 53502),

Gene: RawrgerThat\_57 Start: 55774, Stop: 55343, Start Num: 20

Candidate Starts for RawrgerThat\_57:

(Start: 20 @55774 has 56 MA's), (28, 55696), (32, 55660), (37, 55621), (42, 55588), (44, 55570), (46, 55564), (51, 55534), (53, 55528), (54, 55516), (61, 55483), (75, 55414), (80, 55381),

Gene: Reprobate\_59 Start: 55659, Stop: 55228, Start Num: 20

Candidate Starts for Reprobate\_59:

(Start: 20 @55659 has 56 MA's), (28, 55593), (31, 55560), (32, 55557), (33, 55554), (37, 55518), (39, 55509), (44, 55461), (51, 55425), (75, 55293), (80, 55260),

Gene: Rhinoforte\_60 Start: 53909, Stop: 53469, Start Num: 20

Candidate Starts for Rhinoforte\_60:

(Start: 20 @53909 has 56 MA's), (Start: 24 @53879 has 1 MA's), (Start: 27 @53849 has 1 MA's), (35, 53786), (37, 53759), (42, 53723), (44, 53705), (48, 53681), (51, 53669), (53, 53663), (55, 53648), (79, 53504), (80, 53498),

Gene: Rich\_60 Start: 56869, Stop: 56435, Start Num: 20

Candidate Starts for Rich\_60:

(Start: 20 @56869 has 56 MA's), (28, 56803), (37, 56728), (40, 56716), (49, 56644), (68, 56530), (80, 56467),

Gene: Rosebush\_59 Start: 53936, Stop: 53496, Start Num: 20

Candidate Starts for Rosebush\_59:

(Start: 20 @53936 has 56 MA's), (Start: 24 @53906 has 1 MA's), (Start: 27 @53876 has 1 MA's), (35, 53813), (37, 53786), (42, 53750), (44, 53732), (48, 53708), (51, 53696), (53, 53690), (55, 53675), (79, 53531), (80, 53525),

Gene: Sabella\_59 Start: 53772, Stop: 53332, Start Num: 20

Candidate Starts for Sabella\_59:

(Start: 20 @53772 has 56 MA's), (Start: 24 @53742 has 1 MA's), (Start: 27 @53712 has 1 MA's), (35, 53649), (37, 53622), (42, 53586), (44, 53568), (48, 53544), (51, 53532), (53, 53526), (55, 53511), (79,

53367), (80, 53361),

Gene: Serendipitous\_59 Start: 55249, Stop: 54818, Start Num: 20

Candidate Starts for Serendipitous\_59:

(Start: 20 @55249 has 56 MA's), (31, 55150), (37, 55108), (39, 55099), (44, 55051), (80, 54850),

Gene: SirJeffery\_59 Start: 55613, Stop: 55182, Start Num: 20

Candidate Starts for SirJeffery\_59:

(Start: 20 @55613 has 56 MA's), (28, 55547), (37, 55472), (40, 55460), (51, 55379), (67, 55277), (80, 55214),

Gene: Stinger\_57 Start: 54647, Stop: 54213, Start Num: 20

Candidate Starts for Stinger\_57:

(Start: 20 @54647 has 56 MA's), (28, 54569), (34, 54524), (44, 54440), (61, 54353), (75, 54284), (80, 54251),

Gene: StinkyVeggy\_60 Start: 55658, Stop: 55227, Start Num: 20

Candidate Starts for StinkyVeggy\_60:

(Start: 20 @55658 has 56 MA's), (28, 55592), (32, 55556), (33, 55553), (37, 55517), (39, 55508), (46, 55454), (51, 55424), (53, 55418), (80, 55259),

Gene: Suigeneris\_61 Start: 55734, Stop: 55303, Start Num: 20

Candidate Starts for Suigeneris\_61:

(Start: 20 @55734 has 56 MA's), (28, 55668), (37, 55593), (40, 55581), (51, 55500), (67, 55398), (80, 55335),

Gene: TA17A\_60 Start: 53777, Stop: 53337, Start Num: 20

Candidate Starts for TA17A\_60:

(Start: 20 @53777 has 56 MA's), (Start: 24 @53747 has 1 MA's), (Start: 27 @53717 has 1 MA's), (35, 53654), (37, 53627), (42, 53591), (44, 53573), (48, 53549), (53, 53531), (55, 53516), (79, 53372), (80, 53366),

Gene: Tinciduntolum\_61 Start: 53939, Stop: 53499, Start Num: 20

Candidate Starts for Tinciduntolum\_61:

(Start: 20 @53939 has 56 MA's), (Start: 24 @53909 has 1 MA's), (Start: 27 @53879 has 1 MA's), (35, 53816), (37, 53789), (42, 53753), (44, 53735), (48, 53711), (51, 53699), (53, 53693), (55, 53678), (79, 53534), (80, 53528),

Gene: Tres\_60 Start: 53793, Stop: 53353, Start Num: 20

Candidate Starts for Tres\_60:

(Start: 20 @53793 has 56 MA's), (Start: 24 @53763 has 1 MA's), (Start: 27 @53733 has 1 MA's), (35, 53670), (37, 53643), (42, 53607), (44, 53589), (48, 53565), (51, 53553), (53, 53547), (55, 53532), (79, 53388), (80, 53382),

Gene: Vincenzo\_59 Start: 56862, Stop: 56431, Start Num: 20

Candidate Starts for Vincenzo\_59:

(7, 57051), (17, 56874), (Start: 20 @56862 has 56 MA's), (25, 56808), (32, 56748), (36, 56724), (37, 56712), (39, 56703), (44, 56658), (48, 56634), (50, 56628), (51, 56622), (53, 56616), (57, 56595), (66, 56526), (75, 56499), (80, 56466),

Gene: VioletZ\_58 Start: 55847, Stop: 55419, Start Num: 20

Candidate Starts for VioletZ\_58:

(Start: 20 @55847 has 56 MA's), (28, 55769), (32, 55736), (37, 55697), (43, 55649), (44, 55643), (45, 55640), (54, 55589), (75, 55490), (80, 55457),

Gene: Waleliano\_56 Start: 55788, Stop: 55357, Start Num: 20

Candidate Starts for Waleliano\_56:

(Start: 20 @55788 has 56 MA's), (36, 55653), (37, 55641), (39, 55632), (41, 55608), (47, 55572), (48, 55563), (50, 55557), (57, 55524), (80, 55395),

Gene: West99\_60 Start: 53936, Stop: 53496, Start Num: 24

Candidate Starts for West99\_60:

(Start: 20 @53966 has 56 MA's), (Start: 24 @53936 has 1 MA's), (Start: 27 @53906 has 1 MA's), (35, 53843), (37, 53816), (42, 53780), (44, 53762), (51, 53726), (53, 53720), (55, 53705), (59, 53675), (79, 53531), (80, 53525),

Gene: Zemanar\_57 Start: 55620, Stop: 55189, Start Num: 20

Candidate Starts for Zemanar\_57:

(Start: 20 @55620 has 56 MA's), (36, 55485), (37, 55473), (39, 55464), (41, 55440), (47, 55404), (48, 55395), (50, 55389), (57, 55356), (80, 55227),

Gene: Zenteno07\_65 Start: 55334, Stop: 54873, Start Num: 18

Candidate Starts for Zenteno07\_65:

(Start: 18 @55334 has 7 MA's), (23, 55304), (30, 55223), (32, 55217), (60, 55034),