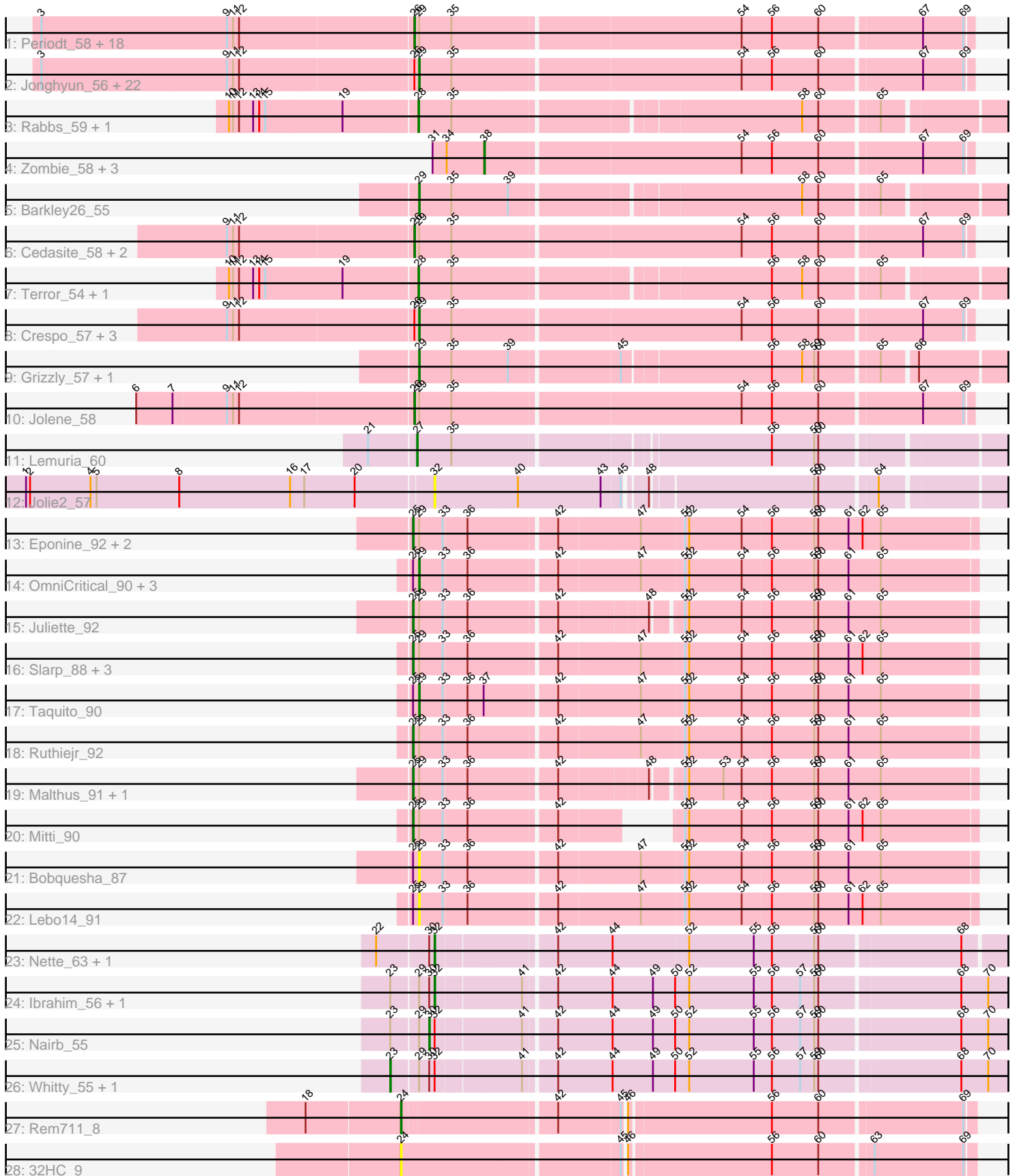


Pham 212509



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 212509 Report

This analysis was run 02/22/25 on database version 588.

Pham number 212509 has 91 members, 9 are drafts.

Phages represented in each track:

- Track 1 : Periodt\_58, Kareem\_57, Aroostook\_58, Marmie\_58, Plagueis\_58, Gideon\_58, Renaissance\_57, Cherrybomb426\_57, Annihilator\_56, Phreak\_58, Mowgli\_58, CLED96\_57, GoldenAsh\_56, ZoMa\_55, BQuat\_57, LouisV14\_59, Coleslaw\_57, ECartman\_56, Halo\_59
- Track 2 : Jonghyun\_56, Sizemore\_57, Olga\_57, Hotshotbaby7\_58, BPs\_56, BruceB\_56, TinaBug\_56, Chance64\_58, Liefie\_55, Avrafan\_56, Darionha\_58, Frosty24\_56, Gomashi\_56, PinkYoshi\_57, Jane\_57, Camri\_57, Wendigo\_55, Sweets\_56, Angel\_56, OctaviousRex\_56, Kasen3\_57, DMoney\_56, Schiebel\_56
- Track 3 : Rabbs\_59, Sneeze\_58
- Track 4 : Zombie\_58, Hope\_58, JorRay\_59, AzulaCat\_56
- Track 5 : Barkley26\_55
- Track 6 : Cedasite\_58, Remy19\_58, Phish\_57
- Track 7 : Terror\_54, Taheera\_54
- Track 8 : Crespo\_57, ShaboiShabazz\_57, CassieYates\_58, TomBrady\_58
- Track 9 : Grizzly\_57, Peeb\_57
- Track 10 : Jolene\_58
- Track 11 : Lemuria\_60
- Track 12 : Jolie2\_57
- Track 13 : Eponine\_92, Fionnbharth\_90, Wintermute\_90
- Track 14 : OmniCritical\_90, Y10\_86, JF1\_90, Y2\_86
- Track 15 : Juliette\_92
- Track 16 : Slarp\_88, Chancellor\_90, SamScheppers\_89, Cheetobro\_88
- Track 17 : Taquito\_90
- Track 18 : Ruthiejr\_92
- Track 19 : Malthus\_91, Kraw\_91
- Track 20 : Mitti\_90
- Track 21 : Bobquesha\_87
- Track 22 : Lebo14\_91
- Track 23 : Nette\_63, Mendokysei\_59
- Track 24 : Ibrahim\_56, Bernal13\_56
- Track 25 : Nairb\_55
- Track 26 : Whitty\_55, RonRayGun\_56
- Track 27 : Rem711\_8
- Track 28 : 32HC\_9

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

The start number called the most often in the published annotations is 29, it was called in 33 of the 82 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Angel\_56, Avrafan\_56, BPs\_56, Barkley26\_55, Bobquesha\_87, BruceB\_56, Camri\_57, CassieYates\_58, Chance64\_58, Crespo\_57, DMoney\_56, Darionha\_58, Frosty24\_56, Gomashi\_56, Grizzly\_57, Hotshotbaby7\_58, JF1\_90, Jane\_57, Jonghyun\_56, Kasen3\_57, Lebo14\_91, Liefie\_55, OctaviousRex\_56, Olga\_57, OmniCritical\_90, Peeb\_57, PinkYoshi\_57, Schiebel\_56, ShaboiShabazz\_57, Sizemore\_57, Sweets\_56, Taquito\_90, TinaBug\_56, TomBrady\_58, Wendigo\_55, Y10\_86, Y2\_86,

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

- Annihilator\_56, Aroostook\_58, BQuat\_57, Bernal13\_56, CLED96\_57, Cedasite\_58, Chancellor\_90, Cheetobro\_88, Cherrybomb426\_57, Coleslaw\_57, ECartman\_56, Eponine\_92, Fionnbharth\_90, Gideon\_58, GoldenAsh\_56, Halo\_59, Ibrahim\_56, Jolene\_58, Juliette\_92, Kareem\_57, Kraw\_91, LouisV14\_59, Malthus\_91, Marmie\_58, Mitti\_90, Mowgli\_58, Nairb\_55, Periodt\_58, Phish\_57, Phreak\_58, Plagueis\_58, Remy19\_58, Renaissance\_57, RonRayGun\_56, Ruthiejr\_92, SamScheppers\_89, Slarp\_88, Whitty\_55, Wintermute\_90, ZoMa\_55,

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

- 32HC\_9, AzulaCat\_56, Hope\_58, Jolie2\_57, JorRay\_59, Lemuria\_60, Mendokysei\_59, Nette\_63, Rabbs\_59, Rem711\_8, Sneeze\_58, Taheera\_54, Terror\_54, Zombie\_58,

## **Summary by start number:**

Start 23:

- Found in 5 of 91 ( 5.5% ) of genes in pham
- Manual Annotations of this start: 2 of 82
- Called 40.0% of time when present
- Phage (with cluster) where this start called: RonRayGun\_56 (T), Whitty\_55 (T),

Start 24:

- Found in 2 of 91 ( 2.2% ) of genes in pham
- Manual Annotations of this start: 1 of 82
- Called 100.0% of time when present
- Phage (with cluster) where this start called: 32HC\_9 (Z), Rem711\_8 (Z),

Start 25:

- Found in 19 of 91 ( 20.9% ) of genes in pham
- Manual Annotations of this start: 11 of 82
- Called 63.2% of time when present
- Phage (with cluster) where this start called: Chancellor\_90 (K4), Cheetobro\_88 (K4), Eponine\_92 (K4), Fionnbharth\_90 (K4), Juliette\_92 (K4), Kraw\_91 (K4), Malthus\_91 (K4), Mitti\_90 (K4), Ruthiejr\_92 (K4), SamScheppers\_89 (K4), Slarp\_88 (K4), Wintermute\_90 (K4),

Start 26:

- Found in 50 of 91 ( 54.9% ) of genes in pham
- Manual Annotations of this start: 23 of 82
- Called 46.0% of time when present
- Phage (with cluster) where this start called: Annihilator\_56 (G1), Aroostook\_58 (G1), BQuat\_57 (G1), CLED96\_57 (G1), Cedasite\_58 (G1), Cherrybomb426\_57 (G1), Coleslaw\_57 (G1), ECartman\_56 (G1), Gideon\_58 (G1), GoldenAsh\_56 (G1), Halo\_59 (G1), Jolene\_58 (G1), Kareem\_57 (G1), LouisV14\_59 (G1), Marmie\_58 (G1), Mowgli\_58 (G1), Periodt\_58 (G1), Phish\_57 (G1), Phreak\_58 (G1), Plagueis\_58 (G1), Remy19\_58 (G1), Renaissance\_57 (G1), ZoMa\_55 (G1),

#### Start 27:

- Found in 1 of 91 ( 1.1% ) of genes in pham
- Manual Annotations of this start: 1 of 82
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Lemuria\_60 (G4),

#### Start 28:

- Found in 4 of 91 ( 4.4% ) of genes in pham
- Manual Annotations of this start: 4 of 82
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Rabbs\_59 (G1), Sneeze\_58 (G1), Taheera\_54 (G1), Terror\_54 (G1),

#### Start 29:

- Found in 77 of 91 ( 84.6% ) of genes in pham
- Manual Annotations of this start: 33 of 82
- Called 48.1% of time when present
- Phage (with cluster) where this start called: Angel\_56 (G1), Avrafan\_56 (G1), BPs\_56 (G1), Barkley26\_55 (G1), Bobquesha\_87 (K4), BruceB\_56 (G1), Camri\_57 (G1), CassieYates\_58 (G1), Chance64\_58 (G1), Crespo\_57 (G1), DMoney\_56 (G1), Darionha\_58 (G1), Frosty24\_56 (G1), Gomashi\_56 (G1), Grizzly\_57 (G1), Hotshotbaby7\_58 (G1), JF1\_90 (K4), Jane\_57 (G1), Jonghyun\_56 (G1), Kasen3\_57 (G1), Lebo14\_91 (K4), Liefie\_55 (G1), OctaviousRex\_56 (G1), Olga\_57 (G1), OmniCritical\_90 (K4), Peeb\_57 (G1), PinkYoshi\_57 (G1), Schiebel\_56 (G1), ShaboiShabazz\_57 (G1), Sizemore\_57 (G1), Sweets\_56 (G1), Taquito\_90 (K4), TinaBug\_56 (G1), TomBrady\_58 (G1), Wendigo\_55 (G1), Y10\_86 (K4), Y2\_86 (K4),

#### Start 30:

- Found in 7 of 91 ( 7.7% ) of genes in pham
- Manual Annotations of this start: 1 of 82
- Called 14.3% of time when present
- Phage (with cluster) where this start called: Nairb\_55 (T),

#### Start 32:

- Found in 8 of 91 ( 8.8% ) of genes in pham
- Manual Annotations of this start: 3 of 82
- Called 62.5% of time when present
- Phage (with cluster) where this start called: Bernal13\_56 (T), Ibrahim\_56 (T), Jolie2\_57 (G4), Mendokysei\_59 (T), Nette\_63 (T),

#### Start 38:

- Found in 4 of 91 ( 4.4% ) of genes in pham
- Manual Annotations of this start: 3 of 82

- Called 100.0% of time when present
- Phage (with cluster) where this start called: AzulaCat\_56 (G1), Hope\_58 (G1), JorRay\_59 (G1), Zombie\_58 (G1),

### **Summary by clusters:**

There are 5 clusters represented in this pham: Z, G4, T, G1, K4,

Info for manual annotations of cluster G1:

- Start number 26 was manually annotated 23 times for cluster G1.
- Start number 28 was manually annotated 4 times for cluster G1.
- Start number 29 was manually annotated 28 times for cluster G1.
- Start number 38 was manually annotated 3 times for cluster G1.

Info for manual annotations of cluster G4:

- Start number 27 was manually annotated 1 time for cluster G4.

Info for manual annotations of cluster K4:

- Start number 25 was manually annotated 11 times for cluster K4.
- Start number 29 was manually annotated 5 times for cluster K4.

Info for manual annotations of cluster T:

- Start number 23 was manually annotated 2 times for cluster T.
- Start number 30 was manually annotated 1 time for cluster T.
- Start number 32 was manually annotated 3 times for cluster T.

Info for manual annotations of cluster Z:

- Start number 24 was manually annotated 1 time for cluster Z.

### **Gene Information:**

Gene: 32HC\_9 Start: 4702, Stop: 3899, Start Num: 24

Candidate Starts for 32HC\_9:

(Start: 24 @4702 has 1 MA's), (45, 4393), (46, 4390), (56, 4186), (60, 4117), (63, 4045), (69, 3913),

Gene: Angel\_56 Start: 38960, Stop: 39751, Start Num: 29

Candidate Starts for Angel\_56:

(3, 38411), (9, 38684), (11, 38693), (12, 38702), (Start: 26 @38954 has 23 MA's), (Start: 29 @38960 has 33 MA's), (35, 39008), (54, 39422), (56, 39467), (60, 39536), (67, 39680), (69, 39740),

Gene: Annihilator\_56 Start: 38960, Stop: 39757, Start Num: 26

Candidate Starts for Annihilator\_56:

(3, 38417), (9, 38690), (11, 38699), (12, 38708), (Start: 26 @38960 has 23 MA's), (Start: 29 @38966 has 33 MA's), (35, 39014), (54, 39428), (56, 39473), (60, 39542), (67, 39686), (69, 39746),

Gene: Aroostook\_58 Start: 39416, Stop: 40213, Start Num: 26

Candidate Starts for Aroostook\_58:

(3, 38873), (9, 39146), (11, 39155), (12, 39164), (Start: 26 @39416 has 23 MA's), (Start: 29 @39422 has 33 MA's), (35, 39470), (54, 39884), (56, 39929), (60, 39998), (67, 40142), (69, 40202),

Gene: Avrafan\_56 Start: 38975, Stop: 39766, Start Num: 29

Candidate Starts for Avrafan\_56:

(3, 38426), (9, 38699), (11, 38708), (12, 38717), (Start: 26 @38969 has 23 MA's), (Start: 29 @38975 has 33 MA's), (35, 39023), (54, 39437), (56, 39482), (60, 39551), (67, 39695), (69, 39755),

Gene: AzulaCat\_56 Start: 39516, Stop: 40211, Start Num: 38

Candidate Starts for AzulaCat\_56:

(31, 39441), (34, 39462), (Start: 38 @39516 has 3 MA's), (54, 39882), (56, 39927), (60, 39996), (67, 40140), (69, 40200),

Gene: BPs\_56 Start: 38975, Stop: 39766, Start Num: 29

Candidate Starts for BPs\_56:

(3, 38426), (9, 38699), (11, 38708), (12, 38717), (Start: 26 @38969 has 23 MA's), (Start: 29 @38975 has 33 MA's), (35, 39023), (54, 39437), (56, 39482), (60, 39551), (67, 39695), (69, 39755),

Gene: BQuat\_57 Start: 39406, Stop: 40203, Start Num: 26

Candidate Starts for BQuat\_57:

(3, 38863), (9, 39136), (11, 39145), (12, 39154), (Start: 26 @39406 has 23 MA's), (Start: 29 @39412 has 33 MA's), (35, 39460), (54, 39874), (56, 39919), (60, 39988), (67, 40132), (69, 40192),

Gene: Barkley26\_55 Start: 38713, Stop: 39525, Start Num: 29

Candidate Starts for Barkley26\_55:

(Start: 29 @38713 has 33 MA's), (35, 38761), (39, 38842), (58, 39244), (60, 39268), (65, 39349),

Gene: Bernal13\_56 Start: 40310, Stop: 39471, Start Num: 32

Candidate Starts for Bernal13\_56:

(Start: 23 @40367 has 2 MA's), (Start: 29 @40331 has 33 MA's), (Start: 30 @40316 has 1 MA's), (Start: 32 @40310 has 3 MA's), (41, 40190), (42, 40148), (44, 40067), (49, 40007), (50, 39974), (52, 39953), (55, 39857), (56, 39830), (57, 39788), (59, 39767), (60, 39761), (68, 39560), (70, 39521),

Gene: Bobquesha\_87 Start: 51466, Stop: 52257, Start Num: 29

Candidate Starts for Bobquesha\_87:

(Start: 25 @51457 has 11 MA's), (Start: 29 @51466 has 33 MA's), (33, 51499), (36, 51532), (42, 51655), (47, 51769), (51, 51829), (52, 51835), (54, 51913), (56, 51955), (59, 52018), (60, 52024), (61, 52069), (65, 52117),

Gene: BruceB\_56 Start: 38975, Stop: 39766, Start Num: 29

Candidate Starts for BruceB\_56:

(3, 38426), (9, 38699), (11, 38708), (12, 38717), (Start: 26 @38969 has 23 MA's), (Start: 29 @38975 has 33 MA's), (35, 39023), (54, 39437), (56, 39482), (60, 39551), (67, 39695), (69, 39755),

Gene: CLED96\_57 Start: 38969, Stop: 39766, Start Num: 26

Candidate Starts for CLED96\_57:

(3, 38426), (9, 38699), (11, 38708), (12, 38717), (Start: 26 @38969 has 23 MA's), (Start: 29 @38975 has 33 MA's), (35, 39023), (54, 39437), (56, 39482), (60, 39551), (67, 39695), (69, 39755),

Gene: Camri\_57 Start: 38975, Stop: 39766, Start Num: 29

Candidate Starts for Camri\_57:

(3, 38426), (9, 38699), (11, 38708), (12, 38717), (Start: 26 @38969 has 23 MA's), (Start: 29 @38975 has 33 MA's), (35, 39023), (54, 39437), (56, 39482), (60, 39551), (67, 39695), (69, 39755),

Gene: CassieYates\_58 Start: 39420, Stop: 40211, Start Num: 29

Candidate Starts for CassieYates\_58:

(9, 39144), (11, 39153), (12, 39162), (Start: 26 @39414 has 23 MA's), (Start: 29 @39420 has 33 MA's), (35, 39468), (54, 39882), (56, 39927), (60, 39996), (67, 40140), (69, 40200),

Gene: Cedasite\_58 Start: 39414, Stop: 40211, Start Num: 26

Candidate Starts for Cedasite\_58:

(9, 39144), (11, 39153), (12, 39162), (Start: 26 @39414 has 23 MA's), (Start: 29 @39420 has 33 MA's), (35, 39468), (54, 39882), (56, 39927), (60, 39996), (67, 40140), (69, 40200),

Gene: Chance64\_58 Start: 39422, Stop: 40213, Start Num: 29

Candidate Starts for Chance64\_58:

(3, 38873), (9, 39146), (11, 39155), (12, 39164), (Start: 26 @39416 has 23 MA's), (Start: 29 @39422 has 33 MA's), (35, 39470), (54, 39884), (56, 39929), (60, 39998), (67, 40142), (69, 40202),

Gene: Chancellor\_90 Start: 54032, Stop: 54832, Start Num: 25

Candidate Starts for Chancellor\_90:

(Start: 25 @54032 has 11 MA's), (Start: 29 @54041 has 33 MA's), (33, 54074), (36, 54107), (42, 54230), (47, 54344), (51, 54404), (52, 54410), (54, 54488), (56, 54530), (59, 54593), (60, 54599), (61, 54644), (62, 54665), (65, 54692),

Gene: Cheetobro\_88 Start: 53586, Stop: 54386, Start Num: 25

Candidate Starts for Cheetobro\_88:

(Start: 25 @53586 has 11 MA's), (Start: 29 @53595 has 33 MA's), (33, 53628), (36, 53661), (42, 53784), (47, 53898), (51, 53958), (52, 53964), (54, 54042), (56, 54084), (59, 54147), (60, 54153), (61, 54198), (62, 54219), (65, 54246),

Gene: Cherrybomb426\_57 Start: 38969, Stop: 39766, Start Num: 26

Candidate Starts for Cherrybomb426\_57:

(3, 38426), (9, 38699), (11, 38708), (12, 38717), (Start: 26 @38969 has 23 MA's), (Start: 29 @38975 has 33 MA's), (35, 39023), (54, 39437), (56, 39482), (60, 39551), (67, 39695), (69, 39755),

Gene: Coleslaw\_57 Start: 39406, Stop: 40203, Start Num: 26

Candidate Starts for Coleslaw\_57:

(3, 38863), (9, 39136), (11, 39145), (12, 39154), (Start: 26 @39406 has 23 MA's), (Start: 29 @39412 has 33 MA's), (35, 39460), (54, 39874), (56, 39919), (60, 39988), (67, 40132), (69, 40192),

Gene: Crespo\_57 Start: 39421, Stop: 40212, Start Num: 29

Candidate Starts for Crespo\_57:

(9, 39145), (11, 39154), (12, 39163), (Start: 26 @39415 has 23 MA's), (Start: 29 @39421 has 33 MA's), (35, 39469), (54, 39883), (56, 39928), (60, 39997), (67, 40141), (69, 40201),

Gene: DMoney\_56 Start: 38975, Stop: 39766, Start Num: 29

Candidate Starts for DMoney\_56:

(3, 38426), (9, 38699), (11, 38708), (12, 38717), (Start: 26 @38969 has 23 MA's), (Start: 29 @38975 has 33 MA's), (35, 39023), (54, 39437), (56, 39482), (60, 39551), (67, 39695), (69, 39755),

Gene: Darionha\_58 Start: 39420, Stop: 40211, Start Num: 29

Candidate Starts for Darionha\_58:

(3, 38871), (9, 39144), (11, 39153), (12, 39162), (Start: 26 @39414 has 23 MA's), (Start: 29 @39420 has 33 MA's), (35, 39468), (54, 39882), (56, 39927), (60, 39996), (67, 40140), (69, 40200),

Gene: ECartman\_56 Start: 39414, Stop: 40211, Start Num: 26

Candidate Starts for ECartman\_56:

(3, 38871), (9, 39144), (11, 39153), (12, 39162), (Start: 26 @39414 has 23 MA's), (Start: 29 @39420 has 33 MA's), (35, 39468), (54, 39882), (56, 39927), (60, 39996), (67, 40140), (69, 40200),

Gene: Eponine\_92 Start: 55012, Stop: 55812, Start Num: 25

Candidate Starts for Eponine\_92:

(Start: 25 @55012 has 11 MA's), (Start: 29 @55021 has 33 MA's), (33, 55054), (36, 55087), (42, 55210), (47, 55324), (51, 55384), (52, 55390), (54, 55468), (56, 55510), (59, 55573), (60, 55579), (61, 55624), (62, 55645), (65, 55672),

Gene: Fionnbharth\_90 Start: 54410, Stop: 55210, Start Num: 25

Candidate Starts for Fionnbharth\_90:

(Start: 25 @54410 has 11 MA's), (Start: 29 @54419 has 33 MA's), (33, 54452), (36, 54485), (42, 54608), (47, 54722), (51, 54782), (52, 54788), (54, 54866), (56, 54908), (59, 54971), (60, 54977), (61, 55022), (62, 55043), (65, 55070),

Gene: Frosty24\_56 Start: 38975, Stop: 39766, Start Num: 29

Candidate Starts for Frosty24\_56:

(3, 38426), (9, 38699), (11, 38708), (12, 38717), (Start: 26 @38969 has 23 MA's), (Start: 29 @38975 has 33 MA's), (35, 39023), (54, 39437), (56, 39482), (60, 39551), (67, 39695), (69, 39755),

Gene: Gideon\_58 Start: 39416, Stop: 40213, Start Num: 26

Candidate Starts for Gideon\_58:

(3, 38873), (9, 39146), (11, 39155), (12, 39164), (Start: 26 @39416 has 23 MA's), (Start: 29 @39422 has 33 MA's), (35, 39470), (54, 39884), (56, 39929), (60, 39998), (67, 40142), (69, 40202),

Gene: GoldenAsh\_56 Start: 38954, Stop: 39751, Start Num: 26

Candidate Starts for GoldenAsh\_56:

(3, 38411), (9, 38684), (11, 38693), (12, 38702), (Start: 26 @38954 has 23 MA's), (Start: 29 @38960 has 33 MA's), (35, 39008), (54, 39422), (56, 39467), (60, 39536), (67, 39680), (69, 39740),

Gene: Gomashi\_56 Start: 38976, Stop: 39767, Start Num: 29

Candidate Starts for Gomashi\_56:

(3, 38427), (9, 38700), (11, 38709), (12, 38718), (Start: 26 @38970 has 23 MA's), (Start: 29 @38976 has 33 MA's), (35, 39024), (54, 39438), (56, 39483), (60, 39552), (67, 39696), (69, 39756),

Gene: Grizzly\_57 Start: 39236, Stop: 40054, Start Num: 29

Candidate Starts for Grizzly\_57:

(Start: 29 @39236 has 33 MA's), (35, 39284), (39, 39365), (45, 39518), (56, 39728), (58, 39773), (59, 39791), (60, 39797), (65, 39878), (66, 39923),

Gene: Halo\_59 Start: 39962, Stop: 40759, Start Num: 26

Candidate Starts for Halo\_59:

(3, 39419), (9, 39692), (11, 39701), (12, 39710), (Start: 26 @39962 has 23 MA's), (Start: 29 @39968 has 33 MA's), (35, 40016), (54, 40430), (56, 40475), (60, 40544), (67, 40688), (69, 40748),

Gene: Hope\_58 Start: 39516, Stop: 40211, Start Num: 38

Candidate Starts for Hope\_58:

(31, 39441), (34, 39462), (Start: 38 @39516 has 3 MA's), (54, 39882), (56, 39927), (60, 39996), (67, 40140), (69, 40200),

Gene: Hotshotbaby7\_58 Start: 39422, Stop: 40213, Start Num: 29

Candidate Starts for Hotshotbaby7\_58:



(3, 38873), (9, 39146), (11, 39155), (12, 39164), (Start: 26 @39416 has 23 MA's), (Start: 29 @39422 has 33 MA's), (35, 39470), (54, 39884), (56, 39929), (60, 39998), (67, 40142), (69, 40202),

Gene: Ibrahim\_56 Start: 40514, Stop: 39675, Start Num: 32

Candidate Starts for Ibrahim\_56:

(Start: 23 @40571 has 2 MA's), (Start: 29 @40535 has 33 MA's), (Start: 30 @40520 has 1 MA's), (Start: 32 @40514 has 3 MA's), (41, 40394), (42, 40352), (44, 40271), (49, 40211), (50, 40178), (52, 40157), (55, 40061), (56, 40034), (57, 39992), (59, 39971), (60, 39965), (68, 39764), (70, 39725),

Gene: JF1\_90 Start: 54343, Stop: 55134, Start Num: 29

Candidate Starts for JF1\_90:

(Start: 25 @54334 has 11 MA's), (Start: 29 @54343 has 33 MA's), (33, 54376), (36, 54409), (42, 54532), (47, 54646), (51, 54706), (52, 54712), (54, 54790), (56, 54832), (59, 54895), (60, 54901), (61, 54946), (65, 54994),

Gene: Jane\_57 Start: 38975, Stop: 39766, Start Num: 29

Candidate Starts for Jane\_57:

(3, 38426), (9, 38699), (11, 38708), (12, 38717), (Start: 26 @38969 has 23 MA's), (Start: 29 @38975 has 33 MA's), (35, 39023), (54, 39437), (56, 39482), (60, 39551), (67, 39695), (69, 39755),

Gene: Jolene\_58 Start: 39818, Stop: 40615, Start Num: 26

Candidate Starts for Jolene\_58:

(6, 39416), (7, 39470), (9, 39548), (11, 39557), (12, 39566), (Start: 26 @39818 has 23 MA's), (Start: 29 @39824 has 33 MA's), (35, 39872), (54, 40286), (56, 40331), (60, 40400), (67, 40544), (69, 40604),

Gene: Jolie2\_57 Start: 40488, Stop: 41270, Start Num: 32

Candidate Starts for Jolie2\_57:

(1, 39891), (2, 39897), (4, 39987), (5, 39996), (8, 40119), (16, 40284), (17, 40305), (20, 40380), (Start: 32 @40488 has 3 MA's), (40, 40605), (43, 40728), (45, 40755), (48, 40779), (59, 41007), (60, 41013), (64, 41091),

Gene: Jonghyun\_56 Start: 39423, Stop: 40214, Start Num: 29

Candidate Starts for Jonghyun\_56:

(3, 38874), (9, 39147), (11, 39156), (12, 39165), (Start: 26 @39417 has 23 MA's), (Start: 29 @39423 has 33 MA's), (35, 39471), (54, 39885), (56, 39930), (60, 39999), (67, 40143), (69, 40203),

Gene: JorRay\_59 Start: 39516, Stop: 40211, Start Num: 38

Candidate Starts for JorRay\_59:

(31, 39441), (34, 39462), (Start: 38 @39516 has 3 MA's), (54, 39882), (56, 39927), (60, 39996), (67, 40140), (69, 40200),

Gene: Juliette\_92 Start: 54447, Stop: 55226, Start Num: 25

Candidate Starts for Juliette\_92:

(Start: 25 @54447 has 11 MA's), (Start: 29 @54456 has 33 MA's), (33, 54489), (36, 54522), (42, 54645), (48, 54765), (51, 54798), (52, 54804), (54, 54882), (56, 54924), (59, 54987), (60, 54993), (61, 55038), (65, 55086),

Gene: Kareem\_57 Start: 38969, Stop: 39766, Start Num: 26

Candidate Starts for Kareem\_57:

(3, 38426), (9, 38699), (11, 38708), (12, 38717), (Start: 26 @38969 has 23 MA's), (Start: 29 @38975 has 33 MA's), (35, 39023), (54, 39437), (56, 39482), (60, 39551), (67, 39695), (69, 39755),

Gene: Kasen3\_57 Start: 38961, Stop: 39755, Start Num: 29

Candidate Starts for Kasen3\_57:

(3, 38412), (9, 38685), (11, 38694), (12, 38703), (Start: 26 @38955 has 23 MA's), (Start: 29 @38961 has 33 MA's), (35, 39009), (54, 39423), (56, 39468), (60, 39537), (67, 39684), (69, 39744),

Gene: Kraw\_91 Start: 54162, Stop: 54941, Start Num: 25

Candidate Starts for Kraw\_91:

(Start: 25 @54162 has 11 MA's), (Start: 29 @54171 has 33 MA's), (33, 54204), (36, 54237), (42, 54360), (48, 54480), (51, 54513), (52, 54519), (53, 54570), (54, 54597), (56, 54639), (59, 54702), (60, 54708), (61, 54753), (65, 54801),

Gene: Lebo14\_91 Start: 54573, Stop: 55364, Start Num: 29

Candidate Starts for Lebo14\_91:

(Start: 25 @54564 has 11 MA's), (Start: 29 @54573 has 33 MA's), (33, 54606), (36, 54639), (42, 54762), (47, 54876), (51, 54936), (52, 54942), (54, 55020), (56, 55062), (59, 55125), (60, 55131), (61, 55176), (62, 55197), (65, 55224),

Gene: Lemuria\_60 Start: 42095, Stop: 42910, Start Num: 27

Candidate Starts for Lemuria\_60:

(21, 42029), (Start: 27 @42095 has 1 MA's), (35, 42146), (56, 42584), (59, 42647), (60, 42653),

Gene: Liefie\_55 Start: 39086, Stop: 39850, Start Num: 29

Candidate Starts for Liefie\_55:

(3, 38537), (9, 38810), (11, 38819), (12, 38828), (Start: 26 @39080 has 23 MA's), (Start: 29 @39086 has 33 MA's), (35, 39134), (54, 39521), (56, 39566), (60, 39635), (67, 39779), (69, 39839),

Gene: LouisV14\_59 Start: 41234, Stop: 42031, Start Num: 26

Candidate Starts for LouisV14\_59:

(3, 40691), (9, 40964), (11, 40973), (12, 40982), (Start: 26 @41234 has 23 MA's), (Start: 29 @41240 has 33 MA's), (35, 41288), (54, 41702), (56, 41747), (60, 41816), (67, 41960), (69, 42020),

Gene: Malthus\_91 Start: 54156, Stop: 54935, Start Num: 25

Candidate Starts for Malthus\_91:

(Start: 25 @54156 has 11 MA's), (Start: 29 @54165 has 33 MA's), (33, 54198), (36, 54231), (42, 54354), (48, 54474), (51, 54507), (52, 54513), (53, 54564), (54, 54591), (56, 54633), (59, 54696), (60, 54702), (61, 54747), (65, 54795),

Gene: Marmie\_58 Start: 39415, Stop: 40212, Start Num: 26

Candidate Starts for Marmie\_58:

(3, 38872), (9, 39145), (11, 39154), (12, 39163), (Start: 26 @39415 has 23 MA's), (Start: 29 @39421 has 33 MA's), (35, 39469), (54, 39883), (56, 39928), (60, 39997), (67, 40141), (69, 40201),

Gene: Mendokysei\_59 Start: 41092, Stop: 40265, Start Num: 32

Candidate Starts for Mendokysei\_59:

(22, 41170), (Start: 30 @41098 has 1 MA's), (Start: 32 @41092 has 3 MA's), (42, 40930), (44, 40849), (52, 40738), (55, 40642), (56, 40615), (59, 40552), (60, 40546), (68, 40345),

Gene: Mitti\_90 Start: 54306, Stop: 55028, Start Num: 25

Candidate Starts for Mitti\_90:

(Start: 25 @54306 has 11 MA's), (Start: 29 @54315 has 33 MA's), (33, 54348), (36, 54381), (42, 54504), (51, 54600), (52, 54606), (54, 54684), (56, 54726), (59, 54789), (60, 54795), (61, 54840), (62, 54861), (65, 54888),

Gene: Mowgli\_58 Start: 39415, Stop: 40212, Start Num: 26

Candidate Starts for Mowgli\_58:

(3, 38872), (9, 39145), (11, 39154), (12, 39163), (Start: 26 @39415 has 23 MA's), (Start: 29 @39421 has 33 MA's), (35, 39469), (54, 39883), (56, 39928), (60, 39997), (67, 40141), (69, 40201),

Gene: Nairb\_55 Start: 40316, Stop: 39471, Start Num: 30

Candidate Starts for Nairb\_55:

(Start: 23 @40367 has 2 MA's), (Start: 29 @40331 has 33 MA's), (Start: 30 @40316 has 1 MA's), (Start: 32 @40310 has 3 MA's), (41, 40190), (42, 40148), (44, 40067), (49, 40007), (50, 39974), (52, 39953), (55, 39857), (56, 39830), (57, 39788), (59, 39767), (60, 39761), (68, 39560), (70, 39521),

Gene: Nette\_63 Start: 41101, Stop: 40274, Start Num: 32

Candidate Starts for Nette\_63:

(22, 41179), (Start: 30 @41107 has 1 MA's), (Start: 32 @41101 has 3 MA's), (42, 40939), (44, 40858), (52, 40747), (55, 40651), (56, 40624), (59, 40561), (60, 40555), (68, 40354),

Gene: OctaviousRex\_56 Start: 38975, Stop: 39766, Start Num: 29

Candidate Starts for OctaviousRex\_56:

(3, 38426), (9, 38699), (11, 38708), (12, 38717), (Start: 26 @38969 has 23 MA's), (Start: 29 @38975 has 33 MA's), (35, 39023), (54, 39437), (56, 39482), (60, 39551), (67, 39695), (69, 39755),

Gene: Olga\_57 Start: 38975, Stop: 39766, Start Num: 29

Candidate Starts for Olga\_57:

(3, 38426), (9, 38699), (11, 38708), (12, 38717), (Start: 26 @38969 has 23 MA's), (Start: 29 @38975 has 33 MA's), (35, 39023), (54, 39437), (56, 39482), (60, 39551), (67, 39695), (69, 39755),

Gene: OmniCritical\_90 Start: 54317, Stop: 55108, Start Num: 29

Candidate Starts for OmniCritical\_90:

(Start: 25 @54308 has 11 MA's), (Start: 29 @54317 has 33 MA's), (33, 54350), (36, 54383), (42, 54506), (47, 54620), (51, 54680), (52, 54686), (54, 54764), (56, 54806), (59, 54869), (60, 54875), (61, 54920), (65, 54968),

Gene: Peeb\_57 Start: 39360, Stop: 40178, Start Num: 29

Candidate Starts for Peeb\_57:

(Start: 29 @39360 has 33 MA's), (35, 39408), (39, 39489), (45, 39642), (56, 39852), (58, 39897), (59, 39915), (60, 39921), (65, 40002), (66, 40047),

Gene: Periodt\_58 Start: 39807, Stop: 40604, Start Num: 26

Candidate Starts for Periodt\_58:

(3, 39264), (9, 39537), (11, 39546), (12, 39555), (Start: 26 @39807 has 23 MA's), (Start: 29 @39813 has 33 MA's), (35, 39861), (54, 40275), (56, 40320), (60, 40389), (67, 40533), (69, 40593),

Gene: Phish\_57 Start: 39414, Stop: 40211, Start Num: 26

Candidate Starts for Phish\_57:

(9, 39144), (11, 39153), (12, 39162), (Start: 26 @39414 has 23 MA's), (Start: 29 @39420 has 33 MA's), (35, 39468), (54, 39882), (56, 39927), (60, 39996), (67, 40140), (69, 40200),

Gene: Phreak\_58 Start: 39414, Stop: 40211, Start Num: 26

Candidate Starts for Phreak\_58:

(3, 38871), (9, 39144), (11, 39153), (12, 39162), (Start: 26 @39414 has 23 MA's), (Start: 29 @39420 has 33 MA's), (35, 39468), (54, 39882), (56, 39927), (60, 39996), (67, 40140), (69, 40200),

Gene: PinkYoshi\_57 Start: 38966, Stop: 39757, Start Num: 29

Candidate Starts for PinkYoshi\_57:

(3, 38417), (9, 38690), (11, 38699), (12, 38708), (Start: 26 @38960 has 23 MA's), (Start: 29 @38966 has 33 MA's), (35, 39014), (54, 39428), (56, 39473), (60, 39542), (67, 39686), (69, 39746),

Gene: Plagueis\_58 Start: 39235, Stop: 40032, Start Num: 26

Candidate Starts for Plagueis\_58:

(3, 38692), (9, 38965), (11, 38974), (12, 38983), (Start: 26 @39235 has 23 MA's), (Start: 29 @39241 has 33 MA's), (35, 39289), (54, 39703), (56, 39748), (60, 39817), (67, 39961), (69, 40021),

Gene: Rabbs\_59 Start: 39343, Stop: 40155, Start Num: 28

Candidate Starts for Rabbs\_59:

(10, 39073), (11, 39079), (12, 39088), (13, 39109), (14, 39118), (15, 39127), (19, 39241), (Start: 28 @39343 has 4 MA's), (35, 39391), (58, 39874), (60, 39898), (65, 39979),

Gene: Rem711\_8 Start: 4757, Stop: 3960, Start Num: 24

Candidate Starts for Rem711\_8:

(18, 4892), (Start: 24 @4757 has 1 MA's), (42, 4544), (45, 4454), (46, 4451), (56, 4247), (60, 4178), (69, 3974),

Gene: Remy19\_58 Start: 39414, Stop: 40211, Start Num: 26

Candidate Starts for Remy19\_58:

(9, 39144), (11, 39153), (12, 39162), (Start: 26 @39414 has 23 MA's), (Start: 29 @39420 has 33 MA's), (35, 39468), (54, 39882), (56, 39927), (60, 39996), (67, 40140), (69, 40200),

Gene: Renaissance\_57 Start: 38969, Stop: 39766, Start Num: 26

Candidate Starts for Renaissance\_57:

(3, 38426), (9, 38699), (11, 38708), (12, 38717), (Start: 26 @38969 has 23 MA's), (Start: 29 @38975 has 33 MA's), (35, 39023), (54, 39437), (56, 39482), (60, 39551), (67, 39695), (69, 39755),

Gene: RonRayGun\_56 Start: 40571, Stop: 39675, Start Num: 23

Candidate Starts for RonRayGun\_56:

(Start: 23 @40571 has 2 MA's), (Start: 29 @40535 has 33 MA's), (Start: 30 @40520 has 1 MA's), (Start: 32 @40514 has 3 MA's), (41, 40394), (42, 40352), (44, 40271), (49, 40211), (50, 40178), (52, 40157), (55, 40061), (56, 40034), (57, 39992), (59, 39971), (60, 39965), (68, 39764), (70, 39725),

Gene: Ruthiejr\_92 Start: 54201, Stop: 55001, Start Num: 25

Candidate Starts for Ruthiejr\_92:

(Start: 25 @54201 has 11 MA's), (Start: 29 @54210 has 33 MA's), (33, 54243), (36, 54276), (42, 54399), (47, 54513), (51, 54573), (52, 54579), (54, 54657), (56, 54699), (59, 54762), (60, 54768), (61, 54813), (65, 54861),

Gene: SamScheppers\_89 Start: 54686, Stop: 55486, Start Num: 25

Candidate Starts for SamScheppers\_89:

(Start: 25 @54686 has 11 MA's), (Start: 29 @54695 has 33 MA's), (33, 54728), (36, 54761), (42, 54884), (47, 54998), (51, 55058), (52, 55064), (54, 55142), (56, 55184), (59, 55247), (60, 55253), (61, 55298), (62, 55319), (65, 55346),

Gene: Schiebel\_56 Start: 38960, Stop: 39751, Start Num: 29

Candidate Starts for Schiebel\_56:

(3, 38411), (9, 38684), (11, 38693), (12, 38702), (Start: 26 @38954 has 23 MA's), (Start: 29 @38960 has 33 MA's), (35, 39008), (54, 39422), (56, 39467), (60, 39536), (67, 39680), (69, 39740),

Gene: ShaboiShabazz\_57 Start: 39420, Stop: 40211, Start Num: 29

Candidate Starts for ShaboiShabazz\_57:

(9, 39144), (11, 39153), (12, 39162), (Start: 26 @39414 has 23 MA's), (Start: 29 @39420 has 33 MA's), (35, 39468), (54, 39882), (56, 39927), (60, 39996), (67, 40140), (69, 40200),

Gene: Sizemore\_57 Start: 38961, Stop: 39755, Start Num: 29

Candidate Starts for Sizemore\_57:

(3, 38412), (9, 38685), (11, 38694), (12, 38703), (Start: 26 @38955 has 23 MA's), (Start: 29 @38961 has 33 MA's), (35, 39009), (54, 39423), (56, 39468), (60, 39537), (67, 39684), (69, 39744),

Gene: Slarp\_88 Start: 53589, Stop: 54389, Start Num: 25

Candidate Starts for Slarp\_88:

(Start: 25 @53589 has 11 MA's), (Start: 29 @53598 has 33 MA's), (33, 53631), (36, 53664), (42, 53787), (47, 53901), (51, 53961), (52, 53967), (54, 54045), (56, 54087), (59, 54150), (60, 54156), (61, 54201), (62, 54222), (65, 54249),

Gene: Sneeze\_58 Start: 39342, Stop: 40154, Start Num: 28

Candidate Starts for Sneeze\_58:

(10, 39072), (11, 39078), (12, 39087), (13, 39108), (14, 39117), (15, 39126), (19, 39240), (Start: 28 @39342 has 4 MA's), (35, 39390), (58, 39873), (60, 39897), (65, 39978),

Gene: Sweets\_56 Start: 38970, Stop: 39761, Start Num: 29

Candidate Starts for Sweets\_56:

(3, 38421), (9, 38694), (11, 38703), (12, 38712), (Start: 26 @38964 has 23 MA's), (Start: 29 @38970 has 33 MA's), (35, 39018), (54, 39432), (56, 39477), (60, 39546), (67, 39690), (69, 39750),

Gene: Taheera\_54 Start: 38240, Stop: 39052, Start Num: 28

Candidate Starts for Taheera\_54:

(10, 37970), (11, 37976), (12, 37985), (13, 38006), (14, 38015), (15, 38024), (19, 38138), (Start: 28 @38240 has 4 MA's), (35, 38288), (56, 38726), (58, 38771), (60, 38795), (65, 38876),

Gene: Taquito\_90 Start: 54661, Stop: 55455, Start Num: 29

Candidate Starts for Taquito\_90:

(Start: 25 @54652 has 11 MA's), (Start: 29 @54661 has 33 MA's), (33, 54694), (36, 54727), (37, 54751), (42, 54850), (47, 54967), (51, 55027), (52, 55033), (54, 55111), (56, 55153), (59, 55216), (60, 55222), (61, 55267), (65, 55315),

Gene: Terror\_54 Start: 38240, Stop: 39052, Start Num: 28

Candidate Starts for Terror\_54:

(10, 37970), (11, 37976), (12, 37985), (13, 38006), (14, 38015), (15, 38024), (19, 38138), (Start: 28 @38240 has 4 MA's), (35, 38288), (56, 38726), (58, 38771), (60, 38795), (65, 38876),

Gene: TinaBug\_56 Start: 39968, Stop: 40759, Start Num: 29

Candidate Starts for TinaBug\_56:

(3, 39419), (9, 39692), (11, 39701), (12, 39710), (Start: 26 @39962 has 23 MA's), (Start: 29 @39968 has 33 MA's), (35, 40016), (54, 40430), (56, 40475), (60, 40544), (67, 40688), (69, 40748),

Gene: TomBrady\_58 Start: 39421, Stop: 40212, Start Num: 29

Candidate Starts for TomBrady\_58:

(9, 39145), (11, 39154), (12, 39163), (Start: 26 @39415 has 23 MA's), (Start: 29 @39421 has 33 MA's), (35, 39469), (54, 39883), (56, 39928), (60, 39997), (67, 40141), (69, 40201),

Gene: Wendigo\_55 Start: 38975, Stop: 39766, Start Num: 29

Candidate Starts for Wendigo\_55:

(3, 38426), (9, 38699), (11, 38708), (12, 38717), (Start: 26 @38969 has 23 MA's), (Start: 29 @38975 has 33 MA's), (35, 39023), (54, 39437), (56, 39482), (60, 39551), (67, 39695), (69, 39755),

Gene: Whitty\_55 Start: 40368, Stop: 39472, Start Num: 23

Candidate Starts for Whitty\_55:

(Start: 23 @40368 has 2 MA's), (Start: 29 @40332 has 33 MA's), (Start: 30 @40317 has 1 MA's), (Start: 32 @40311 has 3 MA's), (41, 40191), (42, 40149), (44, 40068), (49, 40008), (50, 39975), (52, 39954), (55, 39858), (56, 39831), (57, 39789), (59, 39768), (60, 39762), (68, 39561), (70, 39522),

Gene: Wintermute\_90 Start: 54390, Stop: 55190, Start Num: 25

Candidate Starts for Wintermute\_90:

(Start: 25 @54390 has 11 MA's), (Start: 29 @54399 has 33 MA's), (33, 54432), (36, 54465), (42, 54588), (47, 54702), (51, 54762), (52, 54768), (54, 54846), (56, 54888), (59, 54951), (60, 54957), (61, 55002), (62, 55023), (65, 55050),

Gene: Y10\_86 Start: 54343, Stop: 55134, Start Num: 29

Candidate Starts for Y10\_86:

(Start: 25 @54334 has 11 MA's), (Start: 29 @54343 has 33 MA's), (33, 54376), (36, 54409), (42, 54532), (47, 54646), (51, 54706), (52, 54712), (54, 54790), (56, 54832), (59, 54895), (60, 54901), (61, 54946), (65, 54994),

Gene: Y2\_86 Start: 54343, Stop: 55134, Start Num: 29

Candidate Starts for Y2\_86:

(Start: 25 @54334 has 11 MA's), (Start: 29 @54343 has 33 MA's), (33, 54376), (36, 54409), (42, 54532), (47, 54646), (51, 54706), (52, 54712), (54, 54790), (56, 54832), (59, 54895), (60, 54901), (61, 54946), (65, 54994),

Gene: ZoMa\_55 Start: 38969, Stop: 39766, Start Num: 26

Candidate Starts for ZoMa\_55:

(3, 38426), (9, 38699), (11, 38708), (12, 38717), (Start: 26 @38969 has 23 MA's), (Start: 29 @38975 has 33 MA's), (35, 39023), (54, 39437), (56, 39482), (60, 39551), (67, 39695), (69, 39755),

Gene: Zombie\_58 Start: 39516, Stop: 40211, Start Num: 38

Candidate Starts for Zombie\_58:

(31, 39441), (34, 39462), (Start: 38 @39516 has 3 MA's), (54, 39882), (56, 39927), (60, 39996), (67, 40140), (69, 40200),