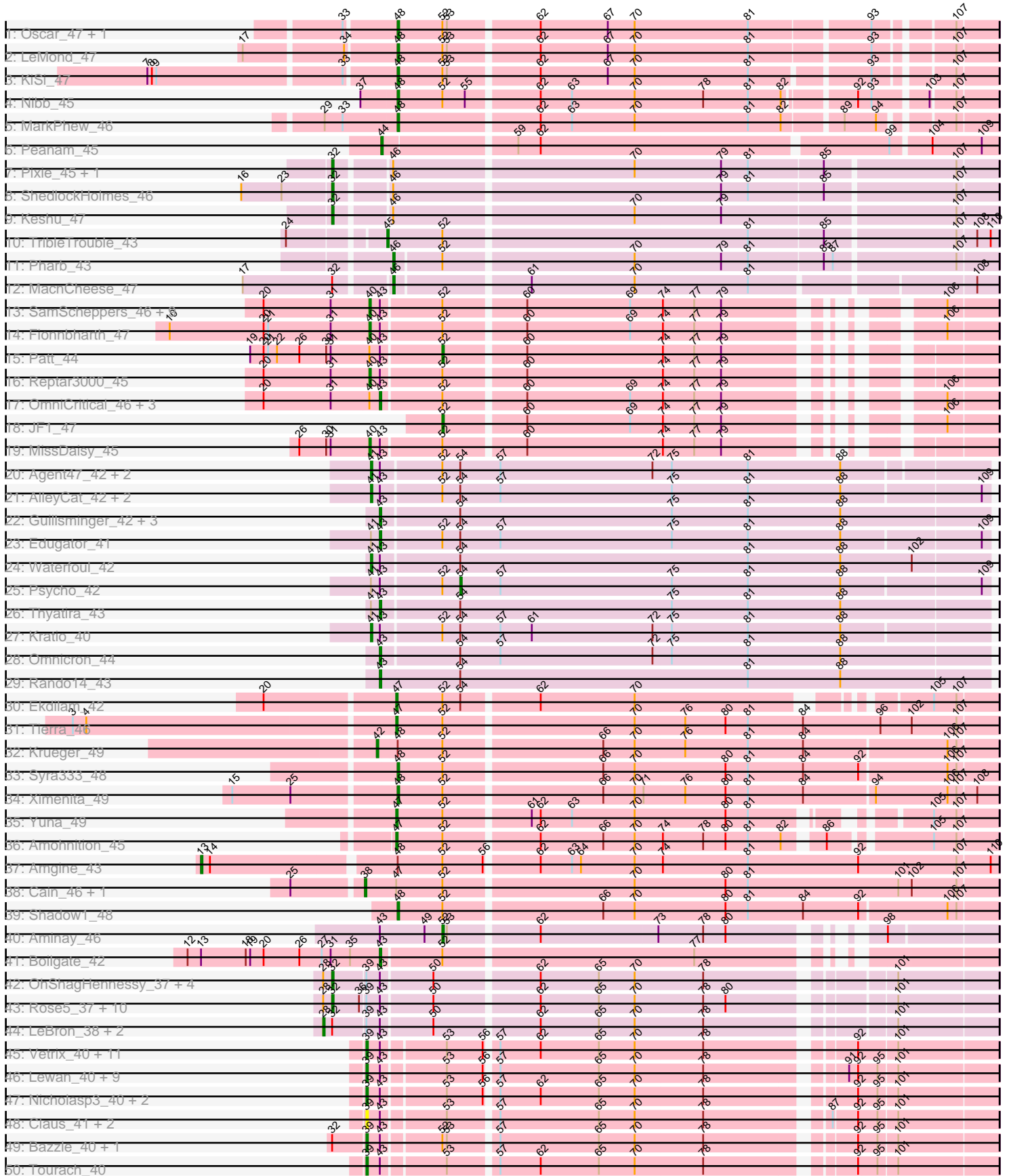
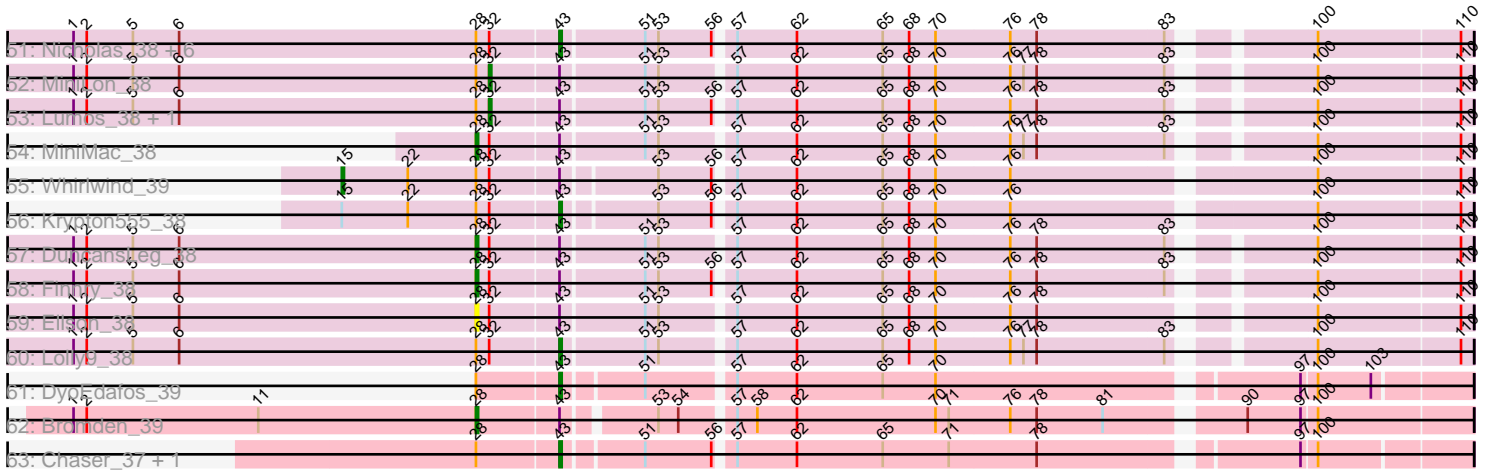


Pham 171278



# Pham 171278



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 171278 Report

This analysis was run 07/10/24 on database version 566.

Pham number 171278 has 134 members, 8 are drafts.

Phages represented in each track:

- Track 1 : Oscar\_47, Scarlett\_47
- Track 2 : LeMond\_47
- Track 3 : KiSi\_47
- Track 4 : Nibb\_45
- Track 5 : MarkPhew\_46
- Track 6 : Peanam\_45
- Track 7 : Pixie\_45, TBond007\_45
- Track 8 : ShedlockHolmes\_46
- Track 9 : Keshu\_47
- Track 10 : TribbleTrouble\_43
- Track 11 : Pharb\_43
- Track 12 : MacnCheese\_47
- Track 13 : SamScheppers\_46, Chancellor\_47, Juliette\_49, Eponine\_49, Slarp\_47, Wintermute\_47, Cheetobro\_47, Malthus\_48, Mitti\_47, Ruthiejr\_48
- Track 14 : Fionnbharth\_47
- Track 15 : Patt\_44
- Track 16 : Reptar3000\_45
- Track 17 : OmniCritical\_46, Taquito\_47, Y10\_46, Y2\_46
- Track 18 : JF1\_47
- Track 19 : MissDaisy\_45
- Track 20 : Agent47\_42, Collard\_41, InvictusManeo\_41
- Track 21 : AlleyCat\_42, Larva\_42, Dadosky\_42
- Track 22 : Guillsminger\_42, Gengar\_41, OkiRoe\_41, Paola\_41
- Track 23 : Edugator\_41
- Track 24 : Waterfoul\_42
- Track 25 : Psycho\_42
- Track 26 : Thyatira\_43
- Track 27 : Kratio\_40
- Track 28 : Omnicron\_44
- Track 29 : Rando14\_43
- Track 30 : Ekdilam\_42
- Track 31 : Tierra\_46
- Track 32 : Krueger\_49
- Track 33 : Syra333\_48
- Track 34 : Ximenita\_49
- Track 35 : Yuna\_49
- Track 36 : Amohnition\_45

- Track 37 : Amgine\_43
- Track 38 : Cain\_46, Bryler\_46
- Track 39 : Shadow1\_48
- Track 40 : Aminay\_46
- Track 41 : Boilgate\_42
- Track 42 : OhShagHennessy\_37, Wamburgrxpress\_38, Enceladus\_37, Appletree2\_37, DirkDirk\_37
- Track 43 : Rose5\_37, Calm\_38, Tyson\_37, CicholasNage\_38, Halena\_37, Wyatt2\_38, MAckerman\_37, Acquire49\_38, Zaria\_38, AvadaKedavra\_38, Silverleaf\_37
- Track 44 : LeBron\_38, UPIE\_38, JoeDirt\_37
- Track 45 : Vetrix\_40, Winky\_40, Breezona\_40, Gabriela\_40, Rumpelstiltskin\_40, BobsGarage\_40, Netyap\_40, LilDestine\_40, BigCheese\_40, Faith1\_40, Miley16\_40, DrSeegs\_40
- Track 46 : Lewan\_40, GuuelaD\_40, Kahlid\_40, Hafay\_40, Crossroads\_40, Loadrie\_40, Wilder\_40, MkaliMitinis3\_40, Wigglewiggle\_40, Zakai\_40
- Track 47 : Nicholasp3\_40, Finemlucis\_40, Gardann\_40
- Track 48 : Claus\_41, Baoshan\_39, ZhongYanYuan\_39
- Track 49 : Bazzle\_40, Archie\_40
- Track 50 : Tourach\_40
- Track 51 : Nicholas\_38, Jubie\_38, Snenia\_38, Bellis\_38, Moostard\_38, Clautastrophe\_38, MsGreen\_38
- Track 52 : MiniLon\_38
- Track 53 : Lumos\_38, Kingsolomon\_38
- Track 54 : MiniMac\_38
- Track 55 : Whirlwind\_39
- Track 56 : Krypton555\_38
- Track 57 : DuncansLeg\_38
- Track 58 : Finnry\_38
- Track 59 : Ellson\_38
- Track 60 : Lolly9\_38
- Track 61 : DyoEdafos\_39
- Track 62 : Bromden\_39
- Track 63 : Chaser\_37, Douge\_37

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

The start number called the most often in the published annotations is 39, it was called in 27 of the 126 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Archie\_40, Baoshan\_39, Bazzle\_40, BigCheese\_40, BobsGarage\_40, Breezona\_40, Claus\_41, Crossroads\_40, DrSeegs\_40, Faith1\_40, Finemlucis\_40, Gabriela\_40, Gardann\_40, GuuelaD\_40, Hafay\_40, Kahlid\_40, Lewan\_40, LilDestine\_40, Loadrie\_40, Miley16\_40, MkaliMitinis3\_40, Netyap\_40, Nicholasp3\_40, Rumpelstiltskin\_40, Tourach\_40, Vetrix\_40, Wigglewiggle\_40, Wilder\_40, Winky\_40, Zakai\_40, ZhongYanYuan\_39,

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

• Acquire49\_38, Appletree2\_37, AvadaKedavra\_38, Calm\_38, CicholasNage\_38, DirkDirk\_37, Enceladus\_37, Halena\_37, JoeDirt\_37, LeBron\_38, MAckerman\_37, OhShagHennessy\_37, Rose5\_37, Silverleaf\_37, Tyson\_37, UPIE\_38, Wamburgxpress\_38, Wyatt2\_38, Zaria\_38,

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

• Agent47\_42, AlleyCat\_42, Amgine\_43, Aminay\_46, Amohnition\_45, Bellis\_38, Boilgate\_42, Bromden\_39, Bryler\_46, Cain\_46, Chancellor\_47, Chaser\_37, Cheetobro\_47, Clautastrophe\_38, Collard\_41, Dadosky\_42, Douge\_37, DuncansLeg\_38, DyoEdafos\_39, Edugator\_41, Ekdilam\_42, Ellson\_38, Eponine\_49, Finnry\_38, Fionnbharth\_47, Gengar\_41, Guillsminger\_42, InvictusManeo\_41, JF1\_47, Jubie\_38, Juliette\_49, Keshu\_47, KiSi\_47, Kingsolomon\_38, Kratio\_40, Krueger\_49, Krypton555\_38, Larva\_42, LeMond\_47, Lolly9\_38, Lumos\_38, MacnCheese\_47, Malthus\_48, MarkPhew\_46, MiniLon\_38, MiniMac\_38, MissDaisy\_45, Mitti\_47, Moostard\_38, MsGreen\_38, Nibb\_45, Nicholas\_38, OkiRoe\_41, OmniCritical\_46, Omnicron\_44, Oscar\_47, Paola\_41, Patt\_44, Peanam\_45, Pharb\_43, Pixie\_45, Psycho\_42, Rando14\_43, Reptar3000\_45, Ruthiejr\_48, SamScheppers\_46, Scarlett\_47, Shadow1\_48, ShedlockHolmes\_46, Slarp\_47, Snenia\_38, Syra333\_48, TBond007\_45, Taquito\_47, Thyatira\_43, Tierra\_46, TripleTrouble\_43, Waterfoul\_42, Whirlwind\_39, Wintermute\_47, Ximenita\_49, Y10\_46, Y2\_46, Yuna\_49,

### Summary by start number:

Start 13:

- Found in 2 of 134 ( 1.5% ) of genes in pham
- Manual Annotations of this start: 1 of 126
- Called 50.0% of time when present
- Phage (with cluster) where this start called: Amgine\_43 (K6),

Start 15:

- Found in 3 of 134 ( 2.2% ) of genes in pham
- Manual Annotations of this start: 1 of 126
- Called 33.3% of time when present
- Phage (with cluster) where this start called: Whirlwind\_39 (L3),

Start 28:

- Found in 40 of 134 ( 29.9% ) of genes in pham
- Manual Annotations of this start: 7 of 126
- Called 20.0% of time when present
- Phage (with cluster) where this start called: Bromden\_39 (L4), DuncansLeg\_38 (L3), Ellson\_38 (L3), Finnry\_38 (L3), JoeDirt\_37 (L1), LeBron\_38 (L1), MiniMac\_38 (L3), UPIE\_38 (L1),

Start 32:

- Found in 43 of 134 ( 32.1% ) of genes in pham
- Manual Annotations of this start: 22 of 126
- Called 53.5% of time when present
- Phage (with cluster) where this start called: Acquire49\_38 (L1), Appletree2\_37 (L1), AvadaKedavra\_38 (L1), Calm\_38 (L1), CicholasNage\_38 (L1), DirkDirk\_37 (L1), Enceladus\_37 (L1), Halena\_37 (L1), Keshu\_47 (K3), Kingsolomon\_38 (L3), Lumos\_38 (L3), MAckerman\_37 (L1), MiniLon\_38 (L3), OhShagHennessy\_37 (L1), Pixie\_45 (K3), Rose5\_37 (L1), ShedlockHolmes\_46 (K3), Silverleaf\_37 (L1),

TBond007\_45 (K3), Tyson\_37 (L1), Wamburgexpress\_38 (L1), Wyatt2\_38 (L1), Zaria\_38 (L1),

Start 38:

- Found in 2 of 134 ( 1.5% ) of genes in pham
- Manual Annotations of this start: 2 of 126
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Bryler\_46 (K6), Cain\_46 (K6),

Start 39:

- Found in 50 of 134 ( 37.3% ) of genes in pham
- Manual Annotations of this start: 27 of 126
- Called 62.0% of time when present
- Phage (with cluster) where this start called: Archie\_40 (L2), Baoshan\_39 (L2), Bazzle\_40 (L2), BigCheese\_40 (L2), BobsGarage\_40 (L2), Breezona\_40 (L2), Claus\_41 (L2), Crossroads\_40 (L2), DrSeegs\_40 (L2), Faith1\_40 (L2), Finemlucis\_40 (L2), Gabriela\_40 (L2), Gardann\_40 (L2), GuuelaD\_40 (L2), Hafay\_40 (L2), Kahlid\_40 (L2), Lewan\_40 (L2), LilDestine\_40 (L2), Loadrie\_40 (L2), Miley16\_40 (L2), MkaliMitinis3\_40 (L2), Netyap\_40 (L2), Nicholasp3\_40 (L2), Rumpelstiltskin\_40 (L2), Tourach\_40 (L2), Vetrix\_40 (L2), Wigglewiggle\_40 (L2), Wilder\_40 (L2), Winky\_40 (L2), Zakai\_40 (L2), ZhongYanYuan\_39 (L2),

Start 40:

- Found in 18 of 134 ( 13.4% ) of genes in pham
- Manual Annotations of this start: 13 of 126
- Called 72.2% of time when present
- Phage (with cluster) where this start called: Chancellor\_47 (K4), Cheetobro\_47 (K4), Eponine\_49 (K4), Fionnbharth\_47 (K4), Juliette\_49 (K4), Malthus\_48 (K4), MissDaisy\_45 (K4), Mitti\_47 (K4), Reptar3000\_45 (K4), Ruthiejr\_48 (K4), SamScheppers\_46 (K4), Slarp\_47 (K4), Wintermute\_47 (K4),

Start 41:

- Found in 11 of 134 ( 8.2% ) of genes in pham
- Manual Annotations of this start: 8 of 126
- Called 72.7% of time when present
- Phage (with cluster) where this start called: Agent47\_42 (K5), AlleyCat\_42 (K5), Collard\_41 (K5), Dadosky\_42 (K5), InvictusManeo\_41 (K5), Kratio\_40 (K5), Larva\_42 (K5), Waterfoul\_42 (K5),

Start 42:

- Found in 1 of 134 ( 0.7% ) of genes in pham
- Manual Annotations of this start: 1 of 126
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Krueger\_49 (K6),

Start 43:

- Found in 108 of 134 ( 80.6% ) of genes in pham
- Manual Annotations of this start: 23 of 126
- Called 23.1% of time when present
- Phage (with cluster) where this start called: Bellis\_38 (L3), Boilgate\_42 (K8), Chaser\_37 (L4), Clautastrophe\_38 (L3), Douge\_37 (L4), DyoEdafos\_39 (L4), Edugator\_41 (K5), Gengar\_41 (K5), Guillsminger\_42 (K5), Jubie\_38 (L3), Krypton555\_38 (L3), Lolly9\_38 (L3), Moostard\_38 (L3), MsGreen\_38 (L3),

Nicholas\_38 (L3), OkiRoe\_41 (K5), OmniCritical\_46 (K4), Omnicron\_44 (K5), Paola\_41 (K5), Rando14\_43 (K5), Snenia\_38 (L3), Taquito\_47 (K4), Thyatira\_43 (K5), Y10\_46 (K4), Y2\_46 (K4),

Start 44:

- Found in 1 of 134 ( 0.7% ) of genes in pham
- Manual Annotations of this start: 1 of 126
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Peanam\_45 (K1),

Start 45:

- Found in 1 of 134 ( 0.7% ) of genes in pham
- Manual Annotations of this start: 1 of 126
- Called 100.0% of time when present
- Phage (with cluster) where this start called: TripleTrouble\_43 (K3),

Start 46:

- Found in 6 of 134 ( 4.5% ) of genes in pham
- Manual Annotations of this start: 2 of 126
- Called 33.3% of time when present
- Phage (with cluster) where this start called: MacnCheese\_47 (K3), Pharb\_43 (K3),

Start 47:

- Found in 6 of 134 ( 4.5% ) of genes in pham
- Manual Annotations of this start: 4 of 126
- Called 66.7% of time when present
- Phage (with cluster) where this start called: Amohnition\_45 (K6), Ekdilam\_42 (K6), Tierra\_46 (K6), Yuna\_49 (K6),

Start 48:

- Found in 11 of 134 ( 8.2% ) of genes in pham
- Manual Annotations of this start: 9 of 126
- Called 81.8% of time when present
- Phage (with cluster) where this start called: KiSi\_47 (K1), LeMond\_47 (K1), MarkPhew\_46 (K1), Nibb\_45 (K1), Oscar\_47 (K1), Scarlett\_47 (K1), Shadow1\_48 (K6), Syra333\_48 (K6), Ximenita\_49 (K6),

Start 52:

- Found in 50 of 134 ( 37.3% ) of genes in pham
- Manual Annotations of this start: 3 of 126
- Called 6.0% of time when present
- Phage (with cluster) where this start called: Aminay\_46 (K7), JF1\_47 (K4), Patt\_44 (K4),

Start 54:

- Found in 19 of 134 ( 14.2% ) of genes in pham
- Manual Annotations of this start: 1 of 126
- Called 5.3% of time when present
- Phage (with cluster) where this start called: Psycho\_42 (K5),

**Summary by clusters:**

There are 11 clusters represented in this pham: L1, K1, K3, L4, L2, K6, K5, K4, K7, K8, L3,

Info for manual annotations of cluster K1:

- Start number 44 was manually annotated 1 time for cluster K1.
- Start number 48 was manually annotated 6 times for cluster K1.

Info for manual annotations of cluster K3:

- Start number 32 was manually annotated 4 times for cluster K3.
- Start number 45 was manually annotated 1 time for cluster K3.
- Start number 46 was manually annotated 2 times for cluster K3.

Info for manual annotations of cluster K4:

- Start number 40 was manually annotated 13 times for cluster K4.
- Start number 43 was manually annotated 4 times for cluster K4.
- Start number 52 was manually annotated 2 times for cluster K4.

Info for manual annotations of cluster K5:

- Start number 41 was manually annotated 8 times for cluster K5.
- Start number 43 was manually annotated 8 times for cluster K5.
- Start number 54 was manually annotated 1 time for cluster K5.

Info for manual annotations of cluster K6:

- Start number 13 was manually annotated 1 time for cluster K6.
- Start number 38 was manually annotated 2 times for cluster K6.
- Start number 42 was manually annotated 1 time for cluster K6.
- Start number 47 was manually annotated 4 times for cluster K6.
- Start number 48 was manually annotated 3 times for cluster K6.

Info for manual annotations of cluster K7:

- Start number 52 was manually annotated 1 time for cluster K7.

Info for manual annotations of cluster K8:

- Start number 43 was manually annotated 1 time for cluster K8.

Info for manual annotations of cluster L1:

- Start number 28 was manually annotated 3 times for cluster L1.
- Start number 32 was manually annotated 15 times for cluster L1.

Info for manual annotations of cluster L2:

- Start number 39 was manually annotated 27 times for cluster L2.

Info for manual annotations of cluster L3:

- Start number 15 was manually annotated 1 time for cluster L3.
- Start number 28 was manually annotated 3 times for cluster L3.
- Start number 32 was manually annotated 3 times for cluster L3.
- Start number 43 was manually annotated 8 times for cluster L3.

Info for manual annotations of cluster L4:

- Start number 28 was manually annotated 1 time for cluster L4.
- Start number 43 was manually annotated 2 times for cluster L4.



### **Gene Information:**

Gene: Acquire49\_38 Start: 32935, Stop: 32525, Start Num: 32

Candidate Starts for Acquire49\_38:

(Start: 28 @32941 has 7 MA's), (Start: 32 @32935 has 22 MA's), (36, 32917), (Start: 39 @32914 has 27 MA's), (Start: 43 @32905 has 23 MA's), (50, 32872), (62, 32806), (65, 32767), (70, 32743), (78, 32698), (80, 32683), (101, 32590),

Gene: Agent47\_42 Start: 34530, Stop: 34129, Start Num: 41

Candidate Starts for Agent47\_42:

(Start: 41 @34530 has 8 MA's), (Start: 43 @34524 has 23 MA's), (Start: 52 @34485 has 3 MA's), (Start: 54 @34473 has 1 MA's), (57, 34446), (72, 34344), (75, 34332), (81, 34281), (88, 34221),

Gene: AlleyCat\_42 Start: 34384, Stop: 33980, Start Num: 41

Candidate Starts for AlleyCat\_42:

(Start: 41 @34384 has 8 MA's), (Start: 43 @34378 has 23 MA's), (Start: 52 @34339 has 3 MA's), (Start: 54 @34327 has 1 MA's), (57, 34300), (75, 34186), (81, 34135), (88, 34075), (109, 33985),

Gene: Amgine\_43 Start: 36096, Stop: 35581, Start Num: 13

Candidate Starts for Amgine\_43:

(Start: 13 @36096 has 1 MA's), (14, 36090), (Start: 48 @35973 has 9 MA's), (Start: 52 @35943 has 3 MA's), (56, 35916), (62, 35883), (63, 35862), (64, 35856), (70, 35820), (74, 35802), (81, 35745), (92, 35673), (107, 35607), (110, 35586),

Gene: Aminay\_46 Start: 36466, Stop: 36146, Start Num: 52

Candidate Starts for Aminay\_46:

(Start: 43 @36508 has 23 MA's), (49, 36478), (Start: 52 @36466 has 3 MA's), (53, 36463), (62, 36406), (73, 36328), (78, 36298), (80, 36283), (98, 36214),

Gene: Amohnition\_45 Start: 36010, Stop: 35639, Start Num: 47

Candidate Starts for Amohnition\_45:

(Start: 47 @36010 has 4 MA's), (Start: 52 @35980 has 3 MA's), (62, 35920), (66, 35878), (70, 35857), (74, 35839), (78, 35812), (80, 35797), (81, 35782), (82, 35761), (86, 35740), (105, 35680), (107, 35665),

Gene: Appletree2\_37 Start: 32877, Stop: 32467, Start Num: 32

Candidate Starts for Appletree2\_37:

(Start: 28 @32883 has 7 MA's), (Start: 32 @32877 has 22 MA's), (Start: 39 @32856 has 27 MA's), (Start: 43 @32847 has 23 MA's), (50, 32814), (62, 32748), (65, 32709), (70, 32685), (78, 32640), (101, 32532),

Gene: Archie\_40 Start: 34485, Stop: 34096, Start Num: 39

Candidate Starts for Archie\_40:

(Start: 32 @34506 has 22 MA's), (Start: 39 @34485 has 27 MA's), (Start: 43 @34476 has 23 MA's), (Start: 52 @34440 has 3 MA's), (53, 34437), (57, 34407), (65, 34341), (70, 34317), (78, 34272), (92, 34185), (95, 34173), (101, 34161),

Gene: AvadaKedavra\_38 Start: 32944, Stop: 32534, Start Num: 32

Candidate Starts for AvadaKedavra\_38:

(Start: 28 @32950 has 7 MA's), (Start: 32 @32944 has 22 MA's), (36, 32926), (Start: 39 @32923 has 27 MA's), (Start: 43 @32914 has 23 MA's), (50, 32881), (62, 32815), (65, 32776), (70, 32752), (78, 32707), (80, 32692), (101, 32599),

Gene: Baoshan\_39 Start: 34142, Stop: 33753, Start Num: 39

Candidate Starts for Baoshan\_39:

(Start: 39 @34142 has 27 MA's), (Start: 43 @34133 has 23 MA's), (53, 34094), (57, 34064), (65, 33998), (70, 33974), (78, 33929), (87, 33857), (92, 33842), (95, 33830), (101, 33818),

Gene: Bazzle\_40 Start: 34517, Stop: 34128, Start Num: 39

Candidate Starts for Bazzle\_40:

(Start: 32 @34538 has 22 MA's), (Start: 39 @34517 has 27 MA's), (Start: 43 @34508 has 23 MA's), (Start: 52 @34472 has 3 MA's), (53, 34469), (57, 34439), (65, 34373), (70, 34349), (78, 34304), (92, 34217), (95, 34205), (101, 34193),

Gene: Bellis\_38 Start: 34518, Stop: 34135, Start Num: 43

Candidate Starts for Bellis\_38:

(1, 34737), (2, 34731), (5, 34710), (6, 34689), (Start: 28 @34554 has 7 MA's), (Start: 32 @34548 has 22 MA's), (Start: 43 @34518 has 23 MA's), (51, 34482), (53, 34476), (56, 34452), (57, 34446), (62, 34419), (65, 34380), (68, 34368), (70, 34356), (76, 34323), (78, 34311), (83, 34254), (100, 34203), (110, 34140),

Gene: BigCheese\_40 Start: 34280, Stop: 33891, Start Num: 39

Candidate Starts for BigCheese\_40:

(Start: 39 @34280 has 27 MA's), (Start: 43 @34271 has 23 MA's), (53, 34232), (56, 34208), (57, 34202), (62, 34175), (65, 34136), (70, 34112), (78, 34067), (92, 33980), (101, 33956),

Gene: BobsGarage\_40 Start: 34280, Stop: 33891, Start Num: 39

Candidate Starts for BobsGarage\_40:

(Start: 39 @34280 has 27 MA's), (Start: 43 @34271 has 23 MA's), (53, 34232), (56, 34208), (57, 34202), (62, 34175), (65, 34136), (70, 34112), (78, 34067), (92, 33980), (101, 33956),

Gene: Boilgate\_42 Start: 36179, Stop: 35817, Start Num: 43

Candidate Starts for Boilgate\_42:

(12, 36305), (Start: 13 @36296 has 1 MA's), (18, 36266), (19, 36263), (20, 36254), (26, 36230), (27, 36215), (31, 36209), (35, 36197), (Start: 43 @36179 has 23 MA's), (Start: 52 @36140 has 3 MA's), (77, 35978),

Gene: Breezona\_40 Start: 34280, Stop: 33891, Start Num: 39

Candidate Starts for Breezona\_40:

(Start: 39 @34280 has 27 MA's), (Start: 43 @34271 has 23 MA's), (53, 34232), (56, 34208), (57, 34202), (62, 34175), (65, 34136), (70, 34112), (78, 34067), (92, 33980), (101, 33956),

Gene: Bromden\_39 Start: 33770, Stop: 33351, Start Num: 28

Candidate Starts for Bromden\_39:

(1, 33953), (2, 33947), (11, 33869), (Start: 28 @33770 has 7 MA's), (Start: 43 @33734 has 23 MA's), (53, 33698), (Start: 54 @33689 has 1 MA's), (57, 33668), (58, 33659), (62, 33641), (70, 33578), (71, 33572), (76, 33545), (78, 33533), (81, 33503), (90, 33449), (97, 33425), (100, 33419),

Gene: Bryler\_46 Start: 34876, Stop: 34463, Start Num: 38

Candidate Starts for Bryler\_46:

(25, 34921), (Start: 38 @34876 has 2 MA's), (Start: 47 @34855 has 4 MA's), (Start: 52 @34825 has 3 MA's), (70, 34702), (80, 34642), (81, 34627), (101, 34528), (102, 34519), (107, 34489),

Gene: Cain\_46 Start: 34864, Stop: 34451, Start Num: 38

Candidate Starts for Cain\_46:

(25, 34909), (Start: 38 @34864 has 2 MA's), (Start: 47 @34843 has 4 MA's), (Start: 52 @34813 has 3 MA's), (70, 34690), (80, 34630), (81, 34615), (101, 34516), (102, 34507), (107, 34477),

Gene: Calm\_38 Start: 32950, Stop: 32540, Start Num: 32

Candidate Starts for Calm\_38:

(Start: 28 @32956 has 7 MA's), (Start: 32 @32950 has 22 MA's), (36, 32932), (Start: 39 @32929 has 27 MA's), (Start: 43 @32920 has 23 MA's), (50, 32887), (62, 32821), (65, 32782), (70, 32758), (78, 32713), (80, 32698), (101, 32605),

Gene: Chancellor\_47 Start: 36038, Stop: 35679, Start Num: 40

Candidate Starts for Chancellor\_47:

(20, 36107), (31, 36062), (Start: 40 @36038 has 13 MA's), (Start: 43 @36032 has 23 MA's), (Start: 52 @35993 has 3 MA's), (60, 35942), (69, 35873), (74, 35852), (77, 35831), (79, 35813), (106, 35711),

Gene: Chaser\_37 Start: 32998, Stop: 32618, Start Num: 43

Candidate Starts for Chaser\_37:

(Start: 28 @33034 has 7 MA's), (Start: 43 @32998 has 23 MA's), (51, 32965), (56, 32935), (57, 32929), (62, 32902), (65, 32863), (71, 32833), (78, 32794), (97, 32689), (100, 32683),

Gene: Cheetobro\_47 Start: 36035, Stop: 35676, Start Num: 40

Candidate Starts for Cheetobro\_47:

(20, 36104), (31, 36059), (Start: 40 @36035 has 13 MA's), (Start: 43 @36029 has 23 MA's), (Start: 52 @35990 has 3 MA's), (60, 35939), (69, 35870), (74, 35849), (77, 35828), (79, 35810), (106, 35708),

Gene: CicholasNage\_38 Start: 32971, Stop: 32561, Start Num: 32

Candidate Starts for CicholasNage\_38:

(Start: 28 @32977 has 7 MA's), (Start: 32 @32971 has 22 MA's), (36, 32953), (Start: 39 @32950 has 27 MA's), (Start: 43 @32941 has 23 MA's), (50, 32908), (62, 32842), (65, 32803), (70, 32779), (78, 32734), (80, 32719), (101, 32626),

Gene: Claus\_41 Start: 34300, Stop: 33911, Start Num: 39

Candidate Starts for Claus\_41:

(Start: 39 @34300 has 27 MA's), (Start: 43 @34291 has 23 MA's), (53, 34252), (57, 34222), (65, 34156), (70, 34132), (78, 34087), (87, 34015), (92, 34000), (95, 33988), (101, 33976),

Gene: Clautastrophe\_38 Start: 34516, Stop: 34133, Start Num: 43

Candidate Starts for Clautastrophe\_38:

(1, 34735), (2, 34729), (5, 34708), (6, 34687), (Start: 28 @34552 has 7 MA's), (Start: 32 @34546 has 22 MA's), (Start: 43 @34516 has 23 MA's), (51, 34480), (53, 34474), (56, 34450), (57, 34444), (62, 34417), (65, 34378), (68, 34366), (70, 34354), (76, 34321), (78, 34309), (83, 34252), (100, 34201), (110, 34138),

Gene: Collard\_41 Start: 34491, Stop: 34090, Start Num: 41

Candidate Starts for Collard\_41:

(Start: 41 @34491 has 8 MA's), (Start: 43 @34485 has 23 MA's), (Start: 52 @34446 has 3 MA's), (Start: 54 @34434 has 1 MA's), (57, 34407), (72, 34305), (75, 34293), (81, 34242), (88, 34182),

Gene: Crossroads\_40 Start: 34282, Stop: 33893, Start Num: 39

Candidate Starts for Crossroads\_40:

(Start: 39 @34282 has 27 MA's), (Start: 43 @34273 has 23 MA's), (53, 34234), (56, 34210), (57, 34204), (65, 34138), (70, 34114), (78, 34069), (91, 33988), (92, 33982), (95, 33970), (101, 33958),

Gene: Dadosky\_42 Start: 34386, Stop: 33982, Start Num: 41

Candidate Starts for Dadosky\_42:

(Start: 41 @34386 has 8 MA's), (Start: 43 @34380 has 23 MA's), (Start: 52 @34341 has 3 MA's), (Start: 54 @34329 has 1 MA's), (57, 34302), (75, 34188), (81, 34137), (88, 34077), (109, 33987),

Gene: DirkDirk\_37 Start: 32937, Stop: 32527, Start Num: 32

Candidate Starts for DirkDirk\_37:

(Start: 28 @32943 has 7 MA's), (Start: 32 @32937 has 22 MA's), (Start: 39 @32916 has 27 MA's), (Start: 43 @32907 has 23 MA's), (50, 32874), (62, 32808), (65, 32769), (70, 32745), (78, 32700), (101, 32592),

Gene: Douge\_37 Start: 32936, Stop: 32556, Start Num: 43

Candidate Starts for Douge\_37:

(Start: 28 @32972 has 7 MA's), (Start: 43 @32936 has 23 MA's), (51, 32903), (56, 32873), (57, 32867), (62, 32840), (65, 32801), (71, 32771), (78, 32732), (97, 32627), (100, 32621),

Gene: DrSeegs\_40 Start: 34280, Stop: 33891, Start Num: 39

Candidate Starts for DrSeegs\_40:

(Start: 39 @34280 has 27 MA's), (Start: 43 @34271 has 23 MA's), (53, 34232), (56, 34208), (57, 34202), (62, 34175), (65, 34136), (70, 34112), (78, 34067), (92, 33980), (101, 33956),

Gene: DuncansLeg\_38 Start: 34570, Stop: 34151, Start Num: 28

Candidate Starts for DuncansLeg\_38:

(1, 34753), (2, 34747), (5, 34726), (6, 34705), (Start: 28 @34570 has 7 MA's), (Start: 32 @34564 has 22 MA's), (Start: 43 @34534 has 23 MA's), (51, 34498), (53, 34492), (57, 34462), (62, 34435), (65, 34396), (68, 34384), (70, 34372), (76, 34339), (78, 34327), (83, 34270), (100, 34219), (110, 34156),

Gene: DyoEdafos\_39 Start: 33270, Stop: 32890, Start Num: 43

Candidate Starts for DyoEdafos\_39:

(Start: 28 @33306 has 7 MA's), (Start: 43 @33270 has 23 MA's), (51, 33237), (57, 33201), (62, 33174), (65, 33135), (70, 33111), (97, 32961), (100, 32955), (103, 32931),

Gene: Edugator\_41 Start: 34805, Stop: 34407, Start Num: 43

Candidate Starts for Edugator\_41:

(Start: 41 @34811 has 8 MA's), (Start: 43 @34805 has 23 MA's), (Start: 52 @34766 has 3 MA's), (Start: 54 @34754 has 1 MA's), (57, 34727), (75, 34613), (81, 34562), (88, 34502), (109, 34412),

Gene: Ekdilam\_42 Start: 35465, Stop: 35106, Start Num: 47

Candidate Starts for Ekdilam\_42:

(20, 35549), (Start: 47 @35465 has 4 MA's), (Start: 52 @35435 has 3 MA's), (Start: 54 @35423 has 1 MA's), (62, 35375), (70, 35312), (105, 35147), (107, 35132),

Gene: Ellson\_38 Start: 34546, Stop: 34127, Start Num: 28

Candidate Starts for Ellson\_38:

(1, 34729), (2, 34723), (5, 34702), (6, 34681), (Start: 28 @34546 has 7 MA's), (Start: 32 @34540 has 22 MA's), (Start: 43 @34510 has 23 MA's), (51, 34474), (53, 34468), (57, 34438), (62, 34411), (65, 34372), (68, 34360), (70, 34348), (76, 34315), (78, 34303), (100, 34195), (110, 34132),

Gene: Enceladus\_37 Start: 32920, Stop: 32510, Start Num: 32

Candidate Starts for Enceladus\_37:

(Start: 28 @32926 has 7 MA's), (Start: 32 @32920 has 22 MA's), (Start: 39 @32899 has 27 MA's), (Start: 43 @32890 has 23 MA's), (50, 32857), (62, 32791), (65, 32752), (70, 32728), (78, 32683), (101, 32575),

Gene: Eponine\_49 Start: 36791, Stop: 36432, Start Num: 40

Candidate Starts for Eponine\_49:

(20, 36860), (31, 36815), (Start: 40 @36791 has 13 MA's), (Start: 43 @36785 has 23 MA's), (Start: 52 @36746 has 3 MA's), (60, 36695), (69, 36626), (74, 36605), (77, 36584), (79, 36566), (106, 36464),

Gene: Faith1\_40 Start: 34280, Stop: 33891, Start Num: 39

Candidate Starts for Faith1\_40:

(Start: 39 @34280 has 27 MA's), (Start: 43 @34271 has 23 MA's), (53, 34232), (56, 34208), (57, 34202), (62, 34175), (65, 34136), (70, 34112), (78, 34067), (92, 33980), (101, 33956),

Gene: Finemlucis\_40 Start: 34556, Stop: 34167, Start Num: 39

Candidate Starts for Finemlucis\_40:

(Start: 39 @34556 has 27 MA's), (Start: 43 @34547 has 23 MA's), (53, 34508), (56, 34484), (57, 34478), (62, 34451), (65, 34412), (70, 34388), (78, 34343), (92, 34256), (95, 34244), (101, 34232),

Gene: Finnry\_38 Start: 34555, Stop: 34136, Start Num: 28

Candidate Starts for Finnry\_38:

(1, 34738), (2, 34732), (5, 34711), (6, 34690), (Start: 28 @34555 has 7 MA's), (Start: 32 @34549 has 22 MA's), (Start: 43 @34519 has 23 MA's), (51, 34483), (53, 34477), (56, 34453), (57, 34447), (62, 34420), (65, 34381), (68, 34369), (70, 34357), (76, 34324), (78, 34312), (83, 34255), (100, 34204), (110, 34141),

Gene: Fionnbharth\_47 Start: 36189, Stop: 35830, Start Num: 40

Candidate Starts for Fionnbharth\_47:

(10, 36321), (20, 36258), (21, 36255), (31, 36213), (Start: 40 @36189 has 13 MA's), (Start: 43 @36183 has 23 MA's), (Start: 52 @36144 has 3 MA's), (60, 36093), (69, 36024), (74, 36003), (77, 35982), (79, 35964), (106, 35862),

Gene: Gabriela\_40 Start: 34542, Stop: 34153, Start Num: 39

Candidate Starts for Gabriela\_40:

(Start: 39 @34542 has 27 MA's), (Start: 43 @34533 has 23 MA's), (53, 34494), (56, 34470), (57, 34464), (62, 34437), (65, 34398), (70, 34374), (78, 34329), (92, 34242), (101, 34218),

Gene: Gardann\_40 Start: 34281, Stop: 33892, Start Num: 39

Candidate Starts for Gardann\_40:

(Start: 39 @34281 has 27 MA's), (Start: 43 @34272 has 23 MA's), (53, 34233), (56, 34209), (57, 34203), (62, 34176), (65, 34137), (70, 34113), (78, 34068), (92, 33981), (95, 33969), (101, 33957),

Gene: Gengar\_41 Start: 34347, Stop: 33946, Start Num: 43

Candidate Starts for Gengar\_41:

(Start: 43 @34347 has 23 MA's), (Start: 54 @34296 has 1 MA's), (75, 34155), (81, 34104), (88, 34044),

Gene: Guillsminger\_42 Start: 34318, Stop: 33917, Start Num: 43

Candidate Starts for Guillsminger\_42:

(Start: 43 @34318 has 23 MA's), (Start: 54 @34267 has 1 MA's), (75, 34126), (81, 34075), (88, 34015),

Gene: GuuelaD\_40 Start: 34319, Stop: 33930, Start Num: 39

Candidate Starts for GuuelaD\_40:

(Start: 39 @34319 has 27 MA's), (Start: 43 @34310 has 23 MA's), (53, 34271), (56, 34247), (57, 34241), (65, 34175), (70, 34151), (78, 34106), (91, 34025), (92, 34019), (95, 34007), (101, 33995),

Gene: Hafay\_40 Start: 34314, Stop: 33925, Start Num: 39

Candidate Starts for Hafay\_40:

(Start: 39 @34314 has 27 MA's), (Start: 43 @34305 has 23 MA's), (53, 34266), (56, 34242), (57, 34236), (65, 34170), (70, 34146), (78, 34101), (91, 34020), (92, 34014), (95, 34002), (101, 33990),

Gene: Halena\_37 Start: 32946, Stop: 32536, Start Num: 32

Candidate Starts for Halena\_37:

(Start: 28 @32952 has 7 MA's), (Start: 32 @32946 has 22 MA's), (36, 32928), (Start: 39 @32925 has 27 MA's), (Start: 43 @32916 has 23 MA's), (50, 32883), (62, 32817), (65, 32778), (70, 32754), (78, 32709), (80, 32694), (101, 32601),

Gene: InvictusManeo\_41 Start: 34534, Stop: 34133, Start Num: 41

Candidate Starts for InvictusManeo\_41:

(Start: 41 @34534 has 8 MA's), (Start: 43 @34528 has 23 MA's), (Start: 52 @34489 has 3 MA's), (Start: 54 @34477 has 1 MA's), (57, 34450), (72, 34348), (75, 34336), (81, 34285), (88, 34225),

Gene: JF1\_47 Start: 36061, Stop: 35747, Start Num: 52

Candidate Starts for JF1\_47:

(Start: 52 @36061 has 3 MA's), (60, 36010), (69, 35941), (74, 35920), (77, 35899), (79, 35881), (106, 35779),

Gene: JoeDirt\_37 Start: 32924, Stop: 32508, Start Num: 28

Candidate Starts for JoeDirt\_37:

(Start: 28 @32924 has 7 MA's), (Start: 32 @32918 has 22 MA's), (Start: 39 @32897 has 27 MA's), (Start: 43 @32888 has 23 MA's), (50, 32855), (62, 32789), (65, 32750), (70, 32726), (78, 32681), (101, 32573),

Gene: Jubie\_38 Start: 34517, Stop: 34134, Start Num: 43

Candidate Starts for Jubie\_38:

(1, 34736), (2, 34730), (5, 34709), (6, 34688), (Start: 28 @34553 has 7 MA's), (Start: 32 @34547 has 22 MA's), (Start: 43 @34517 has 23 MA's), (51, 34481), (53, 34475), (56, 34451), (57, 34445), (62, 34418), (65, 34379), (68, 34367), (70, 34355), (76, 34322), (78, 34310), (83, 34253), (100, 34202), (110, 34139),

Gene: Juliette\_49 Start: 36262, Stop: 35903, Start Num: 40

Candidate Starts for Juliette\_49:

(20, 36331), (31, 36286), (Start: 40 @36262 has 13 MA's), (Start: 43 @36256 has 23 MA's), (Start: 52 @36217 has 3 MA's), (60, 36166), (69, 36097), (74, 36076), (77, 36055), (79, 36037), (106, 35935),

Gene: Kahlid\_40 Start: 34286, Stop: 33897, Start Num: 39

Candidate Starts for Kahlid\_40:

(Start: 39 @34286 has 27 MA's), (Start: 43 @34277 has 23 MA's), (53, 34238), (56, 34214), (57, 34208), (65, 34142), (70, 34118), (78, 34073), (91, 33992), (92, 33986), (95, 33974), (101, 33962),

Gene: Keshu\_47 Start: 35704, Stop: 35282, Start Num: 32

Candidate Starts for Keshu\_47:

(Start: 32 @35704 has 22 MA's), (Start: 46 @35671 has 2 MA's), (70, 35515), (79, 35458), (107, 35308),

Gene: KiSi\_47 Start: 36100, Stop: 35729, Start Num: 48

Candidate Starts for KiSi\_47:

(7, 36259), (8, 36256), (9, 36253), (33, 36133), (Start: 48 @36100 has 9 MA's), (Start: 52 @36070 has 3 MA's), (53, 36067), (62, 36010), (67, 35965), (70, 35947), (81, 35872), (93, 35800), (107, 35755),

Gene: Kingsolomon\_38 Start: 34546, Stop: 34133, Start Num: 32

Candidate Starts for Kingsolomon\_38:

(1, 34735), (2, 34729), (5, 34708), (6, 34687), (Start: 28 @34552 has 7 MA's), (Start: 32 @34546 has 22 MA's), (Start: 43 @34516 has 23 MA's), (51, 34480), (53, 34474), (56, 34450), (57, 34444), (62, 34417), (65, 34378), (68, 34366), (70, 34354), (76, 34321), (78, 34309), (83, 34252), (100, 34201), (110, 34138),

Gene: Kratio\_40 Start: 34085, Stop: 33681, Start Num: 41

Candidate Starts for Kratio\_40:

(Start: 41 @34085 has 8 MA's), (Start: 43 @34079 has 23 MA's), (Start: 52 @34040 has 3 MA's), (Start: 54 @34028 has 1 MA's), (57, 34001), (61, 33980), (72, 33899), (75, 33887), (81, 33836), (88, 33776),

Gene: Krueger\_49 Start: 35862, Stop: 35461, Start Num: 42

Candidate Starts for Krueger\_49:

(Start: 42 @35862 has 1 MA's), (Start: 48 @35850 has 9 MA's), (Start: 52 @35820 has 3 MA's), (66, 35718), (70, 35697), (76, 35664), (81, 35622), (84, 35586), (106, 35493), (107, 35487),

Gene: Krypton555\_38 Start: 34434, Stop: 34048, Start Num: 43

Candidate Starts for Krypton555\_38:

(Start: 15 @34530 has 1 MA's), (22, 34500), (Start: 28 @34470 has 7 MA's), (Start: 32 @34464 has 22 MA's), (Start: 43 @34434 has 23 MA's), (53, 34395), (56, 34371), (57, 34365), (62, 34338), (65, 34299), (68, 34287), (70, 34275), (76, 34242), (100, 34116), (110, 34053),

Gene: Larva\_42 Start: 34253, Stop: 33849, Start Num: 41

Candidate Starts for Larva\_42:

(Start: 41 @34253 has 8 MA's), (Start: 43 @34247 has 23 MA's), (Start: 52 @34208 has 3 MA's), (Start: 54 @34196 has 1 MA's), (57, 34169), (75, 34055), (81, 34004), (88, 33944), (109, 33854),

Gene: LeBron\_38 Start: 32968, Stop: 32552, Start Num: 28

Candidate Starts for LeBron\_38:

(Start: 28 @32968 has 7 MA's), (Start: 32 @32962 has 22 MA's), (Start: 39 @32941 has 27 MA's), (Start: 43 @32932 has 23 MA's), (50, 32899), (62, 32833), (65, 32794), (70, 32770), (78, 32725), (101, 32617),

Gene: LeMond\_47 Start: 36084, Stop: 35710, Start Num: 48

Candidate Starts for LeMond\_47:

(17, 36180), (34, 36117), (Start: 48 @36084 has 9 MA's), (Start: 52 @36054 has 3 MA's), (53, 36051), (62, 35994), (67, 35949), (70, 35931), (81, 35856), (93, 35781), (107, 35736),

Gene: Lewan\_40 Start: 34274, Stop: 33885, Start Num: 39

Candidate Starts for Lewan\_40:

(Start: 39 @34274 has 27 MA's), (Start: 43 @34265 has 23 MA's), (53, 34226), (56, 34202), (57, 34196), (65, 34130), (70, 34106), (78, 34061), (91, 33980), (92, 33974), (95, 33962), (101, 33950),

Gene: LilDestine\_40 Start: 34278, Stop: 33889, Start Num: 39

Candidate Starts for LilDestine\_40:

(Start: 39 @34278 has 27 MA's), (Start: 43 @34269 has 23 MA's), (53, 34230), (56, 34206), (57, 34200), (62, 34173), (65, 34134), (70, 34110), (78, 34065), (92, 33978), (101, 33954),

Gene: Loadrie\_40 Start: 34312, Stop: 33923, Start Num: 39

Candidate Starts for Loadrie\_40:

(Start: 39 @34312 has 27 MA's), (Start: 43 @34303 has 23 MA's), (53, 34264), (56, 34240), (57, 34234), (65, 34168), (70, 34144), (78, 34099), (91, 34018), (92, 34012), (95, 34000), (101, 33988),

Gene: Lolly9\_38 Start: 34324, Stop: 33941, Start Num: 43

Candidate Starts for Lolly9\_38:

(1, 34543), (2, 34537), (5, 34516), (6, 34495), (Start: 28 @34360 has 7 MA's), (Start: 32 @34354 has 22 MA's), (Start: 43 @34324 has 23 MA's), (51, 34288), (53, 34282), (57, 34252), (62, 34225), (65, 34186), (68, 34174), (70, 34162), (76, 34129), (77, 34123), (78, 34117), (83, 34060), (100, 34009), (110, 33946),

Gene: Lumos\_38 Start: 34543, Stop: 34130, Start Num: 32

Candidate Starts for Lumos\_38:

(1, 34732), (2, 34726), (5, 34705), (6, 34684), (Start: 28 @34549 has 7 MA's), (Start: 32 @34543 has 22 MA's), (Start: 43 @34513 has 23 MA's), (51, 34477), (53, 34471), (56, 34447), (57, 34441), (62, 34414), (65, 34375), (68, 34363), (70, 34351), (76, 34318), (78, 34306), (83, 34249), (100, 34198), (110, 34135),

Gene: MAckerman\_37 Start: 32940, Stop: 32530, Start Num: 32

Candidate Starts for MAckerman\_37:

(Start: 28 @32946 has 7 MA's), (Start: 32 @32940 has 22 MA's), (36, 32922), (Start: 39 @32919 has 27 MA's), (Start: 43 @32910 has 23 MA's), (50, 32877), (62, 32811), (65, 32772), (70, 32748), (78, 32703), (80, 32688), (101, 32595),

Gene: MacnCheese\_47 Start: 36557, Stop: 36177, Start Num: 46

Candidate Starts for MacnCheese\_47:

(17, 36650), (Start: 32 @36590 has 22 MA's), (Start: 46 @36557 has 2 MA's), (61, 36473), (70, 36404), (81, 36329), (108, 36191),

Gene: Malthus\_48 Start: 35950, Stop: 35591, Start Num: 40

Candidate Starts for Malthus\_48:

(20, 36019), (31, 35974), (Start: 40 @35950 has 13 MA's), (Start: 43 @35944 has 23 MA's), (Start: 52 @35905 has 3 MA's), (60, 35854), (69, 35785), (74, 35764), (77, 35743), (79, 35725), (106, 35623),

Gene: MarkPhew\_46 Start: 35518, Stop: 35147, Start Num: 48

Candidate Starts for MarkPhew\_46:

(29, 35566), (33, 35554), (Start: 48 @35518 has 9 MA's), (62, 35428), (63, 35407), (70, 35365), (81, 35290), (82, 35269), (89, 35233), (94, 35212), (107, 35173),

Gene: Miley16\_40 Start: 34280, Stop: 33891, Start Num: 39

Candidate Starts for Miley16\_40:

(Start: 39 @34280 has 27 MA's), (Start: 43 @34271 has 23 MA's), (53, 34232), (56, 34208), (57, 34202), (62, 34175), (65, 34136), (70, 34112), (78, 34067), (92, 33980), (101, 33956),

Gene: MiniLon\_38 Start: 34355, Stop: 33942, Start Num: 32

Candidate Starts for MiniLon\_38:

(1, 34544), (2, 34538), (5, 34517), (6, 34496), (Start: 28 @34361 has 7 MA's), (Start: 32 @34355 has 22 MA's), (Start: 43 @34325 has 23 MA's), (51, 34289), (53, 34283), (57, 34253), (62, 34226), (65, 34187), (68, 34175), (70, 34163), (76, 34130), (77, 34124), (78, 34118), (83, 34061), (100, 34010), (110, 33947),

Gene: MiniMac\_38 Start: 34358, Stop: 33939, Start Num: 28

Candidate Starts for MiniMac\_38:



(Start: 28 @34358 has 7 MA's), (Start: 32 @34352 has 22 MA's), (Start: 43 @34322 has 23 MA's), (51, 34286), (53, 34280), (57, 34250), (62, 34223), (65, 34184), (68, 34172), (70, 34160), (76, 34127), (77, 34121), (78, 34115), (83, 34058), (100, 34007), (110, 33944),

Gene: MissDaisy\_45 Start: 35425, Stop: 35069, Start Num: 40

Candidate Starts for MissDaisy\_45:

(26, 35470), (30, 35452), (31, 35449), (Start: 40 @35425 has 13 MA's), (Start: 43 @35419 has 23 MA's), (Start: 52 @35380 has 3 MA's), (60, 35329), (74, 35239), (77, 35218), (79, 35200),

Gene: Mitti\_47 Start: 36126, Stop: 35767, Start Num: 40

Candidate Starts for Mitti\_47:

(20, 36195), (31, 36150), (Start: 40 @36126 has 13 MA's), (Start: 43 @36120 has 23 MA's), (Start: 52 @36081 has 3 MA's), (60, 36030), (69, 35961), (74, 35940), (77, 35919), (79, 35901), (106, 35799),

Gene: MkaliMitinis3\_40 Start: 34282, Stop: 33893, Start Num: 39

Candidate Starts for MkaliMitinis3\_40:

(Start: 39 @34282 has 27 MA's), (Start: 43 @34273 has 23 MA's), (53, 34234), (56, 34210), (57, 34204), (65, 34138), (70, 34114), (78, 34069), (91, 33988), (92, 33982), (95, 33970), (101, 33958),

Gene: Moostard\_38 Start: 34518, Stop: 34135, Start Num: 43

Candidate Starts for Moostard\_38:

(1, 34737), (2, 34731), (5, 34710), (6, 34689), (Start: 28 @34554 has 7 MA's), (Start: 32 @34548 has 22 MA's), (Start: 43 @34518 has 23 MA's), (51, 34482), (53, 34476), (56, 34452), (57, 34446), (62, 34419), (65, 34380), (68, 34368), (70, 34356), (76, 34323), (78, 34311), (83, 34254), (100, 34203), (110, 34140),

Gene: MsGreen\_38 Start: 34516, Stop: 34133, Start Num: 43

Candidate Starts for MsGreen\_38:

(1, 34735), (2, 34729), (5, 34708), (6, 34687), (Start: 28 @34552 has 7 MA's), (Start: 32 @34546 has 22 MA's), (Start: 43 @34516 has 23 MA's), (51, 34480), (53, 34474), (56, 34450), (57, 34444), (62, 34417), (65, 34378), (68, 34366), (70, 34354), (76, 34321), (78, 34309), (83, 34252), (100, 34201), (110, 34138),

Gene: Netyap\_40 Start: 34280, Stop: 33891, Start Num: 39

Candidate Starts for Netyap\_40:

(Start: 39 @34280 has 27 MA's), (Start: 43 @34271 has 23 MA's), (53, 34232), (56, 34208), (57, 34202), (62, 34175), (65, 34136), (70, 34112), (78, 34067), (92, 33980), (101, 33956),

Gene: Nibb\_45 Start: 35241, Stop: 34867, Start Num: 48

Candidate Starts for Nibb\_45:

(37, 35265), (Start: 48 @35241 has 9 MA's), (Start: 52 @35211 has 3 MA's), (55, 35196), (62, 35151), (63, 35130), (70, 35088), (78, 35043), (81, 35013), (82, 34992), (92, 34950), (93, 34941), (103, 34908), (107, 34893),

Gene: Nicholas\_38 Start: 34516, Stop: 34133, Start Num: 43

Candidate Starts for Nicholas\_38:

(1, 34735), (2, 34729), (5, 34708), (6, 34687), (Start: 28 @34552 has 7 MA's), (Start: 32 @34546 has 22 MA's), (Start: 43 @34516 has 23 MA's), (51, 34480), (53, 34474), (56, 34450), (57, 34444), (62, 34417), (65, 34378), (68, 34366), (70, 34354), (76, 34321), (78, 34309), (83, 34252), (100, 34201), (110, 34138),

Gene: Nicholasp3\_40 Start: 34281, Stop: 33892, Start Num: 39

Candidate Starts for Nicholasp3\_40:

(Start: 39 @34281 has 27 MA's), (Start: 43 @34272 has 23 MA's), (53, 34233), (56, 34209), (57, 34203), (62, 34176), (65, 34137), (70, 34113), (78, 34068), (92, 33981), (95, 33969), (101, 33957),

Gene: OhShagHennessy\_37 Start: 32908, Stop: 32498, Start Num: 32

Candidate Starts for OhShagHennessy\_37:

(Start: 28 @32914 has 7 MA's), (Start: 32 @32908 has 22 MA's), (Start: 39 @32887 has 27 MA's), (Start: 43 @32878 has 23 MA's), (50, 32845), (62, 32779), (65, 32740), (70, 32716), (78, 32671), (101, 32563),

Gene: OkiRoe\_41 Start: 34320, Stop: 33919, Start Num: 43

Candidate Starts for OkiRoe\_41:

(Start: 43 @34320 has 23 MA's), (Start: 54 @34269 has 1 MA's), (75, 34128), (81, 34077), (88, 34017),

Gene: OmniCritical\_46 Start: 35929, Stop: 35576, Start Num: 43

Candidate Starts for OmniCritical\_46:

(20, 36004), (31, 35959), (Start: 40 @35935 has 13 MA's), (Start: 43 @35929 has 23 MA's), (Start: 52 @35890 has 3 MA's), (60, 35839), (69, 35770), (74, 35749), (77, 35728), (79, 35710), (106, 35608),

Gene: Omnicron\_44 Start: 33930, Stop: 33529, Start Num: 43

Candidate Starts for Omnicron\_44:

(Start: 43 @33930 has 23 MA's), (Start: 54 @33879 has 1 MA's), (57, 33852), (72, 33750), (75, 33738), (81, 33687), (88, 33627),

Gene: Oscar\_47 Start: 35987, Stop: 35613, Start Num: 48

Candidate Starts for Oscar\_47:

(33, 36020), (Start: 48 @35987 has 9 MA's), (Start: 52 @35957 has 3 MA's), (53, 35954), (62, 35897), (67, 35852), (70, 35834), (81, 35759), (93, 35684), (107, 35639),

Gene: Paola\_41 Start: 34318, Stop: 33917, Start Num: 43

Candidate Starts for Paola\_41:

(Start: 43 @34318 has 23 MA's), (Start: 54 @34267 has 1 MA's), (75, 34126), (81, 34075), (88, 34015),

Gene: Patt\_44 Start: 35104, Stop: 34793, Start Num: 52

Candidate Starts for Patt\_44:

(19, 35227), (20, 35218), (21, 35215), (22, 35209), (26, 35194), (30, 35176), (31, 35173), (Start: 40 @35149 has 13 MA's), (Start: 43 @35143 has 23 MA's), (Start: 52 @35104 has 3 MA's), (60, 35053), (74, 34963), (77, 34942), (79, 34924),

Gene: Peanam\_45 Start: 35664, Stop: 35272, Start Num: 44

Candidate Starts for Peanam\_45:

(Start: 44 @35664 has 1 MA's), (59, 35580), (62, 35565), (99, 35340), (104, 35316), (109, 35283),

Gene: Pharb\_43 Start: 34363, Stop: 33977, Start Num: 46

Candidate Starts for Pharb\_43:

(Start: 46 @34363 has 2 MA's), (Start: 52 @34333 has 3 MA's), (70, 34210), (79, 34153), (81, 34135), (85, 34087), (87, 34081), (107, 34003),

Gene: Pixie\_45 Start: 35157, Stop: 34735, Start Num: 32

Candidate Starts for Pixie\_45:

(Start: 32 @35157 has 22 MA's), (Start: 46 @35124 has 2 MA's), (70, 34968), (79, 34911), (81, 34893), (85, 34845), (107, 34761),

Gene: Psycho\_42 Start: 34326, Stop: 33979, Start Num: 54

Candidate Starts for Psycho\_42:

(Start: 41 @34383 has 8 MA's), (Start: 43 @34377 has 23 MA's), (Start: 52 @34338 has 3 MA's), (Start: 54 @34326 has 1 MA's), (57, 34299), (75, 34185), (81, 34134), (88, 34074), (109, 33984),

Gene: Rando14\_43 Start: 33501, Stop: 33097, Start Num: 43

Candidate Starts for Rando14\_43:

(Start: 43 @33501 has 23 MA's), (Start: 54 @33447 has 1 MA's), (81, 33255), (88, 33195),

Gene: Reptar3000\_45 Start: 35140, Stop: 34784, Start Num: 40

Candidate Starts for Reptar3000\_45:

(20, 35209), (31, 35164), (Start: 40 @35140 has 13 MA's), (Start: 43 @35134 has 23 MA's), (Start: 52 @35095 has 3 MA's), (60, 35044), (74, 34954), (77, 34933), (79, 34915),

Gene: Rose5\_37 Start: 32935, Stop: 32525, Start Num: 32

Candidate Starts for Rose5\_37:

(Start: 28 @32941 has 7 MA's), (Start: 32 @32935 has 22 MA's), (36, 32917), (Start: 39 @32914 has 27 MA's), (Start: 43 @32905 has 23 MA's), (50, 32872), (62, 32806), (65, 32767), (70, 32743), (78, 32698), (80, 32683), (101, 32590),

Gene: Rumpelstiltskin\_40 Start: 34547, Stop: 34158, Start Num: 39

Candidate Starts for Rumpelstiltskin\_40:

(Start: 39 @34547 has 27 MA's), (Start: 43 @34538 has 23 MA's), (53, 34499), (56, 34475), (57, 34469), (62, 34442), (65, 34403), (70, 34379), (78, 34334), (92, 34247), (101, 34223),

Gene: Ruthiejr\_48 Start: 36000, Stop: 35641, Start Num: 40

Candidate Starts for Ruthiejr\_48:

(20, 36069), (31, 36024), (Start: 40 @36000 has 13 MA's), (Start: 43 @35994 has 23 MA's), (Start: 52 @35955 has 3 MA's), (60, 35904), (69, 35835), (74, 35814), (77, 35793), (79, 35775), (106, 35673),

Gene: SamScheppers\_46 Start: 36429, Stop: 36070, Start Num: 40

Candidate Starts for SamScheppers\_46:

(20, 36498), (31, 36453), (Start: 40 @36429 has 13 MA's), (Start: 43 @36423 has 23 MA's), (Start: 52 @36384 has 3 MA's), (60, 36333), (69, 36264), (74, 36243), (77, 36222), (79, 36204), (106, 36102),

Gene: Scarlett\_47 Start: 35979, Stop: 35605, Start Num: 48

Candidate Starts for Scarlett\_47:

(33, 36012), (Start: 48 @35979 has 9 MA's), (Start: 52 @35949 has 3 MA's), (53, 35946), (62, 35889), (67, 35844), (70, 35826), (81, 35751), (93, 35676), (107, 35631),

Gene: Shadow1\_48 Start: 35996, Stop: 35607, Start Num: 48

Candidate Starts for Shadow1\_48:

(Start: 48 @35996 has 9 MA's), (Start: 52 @35966 has 3 MA's), (66, 35864), (70, 35843), (80, 35783), (81, 35768), (84, 35732), (92, 35696), (106, 35639), (107, 35633),

Gene: ShedlockHolmes\_46 Start: 35683, Stop: 35261, Start Num: 32

Candidate Starts for ShedlockHolmes\_46:

(16, 35740), (23, 35713), (Start: 32 @35683 has 22 MA's), (Start: 46 @35650 has 2 MA's), (79, 35437), (81, 35419), (85, 35371), (107, 35287),

Gene: Silverleaf\_37 Start: 32935, Stop: 32525, Start Num: 32

Candidate Starts for Silverleaf\_37:

(Start: 28 @32941 has 7 MA's), (Start: 32 @32935 has 22 MA's), (36, 32917), (Start: 39 @32914 has 27 MA's), (Start: 43 @32905 has 23 MA's), (50, 32872), (62, 32806), (65, 32767), (70, 32743), (78, 32698), (80, 32683), (101, 32590),

Gene: Slarp\_47 Start: 36038, Stop: 35679, Start Num: 40

Candidate Starts for Slarp\_47:

(20, 36107), (31, 36062), (Start: 40 @36038 has 13 MA's), (Start: 43 @36032 has 23 MA's), (Start: 52 @35993 has 3 MA's), (60, 35942), (69, 35873), (74, 35852), (77, 35831), (79, 35813), (106, 35711),

Gene: Snenia\_38 Start: 34517, Stop: 34134, Start Num: 43

Candidate Starts for Snenia\_38:

(1, 34736), (2, 34730), (5, 34709), (6, 34688), (Start: 28 @34553 has 7 MA's), (Start: 32 @34547 has 22 MA's), (Start: 43 @34517 has 23 MA's), (51, 34481), (53, 34475), (56, 34451), (57, 34445), (62, 34418), (65, 34379), (68, 34367), (70, 34355), (76, 34322), (78, 34310), (83, 34253), (100, 34202), (110, 34139),

Gene: Syra333\_48 Start: 35764, Stop: 35375, Start Num: 48

Candidate Starts for Syra333\_48:

(Start: 48 @35764 has 9 MA's), (Start: 52 @35734 has 3 MA's), (66, 35632), (70, 35611), (80, 35551), (81, 35536), (84, 35500), (92, 35464), (106, 35407), (107, 35401),

Gene: TBond007\_45 Start: 35156, Stop: 34734, Start Num: 32

Candidate Starts for TBond007\_45:

(Start: 32 @35156 has 22 MA's), (Start: 46 @35123 has 2 MA's), (70, 34967), (79, 34910), (81, 34892), (85, 34844), (107, 34760),

Gene: Taquito\_47 Start: 36279, Stop: 35926, Start Num: 43

Candidate Starts for Taquito\_47:

(20, 36354), (31, 36309), (Start: 40 @36285 has 13 MA's), (Start: 43 @36279 has 23 MA's), (Start: 52 @36240 has 3 MA's), (60, 36189), (69, 36120), (74, 36099), (77, 36078), (79, 36060), (106, 35958),

Gene: Thyatira\_43 Start: 36667, Stop: 36266, Start Num: 43

Candidate Starts for Thyatira\_43:

(Start: 41 @36673 has 8 MA's), (Start: 43 @36667 has 23 MA's), (Start: 54 @36616 has 1 MA's), (75, 36475), (81, 36424), (88, 36364),

Gene: Tierra\_46 Start: 35645, Stop: 35253, Start Num: 47

Candidate Starts for Tierra\_46:

(3, 35855), (4, 35846), (Start: 47 @35645 has 4 MA's), (Start: 52 @35615 has 3 MA's), (70, 35492), (76, 35459), (80, 35432), (81, 35417), (84, 35381), (96, 35330), (102, 35309), (107, 35279),

Gene: Tourach\_40 Start: 34296, Stop: 33907, Start Num: 39

Candidate Starts for Tourach\_40:

(Start: 39 @34296 has 27 MA's), (Start: 43 @34287 has 23 MA's), (53, 34248), (57, 34218), (62, 34191), (65, 34152), (70, 34128), (78, 34083), (92, 33996), (95, 33984), (101, 33972),

Gene: TribbleTrouble\_43 Start: 35018, Stop: 34626, Start Num: 45

Candidate Starts for TribbleTrouble\_43:

(24, 35075), (Start: 45 @35018 has 1 MA's), (Start: 52 @34982 has 3 MA's), (81, 34784), (85, 34736), (107, 34652), (108, 34640), (110, 34631),

Gene: Tyson\_37 Start: 32936, Stop: 32526, Start Num: 32

Candidate Starts for Tyson\_37:

(Start: 28 @32942 has 7 MA's), (Start: 32 @32936 has 22 MA's), (36, 32918), (Start: 39 @32915 has 27 MA's), (Start: 43 @32906 has 23 MA's), (50, 32873), (62, 32807), (65, 32768), (70, 32744), (78, 32699), (80, 32684), (101, 32591),

Gene: UPIE\_38 Start: 32940, Stop: 32524, Start Num: 28

Candidate Starts for UPIE\_38:

(Start: 28 @32940 has 7 MA's), (Start: 32 @32934 has 22 MA's), (Start: 39 @32913 has 27 MA's), (Start: 43 @32904 has 23 MA's), (50, 32871), (62, 32805), (65, 32766), (70, 32742), (78, 32697), (101, 32589),

Gene: Vetric\_40 Start: 34287, Stop: 33898, Start Num: 39

Candidate Starts for Vetric\_40:

(Start: 39 @34287 has 27 MA's), (Start: 43 @34278 has 23 MA's), (53, 34239), (56, 34215), (57, 34209), (62, 34182), (65, 34143), (70, 34119), (78, 34074), (92, 33987), (101, 33963),

Gene: Wamburgexpress\_38 Start: 32949, Stop: 32539, Start Num: 32

Candidate Starts for Wamburgexpress\_38:

(Start: 28 @32955 has 7 MA's), (Start: 32 @32949 has 22 MA's), (Start: 39 @32928 has 27 MA's), (Start: 43 @32919 has 23 MA's), (50, 32886), (62, 32820), (65, 32781), (70, 32757), (78, 32712), (101, 32604),

Gene: Waterfoul\_42 Start: 34567, Stop: 34160, Start Num: 41

Candidate Starts for Waterfoul\_42:

(Start: 41 @34567 has 8 MA's), (Start: 43 @34561 has 23 MA's), (Start: 54 @34510 has 1 MA's), (81, 34318), (88, 34258), (102, 34210),

Gene: Whirlwind\_39 Start: 34372, Stop: 33890, Start Num: 15

Candidate Starts for Whirlwind\_39:

(Start: 15 @34372 has 1 MA's), (22, 34342), (Start: 28 @34312 has 7 MA's), (Start: 32 @34306 has 22 MA's), (Start: 43 @34276 has 23 MA's), (53, 34237), (56, 34213), (57, 34207), (62, 34180), (65, 34141), (68, 34129), (70, 34117), (76, 34084), (100, 33958), (110, 33895),

Gene: Wigglewobble\_40 Start: 34313, Stop: 33924, Start Num: 39

Candidate Starts for Wigglewobble\_40:

(Start: 39 @34313 has 27 MA's), (Start: 43 @34304 has 23 MA's), (53, 34265), (56, 34241), (57, 34235), (65, 34169), (70, 34145), (78, 34100), (91, 34019), (92, 34013), (95, 34001), (101, 33989),

Gene: Wilder\_40 Start: 34286, Stop: 33897, Start Num: 39

Candidate Starts for Wilder\_40:

(Start: 39 @34286 has 27 MA's), (Start: 43 @34277 has 23 MA's), (53, 34238), (56, 34214), (57, 34208), (65, 34142), (70, 34118), (78, 34073), (91, 33992), (92, 33986), (95, 33974), (101, 33962),

Gene: Winky\_40 Start: 34280, Stop: 33891, Start Num: 39

Candidate Starts for Winky\_40:

(Start: 39 @34280 has 27 MA's), (Start: 43 @34271 has 23 MA's), (53, 34232), (56, 34208), (57, 34202), (62, 34175), (65, 34136), (70, 34112), (78, 34067), (92, 33980), (101, 33956),

Gene: Wintermute\_47 Start: 36187, Stop: 35828, Start Num: 40

Candidate Starts for Wintermute\_47:

(20, 36256), (31, 36211), (Start: 40 @36187 has 13 MA's), (Start: 43 @36181 has 23 MA's), (Start: 52 @36142 has 3 MA's), (60, 36091), (69, 36022), (74, 36001), (77, 35980), (79, 35962), (106, 35860),

Gene: Wyatt2\_38 Start: 32935, Stop: 32525, Start Num: 32

Candidate Starts for Wyatt2\_38:

(Start: 28 @32941 has 7 MA's), (Start: 32 @32935 has 22 MA's), (36, 32917), (Start: 39 @32914 has 27 MA's), (Start: 43 @32905 has 23 MA's), (50, 32872), (62, 32806), (65, 32767), (70, 32743), (78, 32698), (80, 32683), (101, 32590),

Gene: Ximenita\_49 Start: 35950, Stop: 35561, Start Num: 48

Candidate Starts for Ximenita\_49:

(Start: 15 @36055 has 1 MA's), (25, 36016), (Start: 48 @35950 has 9 MA's), (Start: 52 @35920 has 3 MA's), (66, 35818), (70, 35797), (71, 35791), (76, 35764), (80, 35737), (81, 35722), (84, 35686), (94, 35641), (106, 35593), (107, 35587), (108, 35575),

Gene: Y10\_46 Start: 36100, Stop: 35747, Start Num: 43

Candidate Starts for Y10\_46:

(20, 36175), (31, 36130), (Start: 40 @36106 has 13 MA's), (Start: 43 @36100 has 23 MA's), (Start: 52 @36061 has 3 MA's), (60, 36010), (69, 35941), (74, 35920), (77, 35899), (79, 35881), (106, 35779),

Gene: Y2\_46 Start: 36100, Stop: 35747, Start Num: 43

Candidate Starts for Y2\_46:

(20, 36175), (31, 36130), (Start: 40 @36106 has 13 MA's), (Start: 43 @36100 has 23 MA's), (Start: 52 @36061 has 3 MA's), (60, 36010), (69, 35941), (74, 35920), (77, 35899), (79, 35881), (106, 35779),

Gene: Yuna\_49 Start: 36719, Stop: 36363, Start Num: 47

Candidate Starts for Yuna\_49:

(Start: 47 @36719 has 4 MA's), (Start: 52 @36689 has 3 MA's), (61, 36635), (62, 36629), (63, 36608), (70, 36566), (80, 36506), (81, 36491), (105, 36404), (107, 36389),

Gene: Zakai\_40 Start: 34538, Stop: 34149, Start Num: 39

Candidate Starts for Zakai\_40:

(Start: 39 @34538 has 27 MA's), (Start: 43 @34529 has 23 MA's), (53, 34490), (56, 34466), (57, 34460), (65, 34394), (70, 34370), (78, 34325), (91, 34244), (92, 34238), (95, 34226), (101, 34214),

Gene: Zaria\_38 Start: 32950, Stop: 32540, Start Num: 32

Candidate Starts for Zaria\_38:

(Start: 28 @32956 has 7 MA's), (Start: 32 @32950 has 22 MA's), (36, 32932), (Start: 39 @32929 has 27 MA's), (Start: 43 @32920 has 23 MA's), (50, 32887), (62, 32821), (65, 32782), (70, 32758), (78, 32713), (80, 32698), (101, 32605),

Gene: ZhongYanYuan\_39 Start: 34142, Stop: 33753, Start Num: 39

Candidate Starts for ZhongYanYuan\_39:

(Start: 39 @34142 has 27 MA's), (Start: 43 @34133 has 23 MA's), (53, 34094), (57, 34064), (65, 33998), (70, 33974), (78, 33929), (87, 33857), (92, 33842), (95, 33830), (101, 33818),