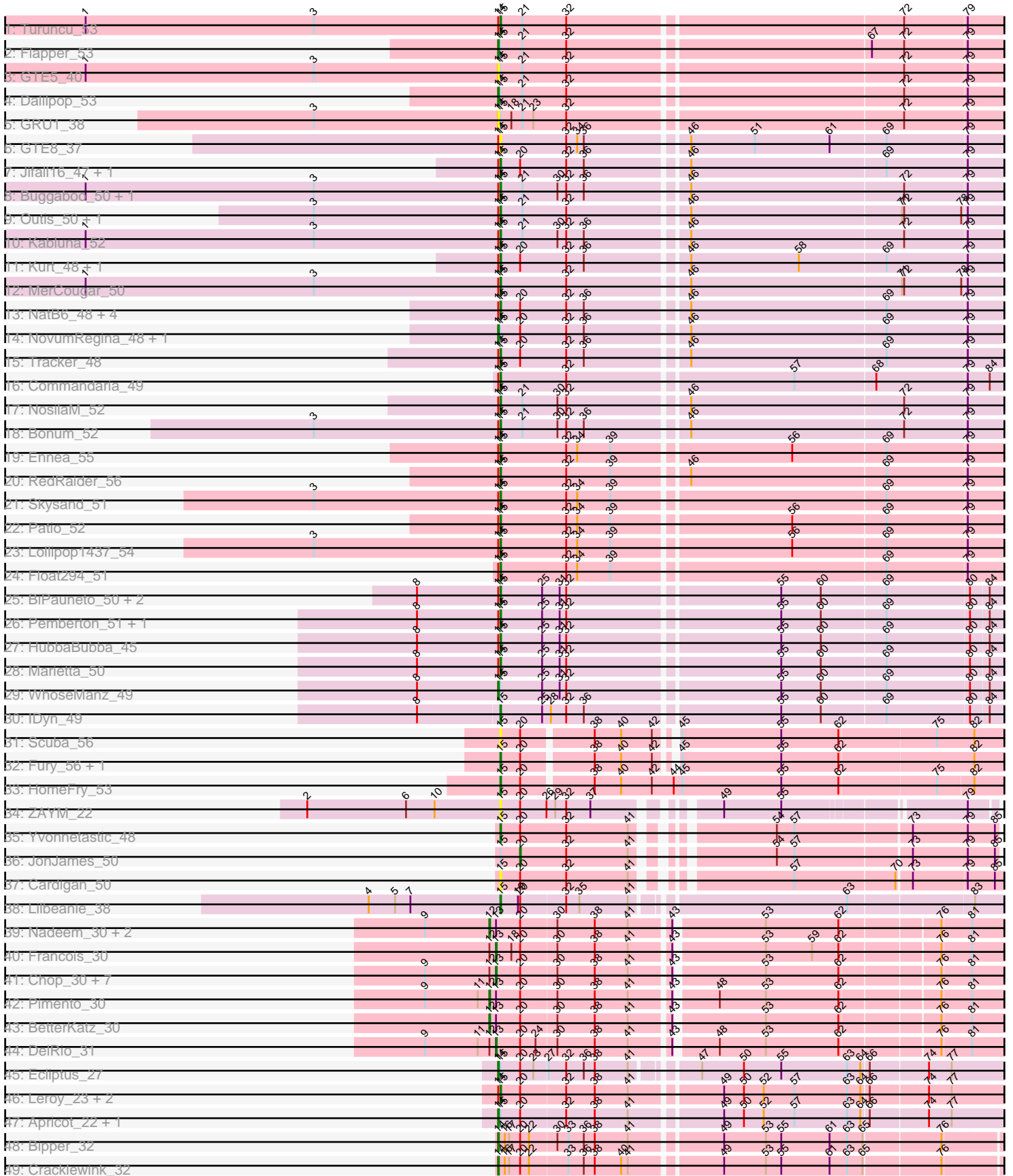


# Zoomed Pham 308524



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 308524 Report

This analysis was run 06/27/26 on database version 652.

Pham number 308524 has 74 members, 7 are drafts.

Phages represented in each track:

- Track 1 : Turuncu\_53
- Track 2 : Flapper\_53
- Track 3 : GTE5\_40
- Track 4 : Dalilpop\_53
- Track 5 : GRU1\_38
- Track 6 : GTE8\_37
- Track 7 : Jifall16\_47, Phomeo\_47
- Track 8 : Buggaboo\_50, SuperSulley\_50
- Track 9 : Outis\_50, StarStruck\_50
- Track 10 : Kabluna\_52
- Track 11 : Kurt\_48, Emianna\_48
- Track 12 : MerCougar\_50
- Track 13 : NatB6\_48, Arti\_48, Foxboro\_49, KidneyBean\_48, Wheezy\_48
- Track 14 : NovumRegina\_48, GrootJr\_50
- Track 15 : Tracker\_48
- Track 16 : Commandaria\_49
- Track 17 : NosilaM\_52
- Track 18 : Bonum\_52
- Track 19 : Ennea\_55
- Track 20 : RedRaider\_56
- Track 21 : Skysand\_51
- Track 22 : Patio\_52
- Track 23 : Lollipop1437\_54
- Track 24 : Float294\_51
- Track 25 : BiPauneto\_50, Sukkupi\_49, Yndexa\_49
- Track 26 : Pemberton\_51, NadineRae\_48
- Track 27 : HubbaBubba\_45
- Track 28 : Marietta\_50
- Track 29 : WhoseManz\_49
- Track 30 : IDyn\_49
- Track 31 : Scuba\_56
- Track 32 : Fury\_56, Pleakley\_56
- Track 33 : HomeFry\_53
- Track 34 : ZAYM\_22
- Track 35 : Yvonnetastic\_48
- Track 36 : JonJames\_50
- Track 37 : Cardigan\_50

- Track 38 : Lilbeanie\_38
- Track 39 : Nadeem\_30, NancyRae\_30, Brylie\_30
- Track 40 : Francois\_30
- Track 41 : Chop\_30, Bock\_30, Parada\_30, Hamood\_30, Ayotoya\_30, Mulch\_30, WheatThin\_30, GrandSlam\_30
- Track 42 : Pimento\_30
- Track 43 : BetterKatz\_30
- Track 44 : DelRio\_31
- Track 45 : Ecliptus\_27
- Track 46 : Leroy\_23, Crater\_21, Phistory\_24
- Track 47 : Apricot\_22, Horus\_23
- Track 48 : Bipper\_32
- Track 49 : Cracklewink\_32

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

The start number called the most often in the published annotations is 15, it was called in 41 of the 67 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Arti\_48, BiPauneto\_50, Bonum\_52, Buggaboo\_50, Cardigan\_50, Commandaria\_49, Crater\_21, Emianna\_48, Ennea\_55, Float294\_51, Foxboro\_49, Fury\_56, GTE8\_37, HomeFry\_53, HubbaBubba\_45, IDyn\_49, Jifall16\_47, Kabluna\_52, KidneyBean\_48, Kurt\_48, Leroy\_23, Lilbeanie\_38, Lollipop1437\_54, Marietta\_50, MerCougar\_50, NadineRae\_48, NatB6\_48, NosilaM\_52, Outis\_50, Patio\_52, Pemberton\_51, Phistory\_24, Phomeo\_47, Pleakley\_56, RedRaider\_56, Scuba\_56, Skysand\_51, StarStruck\_50, Sukkupi\_49, SuperSulley\_50, Tracker\_48, Turuncu\_53, Wheezy\_48, Yndexa\_49, Yvonnetastic\_48, ZAYM\_22,

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

- Apricot\_22, Dalilpop\_53, Ecliptus\_27, Flapper\_53, GRU1\_38, GTE5\_40, GrootJr\_50, Horus\_23, JonJames\_50, NovumRegina\_48, WhoseManz\_49,

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

- Ayotoya\_30, BetterKatz\_30, Bipper\_32, Bock\_30, Brylie\_30, Chop\_30, Cracklewink\_32, DelRio\_31, Francois\_30, GrandSlam\_30, Hamood\_30, Mulch\_30, Nadeem\_30, NancyRae\_30, Parada\_30, Pimento\_30, WheatThin\_30,

**Summary by start number:**

Start 12:

- Found in 15 of 74 ( 20.3% ) of genes in pham
- Manual Annotations of this start: 5 of 67
- Called 33.3% of time when present
- Phage (with cluster) where this start called: BetterKatz\_30 (DI), Brylie\_30 (DI), Nadeem\_30 (DI), NancyRae\_30 (DI), Pimento\_30 (DI),

Start 13:

- Found in 15 of 74 ( 20.3% ) of genes in pham
- Manual Annotations of this start: 10 of 67

- Called 66.7% of time when present
- Phage (with cluster) where this start called: Ayotoya\_30 (DI), Bock\_30 (DI), Chop\_30 (DI), DelRio\_31 (DI), Francois\_30 (DI), GrandSlam\_30 (DI), Hamood\_30 (DI), Mulch\_30 (DI), Parada\_30 (DI), WheatThin\_30 (DI),

Start 14:

- Found in 49 of 74 ( 66.2% ) of genes in pham
- Manual Annotations of this start: 10 of 67
- Called 24.5% of time when present
- Phage (with cluster) where this start called: Apricot\_22 (DN3), Bipper\_32 (Y), Cracklewink\_32 (Y), Dalilpop\_53 (CR1), Ecliptus\_27 (DN), Flapper\_53 (CR1), GRU1\_38 (CR1), GTE5\_40 (CR1), GrootJr\_50 (CR2), Horus\_23 (DN1), NovumRegina\_48 (CR2), WhoseManz\_49 (CR4),

Start 15:

- Found in 57 of 74 ( 77.0% ) of genes in pham
- Manual Annotations of this start: 41 of 67
- Called 80.7% of time when present
- Phage (with cluster) where this start called: Arti\_48 (CR2), BiPauneto\_50 (CR4), Bonum\_52 (CR2), Buggaboo\_50 (CR2), Cardigan\_50 (DD), Commandaria\_49 (CR2), Crater\_21 (DN3), Emianna\_48 (CR2), Ennea\_55 (CR3), Float294\_51 (CR3), Foxboro\_49 (CR2), Fury\_56 (CR5), GTE8\_37 (CR2), HomeFry\_53 (CR5), HubbaBubba\_45 (CR4), IDyn\_49 (CR4), Jifall16\_47 (CR2), Kabluna\_52 (CR2), KidneyBean\_48 (CR2), Kurt\_48 (CR2), Leroy\_23 (DN1), Lilbeanie\_38 (DE5), Lollipop1437\_54 (CR3), Marietta\_50 (CR4), MerCougar\_50 (CR2), NadineRae\_48 (CR4), NatB6\_48 (CR2), NosilaM\_52 (CR2), Outis\_50 (CR2), Patio\_52 (CR3), Pemberton\_51 (CR4), Phistory\_24 (DN1), Phomeo\_47 (CR2), Pleakley\_56 (CR5), RedRaider\_56 (CR3), Scuba\_56 (CR5), Skysand\_51 (CR3), StarStruck\_50 (CR2), Sukkupi\_49 (CR4), SuperSulley\_50 (CR2), Tracker\_48 (CR2), Turuncu\_53 (CR1), Wheezy\_48 (CR2), Yndexa\_49 (CR4), Yvonnetastic\_48 (DD), ZAYM\_22 (DB),

Start 20:

- Found in 44 of 74 ( 59.5% ) of genes in pham
- Manual Annotations of this start: 1 of 67
- Called 2.3% of time when present
- Phage (with cluster) where this start called: JonJames\_50 (DD),

### Summary by clusters:

There are 13 clusters represented in this pham: CR2, CR3, DN, CR1, CR4, DI, DD, CR5, DB, DE5, DN1, DN3, Y,

Info for manual annotations of cluster CR1:

- Start number 14 was manually annotated 2 times for cluster CR1.
- Start number 15 was manually annotated 1 time for cluster CR1.

Info for manual annotations of cluster CR2:

- Start number 14 was manually annotated 2 times for cluster CR2.
- Start number 15 was manually annotated 19 times for cluster CR2.

Info for manual annotations of cluster CR3:

- Start number 15 was manually annotated 6 times for cluster CR3.

Info for manual annotations of cluster CR4:

- Start number 14 was manually annotated 1 time for cluster CR4.
- Start number 15 was manually annotated 7 times for cluster CR4.

Info for manual annotations of cluster CR5:

- Start number 15 was manually annotated 3 times for cluster CR5.

Info for manual annotations of cluster DD:

- Start number 15 was manually annotated 1 time for cluster DD.
- Start number 20 was manually annotated 1 time for cluster DD.

Info for manual annotations of cluster DE5:

- Start number 15 was manually annotated 1 time for cluster DE5.

Info for manual annotations of cluster DI:

- Start number 12 was manually annotated 5 times for cluster DI.
- Start number 13 was manually annotated 10 times for cluster DI.

Info for manual annotations of cluster DN:

- Start number 14 was manually annotated 1 time for cluster DN.

Info for manual annotations of cluster DN1:

- Start number 14 was manually annotated 1 time for cluster DN1.
- Start number 15 was manually annotated 2 times for cluster DN1.

Info for manual annotations of cluster DN3:

- Start number 14 was manually annotated 1 time for cluster DN3.
- Start number 15 was manually annotated 1 time for cluster DN3.

Info for manual annotations of cluster Y:

- Start number 14 was manually annotated 2 times for cluster Y.

### **Gene Information:**

Gene: Apricot\_22 Start: 18919, Stop: 19752, Start Num: 14

Candidate Starts for Apricot\_22:

(Start: 14 @18919 has 10 MA's), (Start: 15 @18922 has 41 MA's), (Start: 20 @18949 has 1 MA's), (32, 19009), (38, 19048), (41, 19093), (49, 19207), (50, 19234), (52, 19261), (57, 19303), (63, 19375), (64, 19393), (66, 19402), (74, 19474), (77, 19504), (91, 19633), (93, 19648), (98, 19675),

Gene: Arti\_48 Start: 37353, Stop: 38375, Start Num: 15

Candidate Starts for Arti\_48:

(Start: 14 @37350 has 10 MA's), (Start: 15 @37353 has 41 MA's), (Start: 20 @37380 has 1 MA's), (32, 37443), (36, 37467), (46, 37596), (69, 37857), (79, 37965), (89, 38040), (94, 38094), (103, 38151), (104, 38157), (110, 38244), (111, 38274),

Gene: Ayotoya\_30 Start: 26417, Stop: 27229, Start Num: 13

Candidate Starts for Ayotoya\_30:

(9, 26321), (Start: 12 @26408 has 5 MA's), (Start: 13 @26417 has 10 MA's), (Start: 20 @26450 has 1 MA's), (30, 26498), (38, 26549), (41, 26594), (43, 26645), (53, 26759), (62, 26858), (76, 26981), (81,

27020), (86, 27065), (92, 27125), (96, 27158), (101, 27191),

Gene: BetterKatz\_30 Start: 25881, Stop: 26702, Start Num: 12

Candidate Starts for BetterKatz\_30:

(Start: 12 @25881 has 5 MA's), (Start: 13 @25890 has 10 MA's), (Start: 20 @25923 has 1 MA's), (30, 25971), (38, 26022), (41, 26067), (43, 26118), (53, 26232), (62, 26331), (76, 26454), (81, 26493), (86, 26538), (92, 26598), (96, 26631), (101, 26664),

Gene: BiPauneto\_50 Start: 36862, Stop: 37881, Start Num: 15

Candidate Starts for BiPauneto\_50:

(8, 36748), (Start: 14 @36859 has 10 MA's), (Start: 15 @36862 has 41 MA's), (25, 36919), (31, 36943), (32, 36952), (55, 37228), (60, 37282), (69, 37366), (80, 37477), (84, 37501), (86, 37522), (94, 37600), (100, 37648), (103, 37657), (104, 37663), (110, 37750), (113, 37801),

Gene: Bipper\_32 Start: 28349, Stop: 29002, Start Num: 14

Candidate Starts for Bipper\_32:

(Start: 14 @28349 has 10 MA's), (16, 28358), (17, 28364), (Start: 20 @28379 has 1 MA's), (22, 28391), (30, 28427), (33, 28442), (36, 28463), (38, 28478), (41, 28523), (49, 28637), (53, 28694), (55, 28715), (61, 28781), (63, 28805), (65, 28826), (76, 28922),

Gene: Bock\_30 Start: 25640, Stop: 26452, Start Num: 13

Candidate Starts for Bock\_30:

(9, 25544), (Start: 12 @25631 has 5 MA's), (Start: 13 @25640 has 10 MA's), (Start: 20 @25673 has 1 MA's), (30, 25721), (38, 25772), (41, 25817), (43, 25868), (53, 25982), (62, 26081), (76, 26204), (81, 26243), (86, 26288), (92, 26348), (96, 26381), (101, 26414),

Gene: Bonum\_52 Start: 38006, Stop: 39028, Start Num: 15

Candidate Starts for Bonum\_52:

(3, 37751), (Start: 14 @38003 has 10 MA's), (Start: 15 @38006 has 41 MA's), (21, 38036), (30, 38084), (32, 38096), (36, 38120), (46, 38249), (72, 38534), (79, 38618), (90, 38705), (97, 38765), (103, 38804), (104, 38810), (107, 38846), (108, 38855), (110, 38897), (111, 38927), (116, 38990),

Gene: Brylie\_30 Start: 25619, Stop: 26440, Start Num: 12

Candidate Starts for Brylie\_30:

(9, 25532), (Start: 12 @25619 has 5 MA's), (Start: 13 @25628 has 10 MA's), (Start: 20 @25661 has 1 MA's), (30, 25709), (38, 25760), (41, 25805), (43, 25856), (53, 25970), (62, 26069), (76, 26192), (81, 26231), (86, 26276), (92, 26336), (96, 26369), (101, 26402),

Gene: Buggaboo\_50 Start: 38485, Stop: 39507, Start Num: 15

Candidate Starts for Buggaboo\_50:

(1, 37918), (3, 38230), (Start: 14 @38482 has 10 MA's), (Start: 15 @38485 has 41 MA's), (21, 38515), (30, 38563), (32, 38575), (36, 38599), (46, 38728), (72, 39013), (79, 39097), (90, 39184), (97, 39244), (103, 39283), (104, 39289), (107, 39325), (111, 39406), (116, 39469),

Gene: Cardigan\_50 Start: 35257, Stop: 36186, Start Num: 15

Candidate Starts for Cardigan\_50:

(Start: 15 @35257 has 41 MA's), (Start: 20 @35284 has 1 MA's), (32, 35347), (41, 35431), (57, 35602), (70, 35734), (73, 35752), (79, 35824), (85, 35860), (99, 35980), (109, 36070),

Gene: Chop\_30 Start: 26165, Stop: 26977, Start Num: 13

Candidate Starts for Chop\_30:

(9, 26069), (Start: 12 @26156 has 5 MA's), (Start: 13 @26165 has 10 MA's), (Start: 20 @26198 has 1 MA's), (30, 26246), (38, 26297), (41, 26342), (43, 26393), (53, 26507), (62, 26606), (76, 26729), (81,

26768), (86, 26813), (92, 26873), (96, 26906), (101, 26939),

Gene: Commandaria\_49 Start: 38469, Stop: 39491, Start Num: 15

Candidate Starts for Commandaria\_49:

(Start: 14 @38466 has 10 MA's), (Start: 15 @38469 has 41 MA's), (32, 38559), (57, 38853), (68, 38961), (79, 39081), (84, 39111), (87, 39147), (103, 39267), (104, 39273), (107, 39309), (111, 39390), (114, 39432), (115, 39438), (116, 39453),

Gene: Cracklewink\_32 Start: 28349, Stop: 29002, Start Num: 14

Candidate Starts for Cracklewink\_32:

(Start: 14 @28349 has 10 MA's), (16, 28358), (17, 28364), (Start: 20 @28379 has 1 MA's), (22, 28391), (33, 28442), (36, 28463), (38, 28478), (40, 28514), (41, 28523), (49, 28637), (53, 28694), (55, 28715), (61, 28781), (63, 28805), (65, 28826), (76, 28922),

Gene: Crater\_21 Start: 18922, Stop: 19752, Start Num: 15

Candidate Starts for Crater\_21:

(Start: 14 @18919 has 10 MA's), (Start: 15 @18922 has 41 MA's), (Start: 20 @18949 has 1 MA's), (32, 19009), (38, 19048), (41, 19093), (49, 19207), (50, 19234), (52, 19261), (57, 19303), (63, 19375), (64, 19393), (66, 19402), (74, 19474), (77, 19504), (91, 19633), (93, 19648), (98, 19675),

Gene: Dalilpop\_53 Start: 39623, Stop: 40648, Start Num: 14

Candidate Starts for Dalilpop\_53:

(Start: 14 @39623 has 10 MA's), (Start: 15 @39626 has 41 MA's), (21, 39656), (32, 39716), (72, 40154), (79, 40238), (90, 40325), (103, 40424), (104, 40430), (106, 40448), (110, 40517), (115, 40595), (116, 40610),

Gene: DelRio\_31 Start: 26636, Stop: 27448, Start Num: 13

Candidate Starts for DelRio\_31:

(9, 26540), (11, 26612), (Start: 12 @26627 has 5 MA's), (Start: 13 @26636 has 10 MA's), (Start: 20 @26669 has 1 MA's), (24, 26690), (30, 26717), (38, 26768), (41, 26813), (43, 26864), (48, 26915), (53, 26978), (62, 27077), (76, 27200), (81, 27239), (86, 27284), (92, 27344), (96, 27377), (101, 27410),

Gene: Ecliptus\_27 Start: 21245, Stop: 22066, Start Num: 14

Candidate Starts for Ecliptus\_27:

(Start: 14 @21245 has 10 MA's), (Start: 15 @21248 has 41 MA's), (Start: 20 @21275 has 1 MA's), (23, 21293), (27, 21311), (32, 21335), (36, 21359), (38, 21374), (41, 21419), (47, 21491), (50, 21548), (55, 21599), (63, 21689), (64, 21707), (66, 21716), (74, 21788), (77, 21818), (91, 21947),

Gene: Emianna\_48 Start: 38345, Stop: 39367, Start Num: 15

Candidate Starts for Emianna\_48:

(Start: 14 @38342 has 10 MA's), (Start: 15 @38345 has 41 MA's), (Start: 20 @38372 has 1 MA's), (32, 38435), (36, 38459), (46, 38588), (58, 38735), (69, 38849), (79, 38957), (89, 39032), (94, 39086), (103, 39143), (104, 39149), (110, 39236), (111, 39266),

Gene: Ennea\_55 Start: 39348, Stop: 40370, Start Num: 15

Candidate Starts for Ennea\_55:

(Start: 14 @39345 has 10 MA's), (Start: 15 @39348 has 41 MA's), (32, 39438), (34, 39453), (39, 39498), (56, 39729), (69, 39852), (79, 39960), (103, 40146), (104, 40152), (110, 40239), (111, 40269), (116, 40332),

Gene: Flapper\_53 Start: 39054, Stop: 40079, Start Num: 14

Candidate Starts for Flapper\_53:

(Start: 14 @39054 has 10 MA's), (Start: 15 @39057 has 41 MA's), (21, 39087), (32, 39147), (67, 39543), (72, 39585), (79, 39669), (90, 39756), (103, 39855), (104, 39861), (110, 39948), (115, 40026), (116, 40041),

Gene: Float294\_51 Start: 38790, Stop: 39812, Start Num: 15

Candidate Starts for Float294\_51:

(Start: 14 @38787 has 10 MA's), (Start: 15 @38790 has 41 MA's), (32, 38880), (34, 38895), (39, 38940), (69, 39294), (79, 39402), (103, 39588), (104, 39594), (110, 39681), (111, 39711), (116, 39774),

Gene: Foxboro\_49 Start: 38851, Stop: 39873, Start Num: 15

Candidate Starts for Foxboro\_49:

(Start: 14 @38848 has 10 MA's), (Start: 15 @38851 has 41 MA's), (Start: 20 @38878 has 1 MA's), (32, 38941), (36, 38965), (46, 39094), (69, 39355), (79, 39463), (89, 39538), (94, 39592), (103, 39649), (104, 39655), (110, 39742), (111, 39772),

Gene: Francois\_30 Start: 25654, Stop: 26466, Start Num: 13

Candidate Starts for Francois\_30:

(Start: 12 @25645 has 5 MA's), (Start: 13 @25654 has 10 MA's), (18, 25675), (Start: 20 @25687 has 1 MA's), (30, 25735), (38, 25786), (41, 25831), (43, 25882), (53, 25996), (59, 26059), (62, 26095), (76, 26218), (81, 26257), (86, 26302), (92, 26362), (95, 26389),

Gene: Fury\_56 Start: 37521, Stop: 38534, Start Num: 15

Candidate Starts for Fury\_56:

(Start: 15 @37521 has 41 MA's), (Start: 20 @37548 has 1 MA's), (38, 37638), (40, 37674), (42, 37716), (45, 37734), (55, 37869), (62, 37947), (82, 38127), (103, 38304),

Gene: GRU1\_38 Start: 30601, Stop: 31626, Start Num: 14

Candidate Starts for GRU1\_38:

(3, 30349), (Start: 14 @30601 has 10 MA's), (Start: 15 @30604 has 41 MA's), (18, 30619), (21, 30634), (23, 30649), (32, 30694), (72, 31132), (79, 31216), (90, 31303), (103, 31402), (104, 31408), (110, 31495), (115, 31573), (116, 31588),

Gene: GTE5\_40 Start: 31911, Stop: 32936, Start Num: 14

Candidate Starts for GTE5\_40:

(1, 31347), (3, 31659), (Start: 14 @31911 has 10 MA's), (Start: 15 @31914 has 41 MA's), (21, 31944), (32, 32004), (72, 32442), (79, 32526), (90, 32613), (103, 32712), (104, 32718), (110, 32805), (115, 32883), (116, 32898),

Gene: GTE8\_37 Start: 31603, Stop: 32625, Start Num: 15

Candidate Starts for GTE8\_37:

(Start: 14 @31600 has 10 MA's), (Start: 15 @31603 has 41 MA's), (32, 31693), (34, 31708), (36, 31717), (46, 31846), (51, 31933), (61, 32035), (69, 32107), (79, 32215), (103, 32401), (104, 32407), (108, 32452), (110, 32494), (111, 32524), (116, 32587),

Gene: GrandSlam\_30 Start: 26165, Stop: 26977, Start Num: 13

Candidate Starts for GrandSlam\_30:

(9, 26069), (Start: 12 @26156 has 5 MA's), (Start: 13 @26165 has 10 MA's), (Start: 20 @26198 has 1 MA's), (30, 26246), (38, 26297), (41, 26342), (43, 26393), (53, 26507), (62, 26606), (76, 26729), (81, 26768), (86, 26813), (92, 26873), (96, 26906), (101, 26939),

Gene: GrootJr\_50 Start: 37724, Stop: 38749, Start Num: 14

Candidate Starts for GrootJr\_50:

(Start: 14 @37724 has 10 MA's), (Start: 15 @37727 has 41 MA's), (Start: 20 @37754 has 1 MA's), (32, 37817), (36, 37841), (46, 37970), (69, 38231), (79, 38339), (89, 38414), (94, 38468), (103, 38525), (104, 38531), (110, 38618), (111, 38648),

Gene: Hamood\_30 Start: 26165, Stop: 26977, Start Num: 13

Candidate Starts for Hamood\_30:

(9, 26069), (Start: 12 @26156 has 5 MA's), (Start: 13 @26165 has 10 MA's), (Start: 20 @26198 has 1 MA's), (30, 26246), (38, 26297), (41, 26342), (43, 26393), (53, 26507), (62, 26606), (76, 26729), (81, 26768), (86, 26813), (92, 26873), (96, 26906), (101, 26939),

Gene: HomeFry\_53 Start: 36153, Stop: 37187, Start Num: 15

Candidate Starts for HomeFry\_53:

(Start: 15 @36153 has 41 MA's), (Start: 20 @36180 has 1 MA's), (38, 36270), (40, 36306), (42, 36348), (44, 36378), (45, 36390), (55, 36525), (62, 36603), (75, 36732), (82, 36780), (103, 36954),

Gene: Horus\_23 Start: 19383, Stop: 20216, Start Num: 14

Candidate Starts for Horus\_23:

(Start: 14 @19383 has 10 MA's), (Start: 15 @19386 has 41 MA's), (Start: 20 @19413 has 1 MA's), (32, 19473), (38, 19512), (41, 19557), (49, 19671), (50, 19698), (52, 19725), (57, 19767), (63, 19839), (64, 19857), (66, 19866), (74, 19938), (77, 19968), (91, 20097), (93, 20112), (98, 20139),

Gene: HubbaBubba\_45 Start: 33880, Stop: 34899, Start Num: 15

Candidate Starts for HubbaBubba\_45:

(8, 33766), (Start: 14 @33877 has 10 MA's), (Start: 15 @33880 has 41 MA's), (25, 33937), (31, 33961), (32, 33970), (55, 34246), (60, 34300), (69, 34384), (80, 34495), (84, 34519), (86, 34540), (94, 34618), (100, 34666), (103, 34675), (104, 34681), (105, 34687), (110, 34768), (113, 34819),

Gene: IDyn\_49 Start: 35306, Stop: 36325, Start Num: 15

Candidate Starts for IDyn\_49:

(8, 35195), (Start: 15 @35306 has 41 MA's), (25, 35363), (28, 35375), (32, 35396), (36, 35420), (55, 35672), (60, 35726), (69, 35810), (80, 35921), (84, 35945), (94, 36044), (100, 36092), (103, 36101), (104, 36107), (110, 36194), (113, 36245),

Gene: Jifall16\_47 Start: 37999, Stop: 39021, Start Num: 15

Candidate Starts for Jifall16\_47:

(Start: 14 @37996 has 10 MA's), (Start: 15 @37999 has 41 MA's), (Start: 20 @38026 has 1 MA's), (32, 38089), (36, 38113), (46, 38242), (69, 38503), (79, 38611), (89, 38686), (94, 38740), (103, 38797), (104, 38803), (110, 38890), (111, 38920),

Gene: JonJames\_50 Start: 36217, Stop: 37089, Start Num: 20

Candidate Starts for JonJames\_50:

(Start: 15 @36190 has 41 MA's), (Start: 20 @36217 has 1 MA's), (32, 36280), (41, 36364), (54, 36511), (57, 36535), (73, 36685), (79, 36760), (85, 36796), (102, 36922),

Gene: Kabluna\_52 Start: 37421, Stop: 38443, Start Num: 15

Candidate Starts for Kabluna\_52:

(1, 36854), (3, 37166), (Start: 14 @37418 has 10 MA's), (Start: 15 @37421 has 41 MA's), (21, 37451), (30, 37499), (32, 37511), (36, 37535), (46, 37664), (72, 37949), (79, 38033), (90, 38120), (97, 38180), (103, 38219), (104, 38225), (107, 38261), (108, 38270), (110, 38312), (111, 38342), (116, 38405),

Gene: KidneyBean\_48 Start: 38123, Stop: 39145, Start Num: 15

Candidate Starts for KidneyBean\_48:

(Start: 14 @38120 has 10 MA's), (Start: 15 @38123 has 41 MA's), (Start: 20 @38150 has 1 MA's), (32, 38213), (36, 38237), (46, 38366), (69, 38627), (79, 38735), (89, 38810), (94, 38864), (103, 38921), (104, 38927), (110, 39014), (111, 39044),

Gene: Kurt\_48 Start: 38360, Stop: 39382, Start Num: 15

Candidate Starts for Kurt\_48:

(Start: 14 @38357 has 10 MA's), (Start: 15 @38360 has 41 MA's), (Start: 20 @38387 has 1 MA's), (32, 38450), (36, 38474), (46, 38603), (58, 38750), (69, 38864), (79, 38972), (89, 39047), (94, 39101), (103, 39158), (104, 39164), (110, 39251), (111, 39281),

Gene: Leroy\_23 Start: 19387, Stop: 20217, Start Num: 15

Candidate Starts for Leroy\_23:

(Start: 14 @19384 has 10 MA's), (Start: 15 @19387 has 41 MA's), (Start: 20 @19414 has 1 MA's), (32, 19474), (38, 19513), (41, 19558), (49, 19672), (50, 19699), (52, 19726), (57, 19768), (63, 19840), (64, 19858), (66, 19867), (74, 19939), (77, 19969), (91, 20098), (93, 20113), (98, 20140),

Gene: Lilbeanie\_38 Start: 31874, Stop: 32515, Start Num: 15

Candidate Starts for Lilbeanie\_38:

(4, 31697), (5, 31733), (7, 31754), (Start: 15 @31874 has 41 MA's), (19, 31898), (Start: 20 @31901 has 1 MA's), (32, 31961), (35, 31979), (41, 32045), (63, 32315), (83, 32471),

Gene: Lollipop1437\_54 Start: 39336, Stop: 40358, Start Num: 15

Candidate Starts for Lollipop1437\_54:

(3, 39081), (Start: 14 @39333 has 10 MA's), (Start: 15 @39336 has 41 MA's), (32, 39426), (34, 39441), (39, 39486), (56, 39717), (69, 39840), (79, 39948), (103, 40134), (104, 40140), (110, 40227), (111, 40257), (116, 40320),

Gene: Marietta\_50 Start: 35200, Stop: 36219, Start Num: 15

Candidate Starts for Marietta\_50:

(8, 35086), (Start: 14 @35197 has 10 MA's), (Start: 15 @35200 has 41 MA's), (25, 35257), (31, 35281), (32, 35290), (55, 35566), (60, 35620), (69, 35704), (80, 35815), (84, 35839), (86, 35860), (94, 35938), (100, 35986), (103, 35995), (104, 36001), (113, 36139),

Gene: MerCougar\_50 Start: 38623, Stop: 39645, Start Num: 15

Candidate Starts for MerCougar\_50:

(1, 38056), (3, 38368), (Start: 14 @38620 has 10 MA's), (Start: 15 @38623 has 41 MA's), (32, 38713), (46, 38866), (71, 39148), (72, 39151), (78, 39229), (79, 39235), (90, 39322), (103, 39421), (104, 39427), (107, 39463), (110, 39514), (111, 39544), (112, 39559), (116, 39607),

Gene: Mulch\_30 Start: 25628, Stop: 26440, Start Num: 13

Candidate Starts for Mulch\_30:

(9, 25532), (Start: 12 @25619 has 5 MA's), (Start: 13 @25628 has 10 MA's), (Start: 20 @25661 has 1 MA's), (30, 25709), (38, 25760), (41, 25805), (43, 25856), (53, 25970), (62, 26069), (76, 26192), (81, 26231), (86, 26276), (92, 26336), (96, 26369), (101, 26402),

Gene: Nadeem\_30 Start: 25619, Stop: 26440, Start Num: 12

Candidate Starts for Nadeem\_30:

(9, 25532), (Start: 12 @25619 has 5 MA's), (Start: 13 @25628 has 10 MA's), (Start: 20 @25661 has 1 MA's), (30, 25709), (38, 25760), (41, 25805), (43, 25856), (53, 25970), (62, 26069), (76, 26192), (81, 26231), (86, 26276), (92, 26336), (96, 26369), (101, 26402),

Gene: NadineRae\_48 Start: 34447, Stop: 35466, Start Num: 15

Candidate Starts for NadineRae\_48:

(8, 34333), (Start: 14 @34444 has 10 MA's), (Start: 15 @34447 has 41 MA's), (25, 34504), (31, 34528), (32, 34537), (55, 34813), (60, 34867), (69, 34951), (80, 35062), (84, 35086), (86, 35107), (94, 35185), (100, 35233), (103, 35242), (104, 35248), (110, 35335), (113, 35386),

Gene: NancyRae\_30 Start: 25628, Stop: 26449, Start Num: 12

Candidate Starts for NancyRae\_30:

(9, 25541), (Start: 12 @25628 has 5 MA's), (Start: 13 @25637 has 10 MA's), (Start: 20 @25670 has 1 MA's), (30, 25718), (38, 25769), (41, 25814), (43, 25865), (53, 25979), (62, 26078), (76, 26201), (81, 26240), (86, 26285), (92, 26345), (96, 26378), (101, 26411),

Gene: NatB6\_48 Start: 37417, Stop: 38439, Start Num: 15

Candidate Starts for NatB6\_48:

(Start: 14 @37414 has 10 MA's), (Start: 15 @37417 has 41 MA's), (Start: 20 @37444 has 1 MA's), (32, 37507), (36, 37531), (46, 37660), (69, 37921), (79, 38029), (89, 38104), (94, 38158), (103, 38215), (104, 38221), (110, 38308), (111, 38338),

Gene: NosilaM\_52 Start: 38318, Stop: 39340, Start Num: 15

Candidate Starts for NosilaM\_52:

(Start: 14 @38315 has 10 MA's), (Start: 15 @38318 has 41 MA's), (21, 38348), (30, 38396), (32, 38408), (46, 38561), (72, 38846), (79, 38930), (90, 39017), (97, 39077), (103, 39116), (104, 39122), (107, 39158), (110, 39209), (111, 39239), (116, 39302),

Gene: NovumRegina\_48 Start: 37723, Stop: 38748, Start Num: 14

Candidate Starts for NovumRegina\_48:

(Start: 14 @37723 has 10 MA's), (Start: 15 @37726 has 41 MA's), (Start: 20 @37753 has 1 MA's), (32, 37816), (36, 37840), (46, 37969), (69, 38230), (79, 38338), (89, 38413), (94, 38467), (103, 38524), (104, 38530), (110, 38617), (111, 38647),

Gene: Outis\_50 Start: 38317, Stop: 39339, Start Num: 15

Candidate Starts for Outis\_50:

(3, 38062), (Start: 14 @38314 has 10 MA's), (Start: 15 @38317 has 41 MA's), (21, 38347), (32, 38407), (46, 38560), (71, 38842), (72, 38845), (78, 38923), (79, 38929), (90, 39016), (103, 39115), (104, 39121), (107, 39157), (110, 39208), (111, 39238), (116, 39301),

Gene: Parada\_30 Start: 25628, Stop: 26440, Start Num: 13

Candidate Starts for Parada\_30:

(9, 25532), (Start: 12 @25619 has 5 MA's), (Start: 13 @25628 has 10 MA's), (Start: 20 @25661 has 1 MA's), (30, 25709), (38, 25760), (41, 25805), (43, 25856), (53, 25970), (62, 26069), (76, 26192), (81, 26231), (86, 26276), (92, 26336), (96, 26369), (101, 26402),

Gene: Patio\_52 Start: 38572, Stop: 39594, Start Num: 15

Candidate Starts for Patio\_52:

(Start: 14 @38569 has 10 MA's), (Start: 15 @38572 has 41 MA's), (32, 38662), (34, 38677), (39, 38722), (56, 38953), (69, 39076), (79, 39184), (103, 39370), (104, 39376), (110, 39463), (111, 39493), (116, 39556),

Gene: Pemberton\_51 Start: 35179, Stop: 36198, Start Num: 15

Candidate Starts for Pemberton\_51:

(8, 35065), (Start: 14 @35176 has 10 MA's), (Start: 15 @35179 has 41 MA's), (25, 35236), (31, 35260), (32, 35269), (55, 35545), (60, 35599), (69, 35683), (80, 35794), (84, 35818), (86, 35839), (94, 35917), (100, 35965), (103, 35974), (104, 35980), (110, 36067), (113, 36118),

Gene: Phistory\_24 Start: 20152, Stop: 20982, Start Num: 15

Candidate Starts for Phistory\_24:

(Start: 14 @20149 has 10 MA's), (Start: 15 @20152 has 41 MA's), (Start: 20 @20179 has 1 MA's), (32, 20239), (38, 20278), (41, 20323), (49, 20437), (50, 20464), (52, 20491), (57, 20533), (63, 20605), (64, 20623), (66, 20632), (74, 20704), (77, 20734), (91, 20863), (93, 20878), (98, 20905),

Gene: Phomeo\_47 Start: 37995, Stop: 39017, Start Num: 15

Candidate Starts for Phomeo\_47:

(Start: 14 @37992 has 10 MA's), (Start: 15 @37995 has 41 MA's), (Start: 20 @38022 has 1 MA's), (32, 38085), (36, 38109), (46, 38238), (69, 38499), (79, 38607), (89, 38682), (94, 38736), (103, 38793), (104, 38799), (110, 38886), (111, 38916),

Gene: Pimento\_30 Start: 25097, Stop: 25918, Start Num: 12

Candidate Starts for Pimento\_30:

(9, 25010), (11, 25082), (Start: 12 @25097 has 5 MA's), (Start: 13 @25106 has 10 MA's), (Start: 20 @25139 has 1 MA's), (30, 25187), (38, 25238), (41, 25283), (43, 25334), (48, 25385), (53, 25448), (62, 25547), (76, 25670), (81, 25709), (86, 25754), (92, 25814), (96, 25847), (101, 25880),

Gene: Pleakley\_56 Start: 37522, Stop: 38535, Start Num: 15

Candidate Starts for Pleakley\_56:

(Start: 15 @37522 has 41 MA's), (Start: 20 @37549 has 1 MA's), (38, 37639), (40, 37675), (42, 37717), (45, 37735), (55, 37870), (62, 37948), (82, 38128), (103, 38305),

Gene: RedRaider\_56 Start: 40594, Stop: 41616, Start Num: 15

Candidate Starts for RedRaider\_56:

(Start: 14 @40591 has 10 MA's), (Start: 15 @40594 has 41 MA's), (32, 40684), (39, 40744), (46, 40837), (69, 41098), (79, 41206), (89, 41281), (103, 41392), (104, 41398), (107, 41434), (110, 41485), (111, 41515), (115, 41563), (116, 41578),

Gene: Scuba\_56 Start: 37596, Stop: 38609, Start Num: 15

Candidate Starts for Scuba\_56:

(Start: 15 @37596 has 41 MA's), (Start: 20 @37623 has 1 MA's), (38, 37713), (40, 37749), (42, 37791), (45, 37809), (55, 37944), (62, 38022), (75, 38151), (82, 38202), (103, 38379),

Gene: Skysand\_51 Start: 38792, Stop: 39814, Start Num: 15

Candidate Starts for Skysand\_51:

(3, 38537), (Start: 14 @38789 has 10 MA's), (Start: 15 @38792 has 41 MA's), (32, 38882), (34, 38897), (39, 38942), (69, 39296), (79, 39404), (103, 39590), (104, 39596), (107, 39632), (110, 39683), (111, 39713), (116, 39776),

Gene: StarStruck\_50 Start: 38317, Stop: 39339, Start Num: 15

Candidate Starts for StarStruck\_50:

(3, 38062), (Start: 14 @38314 has 10 MA's), (Start: 15 @38317 has 41 MA's), (21, 38347), (32, 38407), (46, 38560), (71, 38842), (72, 38845), (78, 38923), (79, 38929), (90, 39016), (103, 39115), (104, 39121), (107, 39157), (110, 39208), (111, 39238), (116, 39301),

Gene: Sukkupi\_49 Start: 36753, Stop: 37772, Start Num: 15

Candidate Starts for Sukkupi\_49:

(8, 36639), (Start: 14 @36750 has 10 MA's), (Start: 15 @36753 has 41 MA's), (25, 36810), (31, 36834), (32, 36843), (55, 37119), (60, 37173), (69, 37257), (80, 37368), (84, 37392), (86, 37413), (94, 37491), (100, 37539), (103, 37548), (104, 37554), (110, 37641), (113, 37692),

Gene: SuperSulley\_50 Start: 38485, Stop: 39507, Start Num: 15

Candidate Starts for SuperSulley\_50:

(1, 37918), (3, 38230), (Start: 14 @38482 has 10 MA's), (Start: 15 @38485 has 41 MA's), (21, 38515), (30, 38563), (32, 38575), (36, 38599), (46, 38728), (72, 39013), (79, 39097), (90, 39184), (97, 39244), (103, 39283), (104, 39289), (107, 39325), (111, 39406), (116, 39469),

Gene: Tracker\_48 Start: 37144, Stop: 38166, Start Num: 15

Candidate Starts for Tracker\_48:

(Start: 14 @37141 has 10 MA's), (Start: 15 @37144 has 41 MA's), (Start: 20 @37171 has 1 MA's), (32, 37234), (36, 37258), (46, 37387), (69, 37648), (79, 37756), (89, 37831), (94, 37885), (103, 37942), (104, 37948), (110, 38035), (111, 38065),

Gene: Turuncu\_53 Start: 38719, Stop: 39741, Start Num: 15

Candidate Starts for Turuncu\_53:

(1, 38152), (3, 38464), (Start: 14 @38716 has 10 MA's), (Start: 15 @38719 has 41 MA's), (21, 38749), (32, 38809), (72, 39247), (79, 39331), (89, 39406), (90, 39418), (103, 39517), (104, 39523), (110, 39610), (115, 39688), (116, 39703),

Gene: WheatThin\_30 Start: 25628, Stop: 26440, Start Num: 13

Candidate Starts for WheatThin\_30:

(9, 25532), (Start: 12 @25619 has 5 MA's), (Start: 13 @25628 has 10 MA's), (Start: 20 @25661 has 1 MA's), (30, 25709), (38, 25760), (41, 25805), (43, 25856), (53, 25970), (62, 26069), (76, 26192), (81, 26231), (86, 26276), (92, 26336), (96, 26369), (101, 26402),

Gene: Wheezy\_48 Start: 37349, Stop: 38371, Start Num: 15

Candidate Starts for Wheezy\_48:

(Start: 14 @37346 has 10 MA's), (Start: 15 @37349 has 41 MA's), (Start: 20 @37376 has 1 MA's), (32, 37439), (36, 37463), (46, 37592), (69, 37853), (79, 37961), (89, 38036), (94, 38090), (103, 38147), (104, 38153), (110, 38240), (111, 38270),

Gene: WhoseManz\_49 Start: 34810, Stop: 35832, Start Num: 14

Candidate Starts for WhoseManz\_49:

(8, 34699), (Start: 14 @34810 has 10 MA's), (Start: 15 @34813 has 41 MA's), (25, 34870), (31, 34894), (32, 34903), (55, 35179), (60, 35233), (69, 35317), (80, 35428), (84, 35452), (86, 35473), (94, 35551), (100, 35599), (103, 35608), (104, 35614), (110, 35701), (113, 35752),

Gene: Yndexa\_49 Start: 36753, Stop: 37772, Start Num: 15

Candidate Starts for Yndexa\_49:

(8, 36639), (Start: 14 @36750 has 10 MA's), (Start: 15 @36753 has 41 MA's), (25, 36810), (31, 36834), (32, 36843), (55, 37119), (60, 37173), (69, 37257), (80, 37368), (84, 37392), (86, 37413), (94, 37491), (100, 37539), (103, 37548), (104, 37554), (110, 37641), (113, 37692),

Gene: Yvonnetastic\_48 Start: 33725, Stop: 34624, Start Num: 15

Candidate Starts for Yvonnetastic\_48:

(Start: 15 @33725 has 41 MA's), (Start: 20 @33752 has 1 MA's), (32, 33815), (41, 33899), (54, 34046), (57, 34070), (73, 34220), (79, 34295), (85, 34331), (102, 34457),

Gene: ZAYM\_22 Start: 20018, Stop: 20857, Start Num: 15

Candidate Starts for ZAYM\_22:

(2, 19754), (6, 19889), (10, 19928), (Start: 15 @20018 has 41 MA's), (Start: 20 @20045 has 1 MA's), (26, 20081), (29, 20093), (32, 20108), (37, 20141), (49, 20270), (55, 20348), (79, 20570), (88, 20612),