

Pham 296400



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 296400 Report

This analysis was run 04/25/26 on database version 644.

Pham number 296400 has 111 members, 9 are drafts.

Phages represented in each track:

- Track 1 : Kugel\_40, Bigfoot\_36, Scowl\_38, Bircsak\_38, Bones\_38, Gompeii16\_38, Espresso\_38, Doom\_38
- Track 2 : Sanya\_37, Pippin\_40, Ciao\_38
- Track 3 : BigPaolini\_37, Eyeball\_38, Agaliana\_36, Graduation\_40, KBG\_39, Wilkins\_37, PacerPaul\_39, LunarLander\_39, ChristmasHams\_36, Topgun\_37, Phlippers\_36, Puppet\_38, Francis47\_38, Smairt\_39, Licorice\_40
- Track 4 : Sibs6\_39
- Track 5 : Solon\_38, Lamina13\_38, Sumter\_37, Tasp14\_39
- Track 6 : LilBib\_38
- Track 7 : Marcell\_38, Euphoria\_38, Snazzy\_37, Switzer\_39, SpikeBT\_40, Norz\_40, U2\_38, Anglerfish\_40, Pari\_39, NEHalo\_38, AFIS\_38, GageAP\_40, BillKnuckles\_39
- Track 8 : Lesedi\_37, PinkPlastic\_37, Petruccio\_39, DreamCatcher\_41, Buttons\_38, Seabiscuit\_40, Treddle\_41, BeesKnees\_39, Oogway\_37, Bigchungji\_38, Edtherson\_40, Aeneas\_41, Whitspit\_37, Adahisdi\_39, Zephyr\_39, Mule\_37
- Track 9 : SwissCheese\_40, Marchy\_33, Corvo\_39, HanShotFirst\_37, Forsytheast\_38, PhineBark\_37, Blackflame\_38, Levia\_35, ShortQueendom\_33, Altman\_40, Payneful\_38, Moose\_38, Kanely\_39
- Track 10 : Fajezeel\_40, Greg\_40, Acme\_41, JC27\_39, Ashballer\_40, Fascinus\_37, Wheeler\_39
- Track 11 : Chanagan\_37, Carlyle\_39, PherrisBueller\_39, Jasper\_39, Dreamboat\_39
- Track 12 : MetalQZJ\_38, MaryBeth\_38
- Track 13 : Museum\_40, BigMau\_40, Burton\_39, Bob3\_37, Molly\_40, TwoPeat\_39, Petp2012\_40
- Track 14 : Magnito\_37, Turj99\_37
- Track 15 : Jerm2\_39, Rohr\_39, HermioneGrange\_38
- Track 16 : Pepe\_34, Monet\_41
- Track 17 : Rutherford\_40, Dulcie\_37
- Track 18 : Gyzlar\_36
- Track 19 : PowerRanger\_40
- Track 20 : JackSparrow\_40
- Track 21 : Seanderson\_39
- Track 22 : Cueylyss\_38
- Track 23 : Trouble\_39
- Track 24 : Watermelon\_40

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

The start number called the most often in the published annotations is 12, it was called in 59 of the 102 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Acme\_41, Agaliana\_36, Altman\_40, Ashballer\_40, BigPaolini\_37, Bigfoot\_36, Bircsak\_38, Blackflame\_38, Bones\_38, ChristmasHams\_36, Ciao\_38, Corvo\_39, Cueyllyss\_38, Doom\_38, Dulcie\_37, Espresso\_38, Eyeball\_38, Fajezeel\_40, Fascinus\_37, Forsytheast\_38, Francis47\_38, Gompeii16\_38, Graduation\_40, Greg\_40, HanShotFirst\_37, HermioneGrange\_38, JC27\_39, JackSparrow\_40, Jerm2\_39, KBG\_39, Kanely\_39, Kugel\_40, Lamina13\_38, Levia\_35, Licorice\_40, LilBib\_38, LunarLander\_39, Marchy\_33, MaryBeth\_38, MetalQZJ\_38, Monet\_41, Moose\_38, PacerPaul\_39, Payneful\_38, Pepe\_34, PhineBark\_37, Phlippers\_36, Pippin\_40, PowerRanger\_40, Puppet\_38, Rohr\_39, Rutherford\_40, Sanya\_37, Scowl\_38, Seanderson\_39, ShortQueendom\_33, Sibs6\_39, Smairt\_39, Solon\_38, Sumter\_37, SwissCheese\_40, Tasp14\_39, Topgun\_37, Trouble\_39, Watermelon\_40, Wheeler\_39, Wilkins\_37,

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

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

- AFIS\_38, Adahisdi\_39, Aeneas\_41, Anglerfish\_40, BeesKnees\_39, BigMau\_40, Bigchungu\_38, BillKnuckles\_39, Bob3\_37, Burton\_39, Buttons\_38, Carlyle\_39, Chanagan\_37, DreamCatcher\_41, Dreamboat\_39, Edtherson\_40, Euphoria\_38, GageAP\_40, Gyzlar\_36, Jasper\_39, Lesedi\_37, Magnito\_37, Marcell\_38, Molly\_40, Mule\_37, Museum\_40, NEHalo\_38, Norz\_40, Oogway\_37, Pari\_39, Petp2012\_40, Petruccio\_39, PherrisBueller\_39, PinkPlastic\_37, Seabiscuit\_40, Snazzy\_37, SpikeBT\_40, Switzer\_39, Treddle\_41, Turj99\_37, TwoPeat\_39, U2\_38, Whitspit\_37, Zephyr\_39,

## **Summary by start number:**

Start 11:

- Found in 43 of 111 ( 38.7% ) of genes in pham
- Manual Annotations of this start: 42 of 102
- Called 100.0% of time when present
- Phage (with cluster) where this start called: AFIS\_38 (A1), Adahisdi\_39 (A1), Aeneas\_41 (A1), Anglerfish\_40 (A1), BeesKnees\_39 (A1), BigMau\_40 (A1), Bigchungu\_38 (A1), BillKnuckles\_39 (A1), Bob3\_37 (A1), Burton\_39 (A1), Buttons\_38 (A1), Carlyle\_39 (A1), Chanagan\_37 (A1), DreamCatcher\_41 (A1), Dreamboat\_39 (A1), Edtherson\_40 (A1), Euphoria\_38 (A1), GageAP\_40 (A1), Jasper\_39 (A1), Lesedi\_37 (A1), Magnito\_37 (A1), Marcell\_38 (A1), Molly\_40 (A1), Mule\_37 (A1), Museum\_40 (A1), NEHalo\_38 (A1), Norz\_40 (A1), Oogway\_37 (A1), Pari\_39 (A1), Petp2012\_40 (A1), Petruccio\_39 (A1), PherrisBueller\_39 (A1), PinkPlastic\_37 (A1), Seabiscuit\_40 (A1), Snazzy\_37 (A1), SpikeBT\_40 (A1), Switzer\_39 (A1), Treddle\_41 (A1), Turj99\_37 (A1), TwoPeat\_39 (A1), U2\_38 (A1), Whitspit\_37 (A1), Zephyr\_39 (A1),

Start 12:

- Found in 67 of 111 ( 60.4% ) of genes in pham

- Manual Annotations of this start: 59 of 102
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Acme\_41 (A1), Agaliana\_36 (A1), Altman\_40 (A1), Ashballer\_40 (A1), BigPaolini\_37 (A1), Bigfoot\_36 (A1), Bircsak\_38 (A1), Blackflame\_38 (A1), Bones\_38 (A1), ChristmasHams\_36 (A1), Ciao\_38 (A1), Corvo\_39 (A1), Cueylyss\_38 (A1), Doom\_38 (A1), Dulcie\_37 (A1), Espresso\_38 (A1), Eyeball\_38 (A1), Fajezeel\_40 (A1), Fascinus\_37 (A1), Forsytheast\_38 (A1), Francis47\_38 (A1), Gompeii16\_38 (A1), Graduation\_40 (A1), Greg\_40 (A1), HanShotFirst\_37 (A1), HermioneGrange\_38 (A1), JC27\_39 (A1), JackSparrow\_40 (A1), Jerm2\_39 (A1), KBG\_39 (A1), Kanely\_39 (A1), Kugel\_40 (A1), Lamina13\_38 (A1), Levia\_35 (A1), Licorice\_40 (A1), LilBib\_38 (A1), LunarLander\_39 (A1), Marchy\_33 (A1), MaryBeth\_38 (A1), MetalQZJ\_38 (A1), Monet\_41 (A1), Moose\_38 (A1), PacerPaul\_39 (A1), Payneful\_38 (A1), Pepe\_34 (A1), PhineBark\_37 (A1), Phippers\_36 (A1), Pippin\_40 (A1), PowerRanger\_40 (A1), Puppet\_38 (A1), Rohr\_39 (A1), Rutherford\_40 (A1), Sanya\_37 (A1), Scowl\_38 (A1), Seanderson\_39 (A1), ShortQueendom\_33 (A1), Sibs6\_39 (A1), Smairt\_39 (A1), Solon\_38 (A1), Sumter\_37 (A1), SwissCheese\_40 (A1), Tasp14\_39 (A1), Topgun\_37 (A1), Trouble\_39 (A1), Watermelon\_40 (A1), Wheeler\_39 (A1), Wilkins\_37 (A1),

Start 13:

- Found in 1 of 111 ( 0.9% ) of genes in pham
- Manual Annotations of this start: 1 of 102
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Gyzlar\_36 (A1),

### Summary by clusters:

There is one cluster represented in this pham: A1

Info for manual annotations of cluster A1:

- Start number 11 was manually annotated 42 times for cluster A1.
- Start number 12 was manually annotated 59 times for cluster A1.
- Start number 13 was manually annotated 1 time for cluster A1.

### Gene Information:

Gene: AFIS\_38 Start: 31598, Stop: 31326, Start Num: 11

Candidate Starts for AFIS\_38:

(2, 31733), (5, 31700), (Start: 11 @31598 has 42 MA's), (18, 31556), (24, 31529), (25, 31484), (26, 31475), (27, 31436), (28, 31349),

Gene: Acme\_41 Start: 31739, Stop: 31467, Start Num: 12

Candidate Starts for Acme\_41:

(1, 31919), (3, 31853), (5, 31829), (7, 31817), (8, 31814), (Start: 12 @31739 has 59 MA's), (18, 31697), (24, 31670), (25, 31625), (26, 31616), (27, 31577), (28, 31490),

Gene: Adahisdi\_39 Start: 31648, Stop: 31376, Start Num: 11

Candidate Starts for Adahisdi\_39:

(2, 31783), (5, 31750), (Start: 11 @31648 has 42 MA's), (18, 31606), (24, 31579), (25, 31534), (26, 31525), (27, 31486),

Gene: Aeneas\_41 Start: 31799, Stop: 31530, Start Num: 11  
Candidate Starts for Aeneas\_41:  
(2, 31934), (5, 31901), (Start: 11 @31799 has 42 MA's), (18, 31760), (24, 31733), (25, 31688), (26, 31679), (27, 31640),

Gene: Agaliana\_36 Start: 28180, Stop: 27908, Start Num: 12  
Candidate Starts for Agaliana\_36:  
(3, 28294), (5, 28270), (7, 28258), (8, 28255), (Start: 12 @28180 has 59 MA's), (18, 28138), (24, 28111), (25, 28066), (26, 28057), (27, 28018), (28, 27931),

Gene: Altman\_40 Start: 32259, Stop: 31951, Start Num: 12  
Candidate Starts for Altman\_40:  
(9, 32346), (Start: 12 @32259 has 59 MA's), (15, 32226), (20, 32190), (22, 32181), (25, 32109), (26, 32100), (27, 32061), (28, 31974),

Gene: Anglerfish\_40 Start: 31701, Stop: 31429, Start Num: 11  
Candidate Starts for Anglerfish\_40:  
(2, 31836), (5, 31803), (Start: 11 @31701 has 42 MA's), (18, 31659), (24, 31632), (25, 31587), (26, 31578), (27, 31539), (28, 31452),

Gene: Ashballer\_40 Start: 32195, Stop: 31923, Start Num: 12  
Candidate Starts for Ashballer\_40:  
(1, 32375), (3, 32309), (5, 32285), (7, 32273), (8, 32270), (Start: 12 @32195 has 59 MA's), (18, 32153), (24, 32126), (25, 32081), (26, 32072), (27, 32033), (28, 31946),

Gene: BeesKnees\_39 Start: 31359, Stop: 31087, Start Num: 11  
Candidate Starts for BeesKnees\_39:  
(2, 31494), (5, 31461), (Start: 11 @31359 has 42 MA's), (18, 31317), (24, 31290), (25, 31245), (26, 31236), (27, 31197),

Gene: BigMau\_40 Start: 31436, Stop: 31206, Start Num: 11  
Candidate Starts for BigMau\_40:  
(2, 31571), (5, 31538), (Start: 11 @31436 has 42 MA's), (18, 31394), (24, 31367), (27, 31316), (28, 31229),

Gene: BigPaolini\_37 Start: 29684, Stop: 29412, Start Num: 12  
Candidate Starts for BigPaolini\_37:  
(3, 29798), (5, 29774), (7, 29762), (8, 29759), (Start: 12 @29684 has 59 MA's), (18, 29642), (24, 29615), (25, 29570), (26, 29561), (27, 29522), (28, 29435),

Gene: Bigchungji\_38 Start: 31052, Stop: 30780, Start Num: 11  
Candidate Starts for Bigchungji\_38:  
(2, 31187), (5, 31154), (Start: 11 @31052 has 42 MA's), (18, 31010), (24, 30983), (25, 30938), (26, 30929), (27, 30890),

Gene: Bigfoot\_36 Start: 30710, Stop: 30438, Start Num: 12  
Candidate Starts for Bigfoot\_36:  
(3, 30824), (5, 30800), (7, 30788), (8, 30785), (Start: 12 @30710 has 59 MA's), (18, 30668), (24, 30641), (25, 30596), (26, 30587), (27, 30548),

Gene: BillKnuckles\_39 Start: 32162, Stop: 31890, Start Num: 11  
Candidate Starts for BillKnuckles\_39:

(2, 32297), (5, 32264), (Start: 11 @32162 has 42 MA's), (18, 32120), (24, 32093), (25, 32048), (26, 32039), (27, 32000), (28, 31913),

Gene: Bircsak\_38 Start: 31775, Stop: 31503, Start Num: 12

Candidate Starts for Bircsak\_38:

(3, 31889), (5, 31865), (7, 31853), (8, 31850), (Start: 12 @31775 has 59 MA's), (18, 31733), (24, 31706), (25, 31661), (26, 31652), (27, 31613),

Gene: Blackflame\_38 Start: 30951, Stop: 30643, Start Num: 12

Candidate Starts for Blackflame\_38:

(9, 31038), (Start: 12 @30951 has 59 MA's), (15, 30918), (20, 30882), (22, 30873), (25, 30801), (26, 30792), (27, 30753), (28, 30666),

Gene: Bob3\_37 Start: 30786, Stop: 30556, Start Num: 11

Candidate Starts for Bob3\_37:

(2, 30921), (5, 30888), (Start: 11 @30786 has 42 MA's), (18, 30744), (24, 30717), (27, 30666), (28, 30579),

Gene: Bones\_38 Start: 31179, Stop: 30907, Start Num: 12

Candidate Starts for Bones\_38:

(3, 31293), (5, 31269), (7, 31257), (8, 31254), (Start: 12 @31179 has 59 MA's), (18, 31137), (24, 31110), (25, 31065), (26, 31056), (27, 31017),

Gene: Burton\_39 Start: 31356, Stop: 31126, Start Num: 11

Candidate Starts for Burton\_39:

(2, 31491), (5, 31458), (Start: 11 @31356 has 42 MA's), (18, 31314), (24, 31287), (27, 31236), (28, 31149),

Gene: Buttons\_38 Start: 30324, Stop: 30052, Start Num: 11

Candidate Starts for Buttons\_38:

(2, 30459), (5, 30426), (Start: 11 @30324 has 42 MA's), (18, 30282), (24, 30255), (25, 30210), (26, 30201), (27, 30162),

Gene: Carlyle\_39 Start: 30068, Stop: 29760, Start Num: 11

Candidate Starts for Carlyle\_39:

(4, 30203), (7, 30170), (Start: 11 @30068 has 42 MA's), (17, 30017), (21, 29996), (25, 29918), (26, 29909), (27, 29870), (28, 29783),

Gene: Chanagan\_37 Start: 30908, Stop: 30600, Start Num: 11

Candidate Starts for Chanagan\_37:

(4, 31043), (7, 31010), (Start: 11 @30908 has 42 MA's), (17, 30857), (21, 30836), (25, 30758), (26, 30749), (27, 30710), (28, 30623),

Gene: ChristmasHams\_36 Start: 28576, Stop: 28304, Start Num: 12

Candidate Starts for ChristmasHams\_36:

(3, 28690), (5, 28666), (7, 28654), (8, 28651), (Start: 12 @28576 has 59 MA's), (18, 28534), (24, 28507), (25, 28462), (26, 28453), (27, 28414), (28, 28327),

Gene: Ciao\_38 Start: 31210, Stop: 30938, Start Num: 12

Candidate Starts for Ciao\_38:

(Start: 12 @31210 has 59 MA's), (18, 31168), (24, 31141), (25, 31096), (26, 31087), (27, 31048), (28, 30961),

Gene: Corvo\_39 Start: 32273, Stop: 31965, Start Num: 12  
Candidate Starts for Corvo\_39:  
(9, 32360), (Start: 12 @32273 has 59 MA's), (15, 32240), (20, 32204), (22, 32195), (25, 32123), (26, 32114), (27, 32075), (28, 31988),

Gene: Cueyllyss\_38 Start: 31412, Stop: 31140, Start Num: 12  
Candidate Starts for Cueyllyss\_38:  
(3, 31526), (5, 31502), (7, 31490), (8, 31487), (Start: 12 @31412 has 59 MA's), (18, 31370), (24, 31343), (25, 31298), (27, 31250), (28, 31163),

Gene: Doom\_38 Start: 31605, Stop: 31333, Start Num: 12  
Candidate Starts for Doom\_38:  
(3, 31719), (5, 31695), (7, 31683), (8, 31680), (Start: 12 @31605 has 59 MA's), (18, 31563), (24, 31536), (25, 31491), (26, 31482), (27, 31443),

Gene: DreamCatcher\_41 Start: 32660, Stop: 32388, Start Num: 11  
Candidate Starts for DreamCatcher\_41:  
(2, 32795), (5, 32762), (Start: 11 @32660 has 42 MA's), (18, 32618), (24, 32591), (25, 32546), (26, 32537), (27, 32498),

Gene: Dreamboat\_39 Start: 31286, Stop: 30978, Start Num: 11  
Candidate Starts for Dreamboat\_39:  
(4, 31421), (7, 31388), (Start: 11 @31286 has 42 MA's), (17, 31235), (21, 31214), (25, 31136), (26, 31127), (27, 31088), (28, 31001),

Gene: Dulcie\_37 Start: 30943, Stop: 30671, Start Num: 12  
Candidate Starts for Dulcie\_37:  
(Start: 12 @30943 has 59 MA's), (18, 30901), (24, 30874), (25, 30829), (26, 30820), (27, 30781),

Gene: Edtherson\_40 Start: 32538, Stop: 32272, Start Num: 11  
Candidate Starts for Edtherson\_40:  
(2, 32673), (5, 32640), (Start: 11 @32538 has 42 MA's), (18, 32496), (24, 32469), (25, 32424), (26, 32415), (27, 32376),

Gene: Espresso\_38 Start: 31529, Stop: 31257, Start Num: 12  
Candidate Starts for Espresso\_38:  
(3, 31643), (5, 31619), (7, 31607), (8, 31604), (Start: 12 @31529 has 59 MA's), (18, 31487), (24, 31460), (25, 31415), (26, 31406), (27, 31367),

Gene: Euphoria\_38 Start: 31379, Stop: 31107, Start Num: 11  
Candidate Starts for Euphoria\_38:  
(2, 31514), (5, 31481), (Start: 11 @31379 has 42 MA's), (18, 31337), (24, 31310), (25, 31265), (26, 31256), (27, 31217), (28, 31130),

Gene: Eyeball\_38 Start: 31085, Stop: 30813, Start Num: 12  
Candidate Starts for Eyeball\_38:  
(3, 31199), (5, 31175), (7, 31163), (8, 31160), (Start: 12 @31085 has 59 MA's), (18, 31043), (24, 31016), (25, 30971), (26, 30962), (27, 30923), (28, 30836),

Gene: Fajezeel\_40 Start: 31568, Stop: 31296, Start Num: 12  
Candidate Starts for Fajezeel\_40:  
(1, 31748), (3, 31682), (5, 31658), (7, 31646), (8, 31643), (Start: 12 @31568 has 59 MA's), (18, 31526), (24, 31499), (25, 31454), (26, 31445), (27, 31406), (28, 31319),

Gene: Fascinus\_37 Start: 30859, Stop: 30587, Start Num: 12

Candidate Starts for Fascinus\_37:

(1, 31039), (3, 30973), (5, 30949), (7, 30937), (8, 30934), (Start: 12 @30859 has 59 MA's), (18, 30817), (24, 30790), (25, 30745), (26, 30736), (27, 30697), (28, 30610),

Gene: Forsytheast\_38 Start: 31551, Stop: 31243, Start Num: 12

Candidate Starts for Forsytheast\_38:

(9, 31638), (Start: 12 @31551 has 59 MA's), (15, 31518), (20, 31482), (22, 31473), (25, 31401), (26, 31392), (27, 31353), (28, 31266),

Gene: Francis47\_38 Start: 31946, Stop: 31674, Start Num: 12

Candidate Starts for Francis47\_38:

(3, 32060), (5, 32036), (7, 32024), (8, 32021), (Start: 12 @31946 has 59 MA's), (18, 31904), (24, 31877), (25, 31832), (26, 31823), (27, 31784), (28, 31697),

Gene: GageAP\_40 Start: 31664, Stop: 31392, Start Num: 11

Candidate Starts for GageAP\_40:

(2, 31799), (5, 31766), (Start: 11 @31664 has 42 MA's), (18, 31622), (24, 31595), (25, 31550), (26, 31541), (27, 31502), (28, 31415),

Gene: Gompeii16\_38 Start: 31776, Stop: 31504, Start Num: 12

Candidate Starts for Gompeii16\_38:

(3, 31890), (5, 31866), (7, 31854), (8, 31851), (Start: 12 @31776 has 59 MA's), (18, 31734), (24, 31707), (25, 31662), (26, 31653), (27, 31614),

Gene: Graduation\_40 Start: 31999, Stop: 31727, Start Num: 12

Candidate Starts for Graduation\_40:

(3, 32113), (5, 32089), (7, 32077), (8, 32074), (Start: 12 @31999 has 59 MA's), (18, 31957), (24, 31930), (25, 31885), (26, 31876), (27, 31837), (28, 31750),

Gene: Greg\_40 Start: 31568, Stop: 31296, Start Num: 12

Candidate Starts for Greg\_40:

(1, 31748), (3, 31682), (5, 31658), (7, 31646), (8, 31643), (Start: 12 @31568 has 59 MA's), (18, 31526), (24, 31499), (25, 31454), (26, 31445), (27, 31406), (28, 31319),

Gene: Gyzlar\_36 Start: 30052, Stop: 29726, Start Num: 13

Candidate Starts for Gyzlar\_36:

(2, 30190), (5, 30157), (Start: 13 @30052 has 1 MA's), (14, 30013), (16, 29995), (19, 29971), (23, 29953), (24, 29929), (25, 29884), (26, 29875), (27, 29836), (28, 29749),

Gene: HanShotFirst\_37 Start: 30903, Stop: 30595, Start Num: 12

Candidate Starts for HanShotFirst\_37:

(9, 30990), (Start: 12 @30903 has 59 MA's), (15, 30870), (20, 30834), (22, 30825), (25, 30753), (26, 30744), (27, 30705), (28, 30618),

Gene: HermioneGrange\_38 Start: 31174, Stop: 30944, Start Num: 12

Candidate Starts for HermioneGrange\_38:

(6, 31258), (Start: 12 @31174 has 59 MA's), (18, 31132), (24, 31105), (27, 31054), (28, 30967),

Gene: JC27\_39 Start: 31765, Stop: 31493, Start Num: 12

Candidate Starts for JC27\_39:

(1, 31945), (3, 31879), (5, 31855), (7, 31843), (8, 31840), (Start: 12 @31765 has 59 MA's), (18, 31723), (24, 31696), (25, 31651), (26, 31642), (27, 31603), (28, 31516),

Gene: JackSparrow\_40 Start: 32093, Stop: 31791, Start Num: 12

Candidate Starts for JackSparrow\_40:

(Start: 12 @32093 has 59 MA's), (17, 32042), (21, 32021), (25, 31943), (26, 31934), (27, 31895),

Gene: Jasper\_39 Start: 31172, Stop: 30864, Start Num: 11

Candidate Starts for Jasper\_39:

(4, 31307), (7, 31274), (Start: 11 @31172 has 42 MA's), (17, 31121), (21, 31100), (25, 31022), (26, 31013), (27, 30974), (28, 30887),

Gene: Jerm2\_39 Start: 31429, Stop: 31199, Start Num: 12

Candidate Starts for Jerm2\_39:

(6, 31513), (Start: 12 @31429 has 59 MA's), (18, 31387), (24, 31360), (27, 31309), (28, 31222),

Gene: KBG\_39 Start: 32392, Stop: 32120, Start Num: 12

Candidate Starts for KBG\_39:

(3, 32506), (5, 32482), (7, 32470), (8, 32467), (Start: 12 @32392 has 59 MA's), (18, 32350), (24, 32323), (25, 32278), (26, 32269), (27, 32230), (28, 32143),

Gene: Kanely\_39 Start: 32035, Stop: 31727, Start Num: 12

Candidate Starts for Kanely\_39:

(9, 32122), (Start: 12 @32035 has 59 MA's), (15, 32002), (20, 31966), (22, 31957), (25, 31885), (26, 31876), (27, 31837), (28, 31750),

Gene: Kugel\_40 Start: 31983, Stop: 31717, Start Num: 12

Candidate Starts for Kugel\_40:

(3, 32097), (5, 32073), (7, 32061), (8, 32058), (Start: 12 @31983 has 59 MA's), (18, 31941), (24, 31914), (25, 31869), (26, 31860), (27, 31821),

Gene: Lamina13\_38 Start: 30935, Stop: 30663, Start Num: 12

Candidate Starts for Lamina13\_38:

(Start: 12 @30935 has 59 MA's), (18, 30893), (24, 30866), (25, 30821), (26, 30812), (27, 30773), (28, 30686),

Gene: Lesedi\_37 Start: 31210, Stop: 30938, Start Num: 11

Candidate Starts for Lesedi\_37:

(2, 31345), (5, 31312), (Start: 11 @31210 has 42 MA's), (18, 31168), (24, 31141), (25, 31096), (26, 31087), (27, 31048),

Gene: Levia\_35 Start: 31194, Stop: 30886, Start Num: 12

Candidate Starts for Levia\_35:

(9, 31281), (Start: 12 @31194 has 59 MA's), (15, 31161), (20, 31125), (22, 31116), (25, 31044), (26, 31035), (27, 30996), (28, 30909),

Gene: Licorice\_40 Start: 32280, Stop: 32008, Start Num: 12

Candidate Starts for Licorice\_40:

(3, 32394), (5, 32370), (7, 32358), (8, 32355), (Start: 12 @32280 has 59 MA's), (18, 32238), (24, 32211), (25, 32166), (26, 32157), (27, 32118), (28, 32031),

Gene: LilBib\_38 Start: 32107, Stop: 31799, Start Num: 12

Candidate Starts for LilBib\_38:

(9, 32194), (Start: 12 @32107 has 59 MA's), (17, 32056), (21, 32035), (25, 31957), (26, 31948), (27, 31909),

Gene: LunarLander\_39 Start: 31403, Stop: 31131, Start Num: 12

Candidate Starts for LunarLander\_39:

(3, 31517), (5, 31493), (7, 31481), (8, 31478), (Start: 12 @31403 has 59 MA's), (18, 31361), (24, 31334), (25, 31289), (26, 31280), (27, 31241), (28, 31154),

Gene: Magnito\_37 Start: 30988, Stop: 30716, Start Num: 11

Candidate Starts for Magnito\_37:

(2, 31135), (5, 31102), (Start: 11 @30988 has 42 MA's), (18, 30946), (24, 30919), (25, 30874), (26, 30865), (27, 30826), (28, 30739),

Gene: Marcell\_38 Start: 31685, Stop: 31413, Start Num: 11

Candidate Starts for Marcell\_38:

(2, 31820), (5, 31787), (Start: 11 @31685 has 42 MA's), (18, 31643), (24, 31616), (25, 31571), (26, 31562), (27, 31523), (28, 31436),

Gene: Marchy\_33 Start: 28275, Stop: 27967, Start Num: 12

Candidate Starts for Marchy\_33:

(9, 28362), (Start: 12 @28275 has 59 MA's), (15, 28242), (20, 28206), (22, 28197), (25, 28125), (26, 28116), (27, 28077), (28, 27990),

Gene: MaryBeth\_38 Start: 31490, Stop: 31218, Start Num: 12

Candidate Starts for MaryBeth\_38:

(Start: 12 @31490 has 59 MA's), (18, 31448), (24, 31421), (25, 31376), (26, 31367), (27, 31328), (28, 31241),

Gene: MetalQZJ\_38 Start: 31490, Stop: 31218, Start Num: 12

Candidate Starts for MetalQZJ\_38:

(Start: 12 @31490 has 59 MA's), (18, 31448), (24, 31421), (25, 31376), (26, 31367), (27, 31328), (28, 31241),

Gene: Molly\_40 Start: 31229, Stop: 30999, Start Num: 11

Candidate Starts for Molly\_40:

(2, 31364), (5, 31331), (Start: 11 @31229 has 42 MA's), (18, 31187), (24, 31160), (27, 31109), (28, 31022),

Gene: Monet\_41 Start: 33055, Stop: 32789, Start Num: 12

Candidate Starts for Monet\_41:

(10, 33091), (Start: 12 @33055 has 59 MA's), (18, 33013), (24, 32986), (25, 32941), (26, 32932), (27, 32893),

Gene: Moose\_38 Start: 31551, Stop: 31243, Start Num: 12

Candidate Starts for Moose\_38:

(9, 31638), (Start: 12 @31551 has 59 MA's), (15, 31518), (20, 31482), (22, 31473), (25, 31401), (26, 31392), (27, 31353), (28, 31266),

Gene: Mule\_37 Start: 29541, Stop: 29269, Start Num: 11

Candidate Starts for Mule\_37:

(2, 29676), (5, 29643), (Start: 11 @29541 has 42 MA's), (18, 29499), (24, 29472), (25, 29427), (26, 29418), (27, 29379),

Gene: Museum\_40 Start: 31295, Stop: 31065, Start Num: 11  
Candidate Starts for Museum\_40:  
(2, 31430), (5, 31397), (Start: 11 @31295 has 42 MA's), (18, 31253), (24, 31226), (27, 31175), (28, 31088),

Gene: NEHalo\_38 Start: 31254, Stop: 30982, Start Num: 11  
Candidate Starts for NEHalo\_38:  
(2, 31389), (5, 31356), (Start: 11 @31254 has 42 MA's), (18, 31212), (24, 31185), (25, 31140), (26, 31131), (27, 31092), (28, 31005),

Gene: Norz\_40 Start: 32172, Stop: 31900, Start Num: 11  
Candidate Starts for Norz\_40:  
(2, 32307), (5, 32274), (Start: 11 @32172 has 42 MA's), (18, 32130), (24, 32103), (25, 32058), (26, 32049), (27, 32010), (28, 31923),

Gene: Oogway\_37 Start: 30855, Stop: 30583, Start Num: 11  
Candidate Starts for Oogway\_37:  
(2, 30990), (5, 30957), (Start: 11 @30855 has 42 MA's), (18, 30813), (24, 30786), (25, 30741), (26, 30732), (27, 30693),

Gene: PacerPaul\_39 Start: 31313, Stop: 31041, Start Num: 12  
Candidate Starts for PacerPaul\_39:  
(3, 31427), (5, 31403), (7, 31391), (8, 31388), (Start: 12 @31313 has 59 MA's), (18, 31271), (24, 31244), (25, 31199), (26, 31190), (27, 31151), (28, 31064),

Gene: Pari\_39 Start: 31087, Stop: 30815, Start Num: 11  
Candidate Starts for Pari\_39:  
(2, 31222), (5, 31189), (Start: 11 @31087 has 42 MA's), (18, 31045), (24, 31018), (25, 30973), (26, 30964), (27, 30925), (28, 30838),

Gene: Payneful\_38 Start: 30992, Stop: 30684, Start Num: 12  
Candidate Starts for Payneful\_38:  
(9, 31079), (Start: 12 @30992 has 59 MA's), (15, 30959), (20, 30923), (22, 30914), (25, 30842), (26, 30833), (27, 30794), (28, 30707),

Gene: Pepe\_34 Start: 29170, Stop: 28904, Start Num: 12  
Candidate Starts for Pepe\_34:  
(10, 29206), (Start: 12 @29170 has 59 MA's), (18, 29128), (24, 29101), (25, 29056), (26, 29047), (27, 29008),

Gene: Petp2012\_40 Start: 32213, Stop: 31983, Start Num: 11  
Candidate Starts for Petp2012\_40:  
(2, 32348), (5, 32315), (Start: 11 @32213 has 42 MA's), (18, 32171), (24, 32144), (27, 32093), (28, 32006),

Gene: Petruccio\_39 Start: 31567, Stop: 31298, Start Num: 11  
Candidate Starts for Petruccio\_39:  
(2, 31702), (5, 31669), (Start: 11 @31567 has 42 MA's), (18, 31528), (24, 31501), (25, 31456), (26, 31447), (27, 31408),

Gene: PherrisBueller\_39 Start: 31183, Stop: 30875, Start Num: 11  
Candidate Starts for PherrisBueller\_39:

(4, 31318), (7, 31285), (Start: 11 @31183 has 42 MA's), (17, 31132), (21, 31111), (25, 31033), (26, 31024), (27, 30985), (28, 30898),

Gene: PhineBark\_37 Start: 32212, Stop: 31904, Start Num: 12

Candidate Starts for PhineBark\_37:

(9, 32299), (Start: 12 @32212 has 59 MA's), (15, 32179), (20, 32143), (22, 32134), (25, 32062), (26, 32053), (27, 32014), (28, 31927),

Gene: Phlippers\_36 Start: 31867, Stop: 31595, Start Num: 12

Candidate Starts for Phlippers\_36:

(3, 31981), (5, 31957), (7, 31945), (8, 31942), (Start: 12 @31867 has 59 MA's), (18, 31825), (24, 31798), (25, 31753), (26, 31744), (27, 31705), (28, 31618),

Gene: PinkPlastic\_37 Start: 31097, Stop: 30825, Start Num: 11

Candidate Starts for PinkPlastic\_37:

(2, 31232), (5, 31199), (Start: 11 @31097 has 42 MA's), (18, 31055), (24, 31028), (25, 30983), (26, 30974), (27, 30935),

Gene: Pippin\_40 Start: 31627, Stop: 31355, Start Num: 12

Candidate Starts for Pippin\_40:

(Start: 12 @31627 has 59 MA's), (18, 31585), (24, 31558), (25, 31513), (26, 31504), (27, 31465), (28, 31378),

Gene: PowerRanger\_40 Start: 32378, Stop: 32106, Start Num: 12

Candidate Starts for PowerRanger\_40:

(Start: 12 @32378 has 59 MA's), (18, 32336), (24, 32309), (25, 32264), (26, 32255), (27, 32216), (28, 32129),

Gene: Puppet\_38 Start: 31352, Stop: 31080, Start Num: 12

Candidate Starts for Puppet\_38:

(3, 31466), (5, 31442), (7, 31430), (8, 31427), (Start: 12 @31352 has 59 MA's), (18, 31310), (24, 31283), (25, 31238), (26, 31229), (27, 31190), (28, 31103),

Gene: Rohr\_39 Start: 31475, Stop: 31245, Start Num: 12

Candidate Starts for Rohr\_39:

(6, 31559), (Start: 12 @31475 has 59 MA's), (18, 31433), (24, 31406), (27, 31355), (28, 31268),

Gene: Rutherferd\_40 Start: 32367, Stop: 32101, Start Num: 12

Candidate Starts for Rutherferd\_40:

(Start: 12 @32367 has 59 MA's), (18, 32325), (24, 32298), (25, 32253), (26, 32244), (27, 32205),

Gene: Sanya\_37 Start: 32063, Stop: 31791, Start Num: 12

Candidate Starts for Sanya\_37:

(Start: 12 @32063 has 59 MA's), (18, 32021), (24, 31994), (25, 31949), (26, 31940), (27, 31901), (28, 31814),

Gene: Scowl\_38 Start: 31823, Stop: 31551, Start Num: 12

Candidate Starts for Scowl\_38:

(3, 31937), (5, 31913), (7, 31901), (8, 31898), (Start: 12 @31823 has 59 MA's), (18, 31781), (24, 31754), (25, 31709), (26, 31700), (27, 31661),

Gene: Seabiscuit\_40 Start: 31328, Stop: 31056, Start Num: 11

Candidate Starts for Seabiscuit\_40:

(2, 31463), (5, 31430), (Start: 11 @31328 has 42 MA's), (18, 31286), (24, 31259), (25, 31214), (26, 31205), (27, 31166),

Gene: Seanderson\_39 Start: 31957, Stop: 31685, Start Num: 12

Candidate Starts for Seanderson\_39:

(10, 31993), (Start: 12 @31957 has 59 MA's), (18, 31915), (24, 31888), (25, 31843), (26, 31834), (27, 31795), (28, 31708),

Gene: ShortQueendom\_33 Start: 28032, Stop: 27724, Start Num: 12

Candidate Starts for ShortQueendom\_33:

(9, 28119), (Start: 12 @28032 has 59 MA's), (15, 27999), (20, 27963), (22, 27954), (25, 27882), (26, 27873), (27, 27834), (28, 27747),

Gene: Sibs6\_39 Start: 30489, Stop: 30181, Start Num: 12

Candidate Starts for Sibs6\_39:

(Start: 12 @30489 has 59 MA's), (17, 30438), (21, 30417), (25, 30339), (26, 30330), (27, 30291),

Gene: Smairt\_39 Start: 31500, Stop: 31228, Start Num: 12

Candidate Starts for Smairt\_39:

(3, 31614), (5, 31590), (7, 31578), (8, 31575), (Start: 12 @31500 has 59 MA's), (18, 31458), (24, 31431), (25, 31386), (26, 31377), (27, 31338), (28, 31251),

Gene: Snazzy\_37 Start: 31284, Stop: 31012, Start Num: 11

Candidate Starts for Snazzy\_37:

(2, 31419), (5, 31386), (Start: 11 @31284 has 42 MA's), (18, 31242), (24, 31215), (25, 31170), (26, 31161), (27, 31122), (28, 31035),

Gene: Solon\_38 Start: 31615, Stop: 31343, Start Num: 12

Candidate Starts for Solon\_38:

(Start: 12 @31615 has 59 MA's), (18, 31573), (24, 31546), (25, 31501), (26, 31492), (27, 31453), (28, 31366),

Gene: SpikeBT\_40 Start: 32361, Stop: 32089, Start Num: 11

Candidate Starts for SpikeBT\_40:

(2, 32496), (5, 32463), (Start: 11 @32361 has 42 MA's), (18, 32319), (24, 32292), (25, 32247), (26, 32238), (27, 32199), (28, 32112),

Gene: Sumter\_37 Start: 31344, Stop: 31072, Start Num: 12

Candidate Starts for Sumter\_37:

(Start: 12 @31344 has 59 MA's), (18, 31302), (24, 31275), (25, 31230), (26, 31221), (27, 31182), (28, 31095),

Gene: SwissCheese\_40 Start: 32051, Stop: 31743, Start Num: 12

Candidate Starts for SwissCheese\_40:

(9, 32138), (Start: 12 @32051 has 59 MA's), (15, 32018), (20, 31982), (22, 31973), (25, 31901), (26, 31892), (27, 31853), (28, 31766),

Gene: Switzer\_39 Start: 31424, Stop: 31152, Start Num: 11

Candidate Starts for Switzer\_39:

(2, 31559), (5, 31526), (Start: 11 @31424 has 42 MA's), (18, 31382), (24, 31355), (25, 31310), (26, 31301), (27, 31262), (28, 31175),

Gene: Tasp14\_39 Start: 31559, Stop: 31287, Start Num: 12

Candidate Starts for Tasp14\_39:

(Start: 12 @31559 has 59 MA's), (18, 31517), (24, 31490), (25, 31445), (26, 31436), (27, 31397), (28, 31310),

Gene: Topgun\_37 Start: 30806, Stop: 30534, Start Num: 12

Candidate Starts for Topgun\_37:

(3, 30920), (5, 30896), (7, 30884), (8, 30881), (Start: 12 @30806 has 59 MA's), (18, 30764), (24, 30737), (25, 30692), (26, 30683), (27, 30644), (28, 30557),

Gene: Treddle\_41 Start: 33009, Stop: 32743, Start Num: 11

Candidate Starts for Treddle\_41:

(2, 33144), (5, 33111), (Start: 11 @33009 has 42 MA's), (18, 32967), (24, 32940), (25, 32895), (26, 32886), (27, 32847),

Gene: Trouble\_39 Start: 32267, Stop: 31995, Start Num: 12

Candidate Starts for Trouble\_39:

(1, 32447), (3, 32381), (5, 32357), (7, 32345), (8, 32342), (Start: 12 @32267 has 59 MA's), (18, 32225), (24, 32198), (25, 32153), (26, 32144), (27, 32105),

Gene: Turj99\_37 Start: 31258, Stop: 30986, Start Num: 11

Candidate Starts for Turj99\_37:

(2, 31405), (5, 31372), (Start: 11 @31258 has 42 MA's), (18, 31216), (24, 31189), (25, 31144), (26, 31135), (27, 31096), (28, 31009),

Gene: TwoPeat\_39 Start: 31714, Stop: 31484, Start Num: 11

Candidate Starts for TwoPeat\_39:

(2, 31849), (5, 31816), (Start: 11 @31714 has 42 MA's), (18, 31672), (24, 31645), (27, 31594), (28, 31507),

Gene: U2\_38 Start: 31407, Stop: 31135, Start Num: 11

Candidate Starts for U2\_38:

(2, 31542), (5, 31509), (Start: 11 @31407 has 42 MA's), (18, 31365), (24, 31338), (25, 31293), (26, 31284), (27, 31245), (28, 31158),

Gene: Watermelon\_40 Start: 32252, Stop: 31944, Start Num: 12

Candidate Starts for Watermelon\_40:

(9, 32339), (Start: 12 @32252 has 59 MA's), (17, 32201), (21, 32180), (25, 32102), (26, 32093), (27, 32054), (28, 31967),

Gene: Wheeler\_39 Start: 31744, Stop: 31472, Start Num: 12

Candidate Starts for Wheeler\_39:

(1, 31924), (3, 31858), (5, 31834), (7, 31822), (8, 31819), (Start: 12 @31744 has 59 MA's), (18, 31702), (24, 31675), (25, 31630), (26, 31621), (27, 31582), (28, 31495),

Gene: Whitspit\_37 Start: 29864, Stop: 29595, Start Num: 11

Candidate Starts for Whitspit\_37:

(2, 29999), (5, 29966), (Start: 11 @29864 has 42 MA's), (18, 29825), (24, 29798), (25, 29753), (26, 29744), (27, 29705),

Gene: Wilkins\_37 Start: 30739, Stop: 30467, Start Num: 12

Candidate Starts for Wilkins\_37:

(3, 30853), (5, 30829), (7, 30817), (8, 30814), (Start: 12 @30739 has 59 MA's), (18, 30697), (24, 30670), (25, 30625), (26, 30616), (27, 30577), (28, 30490),

Gene: Zephyr\_39 Start: 31816, Stop: 31544, Start Num: 11

Candidate Starts for Zephyr\_39:

(2, 31951), (5, 31918), (Start: 11 @31816 has 42 MA's), (18, 31774), (24, 31747), (25, 31702), (26, 31693), (27, 31654),