



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 163469 Report

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

Pham number 163469 has 109 members, 8 are drafts.

Phages represented in each track:

- Track 1 : JustASigh\_5
- Track 2 : Weirido19\_6
- Track 3 : UNTPL\_15, Bogota\_15
- Track 4 : Stuff\_14
- Track 5 : Intolerant\_14
- Track 6 : Marky\_15
- Track 7 : Microdon\_14
- Track 8 : JackieB\_14, Henoccus\_15, Araceli\_15
- Track 9 : LazerLemon\_14
- Track 10 : Crosby\_15
- Track 11 : Utz\_5, MintFen\_5, Guacamole\_5, Zarbodnamra\_5, Lysidious\_5, Jalammah\_5, Melba\_5, Mellie\_5, Barco\_5, Archis\_5, BlingBling\_5, JasperJr\_5, CaptainKirk2\_5, Hitter\_5, Delian\_5
- Track 12 : William\_5, Fairfaxidum\_5, PCoral7\_5, PrincePatrick\_5, Toast\_5
- Track 13 : UmaThurman\_5, Pipp\_5
- Track 14 : JuJu\_5
- Track 15 : MissRona\_5, Walrus\_5, CarolAnn\_5, Petra\_5, Azula\_5, Blueberry\_5, Frokostdame\_5, Gambino\_5, Blino\_5
- Track 16 : Malachai\_5, Wocket\_5, Fenry\_5, PhrostedPhlake\_5, Begonia\_5, ZiggyZoo\_5, Samba\_5, Wisp\_5, Obliviate\_5
- Track 17 : Murp\_5
- Track 18 : KappaFarmDelta\_5
- Track 19 : Ohgeesy\_5
- Track 20 : Yeezy\_5
- Track 21 : BaxterFox\_5
- Track 22 : PantheRoc\_4
- Track 23 : Adora\_5, Shlim410\_5, Hortense\_5, Howe\_5, Twinkle\_5
- Track 24 : Sidious\_5
- Track 25 : BetterKatz\_9
- Track 26 : Bock\_9
- Track 27 : Francois\_9
- Track 28 : Parada\_9, Nadeem\_9, Brylie\_9, NancyRae\_9, WheatThin\_9, Mulch\_9
- Track 29 : Pimento\_8
- Track 30 : DelRio\_9
- Track 31 : Chop\_9, Ayotoya\_9, GrandSlam\_9, Hamood\_9
- Track 32 : Ruthy\_5
- Track 33 : DumpsterDude\_5

- Track 34 : Malibo\_5
- Track 35 : Luna22\_8, Daegal\_9, Wishmaker\_8, Dewey\_8, Ubuntu\_8, Giles\_8, Luke\_8, Amymech\_8, Hadrien\_8, Forge\_8, LilHazelnut\_8, HH92\_8, DeepSoil15\_8, Webster2\_8, Gravaillia\_8, OBUpride\_8, Ein37\_8, Gancho\_7, Evanesce\_8, Hail\_8, Kinbote\_8, Amochick\_8
- Track 36 : REQ2\_05
- Track 37 : Mbo4\_5
- Track 38 : Whack\_5

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

The start number called the most often in the published annotations is 10, it was called in 101 of the 101 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Adora\_5, Amochick\_8, Amymech\_8, Araceli\_15, Archis\_5, Ayotoya\_9, Azula\_5, Barco\_5, BaxterFox\_5, Begonia\_5, BetterKatz\_9, BlingBling\_5, Blino\_5, Blueberry\_5, Bock\_9, Bogota\_15, Brylie\_9, CaptainKirk2\_5, CarolAnn\_5, Chop\_9, Crosby\_15, Daegal\_9, DeepSoil15\_8, DelRio\_9, Delian\_5, Dewey\_8, DumpsterDude\_5, Ein37\_8, Evanesce\_8, Fairfaxidum\_5, Fenry\_5, Forge\_8, Francois\_9, Frokostdame\_5, Gambino\_5, Gancho\_7, Giles\_8, GrandSlam\_9, Gravaillia\_8, Guacamole\_5, HH92\_8, Hadrien\_8, Hail\_8, Hamood\_9, Henoccus\_15, Hitter\_5, Hortense\_5, Howe\_5, Intolerant\_14, JackieB\_14, Jalamah\_5, JasperJr\_5, JuJu\_5, JustASigh\_5, KappaFarmDelta\_5, Kinbote\_8, LazerLemon\_14, LilHazelnut\_8, Luke\_8, Luna22\_8, Lysidious\_5, Malachai\_5, Malibo\_5, Marky\_15, Mbo4\_5, Melba\_5, Mellie\_5, Microdon\_14, MintFen\_5, MissRona\_5, Mulch\_9, Murp\_5, Nadeem\_9, NancyRae\_9, OBUpride\_8, Obliviate\_5, Ohgeesy\_5, PCoral7\_5, PantheRoc\_4, Parada\_9, Petra\_5, PhrostedPhlake\_5, Pimento\_8, Pipp\_5, PrincePatrick\_5, REQ2\_05, Ruthy\_5, Samba\_5, Shlim410\_5, Sidious\_5, Stuff\_14, Toast\_5, Twinkle\_5, UNTPL\_15, Ubuntu\_8, UmaThurman\_5, Utz\_5, Walrus\_5, Webster2\_8, Weirdo19\_6, Whack\_5, WheatThin\_9, William\_5, Wishmaker\_8, Wisp\_5, Wocket\_5, Yeezy\_5, Zarbodnamra\_5, ZiggyZoo\_5,

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

- 

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

- 

**Summary by start number:**

Start 10:

- Found in 109 of 109 ( 100.0% ) of genes in pham
- Manual Annotations of this start: 101 of 101
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Adora\_5 (CZ4), Amochick\_8 (Q), Amymech\_8 (Q), Araceli\_15 (BH), Archis\_5 (CV), Ayotoya\_9 (DI), Azula\_5 (CV), Barco\_5 (CV), BaxterFox\_5 (CZ3), Begonia\_5 (CV), BetterKatz\_9 (DI), BlingBling\_5 (CV), Blino\_5 (CV), Blueberry\_5 (CV), Bock\_9 (DI), Bogota\_15 (BH), Brylie\_9 (DI), CaptainKirk2\_5 (CV), CarolAnn\_5 (CV), Chop\_9 (DI), Crosby\_15 (BH), Daegal\_9 (Q),

DeepSoil15\_8 (Q), DelRio\_9 (DI), Delian\_5 (CV), Dewey\_8 (Q), DumpsterDude\_5 (DW), Ein37\_8 (Q), Evanesce\_8 (Q), Fairfaxidum\_5 (CV), Fenry\_5 (CV), Forge\_8 (Q), Francois\_9 (DI), Frokostdame\_5 (CV), Gambino\_5 (CV), Gancho\_7 (Q), Giles\_8 (Q), GrandSlam\_9 (DI), Gravaillia\_8 (Q), Guacamole\_5 (CV), HH92\_8 (Q), Hadrien\_8 (Q), Hail\_8 (Q), Hamood\_9 (DI), Henoccus\_15 (BH), Hitter\_5 (CV), Hortense\_5 (CZ4), Howe\_5 (CZ4), Intolerant\_14 (BH), JackieB\_14 (BH), Jalammah\_5 (CV), JasperJr\_5 (CV), JuJu\_5 (CV), JustASigh\_5 (AH), KappaFarmDelta\_5 (CV), Kinbote\_8 (Q), LazerLemon\_14 (BH), LilHazelNut\_8 (Q), Luke\_8 (Q), Luna22\_8 (Q), Lysidious\_5 (CV), Malachai\_5 (CV), Malibo\_5 (DW), Marky\_15 (BH), Mbo4\_5 (singleton), Melba\_5 (CV), Mellie\_5 (CV), Microdon\_14 (BH), MintFen\_5 (CV), MissRona\_5 (CV), Mulch\_9 (DI), Murp\_5 (CV), Nadeem\_9 (DI), NancyRae\_9 (DI), OBUpride\_8 (Q), Obliviate\_5 (CV), Ohgeesy\_5 (CZ), PCoral7\_5 (CV), PantheRoc\_4 (CZ3), Parada\_9 (DI), Petra\_5 (CV), PhrostedPhlake\_5 (CV), Pimento\_8 (DI), Pipp\_5 (CV), PrincePatrick\_5 (CV), REQ2\_05 (singleton), Ruthy\_5 (DW), Samba\_5 (CV), Shlim410\_5 (CZ4), Sidious\_5 (CZ7), Stuff\_14 (BH), Toast\_5 (CV), Twinkle\_5 (CZ4), UNTPL\_15 (BH), Ubuntu\_8 (Q), UmaThurman\_5 (CV), Utz\_5 (CV), Walrus\_5 (CV), Webster2\_8 (Q), WeirDo19\_6 (AH), Whack\_5 (singleton), WheatThin\_9 (DI), William\_5 (CV), Wishmaker\_8 (Q), Wisp\_5 (CV), Wocket\_5 (CV), Yeezy\_5 (CZ3), Zarbodnamra\_5 (CV), ZiggyZoo\_5 (CV),

### Summary by clusters:

There are 11 clusters represented in this pham: singleton, DI, CZ3, BH, CZ7, CZ4, Q, CZ, AH, DW, CV,

Info for manual annotations of cluster AH:

- Start number 10 was manually annotated 1 time for cluster AH.

Info for manual annotations of cluster BH:

- Start number 10 was manually annotated 11 times for cluster BH.

Info for manual annotations of cluster CV:

- Start number 10 was manually annotated 41 times for cluster CV.

Info for manual annotations of cluster CZ:

- Start number 10 was manually annotated 1 time for cluster CZ.

Info for manual annotations of cluster CZ3:

- Start number 10 was manually annotated 2 times for cluster CZ3.

Info for manual annotations of cluster CZ4:

- Start number 10 was manually annotated 5 times for cluster CZ4.

Info for manual annotations of cluster CZ7:

- Start number 10 was manually annotated 1 time for cluster CZ7.

Info for manual annotations of cluster DI:

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

Info for manual annotations of cluster DW:

- Start number 10 was manually annotated 3 times for cluster DW.

Info for manual annotations of cluster Q:

- Start number 10 was manually annotated 22 times for cluster Q.

### **Gene Information:**

Gene: Adora\_5 Start: 4490, Stop: 4900, Start Num: 10

Candidate Starts for Adora\_5:

(Start: 10 @4490 has 101 MA's), (12, 4505), (18, 4565), (19, 4568), (23, 4598), (29, 4679), (33, 4703), (43, 4772), (45, 4796),

Gene: Amochick\_8 Start: 6094, Stop: 6546, Start Num: 10

Candidate Starts for Amochick\_8:

(Start: 10 @6094 has 101 MA's), (18, 6175), (28, 6274), (32, 6313), (46, 6415), (47, 6436), (52, 6532),

Gene: Amymech\_8 Start: 6100, Stop: 6552, Start Num: 10

Candidate Starts for Amymech\_8:

(Start: 10 @6100 has 101 MA's), (18, 6181), (28, 6280), (32, 6319), (46, 6421), (47, 6442), (52, 6538),

Gene: Araceli\_15 Start: 11201, Stop: 11638, Start Num: 10

Candidate Starts for Araceli\_15:

(Start: 10 @11201 has 101 MA's), (13, 11228), (14, 11252), (19, 11288), (20, 11297), (21, 11309), (22, 11312), (25, 11345), (33, 11417), (38, 11444), (39, 11450), (44, 11495), (47, 11531), (49, 11600),

Gene: Archis\_5 Start: 4730, Stop: 5182, Start Num: 10

Candidate Starts for Archis\_5:

(Start: 10 @4730 has 101 MA's), (24, 4868), (38, 4979), (41, 5006), (42, 5012), (51, 5144),

Gene: Ayotoya\_9 Start: 6663, Stop: 7109, Start Num: 10

Candidate Starts for Ayotoya\_9:

(4, 6360), (8, 6582), (9, 6618), (Start: 10 @6663 has 101 MA's), (24, 6801), (33, 6885), (39, 6918), (48, 7050),

Gene: Azula\_5 Start: 4627, Stop: 5037, Start Num: 10

Candidate Starts for Azula\_5:

(Start: 10 @4627 has 101 MA's), (12, 4642), (18, 4702), (19, 4705), (23, 4735), (29, 4816), (33, 4840), (38, 4867), (39, 4873),

Gene: Barco\_5 Start: 4730, Stop: 5182, Start Num: 10

Candidate Starts for Barco\_5:

(Start: 10 @4730 has 101 MA's), (24, 4868), (38, 4979), (41, 5006), (42, 5012), (51, 5144),

Gene: BaxterFox\_5 Start: 4481, Stop: 4891, Start Num: 10

Candidate Starts for BaxterFox\_5:

(5, 4181), (Start: 10 @4481 has 101 MA's), (12, 4496), (18, 4556), (19, 4559), (23, 4589), (29, 4670), (33, 4694), (34, 4700), (37, 4718), (38, 4721), (43, 4763), (45, 4787),

Gene: Begonia\_5 Start: 4733, Stop: 5185, Start Num: 10

Candidate Starts for Begonia\_5:

(Start: 10 @4733 has 101 MA's), (24, 4871), (33, 4955), (38, 4982), (41, 5009), (42, 5015), (51, 5147),

Gene: BetterKatz\_9 Start: 6631, Stop: 7077, Start Num: 10

Candidate Starts for BetterKatz\_9:

(7, 6409), (8, 6550), (9, 6586), (Start: 10 @6631 has 101 MA's), (18, 6712), (24, 6769), (33, 6853), (48, 7018),

Gene: BlingBling\_5 Start: 4730, Stop: 5182, Start Num: 10

Candidate Starts for BlingBling\_5:

(Start: 10 @4730 has 101 MA's), (24, 4868), (38, 4979), (41, 5006), (42, 5012), (51, 5144),

Gene: Blino\_5 Start: 4630, Stop: 5040, Start Num: 10

Candidate Starts for Blino\_5:

(Start: 10 @4630 has 101 MA's), (12, 4645), (18, 4705), (19, 4708), (23, 4738), (29, 4819), (33, 4843), (38, 4870), (39, 4876),

Gene: Blueberry\_5 Start: 4627, Stop: 5037, Start Num: 10

Candidate Starts for Blueberry\_5:

(Start: 10 @4627 has 101 MA's), (12, 4642), (18, 4702), (19, 4705), (23, 4735), (29, 4816), (33, 4840), (38, 4867), (39, 4873),

Gene: Bock\_9 Start: 6381, Stop: 6827, Start Num: 10

Candidate Starts for Bock\_9:

(8, 6300), (9, 6336), (Start: 10 @6381 has 101 MA's), (18, 6462), (24, 6519), (33, 6603), (48, 6768),

Gene: Bogota\_15 Start: 11330, Stop: 11767, Start Num: 10

Candidate Starts for Bogota\_15:

(Start: 10 @11330 has 101 MA's), (13, 11357), (14, 11381), (17, 11402), (19, 11417), (21, 11438), (24, 11471), (25, 11474), (33, 11546), (38, 11573), (39, 11579), (44, 11624),

Gene: Brylie\_9 Start: 6378, Stop: 6824, Start Num: 10

Candidate Starts for Brylie\_9:

(8, 6297), (9, 6333), (Start: 10 @6378 has 101 MA's), (18, 6459), (24, 6516), (31, 6582), (33, 6600), (48, 6765),

Gene: CaptainKirk2\_5 Start: 4730, Stop: 5182, Start Num: 10

Candidate Starts for CaptainKirk2\_5:

(Start: 10 @4730 has 101 MA's), (24, 4868), (38, 4979), (41, 5006), (42, 5012), (51, 5144),

Gene: CarolAnn\_5 Start: 4629, Stop: 5039, Start Num: 10

Candidate Starts for CarolAnn\_5:

(Start: 10 @4629 has 101 MA's), (12, 4644), (18, 4704), (19, 4707), (23, 4737), (29, 4818), (33, 4842), (38, 4869), (39, 4875),

Gene: Chop\_9 Start: 6411, Stop: 6857, Start Num: 10

Candidate Starts for Chop\_9:

(4, 6108), (8, 6330), (9, 6366), (Start: 10 @6411 has 101 MA's), (24, 6549), (33, 6633), (39, 6666), (48, 6798),

Gene: Crosby\_15 Start: 11315, Stop: 11752, Start Num: 10

Candidate Starts for Crosby\_15:

(Start: 10 @11315 has 101 MA's), (13, 11342), (14, 11366), (19, 11402), (20, 11411), (21, 11423), (25, 11459), (33, 11531), (38, 11558), (39, 11564), (42, 11585), (44, 11609), (47, 11645), (49, 11714),

Gene: Daegal\_9 Start: 6391, Stop: 6843, Start Num: 10

Candidate Starts for Daegal\_9:

(Start: 10 @6391 has 101 MA's), (18, 6472), (28, 6571), (32, 6610), (46, 6712), (47, 6733), (52, 6829),

Gene: DeepSoil15\_8 Start: 6100, Stop: 6552, Start Num: 10

Candidate Starts for DeepSoil15\_8:

(Start: 10 @6100 has 101 MA's), (18, 6181), (28, 6280), (32, 6319), (46, 6421), (47, 6442), (52, 6538),

Gene: DelRio\_9 Start: 6675, Stop: 7121, Start Num: 10

Candidate Starts for DelRio\_9:

(8, 6594), (9, 6630), (Start: 10 @6675 has 101 MA's), (24, 6813), (33, 6897), (39, 6930), (48, 7062),

Gene: Delian\_5 Start: 4730, Stop: 5182, Start Num: 10

Candidate Starts for Delian\_5:

(Start: 10 @4730 has 101 MA's), (24, 4868), (38, 4979), (41, 5006), (42, 5012), (51, 5144),

Gene: Dewey\_8 Start: 6100, Stop: 6552, Start Num: 10

Candidate Starts for Dewey\_8:

(Start: 10 @6100 has 101 MA's), (18, 6181), (28, 6280), (32, 6319), (46, 6421), (47, 6442), (52, 6538),

Gene: DumpsterDude\_5 Start: 4950, Stop: 5396, Start Num: 10

Candidate Starts for DumpsterDude\_5:

(6, 4704), (Start: 10 @4950 has 101 MA's), (24, 5088), (33, 5172), (41, 5226), (42, 5232),

Gene: Ein37\_8 Start: 6100, Stop: 6552, Start Num: 10

Candidate Starts for Ein37\_8:

(Start: 10 @6100 has 101 MA's), (18, 6181), (28, 6280), (32, 6319), (46, 6421), (47, 6442), (52, 6538),

Gene: Evanesce\_8 Start: 6100, Stop: 6552, Start Num: 10

Candidate Starts for Evanesce\_8:

(Start: 10 @6100 has 101 MA's), (18, 6181), (28, 6280), (32, 6319), (46, 6421), (47, 6442), (52, 6538),

Gene: Fairfaxidum\_5 Start: 4725, Stop: 5177, Start Num: 10

Candidate Starts for Fairfaxidum\_5:

(Start: 10 @4725 has 101 MA's), (24, 4863), (35, 4956), (47, 5067), (49, 5133), (51, 5139),

Gene: Fenry\_5 Start: 4731, Stop: 5183, Start Num: 10

Candidate Starts for Fenry\_5:

(Start: 10 @4731 has 101 MA's), (24, 4869), (33, 4953), (38, 4980), (41, 5007), (42, 5013), (51, 5145),

Gene: Forge\_8 Start: 6100, Stop: 6552, Start Num: 10

Candidate Starts for Forge\_8:

(Start: 10 @6100 has 101 MA's), (18, 6181), (28, 6280), (32, 6319), (46, 6421), (47, 6442), (52, 6538),

Gene: Francois\_9 Start: 6380, Stop: 6826, Start Num: 10

Candidate Starts for Francois\_9:

(6, 6134), (Start: 10 @6380 has 101 MA's), (24, 6518), (33, 6602), (48, 6767),

Gene: Frokostdame\_5 Start: 4698, Stop: 5108, Start Num: 10

Candidate Starts for Frokostdame\_5:

(Start: 10 @4698 has 101 MA's), (12, 4713), (18, 4773), (19, 4776), (23, 4806), (29, 4887), (33, 4911), (38, 4938), (39, 4944),

Gene: Gambino\_5 Start: 4627, Stop: 5037, Start Num: 10

Candidate Starts for Gambino\_5:

(Start: 10 @4627 has 101 MA's), (12, 4642), (18, 4702), (19, 4705), (23, 4735), (29, 4816), (33, 4840), (38, 4867), (39, 4873),

Gene: Gancho\_7 Start: 5800, Stop: 6252, Start Num: 10

Candidate Starts for Gancho\_7:

(Start: 10 @5800 has 101 MA's), (18, 5881), (28, 5980), (32, 6019), (46, 6121), (47, 6142), (52, 6238),

Gene: Giles\_8 Start: 6100, Stop: 6552, Start Num: 10

Candidate Starts for Giles\_8:

(Start: 10 @6100 has 101 MA's), (18, 6181), (28, 6280), (32, 6319), (46, 6421), (47, 6442), (52, 6538),

Gene: GrandSlam\_9 Start: 6411, Stop: 6857, Start Num: 10

Candidate Starts for GrandSlam\_9:

(4, 6108), (8, 6330), (9, 6366), (Start: 10 @6411 has 101 MA's), (24, 6549), (33, 6633), (39, 6666), (48, 6798),

Gene: Gravaillia\_8 Start: 5833, Stop: 6285, Start Num: 10

Candidate Starts for Gravaillia\_8:

(Start: 10 @5833 has 101 MA's), (18, 5914), (28, 6013), (32, 6052), (46, 6154), (47, 6175), (52, 6271),

Gene: Guacamole\_5 Start: 4734, Stop: 5186, Start Num: 10

Candidate Starts for Guacamole\_5:

(Start: 10 @4734 has 101 MA's), (24, 4872), (38, 4983), (41, 5010), (42, 5016), (51, 5148),

Gene: HH92\_8 Start: 6100, Stop: 6552, Start Num: 10

Candidate Starts for HH92\_8:

(Start: 10 @6100 has 101 MA's), (18, 6181), (28, 6280), (32, 6319), (46, 6421), (47, 6442), (52, 6538),

Gene: Hadrien\_8 Start: 6100, Stop: 6552, Start Num: 10

Candidate Starts for Hadrien\_8:

(Start: 10 @6100 has 101 MA's), (18, 6181), (28, 6280), (32, 6319), (46, 6421), (47, 6442), (52, 6538),

Gene: Hail\_8 Start: 6100, Stop: 6552, Start Num: 10

Candidate Starts for Hail\_8:

(Start: 10 @6100 has 101 MA's), (18, 6181), (28, 6280), (32, 6319), (46, 6421), (47, 6442), (52, 6538),

Gene: Hamood\_9 Start: 6411, Stop: 6857, Start Num: 10

Candidate Starts for Hamood\_9:

(4, 6108), (8, 6330), (9, 6366), (Start: 10 @6411 has 101 MA's), (24, 6549), (33, 6633), (39, 6666), (48, 6798),

Gene: Henoccus\_15 Start: 11211, Stop: 11648, Start Num: 10

Candidate Starts for Henoccus\_15:

(Start: 10 @11211 has 101 MA's), (13, 11238), (14, 11262), (19, 11298), (20, 11307), (21, 11319), (22, 11322), (25, 11355), (33, 11427), (38, 11454), (39, 11460), (44, 11505), (47, 11541), (49, 11610),

Gene: Hitter\_5 Start: 4730, Stop: 5182, Start Num: 10

Candidate Starts for Hitter\_5:

(Start: 10 @4730 has 101 MA's), (24, 4868), (38, 4979), (41, 5006), (42, 5012), (51, 5144),

Gene: Hortense\_5 Start: 4490, Stop: 4900, Start Num: 10

Candidate Starts for Hortense\_5:



(Start: 10 @4490 has 101 MA's), (12, 4505), (18, 4565), (19, 4568), (23, 4598), (29, 4679), (33, 4703), (43, 4772), (45, 4796),

Gene: Howe\_5 Start: 4490, Stop: 4900, Start Num: 10

Candidate Starts for Howe\_5:

(Start: 10 @4490 has 101 MA's), (12, 4505), (18, 4565), (19, 4568), (23, 4598), (29, 4679), (33, 4703), (43, 4772), (45, 4796),

Gene: Intolerant\_14 Start: 11194, Stop: 11631, Start Num: 10

Candidate Starts for Intolerant\_14:

(Start: 10 @11194 has 101 MA's), (13, 11221), (14, 11245), (19, 11281), (20, 11290), (21, 11302), (25, 11338), (33, 11410), (38, 11437), (39, 11443), (42, 11464), (44, 11488), (47, 11524),

Gene: JackieB\_14 Start: 11066, Stop: 11503, Start Num: 10

Candidate Starts for JackieB\_14:

(Start: 10 @11066 has 101 MA's), (13, 11093), (14, 11117), (19, 11153), (20, 11162), (21, 11174), (22, 11177), (25, 11210), (33, 11282), (38, 11309), (39, 11315), (44, 11360), (47, 11396), (49, 11465),

Gene: Jalammah\_5 Start: 4730, Stop: 5182, Start Num: 10

Candidate Starts for Jalammah\_5:

(Start: 10 @4730 has 101 MA's), (24, 4868), (38, 4979), (41, 5006), (42, 5012), (51, 5144),

Gene: JasperJr\_5 Start: 4734, Stop: 5186, Start Num: 10

Candidate Starts for JasperJr\_5:

(Start: 10 @4734 has 101 MA's), (24, 4872), (38, 4983), (41, 5010), (42, 5016), (51, 5148),

Gene: JuJu\_5 Start: 4640, Stop: 5050, Start Num: 10

Candidate Starts for JuJu\_5:

(5, 4340), (Start: 10 @4640 has 101 MA's), (12, 4655), (18, 4715), (19, 4718), (23, 4748), (29, 4829), (33, 4853), (38, 4880), (39, 4886),

Gene: JustASigh\_5 Start: 5107, Stop: 5562, Start Num: 10

Candidate Starts for JustASigh\_5:

(Start: 10 @5107 has 101 MA's), (16, 5176), (26, 5257), (35, 5338), (36, 5341), (39, 5362), (41, 5383), (42, 5389), (47, 5449),

Gene: KappaFarmDelta\_5 Start: 4715, Stop: 5167, Start Num: 10

Candidate Starts for KappaFarmDelta\_5:

(Start: 10 @4715 has 101 MA's), (24, 4853), (38, 4964), (41, 4991), (42, 4997), (51, 5129),

Gene: Kinbote\_8 Start: 6100, Stop: 6552, Start Num: 10

Candidate Starts for Kinbote\_8:

(Start: 10 @6100 has 101 MA's), (18, 6181), (28, 6280), (32, 6319), (46, 6421), (47, 6442), (52, 6538),

Gene: LazerLemon\_14 Start: 11402, Stop: 11839, Start Num: 10

Candidate Starts for LazerLemon\_14:

(Start: 10 @11402 has 101 MA's), (13, 11429), (14, 11453), (19, 11489), (21, 11510), (25, 11546), (33, 11618), (38, 11645), (39, 11651), (44, 11696), (47, 11732),

Gene: LilHazelnut\_8 Start: 6100, Stop: 6552, Start Num: 10

Candidate Starts for LilHazelnut\_8:

(Start: 10 @6100 has 101 MA's), (18, 6181), (28, 6280), (32, 6319), (46, 6421), (47, 6442), (52, 6538),

Gene: Luke\_8 Start: 6100, Stop: 6552, Start Num: 10  
Candidate Starts for Luke\_8:  
(Start: 10 @6100 has 101 MA's), (18, 6181), (28, 6280), (32, 6319), (46, 6421), (47, 6442), (52, 6538),

Gene: Luna22\_8 Start: 6100, Stop: 6552, Start Num: 10  
Candidate Starts for Luna22\_8:  
(Start: 10 @6100 has 101 MA's), (18, 6181), (28, 6280), (32, 6319), (46, 6421), (47, 6442), (52, 6538),

Gene: Lysidious\_5 Start: 4730, Stop: 5182, Start Num: 10  
Candidate Starts for Lysidious\_5:  
(Start: 10 @4730 has 101 MA's), (24, 4868), (38, 4979), (41, 5006), (42, 5012), (51, 5144),

Gene: Malachai\_5 Start: 4733, Stop: 5185, Start Num: 10  
Candidate Starts for Malachai\_5:  
(Start: 10 @4733 has 101 MA's), (24, 4871), (33, 4955), (38, 4982), (41, 5009), (42, 5015), (51, 5147),

Gene: Malibo\_5 Start: 4956, Stop: 5402, Start Num: 10  
Candidate Starts for Malibo\_5:  
(9, 4911), (Start: 10 @4956 has 101 MA's), (24, 5094), (33, 5178), (41, 5232), (42, 5238),

Gene: Marky\_15 Start: 11238, Stop: 11675, Start Num: 10  
Candidate Starts for Marky\_15:  
(Start: 10 @11238 has 101 MA's), (14, 11289), (16, 11307), (20, 11334), (21, 11346), (22, 11349), (26, 11388), (33, 11454), (38, 11481), (42, 11508), (44, 11532), (47, 11568),

Gene: Mbo4\_5 Start: 4975, Stop: 5424, Start Num: 10  
Candidate Starts for Mbo4\_5:  
(Start: 10 @4975 has 101 MA's), (31, 5176), (40, 5242), (46, 5293), (49, 5380), (50, 5383),

Gene: Melba\_5 Start: 4730, Stop: 5182, Start Num: 10  
Candidate Starts for Melba\_5:  
(Start: 10 @4730 has 101 MA's), (24, 4868), (38, 4979), (41, 5006), (42, 5012), (51, 5144),

Gene: Mellie\_5 Start: 4730, Stop: 5182, Start Num: 10  
Candidate Starts for Mellie\_5:  
(Start: 10 @4730 has 101 MA's), (24, 4868), (38, 4979), (41, 5006), (42, 5012), (51, 5144),

Gene: Microdon\_14 Start: 11000, Stop: 11437, Start Num: 10  
Candidate Starts for Microdon\_14:  
(Start: 10 @11000 has 101 MA's), (13, 11027), (14, 11051), (19, 11087), (21, 11108), (25, 11144), (33, 11216), (39, 11249), (42, 11270), (44, 11294), (47, 11330), (49, 11399),

Gene: MintFen\_5 Start: 4730, Stop: 5182, Start Num: 10  
Candidate Starts for MintFen\_5:  
(Start: 10 @4730 has 101 MA's), (24, 4868), (38, 4979), (41, 5006), (42, 5012), (51, 5144),

Gene: MissRona\_5 Start: 4627, Stop: 5037, Start Num: 10  
Candidate Starts for MissRona\_5:  
(Start: 10 @4627 has 101 MA's), (12, 4642), (18, 4702), (19, 4705), (23, 4735), (29, 4816), (33, 4840), (38, 4867), (39, 4873),

Gene: Mulch\_9 Start: 6378, Stop: 6824, Start Num: 10  
Candidate Starts for Mulch\_9:

(8, 6297), (9, 6333), (Start: 10 @6378 has 101 MA's), (18, 6459), (24, 6516), (31, 6582), (33, 6600), (48, 6765),

Gene: Murp\_5 Start: 4718, Stop: 5170, Start Num: 10

Candidate Starts for Murp\_5:

(Start: 10 @4718 has 101 MA's), (24, 4856), (38, 4967), (41, 4994), (42, 5000), (51, 5132),

Gene: Nadeem\_9 Start: 6378, Stop: 6824, Start Num: 10

Candidate Starts for Nadeem\_9:

(8, 6297), (9, 6333), (Start: 10 @6378 has 101 MA's), (18, 6459), (24, 6516), (31, 6582), (33, 6600), (48, 6765),

Gene: NancyRae\_9 Start: 6378, Stop: 6824, Start Num: 10

Candidate Starts for NancyRae\_9:

(8, 6297), (9, 6333), (Start: 10 @6378 has 101 MA's), (18, 6459), (24, 6516), (31, 6582), (33, 6600), (48, 6765),

Gene: OBUpride\_8 Start: 6094, Stop: 6546, Start Num: 10

Candidate Starts for OBUpride\_8:

(Start: 10 @6094 has 101 MA's), (18, 6175), (28, 6274), (32, 6313), (46, 6415), (47, 6436), (52, 6532),

Gene: Obliviate\_5 Start: 4754, Stop: 5206, Start Num: 10

Candidate Starts for Obliviate\_5:

(Start: 10 @4754 has 101 MA's), (24, 4892), (33, 4976), (38, 5003), (41, 5030), (42, 5036), (51, 5168),

Gene: Ohgeesy\_5 Start: 4481, Stop: 4891, Start Num: 10

Candidate Starts for Ohgeesy\_5:

(Start: 10 @4481 has 101 MA's), (12, 4496), (18, 4556), (19, 4559), (23, 4589), (29, 4670), (33, 4694), (34, 4700), (38, 4721), (43, 4763), (45, 4787),

Gene: PCoral7\_5 Start: 4725, Stop: 5177, Start Num: 10

Candidate Starts for PCoral7\_5:

(Start: 10 @4725 has 101 MA's), (24, 4863), (35, 4956), (47, 5067), (49, 5133), (51, 5139),

Gene: PantheRoc\_4 Start: 4481, Stop: 4891, Start Num: 10

Candidate Starts for PantheRoc\_4:

(Start: 10 @4481 has 101 MA's), (12, 4496), (18, 4556), (19, 4559), (23, 4589), (29, 4670), (33, 4694), (34, 4700), (38, 4721), (43, 4763), (45, 4787),

Gene: Parada\_9 Start: 6378, Stop: 6824, Start Num: 10

Candidate Starts for Parada\_9:

(8, 6297), (9, 6333), (Start: 10 @6378 has 101 MA's), (18, 6459), (24, 6516), (31, 6582), (33, 6600), (48, 6765),

Gene: Petra\_5 Start: 4627, Stop: 5037, Start Num: 10

Candidate Starts for Petra\_5:

(Start: 10 @4627 has 101 MA's), (12, 4642), (18, 4702), (19, 4705), (23, 4735), (29, 4816), (33, 4840), (38, 4867), (39, 4873),

Gene: PhrostedPhlake\_5 Start: 4752, Stop: 5204, Start Num: 10

Candidate Starts for PhrostedPhlake\_5:

(Start: 10 @4752 has 101 MA's), (24, 4890), (33, 4974), (38, 5001), (41, 5028), (42, 5034), (51, 5166),

Gene: Pimento\_8 Start: 6375, Stop: 6821, Start Num: 10

Candidate Starts for Pimento\_8:

(8, 6294), (9, 6330), (Start: 10 @6375 has 101 MA's), (24, 6513), (33, 6597), (48, 6762),

Gene: Pipp\_5 Start: 4753, Stop: 5205, Start Num: 10

Candidate Starts for Pipp\_5:

(Start: 10 @4753 has 101 MA's), (24, 4891), (38, 5002), (41, 5029), (42, 5035), (46, 5074), (51, 5167),

Gene: PrincePatrick\_5 Start: 4726, Stop: 5178, Start Num: 10

Candidate Starts for PrincePatrick\_5:

(Start: 10 @4726 has 101 MA's), (24, 4864), (35, 4957), (47, 5068), (49, 5134), (51, 5140),

Gene: REQ2\_05 Start: 4445, Stop: 4885, Start Num: 10

Candidate Starts for REQ2\_05:

(Start: 10 @4445 has 101 MA's), (15, 4502), (24, 4577), (30, 4637), (35, 4670), (38, 4688), (42, 4721),

Gene: Ruthy\_5 Start: 5019, Stop: 5465, Start Num: 10

Candidate Starts for Ruthy\_5:

(6, 4773), (Start: 10 @5019 has 101 MA's), (24, 5157), (33, 5241), (41, 5295), (42, 5301),

Gene: Samba\_5 Start: 4730, Stop: 5182, Start Num: 10

Candidate Starts for Samba\_5:

(Start: 10 @4730 has 101 MA's), (24, 4868), (33, 4952), (38, 4979), (41, 5006), (42, 5012), (51, 5144),

Gene: Shlim410\_5 Start: 4490, Stop: 4900, Start Num: 10

Candidate Starts for Shlim410\_5:

(Start: 10 @4490 has 101 MA's), (12, 4505), (18, 4565), (19, 4568), (23, 4598), (29, 4679), (33, 4703), (43, 4772), (45, 4796),

Gene: Sidious\_5 Start: 4484, Stop: 4894, Start Num: 10

Candidate Starts for Sidious\_5:

(1, 3392), (2, 3614), (3, 3695), (5, 4184), (Start: 10 @4484 has 101 MA's), (12, 4499), (18, 4559), (19, 4562), (23, 4592), (29, 4673), (33, 4697), (34, 4703), (38, 4724), (45, 4790),

Gene: Stuff\_14 Start: 11197, Stop: 11631, Start Num: 10

Candidate Starts for Stuff\_14:

(Start: 10 @11197 has 101 MA's), (13, 11224), (14, 11248), (19, 11284), (21, 11305), (24, 11338), (33, 11413), (38, 11440), (39, 11446), (42, 11467), (49, 11593),

Gene: Toast\_5 Start: 4725, Stop: 5177, Start Num: 10

Candidate Starts for Toast\_5:

(Start: 10 @4725 has 101 MA's), (24, 4863), (35, 4956), (47, 5067), (49, 5133), (51, 5139),

Gene: Twinkle\_5 Start: 4490, Stop: 4900, Start Num: 10

Candidate Starts for Twinkle\_5:

(Start: 10 @4490 has 101 MA's), (12, 4505), (18, 4565), (19, 4568), (23, 4598), (29, 4679), (33, 4703), (43, 4772), (45, 4796),

Gene: UNTPL\_15 Start: 11314, Stop: 11751, Start Num: 10

Candidate Starts for UNTPL\_15:

(Start: 10 @11314 has 101 MA's), (13, 11341), (14, 11365), (17, 11386), (19, 11401), (21, 11422), (24, 11455), (25, 11458), (33, 11530), (38, 11557), (39, 11563), (44, 11608),

Gene: Ubuntu\_8 Start: 6100, Stop: 6552, Start Num: 10  
Candidate Starts for Ubuntu\_8:  
(Start: 10 @6100 has 101 MA's), (18, 6181), (28, 6280), (32, 6319), (46, 6421), (47, 6442), (52, 6538),

Gene: UmaThurman\_5 Start: 4730, Stop: 5182, Start Num: 10  
Candidate Starts for UmaThurman\_5:  
(Start: 10 @4730 has 101 MA's), (24, 4868), (38, 4979), (41, 5006), (42, 5012), (46, 5051), (51, 5144),

Gene: Utz\_5 Start: 4730, Stop: 5182, Start Num: 10  
Candidate Starts for Utz\_5:  
(Start: 10 @4730 has 101 MA's), (24, 4868), (38, 4979), (41, 5006), (42, 5012), (51, 5144),

Gene: Walrus\_5 Start: 4630, Stop: 5040, Start Num: 10  
Candidate Starts for Walrus\_5:  
(Start: 10 @4630 has 101 MA's), (12, 4645), (18, 4705), (19, 4708), (23, 4738), (29, 4819), (33, 4843),  
(38, 4870), (39, 4876),

Gene: Webster2\_8 Start: 6100, Stop: 6552, Start Num: 10  
Candidate Starts for Webster2\_8:  
(Start: 10 @6100 has 101 MA's), (18, 6181), (28, 6280), (32, 6319), (46, 6421), (47, 6442), (52, 6538),

Gene: Weirido19\_6 Start: 4950, Stop: 5405, Start Num: 10  
Candidate Starts for Weirido19\_6:  
(Start: 10 @4950 has 101 MA's), (11, 4962), (16, 5016), (27, 5115), (32, 5169), (36, 5184), (39, 5205),  
(41, 5226), (45, 5265),

Gene: Whack\_5 Start: 4499, Stop: 4909, Start Num: 10  
Candidate Starts for Whack\_5:  
(Start: 10 @4499 has 101 MA's), (19, 4577), (38, 4739), (45, 4805),

Gene: WheatThin\_9 Start: 6378, Stop: 6824, Start Num: 10  
Candidate Starts for WheatThin\_9:  
(8, 6297), (9, 6333), (Start: 10 @6378 has 101 MA's), (18, 6459), (24, 6516), (31, 6582), (33, 6600),  
(48, 6765),

Gene: William\_5 Start: 4725, Stop: 5177, Start Num: 10  
Candidate Starts for William\_5:  
(Start: 10 @4725 has 101 MA's), (24, 4863), (35, 4956), (47, 5067), (49, 5133), (51, 5139),

Gene: Wishmaker\_8 Start: 6100, Stop: 6552, Start Num: 10  
Candidate Starts for Wishmaker\_8:  
(Start: 10 @6100 has 101 MA's), (18, 6181), (28, 6280), (32, 6319), (46, 6421), (47, 6442), (52, 6538),

Gene: Wisp\_5 Start: 4730, Stop: 5182, Start Num: 10  
Candidate Starts for Wisp\_5:  
(Start: 10 @4730 has 101 MA's), (24, 4868), (33, 4952), (38, 4979), (41, 5006), (42, 5012), (51, 5144),

Gene: Wocket\_5 Start: 4721, Stop: 5173, Start Num: 10  
Candidate Starts for Wocket\_5:  
(Start: 10 @4721 has 101 MA's), (24, 4859), (33, 4943), (38, 4970), (41, 4997), (42, 5003), (51, 5135),

Gene: Yeezy\_5 Start: 4481, Stop: 4891, Start Num: 10  
Candidate Starts for Yeezy\_5:

(Start: 10 @4481 has 101 MA's), (12, 4496), (18, 4556), (19, 4559), (23, 4589), (29, 4670), (33, 4694), (34, 4700), (38, 4721), (43, 4763), (45, 4787),

Gene: Zarbodnamra\_5 Start: 4729, Stop: 5181, Start Num: 10

Candidate Starts for Zarbodnamra\_5:

(Start: 10 @4729 has 101 MA's), (24, 4867), (38, 4978), (41, 5005), (42, 5011), (51, 5143),

Gene: ZiggyZoo\_5 Start: 4754, Stop: 5206, Start Num: 10

Candidate Starts for ZiggyZoo\_5:

(Start: 10 @4754 has 101 MA's), (24, 4892), (33, 4976), (38, 5003), (41, 5030), (42, 5036), (51, 5168),