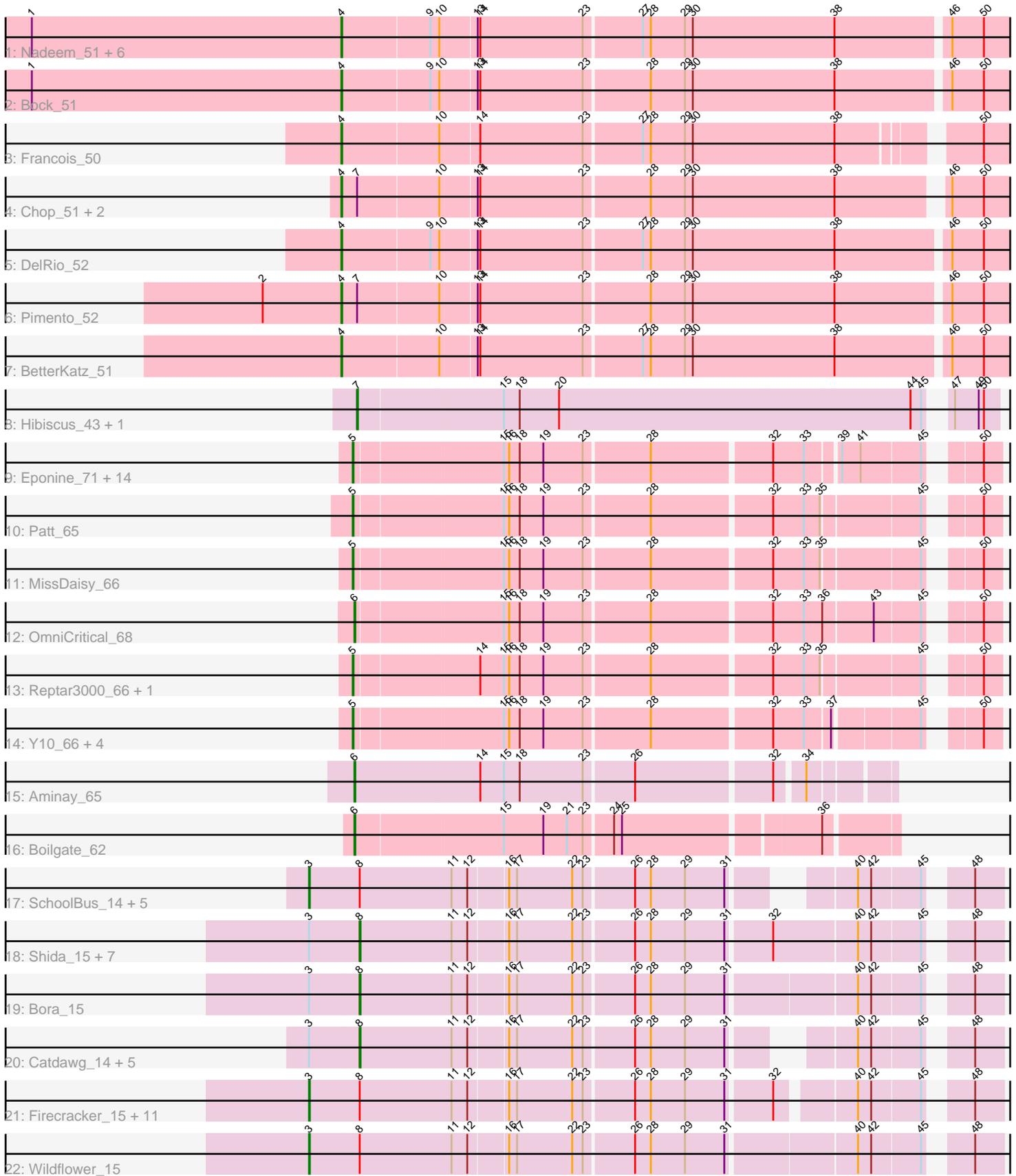


# Pham 291097



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 291097 Report

This analysis was run 03/28/26 on database version 641.

Pham number 291097 has 78 members, 7 are drafts.

Phages represented in each track:

- Track 1 : Nadeem\_51, WheatThin\_50, Brylie\_51, Parada\_51, NancyRae\_50, Mulch\_51, Ayotoya\_51
- Track 2 : Bock\_51
- Track 3 : Francois\_50
- Track 4 : Chop\_51, Hamood\_51, GrandSlam\_51
- Track 5 : DelRio\_52
- Track 6 : Pimento\_52
- Track 7 : BetterKatz\_51
- Track 8 : Hibiscus\_43, Heinz\_42
- Track 9 : Eponine\_71, Qhanda\_71, Kraw\_69, Juliette\_71, SamScheppers\_67, Cheetobro\_69, Chancellor\_69, Malthus\_70, Taquito\_68, Slarp\_69, Fionnbharth\_69, DanSyl44\_72, Lebo14\_68, Mitti\_69, Wintermute\_69
- Track 10 : Patt\_65
- Track 11 : MissDaisy\_66
- Track 12 : OmniCritical\_68
- Track 13 : Reptar3000\_66, Bobquesha\_70
- Track 14 : Y10\_66, YasnayaPolyana\_68, Y2\_66, JF1\_69, Ruthiejr\_70
- Track 15 : Aminay\_65
- Track 16 : Boilgate\_62
- Track 17 : SchoolBus\_14, Blessica\_15, Familton\_15, TelAviv\_14, Idergollasper\_14, Zebo\_14
- Track 18 : Shida\_15, Corndog\_17, Wogge42\_15, Vorrps\_15, Alkhayr\_15, Schuy\_16, Mori\_15, NiebruSaylor\_15
- Track 19 : Bora\_15
- Track 20 : Catdawg\_14, KingPhillip3\_14, YoyoKar\_15, JangDynasty\_14, Imara\_15, FoulBall\_14
- Track 21 : Firecracker\_15, Ashwin\_16, Dylan\_15, Krili\_15, Murai\_15, Ryadel\_17, Zakhe101\_16, Smooch\_16, MadKillah\_16, Winget\_15, YungJama1\_16, Vagabond\_15
- Track 22 : Wildflower\_15

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

The start number called the most often in the published annotations is 5, it was called in 21 of the 71 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Bobquesha\_70, Chancellor\_69, Cheetobro\_69, DanSyl44\_72, Eponine\_71, Fionnbharth\_69, JF1\_69, Juliette\_71, Kraw\_69, Lebo14\_68, Malthus\_70, MissDaisy\_66, Mitti\_69, Patt\_65, Qhanda\_71, Reptar3000\_66, Ruthiejr\_70, SamScheppers\_67, Slarp\_69, Taquito\_68, Wintermute\_69, Y10\_66, Y2\_66, YasnayaPolyana\_68,

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

- 

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

- Alkhayr\_15, Aminay\_65, Ashwin\_16, Ayotoya\_51, BetterKatz\_51, Blessica\_15, Bock\_51, Boilgate\_62, Bora\_15, Brylie\_51, Catdawg\_14, Chop\_51, Corndog\_17, DelRio\_52, Dylan\_15, Familton\_15, Firecracker\_15, FoulBall\_14, Francois\_50, GrandSlam\_51, Hamood\_51, Heinz\_42, Hibiscus\_43, Idergollasper\_14, Imara\_15, JangDynasty\_14, KingPhillip3\_14, Krili\_15, MadKillah\_16, Mori\_15, Mulch\_51, Murai\_15, Nadeem\_51, NancyRae\_50, NiebruSaylor\_15, OmniCritical\_68, Parada\_51, Pimento\_52, Ryadel\_17, SchoolBus\_14, Schuy\_16, Shida\_15, Smooch\_16, TelAviv\_14, Vagabond\_15, Vorrps\_15, WheatThin\_50, Wildflower\_15, Winget\_15, Wogge42\_15, YoyoKar\_15, YungJamal\_16, Zakhe101\_16, Zebo\_14,

### Summary by start number:

Start 3:

- Found in 34 of 78 ( 43.6% ) of genes in pham
- Manual Annotations of this start: 19 of 71
- Called 55.9% of time when present
- Phage (with cluster) where this start called: Ashwin\_16 (O), Blessica\_15 (O), Dylan\_15 (O), Familton\_15 (O), Firecracker\_15 (O), Idergollasper\_14 (O), Krili\_15 (O), MadKillah\_16 (O), Murai\_15 (O), Ryadel\_17 (O), SchoolBus\_14 (O), Smooch\_16 (O), TelAviv\_14 (O), Vagabond\_15 (O), Wildflower\_15 (O), Winget\_15 (O), YungJamal\_16 (O), Zakhe101\_16 (O), Zebo\_14 (O),

Start 4:

- Found in 15 of 78 ( 19.2% ) of genes in pham
- Manual Annotations of this start: 15 of 71
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Ayotoya\_51 (DI), BetterKatz\_51 (DI), Bock\_51 (DI), Brylie\_51 (DI), Chop\_51 (DI), DelRio\_52 (DI), Francois\_50 (DI), GrandSlam\_51 (DI), Hamood\_51 (DI), Mulch\_51 (DI), Nadeem\_51 (DI), NancyRae\_50 (DI), Parada\_51 (DI), Pimento\_52 (DI), WheatThin\_50 (DI),

Start 5:

- Found in 24 of 78 ( 30.8% ) of genes in pham
- Manual Annotations of this start: 21 of 71
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Bobquesha\_70 (K4), Chancellor\_69 (K4), Cheetobro\_69 (K4), DanSyl44\_72 (K4), Eponine\_71 (K4), Fionnbharth\_69 (K4), JF1\_69 (K4), Juliette\_71 (K4), Kraw\_69 (K4), Lebo14\_68 (K4), Malthus\_70 (K4), MissDaisy\_66 (K4), Mitti\_69 (K4), Patt\_65 (K4), Qhanda\_71 (K4), Reptar3000\_66 (K4), Ruthiejr\_70 (K4), SamScheppers\_67 (K4), Slarp\_69 (K4), Taquito\_68 (K4), Wintermute\_69 (K4), Y10\_66 (K4), Y2\_66 (K4), YasnayaPolyana\_68 (K4),

Start 6:

- Found in 3 of 78 ( 3.8% ) of genes in pham
- Manual Annotations of this start: 3 of 71
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Aminay\_65 (K7), Boilgate\_62 (K8), OmniCritical\_68 (K4),

Start 7:

- Found in 6 of 78 ( 7.7% ) of genes in pham
- Manual Annotations of this start: 2 of 71
- Called 33.3% of time when present
- Phage (with cluster) where this start called: Heinz\_42 (DY), Hibiscus\_43 (DY),

Start 8:

- Found in 34 of 78 ( 43.6% ) of genes in pham
- Manual Annotations of this start: 11 of 71
- Called 44.1% of time when present
- Phage (with cluster) where this start called: Alkhayr\_15 (O), Bora\_15 (O), Catdawg\_14 (O), Corndog\_17 (O), FoulBall\_14 (O), Imara\_15 (O), JangDynasty\_14 (O), KingPhillip3\_14 (O), Mori\_15 (O), NiebruSaylor\_15 (O), Schuy\_16 (O), Shida\_15 (O), Vorrps\_15 (O), Wogge42\_15 (O), YoyoKar\_15 (O),

**Summary by clusters:**

There are 6 clusters represented in this pham: DI, DY, O, K7, K4, K8,

Info for manual annotations of cluster DI:

- Start number 4 was manually annotated 15 times for cluster DI.

Info for manual annotations of cluster DY:

- Start number 7 was manually annotated 2 times for cluster DY.

Info for manual annotations of cluster K4:

- Start number 5 was manually annotated 21 times for cluster K4.
- Start number 6 was manually annotated 1 time for cluster K4.

Info for manual annotations of cluster K7:

- Start number 6 was manually annotated 1 time for cluster K7.

Info for manual annotations of cluster K8:

- Start number 6 was manually annotated 1 time for cluster K8.

Info for manual annotations of cluster O:

- Start number 3 was manually annotated 19 times for cluster O.
- Start number 8 was manually annotated 11 times for cluster O.

**Gene Information:**

Gene: Alkhayr\_15 Start: 6062, Stop: 6742, Start Num: 8

Candidate Starts for Alkhayr\_15:

(Start: 3 @6005 has 19 MA's), (Start: 8 @6062 has 11 MA's), (11, 6167), (12, 6185), (16, 6227), (17, 6236), (22, 6299), (23, 6311), (26, 6365), (28, 6383), (29, 6422), (31, 6467), (32, 6515), (40, 6605), (42, 6620), (45, 6674), (48, 6710),

Gene: Aminay\_65 Start: 42473, Stop: 43045, Start Num: 6

Candidate Starts for Aminay\_65:

(Start: 6 @42473 has 3 MA's), (14, 42614), (15, 42641), (18, 42659), (23, 42731), (26, 42785), (32, 42932), (34, 42959),

Gene: Ashwin\_16 Start: 6240, Stop: 6962, Start Num: 3

Candidate Starts for Ashwin\_16:

(Start: 3 @6240 has 19 MA's), (Start: 8 @6297 has 11 MA's), (11, 6402), (12, 6420), (16, 6462), (17, 6471), (22, 6534), (23, 6546), (26, 6600), (28, 6618), (29, 6657), (31, 6702), (32, 6750), (40, 6825), (42, 6840), (45, 6894), (48, 6930),

Gene: Ayotoya\_51 Start: 37282, Stop: 38049, Start Num: 4

Candidate Starts for Ayotoya\_51:

(1, 36928), (Start: 4 @37282 has 15 MA's), (9, 37381), (10, 37390), (13, 37429), (14, 37432), (23, 37549), (27, 37612), (28, 37621), (29, 37660), (30, 37669), (38, 37831), (46, 37942), (50, 37978),

Gene: BetterKatz\_51 Start: 36768, Stop: 37547, Start Num: 4

Candidate Starts for BetterKatz\_51:

(Start: 4 @36768 has 15 MA's), (10, 36876), (13, 36915), (14, 36918), (23, 37035), (27, 37098), (28, 37107), (29, 37146), (30, 37155), (38, 37317), (46, 37440), (50, 37476),

Gene: Blessica\_15 Start: 6070, Stop: 6765, Start Num: 3

Candidate Starts for Blessica\_15:

(Start: 3 @6070 has 19 MA's), (Start: 8 @6127 has 11 MA's), (11, 6232), (12, 6250), (16, 6292), (17, 6301), (22, 6364), (23, 6376), (26, 6430), (28, 6448), (29, 6487), (31, 6532), (40, 6628), (42, 6643), (45, 6697), (48, 6733),

Gene: Bobquesha\_70 Start: 41491, Stop: 42162, Start Num: 5

Candidate Starts for Bobquesha\_70:

(Start: 5 @41491 has 21 MA's), (14, 41626), (15, 41653), (16, 41659), (18, 41671), (19, 41698), (23, 41743), (28, 41815), (32, 41944), (33, 41977), (35, 41995), (45, 42100), (50, 42142),

Gene: Bock\_51 Start: 36502, Stop: 37281, Start Num: 4

Candidate Starts for Bock\_51:

(1, 36148), (Start: 4 @36502 has 15 MA's), (9, 36601), (10, 36610), (13, 36649), (14, 36652), (23, 36769), (28, 36841), (29, 36880), (30, 36889), (38, 37051), (46, 37174), (50, 37210),

Gene: Boilgate\_62 Start: 44590, Stop: 45171, Start Num: 6

Candidate Starts for Boilgate\_62:

(Start: 6 @44590 has 3 MA's), (15, 44755), (19, 44800), (21, 44827), (23, 44845), (24, 44875), (25, 44884), (36, 45094),

Gene: Bora\_15 Start: 6095, Stop: 6772, Start Num: 8

Candidate Starts for Bora\_15:

(Start: 3 @6038 has 19 MA's), (Start: 8 @6095 has 11 MA's), (11, 6200), (12, 6218), (16, 6260), (17, 6269), (22, 6332), (23, 6344), (26, 6398), (28, 6416), (29, 6455), (31, 6500), (40, 6635), (42, 6650), (45, 6704), (48, 6740),

Gene: Brylie\_51 Start: 36552, Stop: 37343, Start Num: 4

Candidate Starts for Brylie\_51:

(1, 36198), (Start: 4 @36552 has 15 MA's), (9, 36651), (10, 36660), (13, 36699), (14, 36702), (23, 36819), (27, 36882), (28, 36891), (29, 36930), (30, 36939), (38, 37101), (46, 37236), (50, 37272),

Gene: Catdawg\_14 Start: 5733, Stop: 6371, Start Num: 8

Candidate Starts for Catdawg\_14:

(Start: 3 @5676 has 19 MA's), (Start: 8 @5733 has 11 MA's), (11, 5838), (12, 5856), (16, 5898), (17, 5907), (22, 5970), (23, 5982), (26, 6036), (28, 6054), (29, 6093), (31, 6138), (40, 6234), (42, 6249), (45, 6303), (48, 6339),

Gene: Chancellor\_69 Start: 42601, Stop: 43269, Start Num: 5

Candidate Starts for Chancellor\_69:

(Start: 5 @42601 has 21 MA's), (15, 42763), (16, 42769), (18, 42781), (19, 42808), (23, 42853), (28, 42925), (32, 43054), (33, 43087), (39, 43120), (41, 43141), (45, 43207), (50, 43249),

Gene: Cheetobro\_69 Start: 42598, Stop: 43266, Start Num: 5

Candidate Starts for Cheetobro\_69:

(Start: 5 @42598 has 21 MA's), (15, 42760), (16, 42766), (18, 42778), (19, 42805), (23, 42850), (28, 42922), (32, 43051), (33, 43084), (39, 43117), (41, 43138), (45, 43204), (50, 43246),

Gene: Chop\_51 Start: 37033, Stop: 37800, Start Num: 4

Candidate Starts for Chop\_51:

(Start: 4 @37033 has 15 MA's), (Start: 7 @37051 has 2 MA's), (10, 37141), (13, 37180), (14, 37183), (23, 37300), (28, 37372), (29, 37411), (30, 37420), (38, 37582), (46, 37693), (50, 37729),

Gene: Corndog\_17 Start: 6409, Stop: 7074, Start Num: 8

Candidate Starts for Corndog\_17:

(Start: 3 @6352 has 19 MA's), (Start: 8 @6409 has 11 MA's), (11, 6514), (12, 6532), (16, 6574), (17, 6583), (22, 6646), (23, 6658), (26, 6712), (28, 6730), (29, 6769), (31, 6814), (32, 6862), (40, 6937), (42, 6952), (45, 7006), (48, 7042),

Gene: DanSyl44\_72 Start: 43792, Stop: 44460, Start Num: 5

Candidate Starts for DanSyl44\_72:

(Start: 5 @43792 has 21 MA's), (15, 43954), (16, 43960), (18, 43972), (19, 43999), (23, 44044), (28, 44116), (32, 44245), (33, 44278), (39, 44311), (41, 44332), (45, 44398), (50, 44440),

Gene: DelRio\_52 Start: 37746, Stop: 38525, Start Num: 4

Candidate Starts for DelRio\_52:

(Start: 4 @37746 has 15 MA's), (9, 37845), (10, 37854), (13, 37893), (14, 37896), (23, 38013), (27, 38076), (28, 38085), (29, 38124), (30, 38133), (38, 38295), (46, 38418), (50, 38454),

Gene: Dylan\_15 Start: 6240, Stop: 6962, Start Num: 3

Candidate Starts for Dylan\_15:

(Start: 3 @6240 has 19 MA's), (Start: 8 @6297 has 11 MA's), (11, 6402), (12, 6420), (16, 6462), (17, 6471), (22, 6534), (23, 6546), (26, 6600), (28, 6618), (29, 6657), (31, 6702), (32, 6750), (40, 6825), (42, 6840), (45, 6894), (48, 6930),

Gene: Eponine\_71 Start: 43444, Stop: 44112, Start Num: 5

Candidate Starts for Eponine\_71:

(Start: 5 @43444 has 21 MA's), (15, 43606), (16, 43612), (18, 43624), (19, 43651), (23, 43696), (28, 43768), (32, 43897), (33, 43930), (39, 43963), (41, 43984), (45, 44050), (50, 44092),

Gene: Familton\_15 Start: 5677, Stop: 6372, Start Num: 3

Candidate Starts for Familton\_15:

(Start: 3 @5677 has 19 MA's), (Start: 8 @5734 has 11 MA's), (11, 5839), (12, 5857), (16, 5899), (17, 5908), (22, 5971), (23, 5983), (26, 6037), (28, 6055), (29, 6094), (31, 6139), (40, 6235), (42, 6250), (45, 6304), (48, 6340),

Gene: Fionnbharth\_69 Start: 42842, Stop: 43510, Start Num: 5

Candidate Starts for Fionnbharth\_69:

(Start: 5 @42842 has 21 MA's), (15, 43004), (16, 43010), (18, 43022), (19, 43049), (23, 43094), (28, 43166), (32, 43295), (33, 43328), (39, 43361), (41, 43382), (45, 43448), (50, 43490),

Gene: Firecracker\_15 Start: 5973, Stop: 6695, Start Num: 3

Candidate Starts for Firecracker\_15:

(Start: 3 @5973 has 19 MA's), (Start: 8 @6030 has 11 MA's), (11, 6135), (12, 6153), (16, 6195), (17, 6204), (22, 6267), (23, 6279), (26, 6333), (28, 6351), (29, 6390), (31, 6435), (32, 6483), (40, 6558), (42, 6573), (45, 6627), (48, 6663),

Gene: FoulBall\_14 Start: 5734, Stop: 6372, Start Num: 8

Candidate Starts for FoulBall\_14:

(Start: 3 @5677 has 19 MA's), (Start: 8 @5734 has 11 MA's), (11, 5839), (12, 5857), (16, 5899), (17, 5908), (22, 5971), (23, 5983), (26, 6037), (28, 6055), (29, 6094), (31, 6139), (40, 6235), (42, 6250), (45, 6304), (48, 6340),

Gene: Francois\_50 Start: 36554, Stop: 37309, Start Num: 4

Candidate Starts for Francois\_50:

(Start: 4 @36554 has 15 MA's), (10, 36662), (14, 36704), (23, 36821), (27, 36884), (28, 36893), (29, 36932), (30, 36941), (38, 37103), (50, 37238),

Gene: GrandSlam\_51 Start: 37033, Stop: 37800, Start Num: 4

Candidate Starts for GrandSlam\_51:

(Start: 4 @37033 has 15 MA's), (Start: 7 @37051 has 2 MA's), (10, 37141), (13, 37180), (14, 37183), (23, 37300), (28, 37372), (29, 37411), (30, 37420), (38, 37582), (46, 37693), (50, 37729),

Gene: Hamood\_51 Start: 37033, Stop: 37800, Start Num: 4

Candidate Starts for Hamood\_51:

(Start: 4 @37033 has 15 MA's), (Start: 7 @37051 has 2 MA's), (10, 37141), (13, 37180), (14, 37183), (23, 37300), (28, 37372), (29, 37411), (30, 37420), (38, 37582), (46, 37693), (50, 37729),

Gene: Heinz\_42 Start: 28349, Stop: 29047, Start Num: 7

Candidate Starts for Heinz\_42:

(Start: 7 @28349 has 2 MA's), (15, 28511), (18, 28529), (20, 28574), (44, 28973), (45, 28985), (47, 28997), (49, 29024), (50, 29030),

Gene: Hibiscus\_43 Start: 28298, Stop: 28996, Start Num: 7

Candidate Starts for Hibiscus\_43:

(Start: 7 @28298 has 2 MA's), (15, 28460), (18, 28478), (20, 28523), (44, 28922), (45, 28934), (47, 28946), (49, 28973), (50, 28979),

Gene: Idergollasper\_14 Start: 5677, Stop: 6372, Start Num: 3

Candidate Starts for Idergollasper\_14:

(Start: 3 @5677 has 19 MA's), (Start: 8 @5734 has 11 MA's), (11, 5839), (12, 5857), (16, 5899), (17, 5908), (22, 5971), (23, 5983), (26, 6037), (28, 6055), (29, 6094), (31, 6139), (40, 6235), (42, 6250), (45, 6304), (48, 6340),

Gene: Imara\_15 Start: 5987, Stop: 6625, Start Num: 8

Candidate Starts for Imara\_15:

(Start: 3 @5930 has 19 MA's), (Start: 8 @5987 has 11 MA's), (11, 6092), (12, 6110), (16, 6152), (17, 6161), (22, 6224), (23, 6236), (26, 6290), (28, 6308), (29, 6347), (31, 6392), (40, 6488), (42, 6503), (45, 6557), (48, 6593),

Gene: JF1\_69 Start: 42759, Stop: 43424, Start Num: 5

Candidate Starts for JF1\_69:

(Start: 5 @42759 has 21 MA's), (15, 42921), (16, 42927), (18, 42939), (19, 42966), (23, 43011), (28, 43083), (32, 43212), (33, 43245), (37, 43272), (45, 43362), (50, 43404),

Gene: JangDynasty\_14 Start: 5823, Stop: 6461, Start Num: 8

Candidate Starts for JangDynasty\_14:

(Start: 3 @5766 has 19 MA's), (Start: 8 @5823 has 11 MA's), (11, 5928), (12, 5946), (16, 5988), (17, 5997), (22, 6060), (23, 6072), (26, 6126), (28, 6144), (29, 6183), (31, 6228), (40, 6324), (42, 6339), (45, 6393), (48, 6429),

Gene: Juliette\_71 Start: 42906, Stop: 43574, Start Num: 5

Candidate Starts for Juliette\_71:

(Start: 5 @42906 has 21 MA's), (15, 43068), (16, 43074), (18, 43086), (19, 43113), (23, 43158), (28, 43230), (32, 43359), (33, 43392), (39, 43425), (41, 43446), (45, 43512), (50, 43554),

Gene: KingPhillip3\_14 Start: 5734, Stop: 6372, Start Num: 8

Candidate Starts for KingPhillip3\_14:

(Start: 3 @5677 has 19 MA's), (Start: 8 @5734 has 11 MA's), (11, 5839), (12, 5857), (16, 5899), (17, 5908), (22, 5971), (23, 5983), (26, 6037), (28, 6055), (29, 6094), (31, 6139), (40, 6235), (42, 6250), (45, 6304), (48, 6340),

Gene: Kraw\_69 Start: 42594, Stop: 43262, Start Num: 5

Candidate Starts for Kraw\_69:

(Start: 5 @42594 has 21 MA's), (15, 42756), (16, 42762), (18, 42774), (19, 42801), (23, 42846), (28, 42918), (32, 43047), (33, 43080), (39, 43113), (41, 43134), (45, 43200), (50, 43242),

Gene: Krili\_15 Start: 6006, Stop: 6731, Start Num: 3

Candidate Starts for Krili\_15:

(Start: 3 @6006 has 19 MA's), (Start: 8 @6063 has 11 MA's), (11, 6168), (12, 6186), (16, 6228), (17, 6237), (22, 6300), (23, 6312), (26, 6366), (28, 6384), (29, 6423), (31, 6468), (32, 6507), (40, 6594), (42, 6609), (45, 6663), (48, 6699),

Gene: Lebo14\_68 Start: 42927, Stop: 43595, Start Num: 5

Candidate Starts for Lebo14\_68:

(Start: 5 @42927 has 21 MA's), (15, 43089), (16, 43095), (18, 43107), (19, 43134), (23, 43179), (28, 43251), (32, 43380), (33, 43413), (39, 43446), (41, 43467), (45, 43533), (50, 43575),

Gene: MadKillah\_16 Start: 6027, Stop: 6764, Start Num: 3

Candidate Starts for MadKillah\_16:

(Start: 3 @6027 has 19 MA's), (Start: 8 @6084 has 11 MA's), (11, 6189), (12, 6207), (16, 6249), (17, 6258), (22, 6321), (23, 6333), (26, 6387), (28, 6405), (29, 6444), (31, 6489), (32, 6537), (40, 6627), (42, 6642), (45, 6696), (48, 6732),

Gene: Malthus\_70 Start: 42594, Stop: 43262, Start Num: 5

Candidate Starts for Malthus\_70:

(Start: 5 @42594 has 21 MA's), (15, 42756), (16, 42762), (18, 42774), (19, 42801), (23, 42846), (28, 42918), (32, 43047), (33, 43080), (39, 43113), (41, 43134), (45, 43200), (50, 43242),

Gene: MissDaisy\_66 Start: 41506, Stop: 42177, Start Num: 5

Candidate Starts for MissDaisy\_66:

(Start: 5 @41506 has 21 MA's), (15, 41668), (16, 41674), (18, 41686), (19, 41713), (23, 41758), (28, 41830), (32, 41959), (33, 41992), (35, 42010), (45, 42115), (50, 42157),

Gene: Mitti\_69 Start: 42773, Stop: 43417, Start Num: 5

Candidate Starts for Mitti\_69:

(Start: 5 @42773 has 21 MA's), (15, 42935), (16, 42941), (18, 42953), (19, 42980), (23, 43025), (28, 43097), (32, 43226), (33, 43259), (39, 43292), (41, 43313), (45, 43355), (50, 43397),

Gene: Mori\_15 Start: 5923, Stop: 6603, Start Num: 8

Candidate Starts for Mori\_15:

(Start: 3 @5866 has 19 MA's), (Start: 8 @5923 has 11 MA's), (11, 6028), (12, 6046), (16, 6088), (17, 6097), (22, 6160), (23, 6172), (26, 6226), (28, 6244), (29, 6283), (31, 6328), (32, 6376), (40, 6466), (42, 6481), (45, 6535), (48, 6571),

Gene: Mulch\_51 Start: 36552, Stop: 37343, Start Num: 4

Candidate Starts for Mulch\_51:

(1, 36198), (Start: 4 @36552 has 15 MA's), (9, 36651), (10, 36660), (13, 36699), (14, 36702), (23, 36819), (27, 36882), (28, 36891), (29, 36930), (30, 36939), (38, 37101), (46, 37236), (50, 37272),

Gene: Murai\_15 Start: 5866, Stop: 6603, Start Num: 3

Candidate Starts for Murai\_15:

(Start: 3 @5866 has 19 MA's), (Start: 8 @5923 has 11 MA's), (11, 6028), (12, 6046), (16, 6088), (17, 6097), (22, 6160), (23, 6172), (26, 6226), (28, 6244), (29, 6283), (31, 6328), (32, 6376), (40, 6466), (42, 6481), (45, 6535), (48, 6571),

Gene: Nadeem\_51 Start: 36552, Stop: 37331, Start Num: 4

Candidate Starts for Nadeem\_51:

(1, 36198), (Start: 4 @36552 has 15 MA's), (9, 36651), (10, 36660), (13, 36699), (14, 36702), (23, 36819), (27, 36882), (28, 36891), (29, 36930), (30, 36939), (38, 37101), (46, 37224), (50, 37260),

Gene: NancyRae\_50 Start: 36571, Stop: 37350, Start Num: 4

Candidate Starts for NancyRae\_50:

(1, 36217), (Start: 4 @36571 has 15 MA's), (9, 36670), (10, 36679), (13, 36718), (14, 36721), (23, 36838), (27, 36901), (28, 36910), (29, 36949), (30, 36958), (38, 37120), (46, 37243), (50, 37279),

Gene: NiebruSaylor\_15 Start: 5923, Stop: 6603, Start Num: 8

Candidate Starts for NiebruSaylor\_15:

(Start: 3 @5866 has 19 MA's), (Start: 8 @5923 has 11 MA's), (11, 6028), (12, 6046), (16, 6088), (17, 6097), (22, 6160), (23, 6172), (26, 6226), (28, 6244), (29, 6283), (31, 6328), (32, 6376), (40, 6466), (42, 6481), (45, 6535), (48, 6571),

Gene: OmniCritical\_68 Start: 42624, Stop: 43298, Start Num: 6

Candidate Starts for OmniCritical\_68:

(Start: 6 @42624 has 3 MA's), (15, 42786), (16, 42792), (18, 42804), (19, 42831), (23, 42876), (28, 42948), (32, 43077), (33, 43110), (36, 43131), (43, 43185), (45, 43236), (50, 43278),

Gene: Parada\_51 Start: 36552, Stop: 37343, Start Num: 4

Candidate Starts for Parada\_51:

(1, 36198), (Start: 4 @36552 has 15 MA's), (9, 36651), (10, 36660), (13, 36699), (14, 36702), (23, 36819), (27, 36882), (28, 36891), (29, 36930), (30, 36939), (38, 37101), (46, 37236), (50, 37272),

Gene: Patt\_65 Start: 41230, Stop: 41901, Start Num: 5

Candidate Starts for Patt\_65:

(Start: 5 @41230 has 21 MA's), (15, 41392), (16, 41398), (18, 41410), (19, 41437), (23, 41482), (28, 41554), (32, 41683), (33, 41716), (35, 41734), (45, 41839), (50, 41881),

Gene: Pimento\_52 Start: 36149, Stop: 36928, Start Num: 4

Candidate Starts for Pimento\_52:

(2, 36059), (Start: 4 @36149 has 15 MA's), (Start: 7 @36167 has 2 MA's), (10, 36257), (13, 36296), (14, 36299), (23, 36416), (28, 36488), (29, 36527), (30, 36536), (38, 36698), (46, 36821), (50, 36857),

Gene: Qhanda\_71 Start: 42610, Stop: 43278, Start Num: 5

Candidate Starts for Qhanda\_71:

(Start: 5 @42610 has 21 MA's), (15, 42772), (16, 42778), (18, 42790), (19, 42817), (23, 42862), (28, 42934), (32, 43063), (33, 43096), (39, 43129), (41, 43150), (45, 43216), (50, 43258),

Gene: Reptar3000\_66 Start: 41218, Stop: 41889, Start Num: 5

Candidate Starts for Reptar3000\_66:

(Start: 5 @41218 has 21 MA's), (14, 41353), (15, 41380), (16, 41386), (18, 41398), (19, 41425), (23, 41470), (28, 41542), (32, 41671), (33, 41704), (35, 41722), (45, 41827), (50, 41869),

Gene: Ruthiejr\_70 Start: 42644, Stop: 43309, Start Num: 5

Candidate Starts for Ruthiejr\_70:

(Start: 5 @42644 has 21 MA's), (15, 42806), (16, 42812), (18, 42824), (19, 42851), (23, 42896), (28, 42968), (32, 43097), (33, 43130), (37, 43157), (45, 43247), (50, 43289),

Gene: Ryadel\_17 Start: 6460, Stop: 7185, Start Num: 3

Candidate Starts for Ryadel\_17:

(Start: 3 @6460 has 19 MA's), (Start: 8 @6517 has 11 MA's), (11, 6622), (12, 6640), (16, 6682), (17, 6691), (22, 6754), (23, 6766), (26, 6820), (28, 6838), (29, 6877), (31, 6922), (32, 6961), (40, 7048), (42, 7063), (45, 7117), (48, 7153),

Gene: SamScheppers\_67 Start: 43073, Stop: 43741, Start Num: 5

Candidate Starts for SamScheppers\_67:

(Start: 5 @43073 has 21 MA's), (15, 43235), (16, 43241), (18, 43253), (19, 43280), (23, 43325), (28, 43397), (32, 43526), (33, 43559), (39, 43592), (41, 43613), (45, 43679), (50, 43721),

Gene: SchoolBus\_14 Start: 5677, Stop: 6372, Start Num: 3

Candidate Starts for SchoolBus\_14:

(Start: 3 @5677 has 19 MA's), (Start: 8 @5734 has 11 MA's), (11, 5839), (12, 5857), (16, 5899), (17, 5908), (22, 5971), (23, 5983), (26, 6037), (28, 6055), (29, 6094), (31, 6139), (40, 6235), (42, 6250), (45, 6304), (48, 6340),

Gene: Schuy\_16 Start: 6084, Stop: 6764, Start Num: 8

Candidate Starts for Schuy\_16:

(Start: 3 @6027 has 19 MA's), (Start: 8 @6084 has 11 MA's), (11, 6189), (12, 6207), (16, 6249), (17, 6258), (22, 6321), (23, 6333), (26, 6387), (28, 6405), (29, 6444), (31, 6489), (32, 6537), (40, 6627), (42, 6642), (45, 6696), (48, 6732),

Gene: Shida\_15 Start: 5989, Stop: 6669, Start Num: 8

Candidate Starts for Shida\_15:

(Start: 3 @5932 has 19 MA's), (Start: 8 @5989 has 11 MA's), (11, 6094), (12, 6112), (16, 6154), (17, 6163), (22, 6226), (23, 6238), (26, 6292), (28, 6310), (29, 6349), (31, 6394), (32, 6442), (40, 6532), (42, 6547), (45, 6601), (48, 6637),

Gene: Slarp\_69 Start: 42601, Stop: 43269, Start Num: 5

Candidate Starts for Slarp\_69:

(Start: 5 @42601 has 21 MA's), (15, 42763), (16, 42769), (18, 42781), (19, 42808), (23, 42853), (28, 42925), (32, 43054), (33, 43087), (39, 43120), (41, 43141), (45, 43207), (50, 43249),

Gene: Smooch\_16 Start: 6196, Stop: 6918, Start Num: 3

Candidate Starts for Smooch\_16:

(Start: 3 @6196 has 19 MA's), (Start: 8 @6253 has 11 MA's), (11, 6358), (12, 6376), (16, 6418), (17, 6427), (22, 6490), (23, 6502), (26, 6556), (28, 6574), (29, 6613), (31, 6658), (32, 6706), (40, 6781), (42, 6796), (45, 6850), (48, 6886),

Gene: Taquito\_68 Start: 42836, Stop: 43474, Start Num: 5

Candidate Starts for Taquito\_68:

(Start: 5 @42836 has 21 MA's), (15, 42998), (16, 43004), (18, 43016), (19, 43043), (23, 43088), (28, 43160), (32, 43289), (33, 43322), (39, 43355), (41, 43376), (45, 43412), (50, 43454),

Gene: TelAviv\_14 Start: 5674, Stop: 6369, Start Num: 3

Candidate Starts for TelAviv\_14:

(Start: 3 @5674 has 19 MA's), (Start: 8 @5731 has 11 MA's), (11, 5836), (12, 5854), (16, 5896), (17, 5905), (22, 5968), (23, 5980), (26, 6034), (28, 6052), (29, 6091), (31, 6136), (40, 6232), (42, 6247), (45, 6301), (48, 6337),

Gene: Vagabond\_15 Start: 5932, Stop: 6645, Start Num: 3

Candidate Starts for Vagabond\_15:

(Start: 3 @5932 has 19 MA's), (Start: 8 @5989 has 11 MA's), (11, 6094), (12, 6112), (16, 6154), (17, 6163), (22, 6226), (23, 6238), (26, 6292), (28, 6310), (29, 6349), (31, 6394), (32, 6442), (40, 6508), (42, 6523), (45, 6577), (48, 6613),

Gene: Vorrps\_15 Start: 5923, Stop: 6603, Start Num: 8

Candidate Starts for Vorrps\_15:

(Start: 3 @5866 has 19 MA's), (Start: 8 @5923 has 11 MA's), (11, 6028), (12, 6046), (16, 6088), (17, 6097), (22, 6160), (23, 6172), (26, 6226), (28, 6244), (29, 6283), (31, 6328), (32, 6376), (40, 6466), (42, 6481), (45, 6535), (48, 6571),

Gene: WheatThin\_50 Start: 36552, Stop: 37331, Start Num: 4

Candidate Starts for WheatThin\_50:

(1, 36198), (Start: 4 @36552 has 15 MA's), (9, 36651), (10, 36660), (13, 36699), (14, 36702), (23, 36819), (27, 36882), (28, 36891), (29, 36930), (30, 36939), (38, 37101), (46, 37224), (50, 37260),

Gene: Wildflower\_15 Start: 5892, Stop: 6626, Start Num: 3

Candidate Starts for Wildflower\_15:

(Start: 3 @5892 has 19 MA's), (Start: 8 @5949 has 11 MA's), (11, 6054), (12, 6072), (16, 6114), (17, 6123), (22, 6186), (23, 6198), (26, 6252), (28, 6270), (29, 6309), (31, 6354), (40, 6489), (42, 6504), (45, 6558), (48, 6594),

Gene: Winget\_15 Start: 5931, Stop: 6644, Start Num: 3

Candidate Starts for Winget\_15:

(Start: 3 @5931 has 19 MA's), (Start: 8 @5988 has 11 MA's), (11, 6093), (12, 6111), (16, 6153), (17, 6162), (22, 6225), (23, 6237), (26, 6291), (28, 6309), (29, 6348), (31, 6393), (32, 6441), (40, 6507), (42,

6522), (45, 6576), (48, 6612),

Gene: Wintermute\_69 Start: 42831, Stop: 43499, Start Num: 5

Candidate Starts for Wintermute\_69:

(Start: 5 @42831 has 21 MA's), (15, 42993), (16, 42999), (18, 43011), (19, 43038), (23, 43083), (28, 43155), (32, 43284), (33, 43317), (39, 43350), (41, 43371), (45, 43437), (50, 43479),

Gene: Wogge42\_15 Start: 6078, Stop: 6734, Start Num: 8

Candidate Starts for Wogge42\_15:

(Start: 3 @6021 has 19 MA's), (Start: 8 @6078 has 11 MA's), (11, 6183), (12, 6201), (16, 6243), (17, 6252), (22, 6315), (23, 6327), (26, 6381), (28, 6399), (29, 6438), (31, 6483), (32, 6531), (40, 6597), (42, 6612), (45, 6666), (48, 6702),

Gene: Y10\_66 Start: 42759, Stop: 43424, Start Num: 5

Candidate Starts for Y10\_66:

(Start: 5 @42759 has 21 MA's), (15, 42921), (16, 42927), (18, 42939), (19, 42966), (23, 43011), (28, 43083), (32, 43212), (33, 43245), (37, 43272), (45, 43362), (50, 43404),

Gene: Y2\_66 Start: 42759, Stop: 43424, Start Num: 5

Candidate Starts for Y2\_66:

(Start: 5 @42759 has 21 MA's), (15, 42921), (16, 42927), (18, 42939), (19, 42966), (23, 43011), (28, 43083), (32, 43212), (33, 43245), (37, 43272), (45, 43362), (50, 43404),

Gene: YasnayaPolyana\_68 Start: 42684, Stop: 43325, Start Num: 5

Candidate Starts for YasnayaPolyana\_68:

(Start: 5 @42684 has 21 MA's), (15, 42846), (16, 42852), (18, 42864), (19, 42891), (23, 42936), (28, 43008), (32, 43137), (33, 43170), (37, 43197), (45, 43263), (50, 43305),

Gene: YoyoKar\_15 Start: 5735, Stop: 6373, Start Num: 8

Candidate Starts for YoyoKar\_15:

(Start: 3 @5678 has 19 MA's), (Start: 8 @5735 has 11 MA's), (11, 5840), (12, 5858), (16, 5900), (17, 5909), (22, 5972), (23, 5984), (26, 6038), (28, 6056), (29, 6095), (31, 6140), (40, 6236), (42, 6251), (45, 6305), (48, 6341),

Gene: YungJamal\_16 Start: 6232, Stop: 6954, Start Num: 3

Candidate Starts for YungJamal\_16:

(Start: 3 @6232 has 19 MA's), (Start: 8 @6289 has 11 MA's), (11, 6394), (12, 6412), (16, 6454), (17, 6463), (22, 6526), (23, 6538), (26, 6592), (28, 6610), (29, 6649), (31, 6694), (32, 6742), (40, 6817), (42, 6832), (45, 6886), (48, 6922),

Gene: Zakhe101\_16 Start: 6244, Stop: 6966, Start Num: 3

Candidate Starts for Zakhe101\_16:

(Start: 3 @6244 has 19 MA's), (Start: 8 @6301 has 11 MA's), (11, 6406), (12, 6424), (16, 6466), (17, 6475), (22, 6538), (23, 6550), (26, 6604), (28, 6622), (29, 6661), (31, 6706), (32, 6754), (40, 6829), (42, 6844), (45, 6898), (48, 6934),

Gene: Zebo\_14 Start: 5677, Stop: 6372, Start Num: 3

Candidate Starts for Zebo\_14:

(Start: 3 @5677 has 19 MA's), (Start: 8 @5734 has 11 MA's), (11, 5839), (12, 5857), (16, 5899), (17, 5908), (22, 5971), (23, 5983), (26, 6037), (28, 6055), (29, 6094), (31, 6139), (40, 6235), (42, 6250), (45, 6304), (48, 6340),