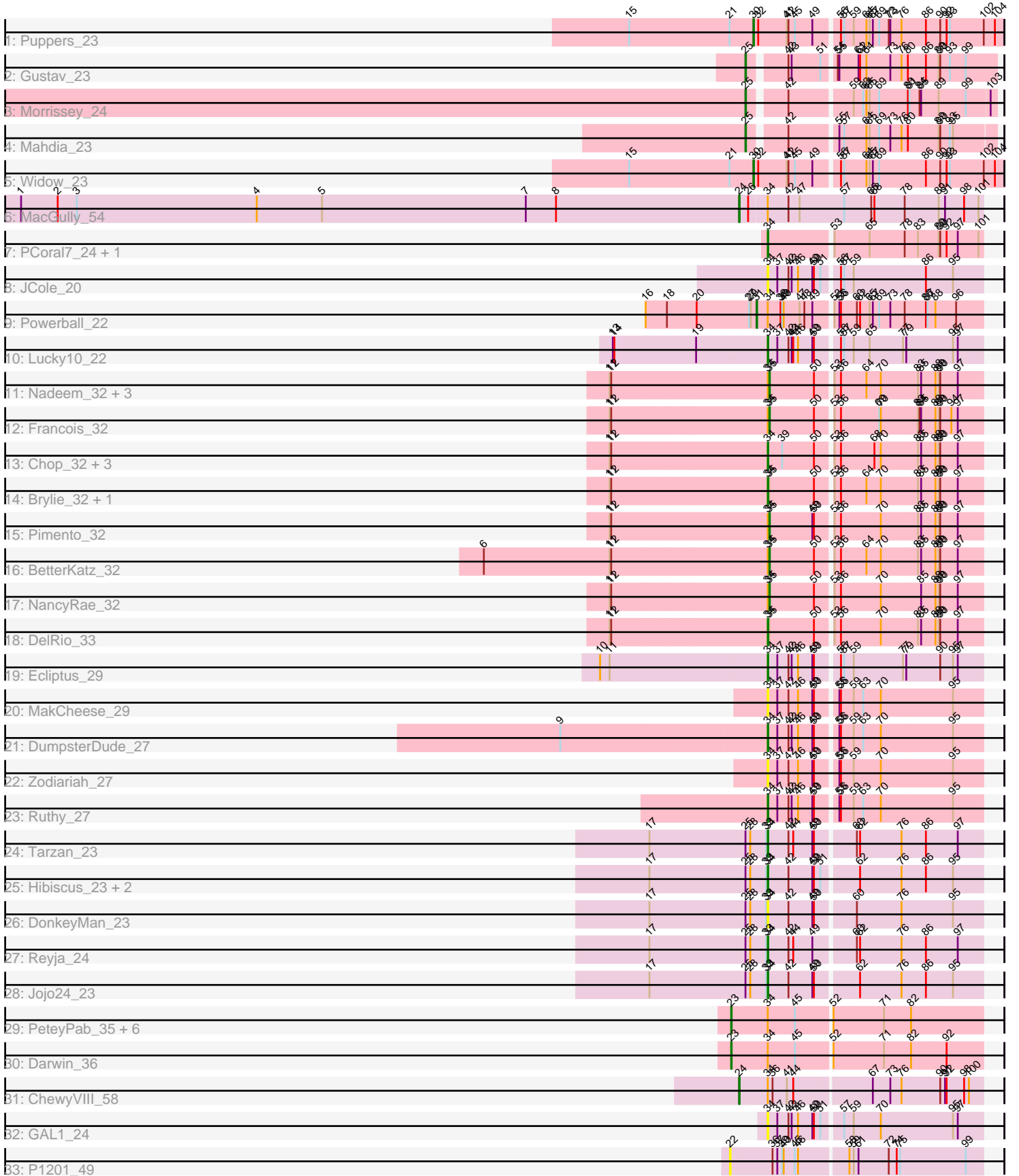


Pham 224666



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 224666 Report

This analysis was run 03/28/25 on database version 593.

Pham number 224666 has 49 members, 7 are drafts.

Phages represented in each track:

- Track 1 : Puppies\_23
- Track 2 : Gustav\_23
- Track 3 : Morrissey\_24
- Track 4 : Mahdia\_23
- Track 5 : Widow\_23
- Track 6 : MacGully\_54
- Track 7 : PCoral7\_24, Toast\_24
- Track 8 : JCole\_20
- Track 9 : Powerball\_22
- Track 10 : Lucky10\_22
- Track 11 : Nadeem\_32, WheatThin\_32, Parada\_32, Mulch\_32
- Track 12 : Francois\_32
- Track 13 : Chop\_32, Hamood\_32, Ayotoya\_32, GrandSlam\_32
- Track 14 : Brylie\_32, Bock\_32
- Track 15 : Pimento\_32
- Track 16 : BetterKatz\_32
- Track 17 : NancyRae\_32
- Track 18 : DelRio\_33
- Track 19 : Ecliptus\_29
- Track 20 : MakCheese\_29
- Track 21 : DumpsterDude\_27
- Track 22 : Zodiariah\_27
- Track 23 : Ruthy\_27
- Track 24 : Tarzan\_23
- Track 25 : Hibiscus\_23, Heinz\_24, Santhid\_23
- Track 26 : DonkeyMan\_23
- Track 27 : Reyja\_24
- Track 28 : Jojo24\_23
- Track 29 : PeteyPab\_35, C3PO\_33, Stickynote\_35, PotatoChip\_36, Zion\_36, Kimchi1738\_33, Cruella\_33
- Track 30 : Darwin\_36
- Track 31 : ChewyVIII\_58
- Track 32 : GAL1\_24
- Track 33 : P1201\_49

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

The start number called the most often in the published annotations is 34, it was called in 18 of the 42 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Ayotoya\_32, Bock\_32, Brylie\_32, Chop\_32, DelRio\_33, DonkeyMan\_23, DumpsterDude\_27, Ecliptus\_29, GAL1\_24, GrandSlam\_32, Hamood\_32, Heinz\_24, Hibiscus\_23, JCole\_20, Jojo24\_23, Lucky10\_22, MakCheese\_29, PCoral7\_24, Reyja\_24, Ruthy\_27, Santhid\_23, Tarzan\_23, Toast\_24, Zodiariah\_27,

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

- BetterKatz\_32, C3PO\_33, ChewyVIII\_58, Cruella\_33, Darwin\_36, Francois\_32, Kimchi1738\_33, MacGully\_54, Mulch\_32, Nadeem\_32, NancyRae\_32, Parada\_32, PeteyPab\_35, Pimento\_32, PotatoChip\_36, Powerball\_22, Stickynote\_35, WheatThin\_32, Zion\_36,

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

- Gustav\_23, Mahdia\_23, Morrissey\_24, P1201\_49, Puppies\_23, Widow\_23,

### **Summary by start number:**

Start 22:

- Found in 1 of 49 ( 2.0% ) of genes in pham
- No Manual Annotations of this start.
- Called 100.0% of time when present
- Phage (with cluster) where this start called: P1201\_49 (singleton),

Start 23:

- Found in 8 of 49 ( 16.3% ) of genes in pham
- Manual Annotations of this start: 8 of 42
- Called 100.0% of time when present
- Phage (with cluster) where this start called: C3PO\_33 (EN), Cruella\_33 (EN), Darwin\_36 (EN), Kimchi1738\_33 (EN), PeteyPab\_35 (EN), PotatoChip\_36 (EN), Stickynote\_35 (EN), Zion\_36 (EN),

Start 24:

- Found in 2 of 49 ( 4.1% ) of genes in pham
- Manual Annotations of this start: 2 of 42
- Called 100.0% of time when present
- Phage (with cluster) where this start called: ChewyVIII\_58 (singleton), MacGully\_54 (CR),

Start 25:

- Found in 10 of 49 ( 20.4% ) of genes in pham
- Manual Annotations of this start: 3 of 42
- Called 30.0% of time when present
- Phage (with cluster) where this start called: Gustav\_23 (CD), Mahdia\_23 (CD), Morrissey\_24 (CD),

Start 30:

- Found in 2 of 49 ( 4.1% ) of genes in pham

- Manual Annotations of this start: 2 of 42
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Puppies\_23 (CD), Widow\_23 (CD),

Start 31:

- Found in 1 of 49 ( 2.0% ) of genes in pham
- Manual Annotations of this start: 1 of 42
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Powerball\_22 (CZ4),

Start 34:

- Found in 43 of 49 ( 87.8% ) of genes in pham
- Manual Annotations of this start: 18 of 42
- Called 55.8% of time when present
- Phage (with cluster) where this start called: Ayotoya\_32 (DI), Bock\_32 (DI), Brylie\_32 (DI), Chop\_32 (DI), DelRio\_33 (DI), DonkeyMan\_23 (DY), DumpsterDude\_27 (DW), Ecliptus\_29 (DN), GAL1\_24 (singleton), GrandSlam\_32 (DI), Hamood\_32 (DI), Heinz\_24 (DY), Hibiscus\_23 (DY), JCole\_20 (CZ2), Jojo24\_23 (DY), Lucky10\_22 (DH), MakCheese\_29 (DW), PCoral7\_24 (CV), Reyja\_24 (DY), Ruthy\_27 (DW), Santhid\_23 (DY), Tarzan\_23 (DY), Toast\_24 (CV), Zodiariah\_27 (DW),

Start 35:

- Found in 11 of 49 ( 22.4% ) of genes in pham
- Manual Annotations of this start: 8 of 42
- Called 72.7% of time when present
- Phage (with cluster) where this start called: BetterKatz\_32 (DI), Francois\_32 (DI), Mulch\_32 (DI), Nadeem\_32 (DI), NancyRae\_32 (DI), Parada\_32 (DI), Pimento\_32 (DI), WheatThin\_32 (DI),

### Summary by clusters:

There are 12 clusters represented in this pham: DN, singleton, EN, DH, DI, CZ2, CZ4, CD, DW, DY, CR, CV,

Info for manual annotations of cluster CD:

- Start number 25 was manually annotated 3 times for cluster CD.
- Start number 30 was manually annotated 2 times for cluster CD.

Info for manual annotations of cluster CR:

- Start number 24 was manually annotated 1 time for cluster CR.

Info for manual annotations of cluster CV:

- Start number 34 was manually annotated 2 times for cluster CV.

Info for manual annotations of cluster CZ4:

- Start number 31 was manually annotated 1 time for cluster CZ4.

Info for manual annotations of cluster DH:

- Start number 34 was manually annotated 1 time for cluster DH.

Info for manual annotations of cluster DI:

- Start number 34 was manually annotated 7 times for cluster DI.
- Start number 35 was manually annotated 8 times for cluster DI.

Info for manual annotations of cluster DN:

- Start number 34 was manually annotated 1 time for cluster DN.

Info for manual annotations of cluster DW:

- Start number 34 was manually annotated 2 times for cluster DW.

Info for manual annotations of cluster DY:

- Start number 34 was manually annotated 5 times for cluster DY.

Info for manual annotations of cluster EN:

- Start number 23 was manually annotated 8 times for cluster EN.

### **Gene Information:**

Gene: Ayotoya\_32 Start: 27588, Stop: 27977, Start Num: 34

Candidate Starts for Ayotoya\_32:

(11, 27300), (12, 27303), (Start: 34 @27588 has 18 MA's), (39, 27615), (50, 27672), (53, 27699), (56, 27711), (68, 27774), (70, 27786), (83, 27855), (85, 27861), (88, 27888), (89, 27894), (90, 27897), (97, 27930),

Gene: BetterKatz\_32 Start: 27064, Stop: 27450, Start Num: 35

Candidate Starts for BetterKatz\_32:

(6, 26536), (11, 26773), (12, 26776), (Start: 34 @27061 has 18 MA's), (Start: 35 @27064 has 8 MA's), (50, 27145), (53, 27172), (56, 27184), (64, 27232), (70, 27259), (83, 27328), (85, 27334), (88, 27361), (89, 27367), (90, 27370), (97, 27403),

Gene: Bock\_32 Start: 26811, Stop: 27200, Start Num: 34

Candidate Starts for Bock\_32:

(11, 26523), (12, 26526), (Start: 34 @26811 has 18 MA's), (Start: 35 @26814 has 8 MA's), (50, 26895), (53, 26922), (56, 26934), (64, 26982), (70, 27009), (83, 27078), (85, 27084), (88, 27111), (89, 27117), (90, 27120), (97, 27153),

Gene: Brylie\_32 Start: 26799, Stop: 27188, Start Num: 34

Candidate Starts for Brylie\_32:

(11, 26511), (12, 26514), (Start: 34 @26799 has 18 MA's), (Start: 35 @26802 has 8 MA's), (50, 26883), (53, 26910), (56, 26922), (64, 26970), (70, 26997), (83, 27066), (85, 27072), (88, 27099), (89, 27105), (90, 27108), (97, 27141),

Gene: C3PO\_33 Start: 30588, Stop: 31046, Start Num: 23

Candidate Starts for C3PO\_33:

(Start: 23 @30588 has 8 MA's), (Start: 34 @30657 has 18 MA's), (45, 30708), (52, 30768), (71, 30861), (82, 30912),

Gene: ChewyVIII\_58 Start: 40904, Stop: 41350, Start Num: 24

Candidate Starts for ChewyVIII\_58:

(Start: 24 @40904 has 2 MA's), (Start: 34 @40958 has 18 MA's), (36, 40967), (41, 40994), (44, 41006), (67, 41144), (73, 41177), (76, 41198), (90, 41270), (91, 41279), (92, 41282), (98, 41315), (100, 41324),

Gene: Chop\_32 Start: 27336, Stop: 27725, Start Num: 34

Candidate Starts for Chop\_32:

(11, 27048), (12, 27051), (Start: 34 @27336 has 18 MA's), (39, 27363), (50, 27420), (53, 27447), (56, 27459), (68, 27522), (70, 27534), (83, 27603), (85, 27609), (88, 27636), (89, 27642), (90, 27645), (97, 27678),

Gene: Cruella\_33 Start: 30588, Stop: 31046, Start Num: 23

Candidate Starts for Cruella\_33:

(Start: 23 @30588 has 8 MA's), (Start: 34 @30657 has 18 MA's), (45, 30708), (52, 30768), (71, 30861), (82, 30912),

Gene: Darwin\_36 Start: 30273, Stop: 30731, Start Num: 23

Candidate Starts for Darwin\_36:

(Start: 23 @30273 has 8 MA's), (Start: 34 @30342 has 18 MA's), (45, 30393), (52, 30453), (71, 30546), (82, 30597), (92, 30663),

Gene: DelRio\_33 Start: 27807, Stop: 28196, Start Num: 34

Candidate Starts for DelRio\_33:

(11, 27519), (12, 27522), (Start: 34 @27807 has 18 MA's), (Start: 35 @27810 has 8 MA's), (50, 27891), (53, 27918), (56, 27930), (70, 28005), (83, 28074), (85, 28080), (88, 28107), (89, 28113), (90, 28116), (97, 28149),

Gene: DonkeyMan\_23 Start: 18871, Stop: 19260, Start Num: 34

Candidate Starts for DonkeyMan\_23:

(17, 18649), (Start: 25 @18829 has 3 MA's), (28, 18838), (33, 18868), (Start: 34 @18871 has 18 MA's), (42, 18910), (49, 18952), (50, 18955), (60, 19024), (76, 19108), (95, 19204),

Gene: DumpsterDude\_27 Start: 25118, Stop: 25507, Start Num: 34

Candidate Starts for DumpsterDude\_27:

(9, 24746), (Start: 34 @25118 has 18 MA's), (37, 25136), (42, 25157), (43, 25163), (46, 25175), (49, 25199), (50, 25202), (55, 25238), (56, 25241), (59, 25265), (63, 25283), (70, 25316), (95, 25451),

Gene: Ecliptus\_29 Start: 22305, Stop: 22694, Start Num: 34

Candidate Starts for Ecliptus\_29:

(10, 21999), (11, 22017), (Start: 34 @22305 has 18 MA's), (37, 22323), (42, 22344), (43, 22350), (46, 22362), (49, 22386), (50, 22389), (56, 22428), (57, 22434), (59, 22452), (77, 22545), (79, 22551), (90, 22614), (95, 22638), (97, 22647),

Gene: Francois\_32 Start: 26828, Stop: 27214, Start Num: 35

Candidate Starts for Francois\_32:

(11, 26537), (12, 26540), (Start: 34 @26825 has 18 MA's), (Start: 35 @26828 has 8 MA's), (50, 26909), (53, 26936), (56, 26948), (69, 27020), (70, 27023), (83, 27092), (84, 27095), (85, 27098), (88, 27125), (89, 27131), (90, 27134), (94, 27155), (97, 27167),

Gene: GAL1\_24 Start: 20564, Stop: 20953, Start Num: 34

Candidate Starts for GAL1\_24:

(Start: 34 @20564 has 18 MA's), (37, 20582), (42, 20603), (43, 20609), (46, 20621), (49, 20645), (50, 20648), (51, 20660), (57, 20693), (59, 20711), (70, 20762), (95, 20897), (97, 20906),

Gene: GrandSlam\_32 Start: 27336, Stop: 27725, Start Num: 34

Candidate Starts for GrandSlam\_32:

(11, 27048), (12, 27051), (Start: 34 @27336 has 18 MA's), (39, 27363), (50, 27420), (53, 27447), (56, 27459), (68, 27522), (70, 27534), (83, 27603), (85, 27609), (88, 27636), (89, 27642), (90, 27645), (97,

27678),

Gene: Gustav\_23 Start: 19270, Stop: 19707, Start Num: 25

Candidate Starts for Gustav\_23:

(Start: 25 @19270 has 3 MA's), (42, 19333), (43, 19339), (51, 19390), (54, 19411), (55, 19414), (61, 19450), (62, 19453), (64, 19465), (73, 19510), (76, 19531), (80, 19543), (86, 19576), (89, 19600), (90, 19603), (93, 19621), (99, 19651),

Gene: Hamood\_32 Start: 27336, Stop: 27725, Start Num: 34

Candidate Starts for Hamood\_32:

(11, 27048), (12, 27051), (Start: 34 @27336 has 18 MA's), (39, 27363), (50, 27420), (53, 27447), (56, 27459), (68, 27522), (70, 27534), (83, 27603), (85, 27609), (88, 27636), (89, 27642), (90, 27645), (97, 27678),

Gene: Heinz\_24 Start: 18963, Stop: 19352, Start Num: 34

Candidate Starts for Heinz\_24:

(17, 18741), (Start: 25 @18921 has 3 MA's), (28, 18930), (33, 18960), (Start: 34 @18963 has 18 MA's), (42, 19002), (49, 19044), (50, 19047), (51, 19059), (62, 19122), (76, 19200), (86, 19245), (95, 19296),

Gene: Hibiscus\_23 Start: 18911, Stop: 19300, Start Num: 34

Candidate Starts for Hibiscus\_23:

(17, 18689), (Start: 25 @18869 has 3 MA's), (28, 18878), (33, 18908), (Start: 34 @18911 has 18 MA's), (42, 18950), (49, 18992), (50, 18995), (51, 19007), (62, 19070), (76, 19148), (86, 19193), (95, 19244),

Gene: JCole\_20 Start: 17888, Stop: 18277, Start Num: 34

Candidate Starts for JCole\_20:

(Start: 34 @17888 has 18 MA's), (37, 17906), (42, 17927), (43, 17933), (46, 17945), (49, 17969), (50, 17972), (51, 17984), (56, 18011), (57, 18017), (59, 18035), (86, 18170), (95, 18221),

Gene: Jojo24\_23 Start: 18908, Stop: 19297, Start Num: 34

Candidate Starts for Jojo24\_23:

(17, 18686), (Start: 25 @18866 has 3 MA's), (28, 18875), (33, 18905), (Start: 34 @18908 has 18 MA's), (42, 18947), (49, 18989), (50, 18992), (62, 19067), (76, 19145), (86, 19190), (95, 19241),

Gene: Kimchi1738\_33 Start: 29676, Stop: 30134, Start Num: 23

Candidate Starts for Kimchi1738\_33:

(Start: 23 @29676 has 8 MA's), (Start: 34 @29745 has 18 MA's), (45, 29796), (52, 29856), (71, 29949), (82, 30000),

Gene: Lucky10\_22 Start: 18828, Stop: 19217, Start Num: 34

Candidate Starts for Lucky10\_22:

(13, 18546), (14, 18549), (19, 18699), (Start: 34 @18828 has 18 MA's), (37, 18846), (42, 18867), (43, 18873), (44, 18876), (46, 18885), (49, 18909), (50, 18912), (56, 18951), (57, 18957), (59, 18975), (65, 19005), (77, 19068), (79, 19074), (95, 19161), (97, 19170),

Gene: MacGully\_54 Start: 36610, Stop: 37059, Start Num: 24

Candidate Starts for MacGully\_54:

(1, 35257), (2, 35326), (3, 35362), (4, 35701), (5, 35824), (7, 36208), (8, 36265), (Start: 24 @36610 has 2 MA's), (26, 36625), (Start: 34 @36658 has 18 MA's), (42, 36697), (47, 36718), (57, 36799), (66, 36850), (68, 36856), (78, 36913), (89, 36976), (91, 36988), (98, 37024), (101, 37051),

Gene: Mahdia\_23 Start: 18947, Stop: 19378, Start Num: 25

Candidate Starts for Mahdia\_23:

(Start: 25 @18947 has 3 MA's), (42, 19010), (55, 19091), (57, 19100), (64, 19142), (65, 19148), (69, 19166), (73, 19187), (76, 19208), (80, 19220), (89, 19277), (90, 19280), (93, 19298), (95, 19304),

Gene: MakCheese\_29 Start: 25049, Stop: 25438, Start Num: 34

Candidate Starts for MakCheese\_29:

(Start: 34 @25049 has 18 MA's), (37, 25067), (42, 25088), (46, 25106), (49, 25130), (50, 25133), (55, 25169), (56, 25172), (59, 25196), (63, 25214), (70, 25247), (95, 25382),

Gene: Morrissey\_24 Start: 20150, Stop: 20584, Start Num: 25

Candidate Starts for Morrissey\_24:

(Start: 25 @20150 has 3 MA's), (42, 20213), (59, 20321), (63, 20339), (64, 20345), (65, 20351), (69, 20369), (80, 20423), (81, 20426), (84, 20444), (85, 20447), (89, 20480), (99, 20531), (103, 20573),

Gene: Mulch\_32 Start: 26802, Stop: 27188, Start Num: 35

Candidate Starts for Mulch\_32:

(11, 26511), (12, 26514), (Start: 34 @26799 has 18 MA's), (Start: 35 @26802 has 8 MA's), (50, 26883), (53, 26910), (56, 26922), (64, 26970), (70, 26997), (83, 27066), (85, 27072), (88, 27099), (89, 27105), (90, 27108), (97, 27141),

Gene: Nadeem\_32 Start: 26802, Stop: 27188, Start Num: 35

Candidate Starts for Nadeem\_32:

(11, 26511), (12, 26514), (Start: 34 @26799 has 18 MA's), (Start: 35 @26802 has 8 MA's), (50, 26883), (53, 26910), (56, 26922), (64, 26970), (70, 26997), (83, 27066), (85, 27072), (88, 27099), (89, 27105), (90, 27108), (97, 27141),

Gene: NancyRae\_32 Start: 26811, Stop: 27197, Start Num: 35

Candidate Starts for NancyRae\_32:

(11, 26520), (12, 26523), (Start: 34 @26808 has 18 MA's), (Start: 35 @26811 has 8 MA's), (50, 26892), (53, 26919), (56, 26931), (70, 27006), (85, 27081), (88, 27108), (89, 27114), (90, 27117), (97, 27150),

Gene: P1201\_49 Start: 36622, Stop: 37077, Start Num: 22

Candidate Starts for P1201\_49:

(22, 36622), (36, 36697), (37, 36706), (39, 36715), (40, 36718), (45, 36739), (46, 36745), (58, 36829), (59, 36835), (61, 36844), (72, 36901), (74, 36916), (75, 36922), (99, 37045),

Gene: PCoral7\_24 Start: 20696, Stop: 21085, Start Num: 34

Candidate Starts for PCoral7\_24:

(Start: 34 @20696 has 18 MA's), (53, 20807), (65, 20873), (78, 20939), (83, 20963), (89, 21002), (90, 21005), (92, 21017), (97, 21038), (101, 21077),

Gene: Parada\_32 Start: 26802, Stop: 27188, Start Num: 35

Candidate Starts for Parada\_32:

(11, 26511), (12, 26514), (Start: 34 @26799 has 18 MA's), (Start: 35 @26802 has 8 MA's), (50, 26883), (53, 26910), (56, 26922), (64, 26970), (70, 26997), (83, 27066), (85, 27072), (88, 27099), (89, 27105), (90, 27108), (97, 27141),

Gene: PeteyPab\_35 Start: 31433, Stop: 31891, Start Num: 23

Candidate Starts for PeteyPab\_35:

(Start: 23 @31433 has 8 MA's), (Start: 34 @31502 has 18 MA's), (45, 31553), (52, 31613), (71, 31706), (82, 31757),

Gene: Pimento\_32 Start: 26280, Stop: 26666, Start Num: 35

Candidate Starts for Pimento\_32:



(11, 25989), (12, 25992), (Start: 34 @26277 has 18 MA's), (Start: 35 @26280 has 8 MA's), (49, 26358), (50, 26361), (53, 26388), (56, 26400), (70, 26475), (83, 26544), (85, 26550), (88, 26577), (89, 26583), (90, 26586), (97, 26619),

Gene: PotatoChip\_36 Start: 31435, Stop: 31893, Start Num: 23

Candidate Starts for PotatoChip\_36:

(Start: 23 @31435 has 8 MA's), (Start: 34 @31504 has 18 MA's), (45, 31555), (52, 31615), (71, 31708), (82, 31759),

Gene: Powerball\_22 Start: 19728, Stop: 20138, Start Num: 31

Candidate Starts for Powerball\_22:

(16, 19533), (18, 19572), (20, 19623), (27, 19716), (29, 19719), (Start: 31 @19728 has 1 MA's), (Start: 34 @19746 has 18 MA's), (38, 19770), (39, 19773), (40, 19776), (47, 19806), (48, 19815), (49, 19830), (53, 19860), (55, 19869), (56, 19872), (60, 19902), (62, 19908), (65, 19926), (67, 19932), (69, 19944), (73, 19965), (78, 19992), (86, 20031), (87, 20034), (88, 20049), (96, 20088),

Gene: Puppies\_23 Start: 18920, Stop: 19375, Start Num: 30

Candidate Starts for Puppies\_23:

(15, 18686), (21, 18875), (Start: 30 @18920 has 2 MA's), (32, 18929), (41, 18983), (42, 18986), (45, 18998), (49, 19028), (56, 19070), (57, 19076), (59, 19094), (64, 19118), (65, 19124), (67, 19130), (69, 19142), (72, 19160), (73, 19163), (76, 19184), (86, 19229), (90, 19256), (92, 19268), (93, 19274), (102, 19337), (104, 19358),

Gene: Reyja\_24 Start: 19082, Stop: 19471, Start Num: 34

Candidate Starts for Reyja\_24:

(17, 18860), (Start: 25 @19040 has 3 MA's), (28, 19049), (33, 19079), (Start: 34 @19082 has 18 MA's), (42, 19121), (44, 19130), (49, 19163), (60, 19235), (62, 19241), (76, 19319), (86, 19364), (97, 19424),

Gene: Ruthy\_27 Start: 23727, Stop: 24116, Start Num: 34

Candidate Starts for Ruthy\_27:

(Start: 34 @23727 has 18 MA's), (37, 23745), (42, 23766), (43, 23772), (46, 23784), (49, 23808), (50, 23811), (55, 23847), (56, 23850), (59, 23874), (63, 23892), (70, 23925), (95, 24060),

Gene: Santhid\_23 Start: 18916, Stop: 19305, Start Num: 34

Candidate Starts for Santhid\_23:

(17, 18694), (Start: 25 @18874 has 3 MA's), (28, 18883), (33, 18913), (Start: 34 @18916 has 18 MA's), (42, 18955), (49, 18997), (50, 19000), (51, 19012), (62, 19075), (76, 19153), (86, 19198), (95, 19249),

Gene: Stickynote\_35 Start: 30855, Stop: 31313, Start Num: 23

Candidate Starts for Stickynote\_35:

(Start: 23 @30855 has 8 MA's), (Start: 34 @30924 has 18 MA's), (45, 30975), (52, 31035), (71, 31128), (82, 31179),

Gene: Tarzan\_23 Start: 18885, Stop: 19274, Start Num: 34

Candidate Starts for Tarzan\_23:

(17, 18663), (Start: 25 @18843 has 3 MA's), (28, 18852), (33, 18882), (Start: 34 @18885 has 18 MA's), (42, 18924), (44, 18933), (49, 18966), (50, 18969), (60, 19038), (62, 19044), (76, 19122), (86, 19167), (97, 19227),

Gene: Toast\_24 Start: 20696, Stop: 21085, Start Num: 34

Candidate Starts for Toast\_24:

(Start: 34 @20696 has 18 MA's), (53, 20807), (65, 20873), (78, 20939), (83, 20963), (89, 21002), (90, 21005), (92, 21017), (97, 21038), (101, 21077),

Gene: WheatThin\_32 Start: 26802, Stop: 27188, Start Num: 35

Candidate Starts for WheatThin\_32:

(11, 26511), (12, 26514), (Start: 34 @26799 has 18 MA's), (Start: 35 @26802 has 8 MA's), (50, 26883), (53, 26910), (56, 26922), (64, 26970), (70, 26997), (83, 27066), (85, 27072), (88, 27099), (89, 27105), (90, 27108), (97, 27141),

Gene: Widow\_23 Start: 18911, Stop: 19366, Start Num: 30

Candidate Starts for Widow\_23:

(15, 18677), (21, 18866), (Start: 30 @18911 has 2 MA's), (32, 18920), (41, 18974), (42, 18977), (45, 18989), (49, 19019), (56, 19061), (57, 19067), (64, 19109), (65, 19115), (67, 19121), (69, 19133), (86, 19220), (90, 19247), (92, 19259), (93, 19265), (102, 19328), (104, 19349),

Gene: Zion\_36 Start: 31433, Stop: 31891, Start Num: 23

Candidate Starts for Zion\_36:

(Start: 23 @31433 has 8 MA's), (Start: 34 @31502 has 18 MA's), (45, 31553), (52, 31613), (71, 31706), (82, 31757),

Gene: Zodiariah\_27 Start: 25345, Stop: 25734, Start Num: 34

Candidate Starts for Zodiariah\_27:

(Start: 34 @25345 has 18 MA's), (37, 25363), (42, 25384), (46, 25402), (49, 25426), (50, 25429), (55, 25465), (56, 25468), (59, 25492), (70, 25543), (95, 25678),