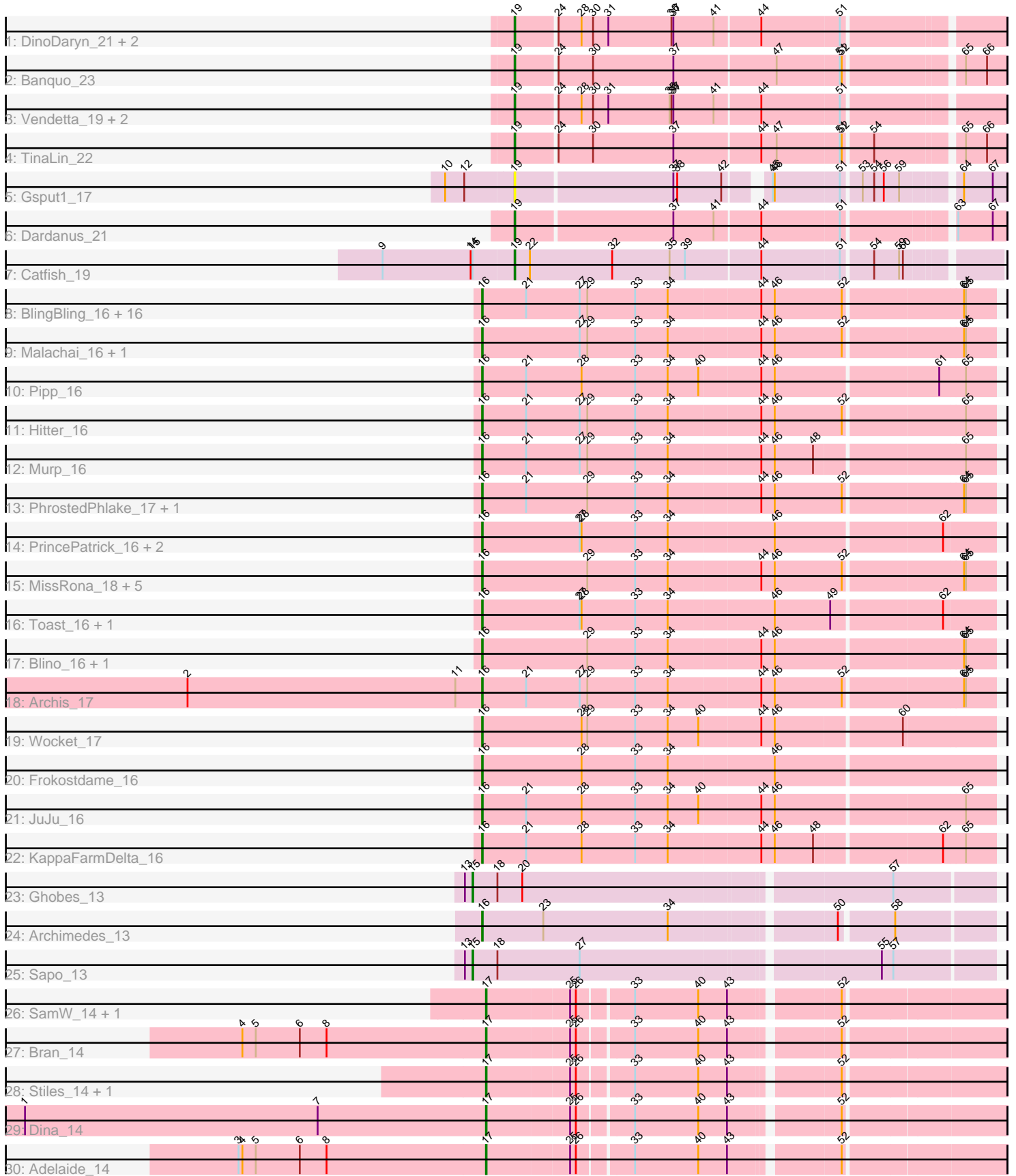


# Pham 169978



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 169978 Report

This analysis was run 07/09/24 on database version 566.

Pham number 169978 has 63 members, 1 are drafts.

Phages represented in each track:

- Track 1 : DinoDaryn\_21, Huffy\_21, TZGordon\_21
- Track 2 : Banquo\_23
- Track 3 : Vendetta\_19, Goib\_20, Splinter\_19
- Track 4 : TinaLin\_22
- Track 5 : Gspu1\_17
- Track 6 : Dardanus\_21
- Track 7 : Catfish\_19
- Track 8 : BlingBling\_16, Utz\_16, Barco\_16, MintFen\_16, Jalammah\_17, CaptainKirk2\_16, Guacamole\_16, Obliviate\_15, Zarbodnamra\_16, JasperJr\_16, Mellie\_15, UmaThurman\_16, Fenry\_15, Delian\_16, Samba\_16, Melba\_16, ZiggyZoo\_15
- Track 9 : Malachai\_16, Begonia\_16
- Track 10 : Pipp\_16
- Track 11 : Hitter\_16
- Track 12 : Murp\_16
- Track 13 : PhrostedPhlake\_17, Lysidious\_16
- Track 14 : PrincePatrick\_16, William\_16, Fairfaxidum\_16
- Track 15 : MissRona\_18, Walrus\_17, Gambino\_18, Petra\_18, Blueberry\_18, Azula\_18
- Track 16 : Toast\_16, PCoral7\_16
- Track 17 : Blino\_16, CarolAnn\_16
- Track 18 : Archis\_17
- Track 19 : Wocket\_17
- Track 20 : Frokostdame\_16
- Track 21 : JuJu\_16
- Track 22 : KappaFarmDelta\_16
- Track 23 : Ghobes\_13
- Track 24 : Archimedes\_13
- Track 25 : Sapo\_13
- Track 26 : SamW\_14, Troy\_14
- Track 27 : Bran\_14
- Track 28 : Stiles\_14, StAB\_14
- Track 29 : Dina\_14
- Track 30 : Adelaide\_14

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

The start number called the most often in the published annotations is 16, it was called in 43 of the 62 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Archimedes\_13, Archis\_17, Azula\_18, Barco\_16, Begonia\_16, BlingBling\_16, Blino\_16, Blueberry\_18, CaptainKirk2\_16, CarolAnn\_16, Delian\_16, Fairfaxidum\_16, Fenry\_15, Frokostdame\_16, Gambino\_18, Guacamole\_16, Hitter\_16, Jalammah\_17, JasperJr\_16, JuJu\_16, KappaFarmDelta\_16, Lysidious\_16, Malachai\_16, Melba\_16, Mellie\_15, MintFen\_16, MissRona\_18, Murp\_16, Obliviate\_15, PCoral7\_16, Petra\_18, PhrostedPhlake\_17, Pipp\_16, PrincePatrick\_16, Samba\_16, Toast\_16, UmaThurman\_16, Utz\_16, Walrus\_17, William\_16, Wocket\_17, Zarbodnamra\_16, ZiggyZoo\_15,

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

- 

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

- Adelaide\_14, Banquo\_23, Bran\_14, Catfish\_19, Dardanus\_21, Dina\_14, DinoDaryn\_21, Ghobes\_13, Goib\_20, Gspu1\_17, Huffy\_21, SamW\_14, Sapo\_13, Splinter\_19, StAB\_14, Stiles\_14, TZGordon\_21, TinaLin\_22, Troy\_14, Vendetta\_19,

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

Start 15:

- Found in 3 of 63 ( 4.8% ) of genes in pham
- Manual Annotations of this start: 2 of 62
- Called 66.7% of time when present
- Phage (with cluster) where this start called: Ghobes\_13 (DA), Sapo\_13 (DA),

Start 16:

- Found in 43 of 63 ( 68.3% ) of genes in pham
- Manual Annotations of this start: 43 of 62
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Archimedes\_13 (DA), Archis\_17 (CV), Azula\_18 (CV), Barco\_16 (CV), Begonia\_16 (CV), BlingBling\_16 (CV), Blino\_16 (CV), Blueberry\_18 (CV), CaptainKirk2\_16 (CV), CarolAnn\_16 (CV), Delian\_16 (CV), Fairfaxidum\_16 (CV), Fenry\_15 (CV), Frokostdame\_16 (CV), Gambino\_18 (CV), Guacamole\_16 (CV), Hitter\_16 (CV), Jalammah\_17 (CV), JasperJr\_16 (CV), JuJu\_16 (CV), KappaFarmDelta\_16 (CV), Lysidious\_16 (CV), Malachai\_16 (CV), Melba\_16 (CV), Mellie\_15 (CV), MintFen\_16 (CV), MissRona\_18 (CV), Murp\_16 (CV), Obliviate\_15 (CV), PCoral7\_16 (CV), Petra\_18 (CV), PhrostedPhlake\_17 (CV), Pipp\_16 (CV), PrincePatrick\_16 (CV), Samba\_16 (CV), Toast\_16 (CV), UmaThurman\_16 (CV), Utz\_16 (CV), Walrus\_17 (CV), William\_16 (CV), Wocket\_17 (CV), Zarbodnamra\_16 (CV), ZiggyZoo\_15 (CV),

Start 17:

- Found in 7 of 63 ( 11.1% ) of genes in pham
- Manual Annotations of this start: 7 of 62
- Called 100.0% of time when present

- Phage (with cluster) where this start called: Adelaide\_14 (EP), Bran\_14 (EP), Dina\_14 (EP), SamW\_14 (EP), StAB\_14 (EP), Stiles\_14 (EP), Troy\_14 (EP),

Start 19:

- Found in 11 of 63 ( 17.5% ) of genes in pham
- Manual Annotations of this start: 10 of 62
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Banquo\_23 (CU1), Catfish\_19 (CU5), Dardanus\_21 (CU3), DinoDaryn\_21 (CU1), Goib\_20 (CU1), Gspu1\_17 (CU2), Huffy\_21 (CU1), Splinter\_19 (CU1), TZGordon\_21 (CU1), TinaLin\_22 (CU1), Vendetta\_19 (CU1),

### **Summary by clusters:**

There are 7 clusters represented in this pham: CU5, CU3, CU2, CU1, DA, CV, EP,

Info for manual annotations of cluster CU1:

- Start number 19 was manually annotated 8 times for cluster CU1.

Info for manual annotations of cluster CU3:

- Start number 19 was manually annotated 1 time for cluster CU3.

Info for manual annotations of cluster CU5:

- Start number 19 was manually annotated 1 time for cluster CU5.

Info for manual annotations of cluster CV:

- Start number 16 was manually annotated 42 times for cluster CV.

Info for manual annotations of cluster DA:

- Start number 15 was manually annotated 2 times for cluster DA.
- Start number 16 was manually annotated 1 time for cluster DA.

Info for manual annotations of cluster EP:

- Start number 17 was manually annotated 7 times for cluster EP.

### **Gene Information:**

Gene: Adelaide\_14 Start: 8955, Stop: 9703, Start Num: 17

Candidate Starts for Adelaide\_14:

(3, 8568), (4, 8574), (5, 8595), (6, 8664), (8, 8706), (Start: 17 @8955 has 7 MA's), (25, 9081), (26, 9090), (33, 9165), (40, 9264), (43, 9309), (52, 9462),

Gene: Archimedes\_13 Start: 8298, Stop: 9046, Start Num: 16

Candidate Starts for Archimedes\_13:

(Start: 16 @8298 has 43 MA's), (23, 8394), (34, 8589), (50, 8820), (58, 8898),

Gene: Archis\_17 Start: 9631, Stop: 10415, Start Num: 16

Candidate Starts for Archis\_17:

(2, 9169), (11, 9589), (Start: 16 @9631 has 43 MA's), (21, 9700), (27, 9784), (29, 9796), (33, 9871), (34, 9922), (44, 10063), (46, 10084), (52, 10189), (64, 10366), (65, 10369),

Gene: Azula\_18 Start: 9765, Stop: 10549, Start Num: 16

Candidate Starts for Azula\_18:

(Start: 16 @9765 has 43 MA's), (29, 9930), (33, 10005), (34, 10056), (44, 10197), (46, 10218), (52, 10323), (64, 10500), (65, 10503),

Gene: Banquo\_23 Start: 12518, Stop: 13239, Start Num: 19

Candidate Starts for Banquo\_23:

(Start: 19 @12518 has 10 MA's), (24, 12578), (30, 12632), (37, 12758), (47, 12914), (51, 13010), (52, 13013), (65, 13178), (66, 13211),

Gene: Barco\_16 Start: 9420, Stop: 10204, Start Num: 16

Candidate Starts for Barco\_16:

(Start: 16 @9420 has 43 MA's), (21, 9489), (27, 9573), (29, 9585), (33, 9660), (34, 9711), (44, 9852), (46, 9873), (52, 9978), (64, 10155), (65, 10158),

Gene: Begonia\_16 Start: 9425, Stop: 10209, Start Num: 16

Candidate Starts for Begonia\_16:

(Start: 16 @9425 has 43 MA's), (27, 9578), (29, 9590), (33, 9665), (34, 9716), (44, 9857), (46, 9878), (52, 9983), (64, 10160), (65, 10163),

Gene: BlingBling\_16 Start: 9420, Stop: 10204, Start Num: 16

Candidate Starts for BlingBling\_16:

(Start: 16 @9420 has 43 MA's), (21, 9489), (27, 9573), (29, 9585), (33, 9660), (34, 9711), (44, 9852), (46, 9873), (52, 9978), (64, 10155), (65, 10158),

Gene: Blino\_16 Start: 9319, Stop: 10103, Start Num: 16

Candidate Starts for Blino\_16:

(Start: 16 @9319 has 43 MA's), (29, 9484), (33, 9559), (34, 9610), (44, 9751), (46, 9772), (64, 10054), (65, 10057),

Gene: Blueberry\_18 Start: 9765, Stop: 10549, Start Num: 16

Candidate Starts for Blueberry\_18:

(Start: 16 @9765 has 43 MA's), (29, 9930), (33, 10005), (34, 10056), (44, 10197), (46, 10218), (52, 10323), (64, 10500), (65, 10503),

Gene: Bran\_14 Start: 8960, Stop: 9708, Start Num: 17

Candidate Starts for Bran\_14:

(4, 8579), (5, 8600), (6, 8669), (8, 8711), (Start: 17 @8960 has 7 MA's), (25, 9086), (26, 9095), (33, 9170), (40, 9269), (43, 9314), (52, 9467),

Gene: CaptainKirk2\_16 Start: 9423, Stop: 10207, Start Num: 16

Candidate Starts for CaptainKirk2\_16:

(Start: 16 @9423 has 43 MA's), (21, 9492), (27, 9576), (29, 9588), (33, 9663), (34, 9714), (44, 9855), (46, 9876), (52, 9981), (64, 10158), (65, 10161),

Gene: CarolAnn\_16 Start: 9318, Stop: 10102, Start Num: 16

Candidate Starts for CarolAnn\_16:

(Start: 16 @9318 has 43 MA's), (29, 9483), (33, 9558), (34, 9609), (44, 9750), (46, 9771), (64, 10053), (65, 10056),

Gene: Catfish\_19 Start: 12571, Stop: 13295, Start Num: 19

Candidate Starts for Catfish\_19:

(9, 12367), (14, 12505), (Start: 15 @12508 has 2 MA's), (Start: 19 @12571 has 10 MA's), (22, 12595), (32, 12724), (35, 12814), (39, 12838), (44, 12952), (51, 13072), (54, 13117), (59, 13156), (60, 13162),

Gene: Dardanus\_21 Start: 11510, Stop: 12228, Start Num: 19

Candidate Starts for Dardanus\_21:

(Start: 19 @11510 has 10 MA's), (37, 11750), (41, 11813), (44, 11882), (51, 12002), (63, 12155), (67, 12209),

Gene: Delian\_16 Start: 9423, Stop: 10207, Start Num: 16

Candidate Starts for Delian\_16:

(Start: 16 @9423 has 43 MA's), (21, 9492), (27, 9576), (29, 9588), (33, 9663), (34, 9714), (44, 9855), (46, 9876), (52, 9981), (64, 10158), (65, 10161),

Gene: Dina\_14 Start: 8944, Stop: 9692, Start Num: 17

Candidate Starts for Dina\_14:

(1, 8221), (7, 8680), (Start: 17 @8944 has 7 MA's), (25, 9070), (26, 9079), (33, 9154), (40, 9253), (43, 9298), (52, 9451),

Gene: DinoDaryn\_21 Start: 11657, Stop: 12378, Start Num: 19

Candidate Starts for DinoDaryn\_21:

(Start: 19 @11657 has 10 MA's), (24, 11717), (28, 11753), (30, 11771), (31, 11795), (36, 11894), (37, 11897), (41, 11960), (44, 12029), (51, 12149),

Gene: Fairfaxidum\_16 Start: 9483, Stop: 10267, Start Num: 16

Candidate Starts for Fairfaxidum\_16:

(Start: 16 @9483 has 43 MA's), (27, 9636), (28, 9639), (33, 9723), (34, 9774), (46, 9936), (62, 10188),

Gene: Fenry\_15 Start: 9169, Stop: 9953, Start Num: 16

Candidate Starts for Fenry\_15:

(Start: 16 @9169 has 43 MA's), (21, 9238), (27, 9322), (29, 9334), (33, 9409), (34, 9460), (44, 9601), (46, 9622), (52, 9727), (64, 9904), (65, 9907),

Gene: Frokostdame\_16 Start: 9413, Stop: 10203, Start Num: 16

Candidate Starts for Frokostdame\_16:

(Start: 16 @9413 has 43 MA's), (28, 9569), (33, 9653), (34, 9704), (46, 9866),

Gene: Gambino\_18 Start: 9765, Stop: 10549, Start Num: 16

Candidate Starts for Gambino\_18:

(Start: 16 @9765 has 43 MA's), (29, 9930), (33, 10005), (34, 10056), (44, 10197), (46, 10218), (52, 10323), (64, 10500), (65, 10503),

Gene: Ghobes\_13 Start: 8385, Stop: 9160, Start Num: 15

Candidate Starts for Ghobes\_13:

(13, 8373), (Start: 15 @8385 has 2 MA's), (18, 8424), (20, 8463), (57, 9009),

Gene: Goib\_20 Start: 11432, Stop: 12153, Start Num: 19

Candidate Starts for Goib\_20:

(Start: 19 @11432 has 10 MA's), (24, 11492), (28, 11528), (30, 11546), (31, 11570), (35, 11666), (36, 11669), (37, 11672), (41, 11735), (44, 11804), (51, 11924),

Gene: Gspu1\_17 Start: 9894, Stop: 10591, Start Num: 19

Candidate Starts for Gspu1\_17:

(10, 9789), (12, 9819), (Start: 19 @9894 has 10 MA's), (37, 10134), (38, 10140), (42, 10209), (45, 10260), (46, 10263), (51, 10362), (53, 10389), (54, 10407), (56, 10422), (59, 10446), (64, 10524), (67, 10569),

Gene: Guacamole\_16 Start: 9424, Stop: 10208, Start Num: 16

Candidate Starts for Guacamole\_16:

(Start: 16 @9424 has 43 MA's), (21, 9493), (27, 9577), (29, 9589), (33, 9664), (34, 9715), (44, 9856), (46, 9877), (52, 9982), (64, 10159), (65, 10162),

Gene: Hitter\_16 Start: 9420, Stop: 10204, Start Num: 16

Candidate Starts for Hitter\_16:

(Start: 16 @9420 has 43 MA's), (21, 9489), (27, 9573), (29, 9585), (33, 9660), (34, 9711), (44, 9852), (46, 9873), (52, 9978), (65, 10158),

Gene: Huffu\_21 Start: 11657, Stop: 12378, Start Num: 19

Candidate Starts for Huffu\_21:

(Start: 19 @11657 has 10 MA's), (24, 11717), (28, 11753), (30, 11771), (31, 11795), (36, 11894), (37, 11897), (41, 11960), (44, 12029), (51, 12149),

Gene: Jalammah\_17 Start: 9691, Stop: 10475, Start Num: 16

Candidate Starts for Jalammah\_17:

(Start: 16 @9691 has 43 MA's), (21, 9760), (27, 9844), (29, 9856), (33, 9931), (34, 9982), (44, 10123), (46, 10144), (52, 10249), (64, 10426), (65, 10429),

Gene: JasperJr\_16 Start: 9424, Stop: 10208, Start Num: 16

Candidate Starts for JasperJr\_16:

(Start: 16 @9424 has 43 MA's), (21, 9493), (27, 9577), (29, 9589), (33, 9664), (34, 9715), (44, 9856), (46, 9877), (52, 9982), (64, 10159), (65, 10162),

Gene: JuJu\_16 Start: 9348, Stop: 10132, Start Num: 16

Candidate Starts for JuJu\_16:

(Start: 16 @9348 has 43 MA's), (21, 9417), (28, 9504), (33, 9588), (34, 9639), (40, 9687), (44, 9780), (46, 9801), (65, 10086),

Gene: KappaFarmDelta\_16 Start: 9573, Stop: 10354, Start Num: 16

Candidate Starts for KappaFarmDelta\_16:

(Start: 16 @9573 has 43 MA's), (21, 9642), (28, 9729), (33, 9813), (34, 9864), (44, 10005), (46, 10026), (48, 10086), (62, 10275), (65, 10308),

Gene: Lysidious\_16 Start: 9420, Stop: 10204, Start Num: 16

Candidate Starts for Lysidious\_16:

(Start: 16 @9420 has 43 MA's), (21, 9489), (29, 9585), (33, 9660), (34, 9711), (44, 9852), (46, 9873), (52, 9978), (64, 10155), (65, 10158),

Gene: Malachai\_16 Start: 9425, Stop: 10209, Start Num: 16

Candidate Starts for Malachai\_16:

(Start: 16 @9425 has 43 MA's), (27, 9578), (29, 9590), (33, 9665), (34, 9716), (44, 9857), (46, 9878), (52, 9983), (64, 10160), (65, 10163),

Gene: Melba\_16 Start: 9420, Stop: 10204, Start Num: 16

Candidate Starts for Melba\_16:

(Start: 16 @9420 has 43 MA's), (21, 9489), (27, 9573), (29, 9585), (33, 9660), (34, 9711), (44, 9852), (46, 9873), (52, 9978), (64, 10155), (65, 10158),

Gene: Mellie\_15 Start: 9160, Stop: 9944, Start Num: 16

Candidate Starts for Mellie\_15:

(Start: 16 @9160 has 43 MA's), (21, 9229), (27, 9313), (29, 9325), (33, 9400), (34, 9451), (44, 9592), (46, 9613), (52, 9718), (64, 9895), (65, 9898),

Gene: MintFen\_16 Start: 9420, Stop: 10204, Start Num: 16

Candidate Starts for MintFen\_16:

(Start: 16 @9420 has 43 MA's), (21, 9489), (27, 9573), (29, 9585), (33, 9660), (34, 9711), (44, 9852), (46, 9873), (52, 9978), (64, 10155), (65, 10158),

Gene: MissRona\_18 Start: 9765, Stop: 10549, Start Num: 16

Candidate Starts for MissRona\_18:

(Start: 16 @9765 has 43 MA's), (29, 9930), (33, 10005), (34, 10056), (44, 10197), (46, 10218), (52, 10323), (64, 10500), (65, 10503),

Gene: Murp\_16 Start: 9413, Stop: 10194, Start Num: 16

Candidate Starts for Murp\_16:

(Start: 16 @9413 has 43 MA's), (21, 9482), (27, 9566), (29, 9578), (33, 9653), (34, 9704), (44, 9845), (46, 9866), (48, 9926), (65, 10148),

Gene: Obliviate\_15 Start: 9189, Stop: 9973, Start Num: 16

Candidate Starts for Obliviate\_15:

(Start: 16 @9189 has 43 MA's), (21, 9258), (27, 9342), (29, 9354), (33, 9429), (34, 9480), (44, 9621), (46, 9642), (52, 9747), (64, 9924), (65, 9927),

Gene: PCoral7\_16 Start: 9411, Stop: 10195, Start Num: 16

Candidate Starts for PCoral7\_16:

(Start: 16 @9411 has 43 MA's), (27, 9564), (28, 9567), (33, 9651), (34, 9702), (46, 9864), (49, 9951), (62, 10116),

Gene: Petra\_18 Start: 9800, Stop: 10584, Start Num: 16

Candidate Starts for Petra\_18:

(Start: 16 @9800 has 43 MA's), (29, 9965), (33, 10040), (34, 10091), (44, 10232), (46, 10253), (52, 10358), (64, 10535), (65, 10538),

Gene: PhrostedPhlake\_17 Start: 9778, Stop: 10562, Start Num: 16

Candidate Starts for PhrostedPhlake\_17:

(Start: 16 @9778 has 43 MA's), (21, 9847), (29, 9943), (33, 10018), (34, 10069), (44, 10210), (46, 10231), (52, 10336), (64, 10513), (65, 10516),

Gene: Pipp\_16 Start: 9395, Stop: 10179, Start Num: 16

Candidate Starts for Pipp\_16:

(Start: 16 @9395 has 43 MA's), (21, 9464), (28, 9551), (33, 9635), (34, 9686), (40, 9734), (44, 9827), (46, 9848), (61, 10094), (65, 10133),

Gene: PrincePatrick\_16 Start: 9479, Stop: 10263, Start Num: 16

Candidate Starts for PrincePatrick\_16:

(Start: 16 @9479 has 43 MA's), (27, 9632), (28, 9635), (33, 9719), (34, 9770), (46, 9932), (62, 10184),

Gene: SamW\_14 Start: 8942, Stop: 9690, Start Num: 17

Candidate Starts for SamW\_14:

(Start: 17 @8942 has 7 MA's), (25, 9068), (26, 9077), (33, 9152), (40, 9251), (43, 9296), (52, 9449),



Gene: Samba\_16 Start: 9528, Stop: 10312, Start Num: 16

Candidate Starts for Samba\_16:

(Start: 16 @9528 has 43 MA's), (21, 9597), (27, 9681), (29, 9693), (33, 9768), (34, 9819), (44, 9960), (46, 9981), (52, 10086), (64, 10263), (65, 10266),

Gene: Sapo\_13 Start: 8370, Stop: 9145, Start Num: 15

Candidate Starts for Sapo\_13:

(13, 8358), (Start: 15 @8370 has 2 MA's), (18, 8409), (27, 8538), (55, 8976), (57, 8994),

Gene: Splinter\_19 Start: 11432, Stop: 12153, Start Num: 19

Candidate Starts for Splinter\_19:

(Start: 19 @11432 has 10 MA's), (24, 11492), (28, 11528), (30, 11546), (31, 11570), (35, 11666), (36, 11669), (37, 11672), (41, 11735), (44, 11804), (51, 11924),

Gene: StAB\_14 Start: 8948, Stop: 9696, Start Num: 17

Candidate Starts for StAB\_14:

(Start: 17 @8948 has 7 MA's), (25, 9074), (26, 9083), (33, 9158), (40, 9257), (43, 9302), (52, 9455),

Gene: Stiles\_14 Start: 8942, Stop: 9690, Start Num: 17

Candidate Starts for Stiles\_14:

(Start: 17 @8942 has 7 MA's), (25, 9068), (26, 9077), (33, 9152), (40, 9251), (43, 9296), (52, 9449),

Gene: TZGordon\_21 Start: 11574, Stop: 12295, Start Num: 19

Candidate Starts for TZGordon\_21:

(Start: 19 @11574 has 10 MA's), (24, 11634), (28, 11670), (30, 11688), (31, 11712), (36, 11811), (37, 11814), (41, 11877), (44, 11946), (51, 12066),

Gene: TinaLin\_22 Start: 12142, Stop: 12863, Start Num: 19

Candidate Starts for TinaLin\_22:

(Start: 19 @12142 has 10 MA's), (24, 12202), (30, 12256), (37, 12382), (44, 12514), (47, 12538), (51, 12634), (52, 12637), (54, 12679), (65, 12802), (66, 12835),

Gene: Toast\_16 Start: 9411, Stop: 10195, Start Num: 16

Candidate Starts for Toast\_16:

(Start: 16 @9411 has 43 MA's), (27, 9564), (28, 9567), (33, 9651), (34, 9702), (46, 9864), (49, 9951), (62, 10116),

Gene: Troy\_14 Start: 8942, Stop: 9690, Start Num: 17

Candidate Starts for Troy\_14:

(Start: 17 @8942 has 7 MA's), (25, 9068), (26, 9077), (33, 9152), (40, 9251), (43, 9296), (52, 9449),

Gene: UmaThurman\_16 Start: 9527, Stop: 10311, Start Num: 16

Candidate Starts for UmaThurman\_16:

(Start: 16 @9527 has 43 MA's), (21, 9596), (27, 9680), (29, 9692), (33, 9767), (34, 9818), (44, 9959), (46, 9980), (52, 10085), (64, 10262), (65, 10265),

Gene: Utz\_16 Start: 9394, Stop: 10178, Start Num: 16

Candidate Starts for Utz\_16:

(Start: 16 @9394 has 43 MA's), (21, 9463), (27, 9547), (29, 9559), (33, 9634), (34, 9685), (44, 9826), (46, 9847), (52, 9952), (64, 10129), (65, 10132),

Gene: Vendetta\_19 Start: 11432, Stop: 12153, Start Num: 19

Candidate Starts for Vendetta\_19:

(Start: 19 @11432 has 10 MA's), (24, 11492), (28, 11528), (30, 11546), (31, 11570), (35, 11666), (36, 11669), (37, 11672), (41, 11735), (44, 11804), (51, 11924),

Gene: Walrus\_17 Start: 9622, Stop: 10406, Start Num: 16

Candidate Starts for Walrus\_17:

(Start: 16 @9622 has 43 MA's), (29, 9787), (33, 9862), (34, 9913), (44, 10054), (46, 10075), (52, 10180), (64, 10357), (65, 10360),

Gene: William\_16 Start: 9357, Stop: 10141, Start Num: 16

Candidate Starts for William\_16:

(Start: 16 @9357 has 43 MA's), (27, 9510), (28, 9513), (33, 9597), (34, 9648), (46, 9810), (62, 10062),

Gene: Wocket\_17 Start: 9645, Stop: 10426, Start Num: 16

Candidate Starts for Wocket\_17:

(Start: 16 @9645 has 43 MA's), (28, 9801), (29, 9810), (33, 9885), (34, 9936), (40, 9984), (44, 10077), (46, 10098), (60, 10287),

Gene: Zarbodnamra\_16 Start: 9419, Stop: 10203, Start Num: 16

Candidate Starts for Zarbodnamra\_16:

(Start: 16 @9419 has 43 MA's), (21, 9488), (27, 9572), (29, 9584), (33, 9659), (34, 9710), (44, 9851), (46, 9872), (52, 9977), (64, 10154), (65, 10157),

Gene: ZiggyZoo\_15 Start: 9189, Stop: 9973, Start Num: 16

Candidate Starts for ZiggyZoo\_15:

(Start: 16 @9189 has 43 MA's), (21, 9258), (27, 9342), (29, 9354), (33, 9429), (34, 9480), (44, 9621), (46, 9642), (52, 9747), (64, 9924), (65, 9927),