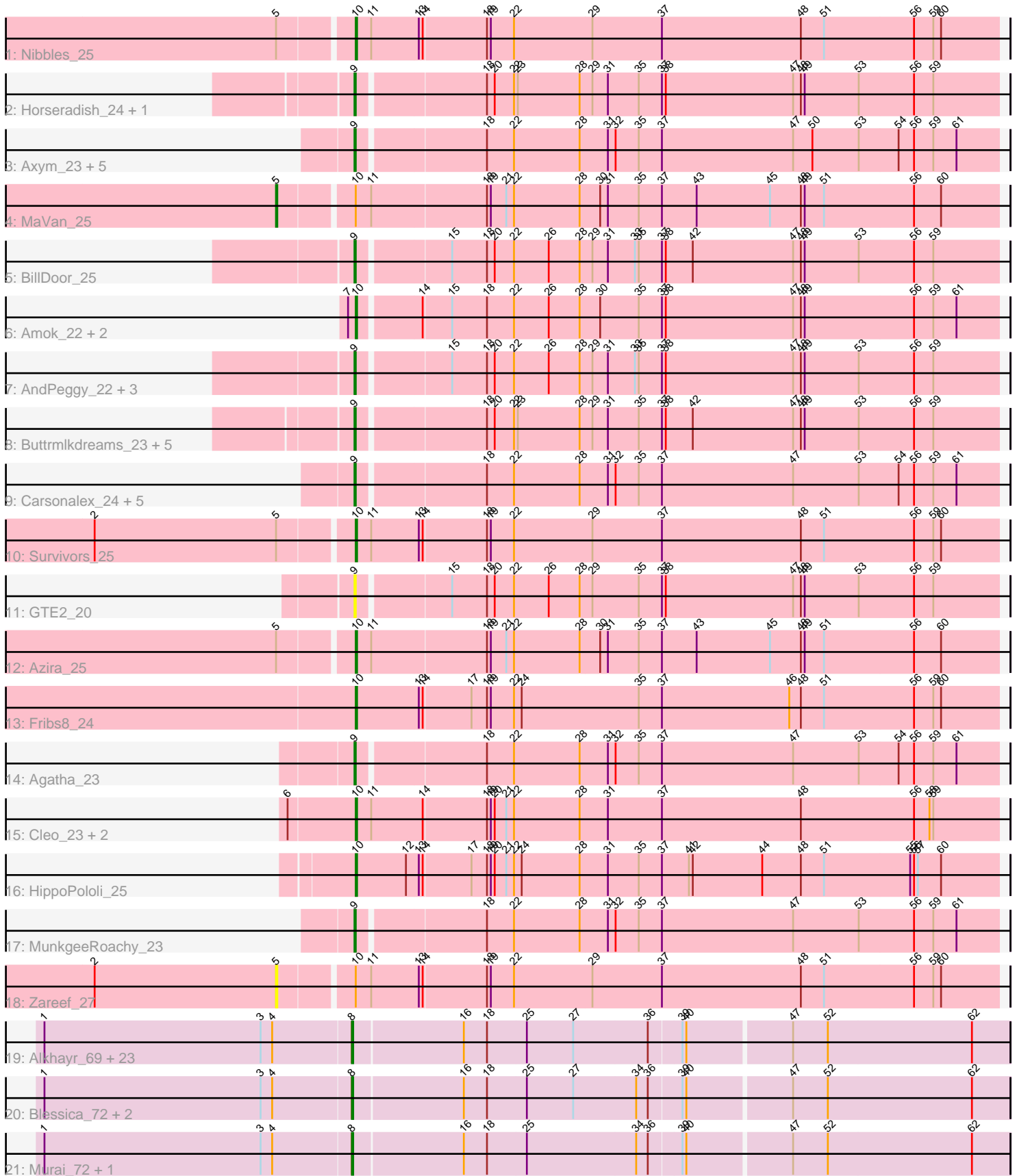


# Pham 177683



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 177683 Report

This analysis was run 11/02/24 on database version 579.

Pham number 177683 has 70 members, 11 are drafts.

Phages represented in each track:

- Track 1 : Nibbles\_25
- Track 2 : Horseradish\_24, Yummy\_24
- Track 3 : Axym\_23, Sopespian\_23, RedBaron\_24, Elliott\_23, GoldHunter\_24, PsychoKiller\_23
- Track 4 : MaVan\_25
- Track 5 : BillDoor\_25
- Track 6 : Amok\_22, Emalyn\_22, AikoCarson\_22
- Track 7 : AndPeggy\_22, Tolls\_25, Yarn\_22, SteamedHams\_25
- Track 8 : Buttrmilkdreams\_23, Troje\_23, MScarn\_25, Biskit\_24, SketchMex\_22, SweatNTears\_25
- Track 9 : Carsonalex\_24, Nina\_24, Cozz\_23, Typhonomachy\_24, Burnsey\_23, Quasar\_23
- Track 10 : Survivors\_25
- Track 11 : GTE2\_20
- Track 12 : Azira\_25
- Track 13 : Fribs8\_24
- Track 14 : Agatha\_23
- Track 15 : Cleo\_23, Dre3\_23, Gibbous\_23
- Track 16 : HippoPololi\_25
- Track 17 : MunkgeeRoachy\_23
- Track 18 : Zareef\_27
- Track 19 : Alkhayr\_69, Idergollasper\_71, Corndog\_74, Krili\_70, Wildflower\_71, Catdawg\_71, Schuy\_72, TelAviv\_68, JangDynasty\_71, YungJamal\_76, Dylan\_71, Vagabond\_69, Familton\_72, Vorpps\_71, Smooch\_74, Mori\_71, Zakhe101\_70, FoulBall\_71, Winget\_72, NiebruSaylor\_70, Ashwin\_73, Shida\_71, Firecracker\_73, SchoolBus\_71
- Track 20 : Blessica\_72, Ryadel\_75, MadKillah\_72
- Track 21 : Murai\_72, Bora\_69

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

The start number called the most often in the published annotations is 8, it was called in 27 of the 59 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Alkhayr\_69, Ashwin\_73, Blessica\_72, Bora\_69, Catdawg\_71, Corndog\_74, Dylan\_71, Familton\_72, Firecracker\_73, FoulBall\_71, Idergollasper\_71, JangDynasty\_71, Krili\_70, MadKillah\_72, Mori\_71, Murai\_72, NiebruSaylor\_70, Ryadel\_75, SchoolBus\_71, Schuy\_72, Shida\_71, Smooch\_74, TelAviv\_68, Vagabond\_69, Vorrps\_71, Wildflower\_71, Winget\_72, YungJamal\_76, Zakhe101\_70,

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

- 

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

- Agatha\_23, AikoCarson\_22, Amok\_22, AndPeggy\_22, Axym\_23, Azira\_25, BillDoor\_25, Biskit\_24, Burnsey\_23, Buttrmlkdreams\_23, Carsonalex\_24, Cleo\_23, Cozz\_23, Dre3\_23, Elliott\_23, Emalyn\_22, Fribs8\_24, GTE2\_20, Gibbous\_23, GoldHunter\_24, HippoPololi\_25, Horseradish\_24, MScarn\_25, MaVan\_25, MunkgeeRoachy\_23, Nibbles\_25, Nina\_24, PsychoKiller\_23, Quasar\_23, RedBaron\_24, SketchMex\_22, Sopespian\_23, SteamedHams\_25, Survivors\_25, SweatNTears\_25, Tolls\_25, Troje\_23, Typhonmarchy\_24, Yarn\_22, Yummy\_24, Zareef\_27,

### Summary by start number:

Start 5:

- Found in 5 of 70 ( 7.1% ) of genes in pham
- Manual Annotations of this start: 1 of 59
- Called 40.0% of time when present
- Phage (with cluster) where this start called: MaVan\_25 (CT), Zareef\_27 (CT),

Start 8:

- Found in 29 of 70 ( 41.4% ) of genes in pham
- Manual Annotations of this start: 27 of 59
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Alkhayr\_69 (O), Ashwin\_73 (O), Blessica\_72 (O), Bora\_69 (O), Catdawg\_71 (O), Corndog\_74 (O), Dylan\_71 (O), Familton\_72 (O), Firecracker\_73 (O), FoulBall\_71 (O), Idergollasper\_71 (O), JangDynasty\_71 (O), Krili\_70 (O), MadKillah\_72 (O), Mori\_71 (O), Murai\_72 (O), NiebruSaylor\_70 (O), Ryadel\_75 (O), SchoolBus\_71 (O), Schuy\_72 (O), Shida\_71 (O), Smooch\_74 (O), TelAviv\_68 (O), Vagabond\_69 (O), Vorrps\_71 (O), Wildflower\_71 (O), Winget\_72 (O), YungJamal\_76 (O), Zakhe101\_70 (O),

Start 9:

- Found in 28 of 70 ( 40.0% ) of genes in pham
- Manual Annotations of this start: 20 of 59
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Agatha\_23 (CT), AndPeggy\_22 (CT), Axym\_23 (CT), BillDoor\_25 (CT), Biskit\_24 (CT), Burnsey\_23 (CT), Buttrmlkdreams\_23 (CT), Carsonalex\_24 (CT), Cozz\_23 (CT), Elliott\_23 (CT), GTE2\_20 (CT), GoldHunter\_24 (CT), Horseradish\_24 (CT), MScarn\_25 (CT), MunkgeeRoachy\_23 (CT), Nina\_24 (CT), PsychoKiller\_23 (CT), Quasar\_23 (CT), RedBaron\_24 (CT), SketchMex\_22 (CT), Sopespian\_23 (CT), SteamedHams\_25 (CT), SweatNTears\_25 (CT), Tolls\_25 (CT), Troje\_23 (CT), Typhonmarchy\_24 (CT), Yarn\_22 (CT), Yummy\_24 (CT),

Start 10:

- Found in 13 of 70 ( 18.6% ) of genes in pham
- Manual Annotations of this start: 11 of 59
- Called 84.6% of time when present
- Phage (with cluster) where this start called: AikoCarson\_22 (CT), Amok\_22 (CT), Azira\_25 (CT), Cleo\_23 (CT), Dre3\_23 (CT), Emalyn\_22 (CT), Fribs8\_24 (CT), Gibbous\_23 (CT), HippoPololi\_25 (CT), Nibbles\_25 (CT), Survivors\_25 (CT),

### **Summary by clusters:**

There are 2 clusters represented in this pham: O, CT,

Info for manual annotations of cluster CT:

- Start number 5 was manually annotated 1 time for cluster CT.
- Start number 9 was manually annotated 20 times for cluster CT.
- Start number 10 was manually annotated 11 times for cluster CT.

Info for manual annotations of cluster O:

- Start number 8 was manually annotated 27 times for cluster O.

### **Gene Information:**

Gene: Agatha\_23 Start: 19719, Stop: 20207, Start Num: 9

Candidate Starts for Agatha\_23:

(Start: 9 @19719 has 20 MA's), (18, 19812), (22, 19833), (28, 19884), (31, 19905), (32, 19911), (35, 19929), (37, 19947), (47, 20049), (53, 20100), (54, 20130), (56, 20142), (59, 20157), (61, 20175),

Gene: AikoCarson\_22 Start: 18977, Stop: 19465, Start Num: 10

Candidate Starts for AikoCarson\_22:

(7, 18971), (Start: 10 @18977 has 11 MA's), (14, 19022), (15, 19043), (18, 19070), (22, 19091), (26, 19118), (28, 19142), (30, 19157), (35, 19187), (37, 19205), (38, 19208), (47, 19307), (48, 19313), (49, 19316), (56, 19400), (59, 19415), (61, 19433),

Gene: Alkhayr\_69 Start: 45256, Stop: 45753, Start Num: 8

Candidate Starts for Alkhayr\_69:

(1, 45019), (3, 45187), (4, 45196), (Start: 8 @45256 has 27 MA's), (16, 45340), (18, 45358), (25, 45388), (27, 45424), (36, 45481), (39, 45505), (40, 45508), (47, 45586), (52, 45613), (62, 45724),

Gene: Amok\_22 Start: 18974, Stop: 19462, Start Num: 10

Candidate Starts for Amok\_22:

(7, 18968), (Start: 10 @18974 has 11 MA's), (14, 19019), (15, 19040), (18, 19067), (22, 19088), (26, 19115), (28, 19139), (30, 19154), (35, 19184), (37, 19202), (38, 19205), (47, 19304), (48, 19310), (49, 19313), (56, 19397), (59, 19412), (61, 19430),

Gene: AndPeggy\_22 Start: 19379, Stop: 19867, Start Num: 9

Candidate Starts for AndPeggy\_22:

(Start: 9 @19379 has 20 MA's), (15, 19445), (18, 19472), (20, 19478), (22, 19493), (26, 19520), (28, 19544), (29, 19553), (31, 19565), (33, 19586), (35, 19589), (37, 19607), (38, 19610), (47, 19709), (48, 19715), (49, 19718), (53, 19760), (56, 19802), (59, 19817),

Gene: Ashwin\_73 Start: 46026, Stop: 46523, Start Num: 8

Candidate Starts for Ashwin\_73:

(1, 45789), (3, 45957), (4, 45966), (Start: 8 @46026 has 27 MA's), (16, 46110), (18, 46128), (25, 46158), (27, 46194), (36, 46251), (39, 46275), (40, 46278), (47, 46356), (52, 46383), (62, 46494),

Gene: Axym\_23 Start: 19719, Stop: 20207, Start Num: 9

Candidate Starts for Axym\_23:

(Start: 9 @19719 has 20 MA's), (18, 19812), (22, 19833), (28, 19884), (31, 19905), (32, 19911), (35, 19929), (37, 19947), (47, 20049), (50, 20064), (53, 20100), (54, 20130), (56, 20142), (59, 20157), (61, 20175),

Gene: Azira\_25 Start: 20672, Stop: 21166, Start Num: 10

Candidate Starts for Azira\_25:

(Start: 5 @20618 has 1 MA's), (Start: 10 @20672 has 11 MA's), (11, 20684), (18, 20771), (19, 20774), (21, 20786), (22, 20792), (28, 20843), (30, 20858), (31, 20864), (35, 20888), (37, 20906), (43, 20933), (45, 20990), (48, 21014), (49, 21017), (51, 21032), (56, 21101), (60, 21122),

Gene: BillDoor\_25 Start: 19347, Stop: 19835, Start Num: 9

Candidate Starts for BillDoor\_25:

(Start: 9 @19347 has 20 MA's), (15, 19413), (18, 19440), (20, 19446), (22, 19461), (26, 19488), (28, 19512), (29, 19521), (31, 19533), (33, 19554), (35, 19557), (37, 19575), (38, 19578), (42, 19599), (47, 19677), (48, 19683), (49, 19686), (53, 19728), (56, 19770), (59, 19785),

Gene: Biskit\_24 Start: 19367, Stop: 19855, Start Num: 9

Candidate Starts for Biskit\_24:

(Start: 9 @19367 has 20 MA's), (18, 19460), (20, 19466), (22, 19481), (23, 19484), (28, 19532), (29, 19541), (31, 19553), (35, 19577), (37, 19595), (38, 19598), (42, 19619), (47, 19697), (48, 19703), (49, 19706), (53, 19748), (56, 19790), (59, 19805),

Gene: Blessica\_72 Start: 45855, Stop: 46352, Start Num: 8

Candidate Starts for Blessica\_72:

(1, 45618), (3, 45786), (4, 45795), (Start: 8 @45855 has 27 MA's), (16, 45939), (18, 45957), (25, 45987), (27, 46023), (34, 46071), (36, 46080), (39, 46104), (40, 46107), (47, 46185), (52, 46212), (62, 46323),

Gene: Bora\_69 Start: 45236, Stop: 45733, Start Num: 8

Candidate Starts for Bora\_69:

(1, 44999), (3, 45167), (4, 45176), (Start: 8 @45236 has 27 MA's), (16, 45320), (18, 45338), (25, 45368), (34, 45452), (36, 45461), (39, 45485), (40, 45488), (47, 45566), (52, 45593), (62, 45704),

Gene: Burnsey\_23 Start: 19720, Stop: 20208, Start Num: 9

Candidate Starts for Burnsey\_23:

(Start: 9 @19720 has 20 MA's), (18, 19813), (22, 19834), (28, 19885), (31, 19906), (32, 19912), (35, 19930), (37, 19948), (47, 20050), (53, 20101), (54, 20131), (56, 20143), (59, 20158), (61, 20176),

Gene: Buttrmlkdreams\_23 Start: 19349, Stop: 19837, Start Num: 9

Candidate Starts for Buttrmlkdreams\_23:

(Start: 9 @19349 has 20 MA's), (18, 19442), (20, 19448), (22, 19463), (23, 19466), (28, 19514), (29, 19523), (31, 19535), (35, 19559), (37, 19577), (38, 19580), (42, 19601), (47, 19679), (48, 19685), (49, 19688), (53, 19730), (56, 19772), (59, 19787),

Gene: Carsonalex\_24 Start: 19777, Stop: 20265, Start Num: 9

Candidate Starts for Carsonalex\_24:

(Start: 9 @19777 has 20 MA's), (18, 19870), (22, 19891), (28, 19942), (31, 19963), (32, 19969), (35, 19987), (37, 20005), (47, 20107), (53, 20158), (54, 20188), (56, 20200), (59, 20215), (61, 20233),

Gene: Catdawg\_71 Start: 45591, Stop: 46088, Start Num: 8

Candidate Starts for Catdawg\_71:

(1, 45354), (3, 45522), (4, 45531), (Start: 8 @45591 has 27 MA's), (16, 45675), (18, 45693), (25, 45723), (27, 45759), (36, 45816), (39, 45840), (40, 45843), (47, 45921), (52, 45948), (62, 46059),

Gene: Cleo\_23 Start: 20016, Stop: 20510, Start Num: 10

Candidate Starts for Cleo\_23:

(6, 19965), (Start: 10 @20016 has 11 MA's), (11, 20028), (14, 20067), (18, 20115), (19, 20118), (20, 20121), (21, 20130), (22, 20136), (28, 20187), (31, 20208), (37, 20250), (48, 20358), (56, 20445), (58, 20457), (59, 20460),

Gene: Corndog\_74 Start: 46585, Stop: 47082, Start Num: 8

Candidate Starts for Corndog\_74:

(1, 46348), (3, 46516), (4, 46525), (Start: 8 @46585 has 27 MA's), (16, 46669), (18, 46687), (25, 46717), (27, 46753), (36, 46810), (39, 46834), (40, 46837), (47, 46915), (52, 46942), (62, 47053),

Gene: Cozz\_23 Start: 19720, Stop: 20208, Start Num: 9

Candidate Starts for Cozz\_23:

(Start: 9 @19720 has 20 MA's), (18, 19813), (22, 19834), (28, 19885), (31, 19906), (32, 19912), (35, 19930), (37, 19948), (47, 20050), (53, 20101), (54, 20131), (56, 20143), (59, 20158), (61, 20176),

Gene: Dre3\_23 Start: 19942, Stop: 20436, Start Num: 10

Candidate Starts for Dre3\_23:

(6, 19891), (Start: 10 @19942 has 11 MA's), (11, 19954), (14, 19993), (18, 20041), (19, 20044), (20, 20047), (21, 20056), (22, 20062), (28, 20113), (31, 20134), (37, 20176), (48, 20284), (56, 20371), (58, 20383), (59, 20386),

Gene: Dylan\_71 Start: 45638, Stop: 46135, Start Num: 8

Candidate Starts for Dylan\_71:

(1, 45401), (3, 45569), (4, 45578), (Start: 8 @45638 has 27 MA's), (16, 45722), (18, 45740), (25, 45770), (27, 45806), (36, 45863), (39, 45887), (40, 45890), (47, 45968), (52, 45995), (62, 46106),

Gene: Elliott\_23 Start: 19719, Stop: 20207, Start Num: 9

Candidate Starts for Elliott\_23:

(Start: 9 @19719 has 20 MA's), (18, 19812), (22, 19833), (28, 19884), (31, 19905), (32, 19911), (35, 19929), (37, 19947), (47, 20049), (50, 20064), (53, 20100), (54, 20130), (56, 20142), (59, 20157), (61, 20175),

Gene: Emalyn\_22 Start: 18976, Stop: 19464, Start Num: 10

Candidate Starts for Emalyn\_22:

(7, 18970), (Start: 10 @18976 has 11 MA's), (14, 19021), (15, 19042), (18, 19069), (22, 19090), (26, 19117), (28, 19141), (30, 19156), (35, 19186), (37, 19204), (38, 19207), (47, 19306), (48, 19312), (49, 19315), (56, 19399), (59, 19414), (61, 19432),

Gene: Familton\_72 Start: 45548, Stop: 46045, Start Num: 8

Candidate Starts for Familton\_72:

(1, 45311), (3, 45479), (4, 45488), (Start: 8 @45548 has 27 MA's), (16, 45632), (18, 45650), (25, 45680), (27, 45716), (36, 45773), (39, 45797), (40, 45800), (47, 45878), (52, 45905), (62, 46016),

Gene: Firecracker\_73 Start: 45938, Stop: 46435, Start Num: 8

Candidate Starts for Firecracker\_73:

(1, 45701), (3, 45869), (4, 45878), (Start: 8 @45938 has 27 MA's), (16, 46022), (18, 46040), (25, 46070), (27, 46106), (36, 46163), (39, 46187), (40, 46190), (47, 46268), (52, 46295), (62, 46406),

Gene: FoulBall\_71 Start: 45542, Stop: 46039, Start Num: 8

Candidate Starts for FoulBall\_71:

(1, 45305), (3, 45473), (4, 45482), (Start: 8 @45542 has 27 MA's), (16, 45626), (18, 45644), (25, 45674), (27, 45710), (36, 45767), (39, 45791), (40, 45794), (47, 45872), (52, 45899), (62, 46010),

Gene: Fribs8\_24 Start: 20525, Stop: 21019, Start Num: 10

Candidate Starts for Fribs8\_24:

(Start: 10 @20525 has 11 MA's), (13, 20573), (14, 20576), (17, 20612), (18, 20624), (19, 20627), (22, 20645), (24, 20651), (35, 20741), (37, 20759), (46, 20858), (48, 20867), (51, 20885), (56, 20954), (59, 20969), (60, 20975),

Gene: GTE2\_20 Start: 19052, Stop: 19540, Start Num: 9

Candidate Starts for GTE2\_20:

(Start: 9 @19052 has 20 MA's), (15, 19118), (18, 19145), (20, 19151), (22, 19166), (26, 19193), (28, 19217), (29, 19226), (35, 19262), (37, 19280), (38, 19283), (47, 19382), (48, 19388), (49, 19391), (53, 19433), (56, 19475), (59, 19490),

Gene: Gibbous\_23 Start: 19942, Stop: 20436, Start Num: 10

Candidate Starts for Gibbous\_23:

(6, 19891), (Start: 10 @19942 has 11 MA's), (11, 19954), (14, 19993), (18, 20041), (19, 20044), (20, 20047), (21, 20056), (22, 20062), (28, 20113), (31, 20134), (37, 20176), (48, 20284), (56, 20371), (58, 20383), (59, 20386),

Gene: GoldHunter\_24 Start: 19720, Stop: 20208, Start Num: 9

Candidate Starts for GoldHunter\_24:

(Start: 9 @19720 has 20 MA's), (18, 19813), (22, 19834), (28, 19885), (31, 19906), (32, 19912), (35, 19930), (37, 19948), (47, 20050), (50, 20065), (53, 20101), (54, 20131), (56, 20143), (59, 20158), (61, 20176),

Gene: HippoPololi\_25 Start: 20591, Stop: 21085, Start Num: 10

Candidate Starts for HippoPololi\_25:

(Start: 10 @20591 has 11 MA's), (12, 20630), (13, 20639), (14, 20642), (17, 20678), (18, 20690), (19, 20693), (20, 20696), (21, 20705), (22, 20711), (24, 20717), (28, 20762), (31, 20783), (35, 20807), (37, 20825), (41, 20846), (42, 20849), (44, 20903), (48, 20933), (51, 20951), (55, 21017), (56, 21020), (57, 21023), (60, 21041),

Gene: Horseradish\_24 Start: 19263, Stop: 19751, Start Num: 9

Candidate Starts for Horseradish\_24:

(Start: 9 @19263 has 20 MA's), (18, 19356), (20, 19362), (22, 19377), (23, 19380), (28, 19428), (29, 19437), (31, 19449), (35, 19473), (37, 19491), (38, 19494), (47, 19593), (48, 19599), (49, 19602), (53, 19644), (56, 19686), (59, 19701),

Gene: Idergollasper\_71 Start: 45542, Stop: 46039, Start Num: 8

Candidate Starts for Idergollasper\_71:

(1, 45305), (3, 45473), (4, 45482), (Start: 8 @45542 has 27 MA's), (16, 45626), (18, 45644), (25, 45674), (27, 45710), (36, 45767), (39, 45791), (40, 45794), (47, 45872), (52, 45899), (62, 46010),

Gene: JangDynasty\_71 Start: 45628, Stop: 46125, Start Num: 8

Candidate Starts for JangDynasty\_71:

(1, 45391), (3, 45559), (4, 45568), (Start: 8 @45628 has 27 MA's), (16, 45712), (18, 45730), (25, 45760), (27, 45796), (36, 45853), (39, 45877), (40, 45880), (47, 45958), (52, 45985), (62, 46096),

Gene: Krili\_70 Start: 45052, Stop: 45549, Start Num: 8

Candidate Starts for Krili\_70:

(1, 44815), (3, 44983), (4, 44992), (Start: 8 @45052 has 27 MA's), (16, 45136), (18, 45154), (25, 45184), (27, 45220), (36, 45277), (39, 45301), (40, 45304), (47, 45382), (52, 45409), (62, 45520),

Gene: MScarn\_25 Start: 19352, Stop: 19840, Start Num: 9

Candidate Starts for MScarn\_25:

(Start: 9 @19352 has 20 MA's), (18, 19445), (20, 19451), (22, 19466), (23, 19469), (28, 19517), (29, 19526), (31, 19538), (35, 19562), (37, 19580), (38, 19583), (42, 19604), (47, 19682), (48, 19688), (49, 19691), (53, 19733), (56, 19775), (59, 19790),

Gene: MaVan\_25 Start: 20618, Stop: 21166, Start Num: 5

Candidate Starts for MaVan\_25:

(Start: 5 @20618 has 1 MA's), (Start: 10 @20672 has 11 MA's), (11, 20684), (18, 20771), (19, 20774), (21, 20786), (22, 20792), (28, 20843), (30, 20858), (31, 20864), (35, 20888), (37, 20906), (43, 20933), (45, 20990), (48, 21014), (49, 21017), (51, 21032), (56, 21101), (60, 21122),

Gene: MadKillah\_72 Start: 45321, Stop: 45818, Start Num: 8

Candidate Starts for MadKillah\_72:

(1, 45084), (3, 45252), (4, 45261), (Start: 8 @45321 has 27 MA's), (16, 45405), (18, 45423), (25, 45453), (27, 45489), (34, 45537), (36, 45546), (39, 45570), (40, 45573), (47, 45651), (52, 45678), (62, 45789),

Gene: Mori\_71 Start: 45583, Stop: 46080, Start Num: 8

Candidate Starts for Mori\_71:

(1, 45346), (3, 45514), (4, 45523), (Start: 8 @45583 has 27 MA's), (16, 45667), (18, 45685), (25, 45715), (27, 45751), (36, 45808), (39, 45832), (40, 45835), (47, 45913), (52, 45940), (62, 46051),

Gene: MunkgeeRoachy\_23 Start: 19767, Stop: 20255, Start Num: 9

Candidate Starts for MunkgeeRoachy\_23:

(Start: 9 @19767 has 20 MA's), (18, 19860), (22, 19881), (28, 19932), (31, 19953), (32, 19959), (35, 19977), (37, 19995), (47, 20097), (53, 20148), (56, 20190), (59, 20205), (61, 20223),

Gene: Murai\_72 Start: 45764, Stop: 46261, Start Num: 8

Candidate Starts for Murai\_72:

(1, 45527), (3, 45695), (4, 45704), (Start: 8 @45764 has 27 MA's), (16, 45848), (18, 45866), (25, 45896), (34, 45980), (36, 45989), (39, 46013), (40, 46016), (47, 46094), (52, 46121), (62, 46232),

Gene: Nibbles\_25 Start: 20672, Stop: 21166, Start Num: 10

Candidate Starts for Nibbles\_25:

(Start: 5 @20618 has 1 MA's), (Start: 10 @20672 has 11 MA's), (11, 20684), (13, 20720), (14, 20723), (18, 20771), (19, 20774), (22, 20792), (29, 20852), (37, 20906), (48, 21014), (51, 21032), (56, 21101), (59, 21116), (60, 21122),

Gene: NiebruSaylor\_70 Start: 44971, Stop: 45468, Start Num: 8

Candidate Starts for NiebruSaylor\_70:

(1, 44734), (3, 44902), (4, 44911), (Start: 8 @44971 has 27 MA's), (16, 45055), (18, 45073), (25, 45103), (27, 45139), (36, 45196), (39, 45220), (40, 45223), (47, 45301), (52, 45328), (62, 45439),

Gene: Nina\_24 Start: 20762, Stop: 21250, Start Num: 9



Candidate Starts for Nina\_24:

(Start: 9 @20762 has 20 MA's), (18, 20855), (22, 20876), (28, 20927), (31, 20948), (32, 20954), (35, 20972), (37, 20990), (47, 21092), (53, 21143), (54, 21173), (56, 21185), (59, 21200), (61, 21218),

Gene: PsychoKiller\_23 Start: 19719, Stop: 20207, Start Num: 9

Candidate Starts for PsychoKiller\_23:

(Start: 9 @19719 has 20 MA's), (18, 19812), (22, 19833), (28, 19884), (31, 19905), (32, 19911), (35, 19929), (37, 19947), (47, 20049), (50, 20064), (53, 20100), (54, 20130), (56, 20142), (59, 20157), (61, 20175),

Gene: Quasar\_23 Start: 20328, Stop: 20816, Start Num: 9

Candidate Starts for Quasar\_23:

(Start: 9 @20328 has 20 MA's), (18, 20421), (22, 20442), (28, 20493), (31, 20514), (32, 20520), (35, 20538), (37, 20556), (47, 20658), (53, 20709), (54, 20739), (56, 20751), (59, 20766), (61, 20784),

Gene: RedBaron\_24 Start: 19763, Stop: 20251, Start Num: 9

Candidate Starts for RedBaron\_24:

(Start: 9 @19763 has 20 MA's), (18, 19856), (22, 19877), (28, 19928), (31, 19949), (32, 19955), (35, 19973), (37, 19991), (47, 20093), (50, 20108), (53, 20144), (54, 20174), (56, 20186), (59, 20201), (61, 20219),

Gene: Ryadel\_75 Start: 46376, Stop: 46873, Start Num: 8

Candidate Starts for Ryadel\_75:

(1, 46139), (3, 46307), (4, 46316), (Start: 8 @46376 has 27 MA's), (16, 46460), (18, 46478), (25, 46508), (27, 46544), (34, 46592), (36, 46601), (39, 46625), (40, 46628), (47, 46706), (52, 46733), (62, 46844),

Gene: SchoolBus\_71 Start: 45524, Stop: 46021, Start Num: 8

Candidate Starts for SchoolBus\_71:

(1, 45287), (3, 45455), (4, 45464), (Start: 8 @45524 has 27 MA's), (16, 45608), (18, 45626), (25, 45656), (27, 45692), (36, 45749), (39, 45773), (40, 45776), (47, 45854), (52, 45881), (62, 45992),

Gene: Schuy\_72 Start: 45327, Stop: 45824, Start Num: 8

Candidate Starts for Schuy\_72:

(1, 45090), (3, 45258), (4, 45267), (Start: 8 @45327 has 27 MA's), (16, 45411), (18, 45429), (25, 45459), (27, 45495), (36, 45552), (39, 45576), (40, 45579), (47, 45657), (52, 45684), (62, 45795),

Gene: Shida\_71 Start: 45234, Stop: 45731, Start Num: 8

Candidate Starts for Shida\_71:

(1, 44997), (3, 45165), (4, 45174), (Start: 8 @45234 has 27 MA's), (16, 45318), (18, 45336), (25, 45366), (27, 45402), (36, 45459), (39, 45483), (40, 45486), (47, 45564), (52, 45591), (62, 45702),

Gene: SketchMex\_22 Start: 19367, Stop: 19855, Start Num: 9

Candidate Starts for SketchMex\_22:

(Start: 9 @19367 has 20 MA's), (18, 19460), (20, 19466), (22, 19481), (23, 19484), (28, 19532), (29, 19541), (31, 19553), (35, 19577), (37, 19595), (38, 19598), (42, 19619), (47, 19697), (48, 19703), (49, 19706), (53, 19748), (56, 19790), (59, 19805),

Gene: Smooch\_74 Start: 47280, Stop: 47777, Start Num: 8

Candidate Starts for Smooch\_74:

(1, 47043), (3, 47211), (4, 47220), (Start: 8 @47280 has 27 MA's), (16, 47364), (18, 47382), (25, 47412), (27, 47448), (36, 47505), (39, 47529), (40, 47532), (47, 47610), (52, 47637), (62, 47748),

Gene: Sopespian\_23 Start: 19720, Stop: 20208, Start Num: 9

Candidate Starts for Sopespian\_23:

(Start: 9 @19720 has 20 MA's), (18, 19813), (22, 19834), (28, 19885), (31, 19906), (32, 19912), (35, 19930), (37, 19948), (47, 20050), (50, 20065), (53, 20101), (54, 20131), (56, 20143), (59, 20158), (61, 20176),

Gene: SteamedHams\_25 Start: 19380, Stop: 19868, Start Num: 9

Candidate Starts for SteamedHams\_25:

(Start: 9 @19380 has 20 MA's), (15, 19446), (18, 19473), (20, 19479), (22, 19494), (26, 19521), (28, 19545), (29, 19554), (31, 19566), (33, 19587), (35, 19590), (37, 19608), (38, 19611), (47, 19710), (48, 19716), (49, 19719), (53, 19761), (56, 19803), (59, 19818),

Gene: Survivors\_25 Start: 20521, Stop: 21015, Start Num: 10

Candidate Starts for Survivors\_25:

(2, 20326), (Start: 5 @20467 has 1 MA's), (Start: 10 @20521 has 11 MA's), (11, 20533), (13, 20569), (14, 20572), (18, 20620), (19, 20623), (22, 20641), (29, 20701), (37, 20755), (48, 20863), (51, 20881), (56, 20950), (59, 20965), (60, 20971),

Gene: SweatNTears\_25 Start: 19878, Stop: 20366, Start Num: 9

Candidate Starts for SweatNTears\_25:

(Start: 9 @19878 has 20 MA's), (18, 19971), (20, 19977), (22, 19992), (23, 19995), (28, 20043), (29, 20052), (31, 20064), (35, 20088), (37, 20106), (38, 20109), (42, 20130), (47, 20208), (48, 20214), (49, 20217), (53, 20259), (56, 20301), (59, 20316),

Gene: TelAviv\_68 Start: 45509, Stop: 46006, Start Num: 8

Candidate Starts for TelAviv\_68:

(1, 45272), (3, 45440), (4, 45449), (Start: 8 @45509 has 27 MA's), (16, 45593), (18, 45611), (25, 45641), (27, 45677), (36, 45734), (39, 45758), (40, 45761), (47, 45839), (52, 45866), (62, 45977),

Gene: Tolls\_25 Start: 19383, Stop: 19871, Start Num: 9

Candidate Starts for Tolls\_25:

(Start: 9 @19383 has 20 MA's), (15, 19449), (18, 19476), (20, 19482), (22, 19497), (26, 19524), (28, 19548), (29, 19557), (31, 19569), (33, 19590), (35, 19593), (37, 19611), (38, 19614), (47, 19713), (48, 19719), (49, 19722), (53, 19764), (56, 19806), (59, 19821),

Gene: Troje\_23 Start: 19349, Stop: 19837, Start Num: 9

Candidate Starts for Troje\_23:

(Start: 9 @19349 has 20 MA's), (18, 19442), (20, 19448), (22, 19463), (23, 19466), (28, 19514), (29, 19523), (31, 19535), (35, 19559), (37, 19577), (38, 19580), (42, 19601), (47, 19679), (48, 19685), (49, 19688), (53, 19730), (56, 19772), (59, 19787),

Gene: Typhonomachy\_24 Start: 19719, Stop: 20207, Start Num: 9

Candidate Starts for Typhonomachy\_24:

(Start: 9 @19719 has 20 MA's), (18, 19812), (22, 19833), (28, 19884), (31, 19905), (32, 19911), (35, 19929), (37, 19947), (47, 20049), (53, 20100), (54, 20130), (56, 20142), (59, 20157), (61, 20175),

Gene: Vagabond\_69 Start: 45372, Stop: 45869, Start Num: 8

Candidate Starts for Vagabond\_69:

(1, 45135), (3, 45303), (4, 45312), (Start: 8 @45372 has 27 MA's), (16, 45456), (18, 45474), (25, 45504), (27, 45540), (36, 45597), (39, 45621), (40, 45624), (47, 45702), (52, 45729), (62, 45840),

Gene: Vorrps\_71 Start: 45584, Stop: 46081, Start Num: 8

Candidate Starts for Vorrps\_71:

(1, 45347), (3, 45515), (4, 45524), (Start: 8 @45584 has 27 MA's), (16, 45668), (18, 45686), (25, 45716), (27, 45752), (36, 45809), (39, 45833), (40, 45836), (47, 45914), (52, 45941), (62, 46052),

Gene: Wildflower\_71 Start: 45096, Stop: 45593, Start Num: 8

Candidate Starts for Wildflower\_71:

(1, 44859), (3, 45027), (4, 45036), (Start: 8 @45096 has 27 MA's), (16, 45180), (18, 45198), (25, 45228), (27, 45264), (36, 45321), (39, 45345), (40, 45348), (47, 45426), (52, 45453), (62, 45564),

Gene: Winget\_72 Start: 45802, Stop: 46299, Start Num: 8

Candidate Starts for Winget\_72:

(1, 45565), (3, 45733), (4, 45742), (Start: 8 @45802 has 27 MA's), (16, 45886), (18, 45904), (25, 45934), (27, 45970), (36, 46027), (39, 46051), (40, 46054), (47, 46132), (52, 46159), (62, 46270),

Gene: Yarn\_22 Start: 19373, Stop: 19861, Start Num: 9

Candidate Starts for Yarn\_22:

(Start: 9 @19373 has 20 MA's), (15, 19439), (18, 19466), (20, 19472), (22, 19487), (26, 19514), (28, 19538), (29, 19547), (31, 19559), (33, 19580), (35, 19583), (37, 19601), (38, 19604), (47, 19703), (48, 19709), (49, 19712), (53, 19754), (56, 19796), (59, 19811),

Gene: Yummy\_24 Start: 19263, Stop: 19751, Start Num: 9

Candidate Starts for Yummy\_24:

(Start: 9 @19263 has 20 MA's), (18, 19356), (20, 19362), (22, 19377), (23, 19380), (28, 19428), (29, 19437), (31, 19449), (35, 19473), (37, 19491), (38, 19494), (47, 19593), (48, 19599), (49, 19602), (53, 19644), (56, 19686), (59, 19701),

Gene: YungJamal\_76 Start: 46994, Stop: 47491, Start Num: 8

Candidate Starts for YungJamal\_76:

(1, 46757), (3, 46925), (4, 46934), (Start: 8 @46994 has 27 MA's), (16, 47078), (18, 47096), (25, 47126), (27, 47162), (36, 47219), (39, 47243), (40, 47246), (47, 47324), (52, 47351), (62, 47462),

Gene: Zakhe101\_70 Start: 45642, Stop: 46139, Start Num: 8

Candidate Starts for Zakhe101\_70:

(1, 45405), (3, 45573), (4, 45582), (Start: 8 @45642 has 27 MA's), (16, 45726), (18, 45744), (25, 45774), (27, 45810), (36, 45867), (39, 45891), (40, 45894), (47, 45972), (52, 45999), (62, 46110),

Gene: Zareef\_27 Start: 20619, Stop: 21167, Start Num: 5

Candidate Starts for Zareef\_27:

(2, 20478), (Start: 5 @20619 has 1 MA's), (Start: 10 @20673 has 11 MA's), (11, 20685), (13, 20721), (14, 20724), (18, 20772), (19, 20775), (22, 20793), (29, 20853), (37, 20907), (48, 21015), (51, 21033), (56, 21102), (59, 21117), (60, 21123),