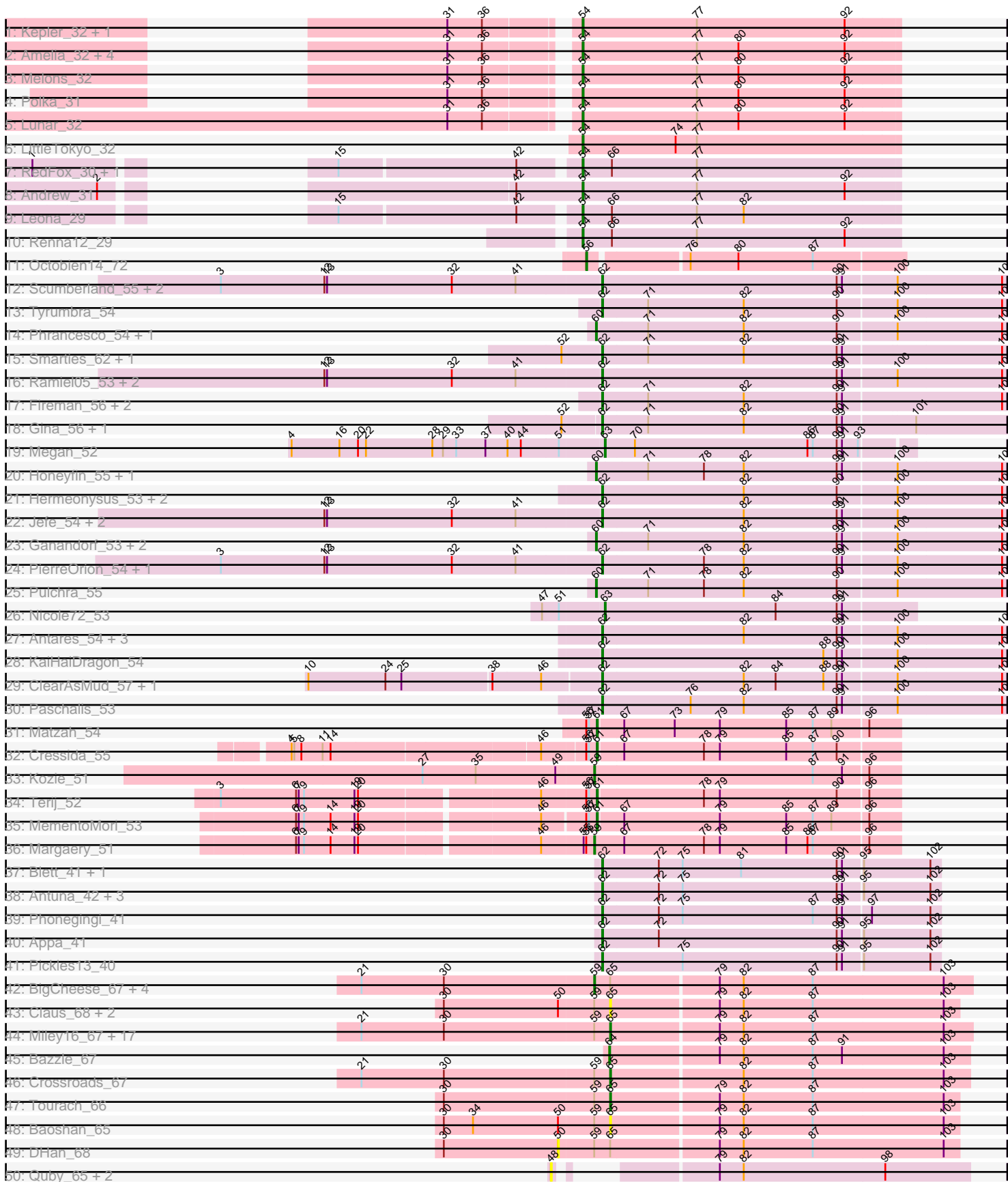
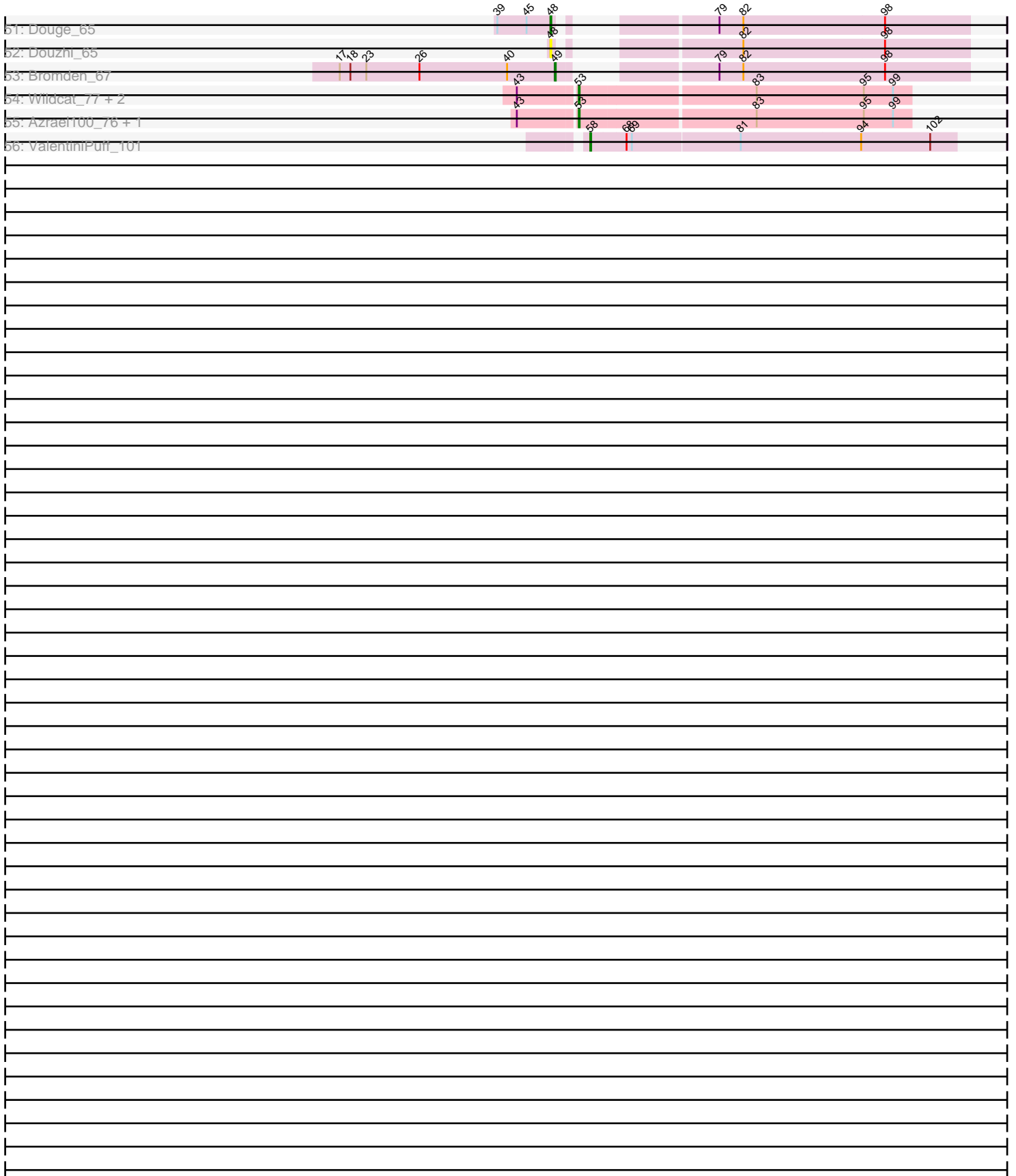


Pham 193860



# Pham 193860



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 193860 Report

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

Pham number 193860 has 115 members, 13 are drafts.

Phages represented in each track:

- Track 1 : Kepler\_32, Daob\_33
- Track 2 : Amelia\_32, HannahPhantana\_32, Cote\_33, Coral\_31, Bedetta\_34
- Track 3 : Melons\_32
- Track 4 : Polka\_31
- Track 5 : Lunar\_32
- Track 6 : LittleTokyo\_32
- Track 7 : RedFox\_30, Juno112\_29
- Track 8 : Andrew\_31
- Track 9 : Leona\_29
- Track 10 : Renna12\_29
- Track 11 : Octobien14\_72
- Track 12 : Scumberland\_55, LittleFortune\_55, Cranjis\_55
- Track 13 : Tyumbra\_54
- Track 14 : Phrancesco\_54, Busephilis\_53
- Track 15 : Smarties\_62, Ariadne\_62
- Track 16 : Ramiel05\_53, Kowalski\_53, BrazzalePHS\_53
- Track 17 : Fireman\_56, RobsFeet\_57, Metamorphoo\_56
- Track 18 : Gina\_56, Teamocil\_56
- Track 19 : Megan\_52
- Track 20 : Honeyfin\_55, Yeti\_54
- Track 21 : Hermeonysus\_53, Onika\_53, PiperSansNom\_54
- Track 22 : Jefe\_54, CrazyRich\_53, Crisis\_55
- Track 23 : Ganandorf\_53, Piperis\_54, Phorgeous\_53
- Track 24 : PierreOrion\_54, Jollipop\_54
- Track 25 : Pulchra\_55
- Track 26 : Nicole72\_53
- Track 27 : Antares\_54, Quhwah\_57, Shotgun\_53, Savannah\_53
- Track 28 : KaiHaiDragon\_54
- Track 29 : ClearAsMud\_57, NoodlelyBoi\_55
- Track 30 : Paschalis\_53
- Track 31 : Matzah\_54
- Track 32 : Cressida\_55
- Track 33 : Kozie\_51
- Track 34 : Terij\_52
- Track 35 : MementoMori\_53
- Track 36 : Margaery\_51
- Track 37 : Blett\_41, Bush\_42

- Track 38 : Antuna\_42, Warren\_41, Dropshot\_41, MenE\_42
- Track 39 : Phonegingi\_41
- Track 40 : Appa\_41
- Track 41 : Pickles13\_40
- Track 42 : BigCheese\_67, Lewan\_68, BobsGarage\_67, Nicholasp3\_67, Vetric\_67
- Track 43 : Claus\_68, ZhongYanYuan\_66, DanBing\_68
- Track 44 : Miley16\_67, Wigglewiggle\_67, Gabriela\_64, Zakai\_68, Finemlucis\_67, GuuelaD\_66, Gardann\_68, MkaliMitinis3\_68, Breezona\_67, Sarshaun\_68, Itos\_66, LilDestine\_67, Rumpelstiltskin\_66, Wilder\_68, Loadrie\_66, Kahlid\_67, Hafay\_69, Winky\_67
- Track 45 : Bazzle\_67
- Track 46 : Crossroads\_67
- Track 47 : Tourach\_66
- Track 48 : Baoshan\_65
- Track 49 : DHan\_68
- Track 50 : Quby\_65, PYPDinur\_63, FarmResident\_67
- Track 51 : Douge\_65
- Track 52 : Douzhi\_65
- Track 53 : Bromden\_67
- Track 54 : Wildcat\_77, EniyanLRS\_168, MaryV\_77
- Track 55 : Azrael100\_76, Cosmo\_77
- Track 56 : ValentiniPuff\_101

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

The start number called the most often in the published annotations is 62, it was called in 38 of the 102 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Antares\_54, Antuna\_42, Appa\_41, Ariadne\_62, Blett\_41, BrazzalePHS\_53, Bush\_42, ClearAsMud\_57, Cranjis\_55, CrazyRich\_53, Crisis\_55, Dropshot\_41, Fireman\_56, Gina\_56, Hermeonysus\_53, Jefe\_54, Jollipop\_54, KaiHaiDragon\_54, Kowalski\_53, LittleFortune\_55, MenE\_42, Metamorphoo\_56, NoodlelyBoi\_55, Onika\_53, Paschalis\_53, Phonegingi\_41, Pickles13\_40, PierreOrion\_54, PiperSansNom\_54, Quhwah\_57, Ramiel05\_53, RobsFeet\_57, Savannah\_53, Scumberland\_55, Shotgun\_53, Smarties\_62, Teamocil\_56, Tyrumbra\_54, Warren\_41,

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

- 

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

- Amelia\_32, Andrew\_31, Azrael100\_76, Baoshan\_65, Bazzle\_67, Bedetta\_34, BigCheese\_67, BobsGarage\_67, Breezona\_67, Bromden\_67, Busephilis\_53, Claus\_68, Coral\_31, Cosmo\_77, Cote\_33, Cressida\_55, Crossroads\_67, DHan\_68, DanBing\_68, Daob\_33, Douge\_65, Douzhi\_65, EniyanLRS\_168, FarmResident\_67, Finemlucis\_67, Gabriela\_64, Ganandorf\_53, Gardann\_68, GuuelaD\_66, Hafay\_69, HannahPhantana\_32, Honeyfin\_55, Itos\_66, Juno112\_29, Kahlid\_67, Kepler\_32, Kozi\_51, Leona\_29, Lewan\_68, LilDestine\_67, LittleTokyo\_32, Loadrie\_66, Lunar\_32, Margaery\_51, MaryV\_77, Matzah\_54, Megan\_52, Melons\_32,

MementoMori\_53, Miley16\_67, MkaliMitinis3\_68, Nicholasp3\_67, Nicole72\_53, Octobien14\_72, PYPDinur\_63, Phorgeous\_53, Phrancesco\_54, Piperis\_54, Polka\_31, Pulchra\_55, Quby\_65, RedFox\_30, Renna12\_29, Rumpelstiltskin\_66, Sarshaun\_68, Terij\_52, Tourach\_66, ValentiniPuff\_101, Vetrix\_67, Wigglewigggle\_67, Wildcat\_77, Wilder\_68, Winky\_67, Yeti\_54, Zakai\_68, ZhongYanYuan\_66,

### Summary by start number:

#### Start 48:

- Found in 5 of 115 ( 4.3% ) of genes in pham
- Manual Annotations of this start: 1 of 102
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Douge\_65 (L4), Douzhi\_65 (L4), FarmResident\_67 (L4), PYPDinur\_63 (L4), Quby\_65 (L4),

#### Start 49:

- Found in 2 of 115 ( 1.7% ) of genes in pham
- Manual Annotations of this start: 1 of 102
- Called 50.0% of time when present
- Phage (with cluster) where this start called: Bromden\_67 (L4),

#### Start 50:

- Found in 5 of 115 ( 4.3% ) of genes in pham
- No Manual Annotations of this start.
- Called 20.0% of time when present
- Phage (with cluster) where this start called: DHan\_68 (L2),

#### Start 53:

- Found in 5 of 115 ( 4.3% ) of genes in pham
- Manual Annotations of this start: 5 of 102
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Azrael100\_76 (V), Cosmo\_77 (V), EniyanLRS\_168 (V), MaryV\_77 (V), Wildcat\_77 (V),

#### Start 54:

- Found in 16 of 115 ( 13.9% ) of genes in pham
- Manual Annotations of this start: 15 of 102
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Amelia\_32 (AS2), Andrew\_31 (AS3), Bedetta\_34 (AS2), Coral\_31 (AS2), Cote\_33 (AS2), Daob\_33 (AS2), HannahPhantana\_32 (AS2), Juno112\_29 (AS3), Kepler\_32 (AS2), Leona\_29 (AS3), LittleTokyo\_32 (AS2), Lunar\_32 (AS2), Melons\_32 (AS2), Polka\_31 (AS2), RedFox\_30 (AS3), Renna12\_29 (AS3),

#### Start 56:

- Found in 6 of 115 ( 5.2% ) of genes in pham
- Manual Annotations of this start: 1 of 102
- Called 16.7% of time when present
- Phage (with cluster) where this start called: Octobien14\_72 (DU1),

#### Start 58:

- Found in 1 of 115 ( 0.9% ) of genes in pham
- Manual Annotations of this start: 1 of 102

- Called 100.0% of time when present
- Phage (with cluster) where this start called: ValentiniPuff\_101 (singleton),

#### Start 59:

- Found in 32 of 115 ( 27.8% ) of genes in pham
- Manual Annotations of this start: 7 of 102
- Called 21.9% of time when present
- Phage (with cluster) where this start called: BigCheese\_67 (L2), BobsGarage\_67 (L2), Kozi\_51 (EI), Lewan\_68 (L2), Margaery\_51 (EI), Nicholas3\_67 (L2), Vetric\_67 (L2),

#### Start 60:

- Found in 8 of 115 ( 7.0% ) of genes in pham
- Manual Annotations of this start: 8 of 102
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Busephilis\_53 (EC), Ganandorf\_53 (EC), Honeyfin\_55 (EC), Phorgeous\_53 (EC), Phrancesco\_54 (EC), Piperis\_54 (EC), Pulchra\_55 (EC), Yeti\_54 (EC),

#### Start 61:

- Found in 4 of 115 ( 3.5% ) of genes in pham
- Manual Annotations of this start: 4 of 102
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Cressida\_55 (EI), Matzah\_54 (EI), MementoMori\_53 (EI), Terij\_52 (EI),

#### Start 62:

- Found in 39 of 115 ( 33.9% ) of genes in pham
- Manual Annotations of this start: 38 of 102
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Antares\_54 (EC), Antuna\_42 (GA), Appa\_41 (GA), Ariadne\_62 (EC), Blett\_41 (GA), BrazzalePHS\_53 (EC), Bush\_42 (GA), ClearAsMud\_57 (EC), Cranjis\_55 (EC), CrazyRich\_53 (EC), Crisis\_55 (EC), Dropshot\_41 (GA), Fireman\_56 (EC), Gina\_56 (EC), Hermeonysus\_53 (EC), Jefe\_54 (EC), Jollipop\_54 (EC), KaiHaiDragon\_54 (EC), Kowalski\_53 (EC), LittleFortune\_55 (EC), MenE\_42 (GA), Metamorphoo\_56 (EC), NoodlelyBoi\_55 (EC), Onika\_53 (EC), Paschalis\_53 (EC), Phonegingi\_41 (GA), Pickles13\_40 (GA), PierreOrion\_54 (EC), PiperSansNom\_54 (EC), Quhwah\_57 (EC), Ramiel05\_53 (EC), RobsFeet\_57 (EC), Savannah\_53 (EC), Scumberland\_55 (EC), Shotgun\_53 (EC), Smarties\_62 (EC), Teamocil\_56 (EC), Tyrumbra\_54 (EC), Warren\_41 (GA),

#### Start 63:

- Found in 2 of 115 ( 1.7% ) of genes in pham
- Manual Annotations of this start: 2 of 102
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Megan\_52 (EC), Nicole72\_53 (EC),

#### Start 64:

- Found in 1 of 115 ( 0.9% ) of genes in pham
- Manual Annotations of this start: 1 of 102
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Bazzle\_67 (L2),

Start 65:

- Found in 30 of 115 ( 26.1% ) of genes in pham
- Manual Annotations of this start: 18 of 102
- Called 80.0% of time when present
- Phage (with cluster) where this start called: Baoshan\_65 (L2), Breezona\_67 (L2), Claus\_68 (L2), Crossroads\_67 (L2), DanBing\_68 (L2), Finemlucis\_67 (L2), Gabriela\_64 (L2), Gardann\_68 (L2), GuuelaD\_66 (L2), Hafay\_69 (L2), Itos\_66 (L2), Kahlid\_67 (L2), LilDestine\_67 (L2), Loadrie\_66 (L2), Miley16\_67 (L2), MkaliMitinis3\_68 (L2), Rumpelstiltskin\_66 (L2), Sarshaun\_68 (L2), Tourach\_66 (L2), Wigglewiggles\_67 (L2), Wilder\_68 (L2), Winky\_67 (L2), Zakai\_68 (L2), ZhongYanYuan\_66 (L2),

### **Summary by clusters:**

There are 10 clusters represented in this pham: AS3, AS2, singleton, EI, EC, L4, L2, GA, V, DU1,

Info for manual annotations of cluster AS2:

- Start number 54 was manually annotated 10 times for cluster AS2.

Info for manual annotations of cluster AS3:

- Start number 54 was manually annotated 5 times for cluster AS3.

Info for manual annotations of cluster DU1:

- Start number 56 was manually annotated 1 time for cluster DU1.

Info for manual annotations of cluster EC:

- Start number 60 was manually annotated 8 times for cluster EC.
- Start number 62 was manually annotated 29 times for cluster EC.
- Start number 63 was manually annotated 2 times for cluster EC.

Info for manual annotations of cluster EI:

- Start number 59 was manually annotated 2 times for cluster EI.
- Start number 61 was manually annotated 4 times for cluster EI.

Info for manual annotations of cluster GA:

- Start number 62 was manually annotated 9 times for cluster GA.

Info for manual annotations of cluster L2:

- Start number 59 was manually annotated 5 times for cluster L2.
- Start number 64 was manually annotated 1 time for cluster L2.
- Start number 65 was manually annotated 18 times for cluster L2.

Info for manual annotations of cluster L4:

- Start number 48 was manually annotated 1 time for cluster L4.
- Start number 49 was manually annotated 1 time for cluster L4.

Info for manual annotations of cluster V:

- Start number 53 was manually annotated 5 times for cluster V.

### **Gene Information:**

Gene: Amelia\_32 Start: 21518, Stop: 21165, Start Num: 54  
Candidate Starts for Amelia\_32:  
(31, 21644), (36, 21605), (Start: 54 @21518 has 15 MA's), (77, 21389), (80, 21344), (92, 21224),

Gene: Andrew\_31 Start: 20815, Stop: 20462, Start Num: 54  
Candidate Starts for Andrew\_31:  
(2, 21166), (42, 20890), (Start: 54 @20815 has 15 MA's), (77, 20686), (92, 20521),

Gene: Antares\_54 Start: 35918, Stop: 36367, Start Num: 62  
Candidate Starts for Antares\_54:  
(Start: 62 @35918 has 38 MA's), (82, 36077), (90, 36182), (91, 36188), (100, 36245), (104, 36362),

Gene: Antuna\_42 Start: 25698, Stop: 26075, Start Num: 62  
Candidate Starts for Antuna\_42:  
(Start: 62 @25698 has 38 MA's), (72, 25761), (75, 25788), (90, 25962), (91, 25968), (95, 25989), (102, 26064),

Gene: Appa\_41 Start: 25620, Stop: 25997, Start Num: 62  
Candidate Starts for Appa\_41:  
(Start: 62 @25620 has 38 MA's), (72, 25683), (90, 25884), (91, 25890), (95, 25911), (102, 25986),

Gene: Ariadne\_62 Start: 37502, Stop: 37951, Start Num: 62  
Candidate Starts for Ariadne\_62:  
(52, 37460), (Start: 62 @37502 has 38 MA's), (71, 37553), (82, 37661), (90, 37766), (91, 37772), (104, 37946),

Gene: Azrael100\_76 Start: 48787, Stop: 49152, Start Num: 53  
Candidate Starts for Azrael100\_76:  
(43, 48724), (Start: 53 @48787 has 5 MA's), (83, 48979), (95, 49099), (99, 49132),

Gene: Baoshan\_65 Start: 46306, Stop: 46692, Start Num: 65  
Candidate Starts for Baoshan\_65:  
(30, 46120), (34, 46153), (50, 46249), (Start: 59 @46288 has 7 MA's), (Start: 65 @46306 has 18 MA's), (79, 46423), (82, 46450), (87, 46528), (103, 46675),

Gene: Bazzle\_67 Start: 46701, Stop: 47099, Start Num: 64  
Candidate Starts for Bazzle\_67:  
(Start: 64 @46701 has 1 MA's), (79, 46818), (82, 46845), (87, 46923), (91, 46956), (103, 47070),

Gene: Bedetta\_34 Start: 21656, Stop: 21303, Start Num: 54  
Candidate Starts for Bedetta\_34:  
(31, 21782), (36, 21743), (Start: 54 @21656 has 15 MA's), (77, 21527), (80, 21482), (92, 21362),

Gene: BigCheese\_67 Start: 46345, Stop: 46764, Start Num: 59  
Candidate Starts for BigCheese\_67:  
(21, 46084), (30, 46177), (Start: 59 @46345 has 7 MA's), (Start: 65 @46363 has 18 MA's), (79, 46480), (82, 46507), (87, 46585), (103, 46732),

Gene: Blett\_41 Start: 25800, Stop: 26177, Start Num: 62  
Candidate Starts for Blett\_41:  
(Start: 62 @25800 has 38 MA's), (72, 25863), (75, 25890), (81, 25956), (90, 26064), (91, 26070), (95, 26091), (102, 26166),



Gene: BobsGarage\_67 Start: 46345, Stop: 46764, Start Num: 59  
Candidate Starts for BobsGarage\_67:  
(21, 46084), (30, 46177), (Start: 59 @46345 has 7 MA's), (Start: 65 @46363 has 18 MA's), (79, 46480), (82, 46507), (87, 46585), (103, 46732),

Gene: BrazzalePHS\_53 Start: 35714, Stop: 36163, Start Num: 62  
Candidate Starts for BrazzalePHS\_53:  
(12, 35405), (13, 35408), (32, 35549), (41, 35621), (Start: 62 @35714 has 38 MA's), (90, 35978), (91, 35984), (100, 36041), (104, 36158),

Gene: Breezona\_67 Start: 46363, Stop: 46764, Start Num: 65  
Candidate Starts for Breezona\_67:  
(21, 46084), (30, 46177), (Start: 59 @46345 has 7 MA's), (Start: 65 @46363 has 18 MA's), (79, 46480), (82, 46507), (87, 46585), (103, 46732),

Gene: Bromden\_67 Start: 46292, Stop: 46696, Start Num: 49  
Candidate Starts for Bromden\_67:  
(17, 46049), (18, 46061), (23, 46079), (26, 46139), (40, 46238), (Start: 49 @46292 has 1 MA's), (79, 46415), (82, 46442), (98, 46601),

Gene: Busephilis\_53 Start: 35622, Stop: 36074, Start Num: 60  
Candidate Starts for Busephilis\_53:  
(Start: 60 @35622 has 8 MA's), (71, 35676), (82, 35784), (90, 35889), (100, 35952), (104, 36069),

Gene: Bush\_42 Start: 25748, Stop: 26125, Start Num: 62  
Candidate Starts for Bush\_42:  
(Start: 62 @25748 has 38 MA's), (72, 25811), (75, 25838), (81, 25904), (90, 26012), (91, 26018), (95, 26039), (102, 26114),

Gene: Claus\_68 Start: 46444, Stop: 46830, Start Num: 65  
Candidate Starts for Claus\_68:  
(30, 46258), (50, 46387), (Start: 59 @46426 has 7 MA's), (Start: 65 @46444 has 18 MA's), (79, 46561), (82, 46588), (87, 46666), (103, 46813),

Gene: ClearAsMud\_57 Start: 36175, Stop: 36624, Start Num: 62  
Candidate Starts for ClearAsMud\_57:  
(10, 35857), (24, 35944), (25, 35962), (38, 36061), (46, 36115), (Start: 62 @36175 has 38 MA's), (82, 36334), (84, 36370), (88, 36424), (90, 36439), (91, 36445), (100, 36502), (104, 36619),

Gene: Coral\_31 Start: 21357, Stop: 21004, Start Num: 54  
Candidate Starts for Coral\_31:  
(31, 21483), (36, 21444), (Start: 54 @21357 has 15 MA's), (77, 21228), (80, 21183), (92, 21063),

Gene: Cosmo\_77 Start: 48788, Stop: 49153, Start Num: 53  
Candidate Starts for Cosmo\_77:  
(43, 48725), (Start: 53 @48788 has 5 MA's), (83, 48980), (95, 49100), (99, 49133),

Gene: Cote\_33 Start: 21834, Stop: 21481, Start Num: 54  
Candidate Starts for Cote\_33:  
(31, 21960), (36, 21921), (Start: 54 @21834 has 15 MA's), (77, 21705), (80, 21660), (92, 21540),

Gene: Cranjis\_55 Start: 35873, Stop: 36322, Start Num: 62  
Candidate Starts for Cranjis\_55:

(3, 35447), (12, 35564), (13, 35567), (32, 35708), (41, 35780), (Start: 62 @35873 has 38 MA's), (90, 36137), (91, 36143), (100, 36200), (104, 36317),

Gene: CrazyRich\_53 Start: 35682, Stop: 36131, Start Num: 62

Candidate Starts for CrazyRich\_53:

(12, 35373), (13, 35376), (32, 35517), (41, 35589), (Start: 62 @35682 has 38 MA's), (82, 35841), (90, 35946), (91, 35952), (100, 36009), (104, 36126),

Gene: Cressida\_55 Start: 36599, Stop: 36934, Start Num: 61

Candidate Starts for Cressida\_55:

(4, 36272), (5, 36275), (8, 36281), (11, 36305), (14, 36314), (46, 36542), (Start: 56 @36587 has 1 MA's), (57, 36590), (Start: 61 @36599 has 4 MA's), (67, 36626), (78, 36716), (79, 36734), (85, 36809), (87, 36839), (90, 36866),

Gene: Crisis\_55 Start: 35673, Stop: 36122, Start Num: 62

Candidate Starts for Crisis\_55:

(12, 35364), (13, 35367), (32, 35508), (41, 35580), (Start: 62 @35673 has 38 MA's), (82, 35832), (90, 35937), (91, 35943), (100, 36000), (104, 36117),

Gene: Crossroads\_67 Start: 46441, Stop: 46839, Start Num: 65

Candidate Starts for Crossroads\_67:

(21, 46162), (30, 46255), (Start: 59 @46423 has 7 MA's), (Start: 65 @46441 has 18 MA's), (82, 46585), (87, 46663), (103, 46810),

Gene: DHan\_68 Start: 46287, Stop: 46730, Start Num: 50

Candidate Starts for DHan\_68:

(30, 46158), (50, 46287), (Start: 59 @46326 has 7 MA's), (Start: 65 @46344 has 18 MA's), (79, 46461), (82, 46488), (87, 46566), (103, 46713),

Gene: DanBing\_68 Start: 46313, Stop: 46699, Start Num: 65

Candidate Starts for DanBing\_68:

(30, 46127), (50, 46256), (Start: 59 @46295 has 7 MA's), (Start: 65 @46313 has 18 MA's), (79, 46430), (82, 46457), (87, 46535), (103, 46682),

Gene: Daob\_33 Start: 21852, Stop: 21499, Start Num: 54

Candidate Starts for Daob\_33:

(31, 21978), (36, 21939), (Start: 54 @21852 has 15 MA's), (77, 21723), (92, 21558),

Gene: Douge\_65 Start: 45034, Stop: 45432, Start Num: 48

Candidate Starts for Douge\_65:

(39, 44974), (45, 45007), (Start: 48 @45034 has 1 MA's), (79, 45151), (82, 45178), (98, 45337),

Gene: Douzhi\_65 Start: 45087, Stop: 45485, Start Num: 48

Candidate Starts for Douzhi\_65:

(Start: 48 @45087 has 1 MA's), (82, 45231), (98, 45390),

Gene: Dropshot\_41 Start: 25455, Stop: 25832, Start Num: 62

Candidate Starts for Dropshot\_41:

(Start: 62 @25455 has 38 MA's), (72, 25518), (75, 25545), (90, 25719), (91, 25725), (95, 25746), (102, 25821),

Gene: EniyanLRS\_168 Start: 48527, Stop: 48892, Start Num: 53

Candidate Starts for EniyanLRS\_168:

(43, 48464), (Start: 53 @48527 has 5 MA's), (83, 48719), (95, 48839), (99, 48872),

Gene: FarmResident\_67 Start: 45043, Stop: 45441, Start Num: 48

Candidate Starts for FarmResident\_67:

(Start: 48 @45043 has 1 MA's), (79, 45160), (82, 45187), (98, 45346),

Gene: Finemlucis\_67 Start: 46684, Stop: 47085, Start Num: 65

Candidate Starts for Finemlucis\_67:

(21, 46405), (30, 46498), (Start: 59 @46666 has 7 MA's), (Start: 65 @46684 has 18 MA's), (79, 46801), (82, 46828), (87, 46906), (103, 47053),

Gene: Fireman\_56 Start: 37569, Stop: 38018, Start Num: 62

Candidate Starts for Fireman\_56:

(Start: 62 @37569 has 38 MA's), (71, 37620), (82, 37728), (90, 37833), (91, 37839), (104, 38013),

Gene: Gabriela\_64 Start: 44813, Stop: 45211, Start Num: 65

Candidate Starts for Gabriela\_64:

(21, 44534), (30, 44627), (Start: 59 @44795 has 7 MA's), (Start: 65 @44813 has 18 MA's), (79, 44930), (82, 44957), (87, 45035), (103, 45182),

Gene: Ganandorf\_53 Start: 35703, Stop: 36155, Start Num: 60

Candidate Starts for Ganandorf\_53:

(Start: 60 @35703 has 8 MA's), (71, 35757), (82, 35865), (90, 35970), (91, 35976), (100, 36033), (104, 36150),

Gene: Gardann\_68 Start: 46399, Stop: 46797, Start Num: 65

Candidate Starts for Gardann\_68:

(21, 46120), (30, 46213), (Start: 59 @46381 has 7 MA's), (Start: 65 @46399 has 18 MA's), (79, 46516), (82, 46543), (87, 46621), (103, 46768),

Gene: Gina\_56 Start: 35677, Stop: 36126, Start Num: 62

Candidate Starts for Gina\_56:

(52, 35638), (Start: 62 @35677 has 38 MA's), (71, 35728), (82, 35836), (90, 35941), (91, 35947), (101, 36025),

Gene: GuuelaD\_66 Start: 46478, Stop: 46879, Start Num: 65

Candidate Starts for GuuelaD\_66:

(21, 46199), (30, 46292), (Start: 59 @46460 has 7 MA's), (Start: 65 @46478 has 18 MA's), (79, 46595), (82, 46622), (87, 46700), (103, 46847),

Gene: Hafay\_69 Start: 46467, Stop: 46868, Start Num: 65

Candidate Starts for Hafay\_69:

(21, 46188), (30, 46281), (Start: 59 @46449 has 7 MA's), (Start: 65 @46467 has 18 MA's), (79, 46584), (82, 46611), (87, 46689), (103, 46836),

Gene: HannahPhantana\_32 Start: 21514, Stop: 21161, Start Num: 54

Candidate Starts for HannahPhantana\_32:

(31, 21640), (36, 21601), (Start: 54 @21514 has 15 MA's), (77, 21385), (80, 21340), (92, 21220),

Gene: Hermeonysus\_53 Start: 35602, Stop: 36051, Start Num: 62

Candidate Starts for Hermeonysus\_53:

(Start: 62 @35602 has 38 MA's), (82, 35761), (90, 35866), (100, 35929), (104, 36046),

Gene: Honeyfin\_55 Start: 35891, Stop: 36343, Start Num: 60

Candidate Starts for Honeyfin\_55:

(Start: 60 @35891 has 8 MA's), (71, 35945), (78, 36008), (82, 36053), (90, 36158), (91, 36164), (100, 36221), (104, 36338),

Gene: Itos\_66 Start: 45269, Stop: 45670, Start Num: 65

Candidate Starts for Itos\_66:

(21, 44990), (30, 45083), (Start: 59 @45251 has 7 MA's), (Start: 65 @45269 has 18 MA's), (79, 45386), (82, 45413), (87, 45491), (103, 45638),

Gene: Jefe\_54 Start: 35660, Stop: 36109, Start Num: 62

Candidate Starts for Jefe\_54:

(12, 35351), (13, 35354), (32, 35495), (41, 35567), (Start: 62 @35660 has 38 MA's), (82, 35819), (90, 35924), (91, 35930), (100, 35987), (104, 36104),

Gene: Jollipop\_54 Start: 35999, Stop: 36448, Start Num: 62

Candidate Starts for Jollipop\_54:

(3, 35573), (12, 35690), (13, 35693), (32, 35834), (41, 35906), (Start: 62 @35999 has 38 MA's), (78, 36113), (82, 36158), (90, 36263), (91, 36269), (100, 36326), (104, 36443),

Gene: Juno112\_29 Start: 20872, Stop: 20519, Start Num: 54

Candidate Starts for Juno112\_29:

(1, 21274), (15, 21124), (42, 20929), (Start: 54 @20872 has 15 MA's), (66, 20839), (77, 20743),

Gene: Kahlid\_67 Start: 46369, Stop: 46770, Start Num: 65

Candidate Starts for Kahlid\_67:

(21, 46090), (30, 46183), (Start: 59 @46351 has 7 MA's), (Start: 65 @46369 has 18 MA's), (79, 46486), (82, 46513), (87, 46591), (103, 46738),

Gene: KaiHaiDragon\_54 Start: 35596, Stop: 36045, Start Num: 62

Candidate Starts for KaiHaiDragon\_54:

(Start: 62 @35596 has 38 MA's), (88, 35845), (90, 35860), (91, 35866), (100, 35923), (104, 36040),

Gene: Kepler\_32 Start: 21801, Stop: 21448, Start Num: 54

Candidate Starts for Kepler\_32:

(31, 21927), (36, 21888), (Start: 54 @21801 has 15 MA's), (77, 21672), (92, 21507),

Gene: Kowalski\_53 Start: 35709, Stop: 36158, Start Num: 62

Candidate Starts for Kowalski\_53:

(12, 35400), (13, 35403), (32, 35544), (41, 35616), (Start: 62 @35709 has 38 MA's), (90, 35973), (91, 35979), (100, 36036), (104, 36153),

Gene: Kozie\_51 Start: 36191, Stop: 36532, Start Num: 59

Candidate Starts for Kozie\_51:

(27, 35999), (35, 36059), (Start: 49 @36149 has 1 MA's), (Start: 59 @36191 has 7 MA's), (87, 36437), (91, 36470), (96, 36497),

Gene: Leona\_29 Start: 20943, Stop: 20590, Start Num: 54

Candidate Starts for Leona\_29:

(15, 21195), (42, 21000), (Start: 54 @20943 has 15 MA's), (66, 20910), (77, 20814), (82, 20763),

Gene: Lewan\_68 Start: 46405, Stop: 46821, Start Num: 59

Candidate Starts for Lewan\_68:

(21, 46144), (30, 46237), (Start: 59 @46405 has 7 MA's), (Start: 65 @46423 has 18 MA's), (79, 46540), (82, 46567), (87, 46645), (103, 46792),

Gene: LilDestine\_67 Start: 46396, Stop: 46797, Start Num: 65

Candidate Starts for LilDestine\_67:

(21, 46117), (30, 46210), (Start: 59 @46378 has 7 MA's), (Start: 65 @46396 has 18 MA's), (79, 46513), (82, 46540), (87, 46618), (103, 46765),

Gene: LittleFortune\_55 Start: 35965, Stop: 36414, Start Num: 62

Candidate Starts for LittleFortune\_55:

(3, 35539), (12, 35656), (13, 35659), (32, 35800), (41, 35872), (Start: 62 @35965 has 38 MA's), (90, 36229), (91, 36235), (100, 36292), (104, 36409),

Gene: LittleTokyo\_32 Start: 21633, Stop: 21280, Start Num: 54

Candidate Starts for LittleTokyo\_32:

(Start: 54 @21633 has 15 MA's), (74, 21528), (77, 21504),

Gene: Loadrie\_66 Start: 46451, Stop: 46849, Start Num: 65

Candidate Starts for Loadrie\_66:

(21, 46172), (30, 46265), (Start: 59 @46433 has 7 MA's), (Start: 65 @46451 has 18 MA's), (79, 46568), (82, 46595), (87, 46673), (103, 46820),

Gene: Lunar\_32 Start: 21502, Stop: 21149, Start Num: 54

Candidate Starts for Lunar\_32:

(31, 21628), (36, 21589), (Start: 54 @21502 has 15 MA's), (77, 21373), (80, 21328), (92, 21208),

Gene: Margaery\_51 Start: 36177, Stop: 36518, Start Num: 59

Candidate Starts for Margaery\_51:

(6, 35859), (7, 35862), (9, 35868), (14, 35898), (19, 35925), (20, 35928), (46, 36120), (55, 36165), (Start: 56 @36168 has 1 MA's), (Start: 59 @36177 has 7 MA's), (67, 36210), (78, 36300), (79, 36318), (85, 36393), (86, 36417), (87, 36423), (96, 36483),

Gene: MaryV\_77 Start: 48609, Stop: 48974, Start Num: 53

Candidate Starts for MaryV\_77:

(43, 48546), (Start: 53 @48609 has 5 MA's), (83, 48801), (95, 48921), (99, 48954),

Gene: Matzah\_54 Start: 37029, Stop: 37364, Start Num: 61

Candidate Starts for Matzah\_54:

(Start: 56 @37017 has 1 MA's), (57, 37020), (Start: 61 @37029 has 4 MA's), (67, 37056), (73, 37113), (79, 37164), (85, 37239), (87, 37269), (89, 37290), (96, 37329),

Gene: Megan\_52 Start: 39265, Stop: 39606, Start Num: 63

Candidate Starts for Megan\_52:

(4, 38917), (16, 38971), (20, 38992), (22, 39001), (28, 39076), (29, 39088), (33, 39103), (37, 39136), (40, 39160), (44, 39175), (51, 39217), (Start: 63 @39265 has 2 MA's), (70, 39298), (86, 39493), (87, 39499), (90, 39526), (91, 39532), (93, 39550),

Gene: Melons\_32 Start: 21502, Stop: 21149, Start Num: 54

Candidate Starts for Melons\_32:

(31, 21628), (36, 21589), (Start: 54 @21502 has 15 MA's), (77, 21373), (80, 21328), (92, 21208),

Gene: MementoMori\_53 Start: 36606, Stop: 36941, Start Num: 61

Candidate Starts for MementoMori\_53:

(6, 36288), (7, 36291), (9, 36297), (14, 36327), (19, 36354), (20, 36357), (46, 36549), (Start: 56 @36594 has 1 MA's), (57, 36597), (Start: 61 @36606 has 4 MA's), (67, 36633), (79, 36741), (85, 36816), (87, 36846), (89, 36867), (96, 36906),

Gene: MenE\_42 Start: 25720, Stop: 26097, Start Num: 62

Candidate Starts for MenE\_42:

(Start: 62 @25720 has 38 MA's), (72, 25783), (75, 25810), (90, 25984), (91, 25990), (95, 26011), (102, 26086),

Gene: Metamorphoo\_56 Start: 36831, Stop: 37280, Start Num: 62

Candidate Starts for Metamorphoo\_56:

(Start: 62 @36831 has 38 MA's), (71, 36882), (82, 36990), (90, 37095), (91, 37101), (104, 37275),

Gene: Miley16\_67 Start: 46363, Stop: 46764, Start Num: 65

Candidate Starts for Miley16\_67:

(21, 46084), (30, 46177), (Start: 59 @46345 has 7 MA's), (Start: 65 @46363 has 18 MA's), (79, 46480), (82, 46507), (87, 46585), (103, 46732),

Gene: MkaliMitinis3\_68 Start: 46435, Stop: 46833, Start Num: 65

Candidate Starts for MkaliMitinis3\_68:

(21, 46156), (30, 46249), (Start: 59 @46417 has 7 MA's), (Start: 65 @46435 has 18 MA's), (79, 46552), (82, 46579), (87, 46657), (103, 46804),

Gene: Nicholasp3\_67 Start: 46381, Stop: 46797, Start Num: 59

Candidate Starts for Nicholasp3\_67:

(21, 46120), (30, 46213), (Start: 59 @46381 has 7 MA's), (Start: 65 @46399 has 18 MA's), (79, 46516), (82, 46543), (87, 46621), (103, 46768),

Gene: Nicole72\_53 Start: 39892, Stop: 40239, Start Num: 63

Candidate Starts for Nicole72\_53:

(47, 39826), (51, 39844), (Start: 63 @39892 has 2 MA's), (84, 40084), (90, 40153), (91, 40159),

Gene: NoodlelyBoi\_55 Start: 36387, Stop: 36836, Start Num: 62

Candidate Starts for NoodlelyBoi\_55:

(10, 36069), (24, 36156), (25, 36174), (38, 36273), (46, 36327), (Start: 62 @36387 has 38 MA's), (82, 36546), (84, 36582), (88, 36636), (90, 36651), (91, 36657), (100, 36714), (104, 36831),

Gene: Octobien14\_72 Start: 45181, Stop: 45522, Start Num: 56

Candidate Starts for Octobien14\_72:

(Start: 56 @45181 has 1 MA's), (76, 45283), (80, 45337), (87, 45421),

Gene: Onika\_53 Start: 35684, Stop: 36133, Start Num: 62

Candidate Starts for Onika\_53:

(Start: 62 @35684 has 38 MA's), (82, 35843), (90, 35948), (100, 36011), (104, 36128),

Gene: PYPDinur\_63 Start: 45117, Stop: 45515, Start Num: 48

Candidate Starts for PYPDinur\_63:

(Start: 48 @45117 has 1 MA's), (79, 45234), (82, 45261), (98, 45420),

Gene: Paschalis\_53 Start: 35691, Stop: 36140, Start Num: 62

Candidate Starts for Paschalis\_53:

(Start: 62 @35691 has 38 MA's), (76, 35790), (82, 35850), (90, 35955), (91, 35961), (100, 36018), (104, 36135),

Gene: Phonegingi\_41 Start: 25666, Stop: 26043, Start Num: 62

Candidate Starts for Phonegingi\_41:

(Start: 62 @25666 has 38 MA's), (72, 25729), (75, 25756), (87, 25903), (90, 25930), (91, 25936), (97, 25966), (102, 26032),

Gene: Phorgeous\_53 Start: 35522, Stop: 35974, Start Num: 60

Candidate Starts for Phorgeous\_53:

(Start: 60 @35522 has 8 MA's), (71, 35576), (82, 35684), (90, 35789), (91, 35795), (100, 35852), (104, 35969),

Gene: Phrancesco\_54 Start: 35812, Stop: 36264, Start Num: 60

Candidate Starts for Phrancesco\_54:

(Start: 60 @35812 has 8 MA's), (71, 35866), (82, 35974), (90, 36079), (100, 36142), (104, 36259),

Gene: Pickles13\_40 Start: 25930, Stop: 26307, Start Num: 62

Candidate Starts for Pickles13\_40:

(Start: 62 @25930 has 38 MA's), (75, 26020), (90, 26194), (91, 26200), (95, 26221), (102, 26296),

Gene: PierreOrion\_54 Start: 35858, Stop: 36307, Start Num: 62

Candidate Starts for PierreOrion\_54:

(3, 35432), (12, 35549), (13, 35552), (32, 35693), (41, 35765), (Start: 62 @35858 has 38 MA's), (78, 35972), (82, 36017), (90, 36122), (91, 36128), (100, 36185), (104, 36302),

Gene: PiperSansNom\_54 Start: 35998, Stop: 36447, Start Num: 62

Candidate Starts for PiperSansNom\_54:

(Start: 62 @35998 has 38 MA's), (82, 36157), (90, 36262), (100, 36325), (104, 36442),

Gene: Piperis\_54 Start: 35645, Stop: 36097, Start Num: 60

Candidate Starts for Piperis\_54:

(Start: 60 @35645 has 8 MA's), (71, 35699), (82, 35807), (90, 35912), (91, 35918), (100, 35975), (104, 36092),

Gene: Polka\_31 Start: 21366, Stop: 21013, Start Num: 54

Candidate Starts for Polka\_31:

(31, 21492), (36, 21453), (Start: 54 @21366 has 15 MA's), (77, 21237), (80, 21192), (92, 21072),

Gene: Pulchra\_55 Start: 36042, Stop: 36494, Start Num: 60

Candidate Starts for Pulchra\_55:

(Start: 60 @36042 has 8 MA's), (71, 36096), (78, 36159), (82, 36204), (90, 36309), (100, 36372), (104, 36489),

Gene: Quby\_65 Start: 45009, Stop: 45407, Start Num: 48

Candidate Starts for Quby\_65:

(Start: 48 @45009 has 1 MA's), (79, 45126), (82, 45153), (98, 45312),

Gene: Quhwah\_57 Start: 36306, Stop: 36755, Start Num: 62

Candidate Starts for Quhwah\_57:

(Start: 62 @36306 has 38 MA's), (82, 36465), (90, 36570), (91, 36576), (100, 36633), (104, 36750),

Gene: Ramiel05\_53 Start: 35709, Stop: 36158, Start Num: 62

Candidate Starts for Ramiel05\_53:

(12, 35400), (13, 35403), (32, 35544), (41, 35616), (Start: 62 @35709 has 38 MA's), (90, 35973), (91, 35979), (100, 36036), (104, 36153),

Gene: RedFox\_30 Start: 20869, Stop: 20516, Start Num: 54

Candidate Starts for RedFox\_30:

(1, 21271), (15, 21121), (42, 20926), (Start: 54 @20869 has 15 MA's), (66, 20836), (77, 20740),

Gene: Renna12\_29 Start: 20890, Stop: 20534, Start Num: 54

Candidate Starts for Renna12\_29:

(Start: 54 @20890 has 15 MA's), (66, 20857), (77, 20761), (92, 20596),

Gene: RobsFeet\_57 Start: 37130, Stop: 37579, Start Num: 62

Candidate Starts for RobsFeet\_57:

(Start: 62 @37130 has 38 MA's), (71, 37181), (82, 37289), (90, 37394), (91, 37400), (104, 37574),

Gene: Rumpelstiltskin\_66 Start: 45792, Stop: 46190, Start Num: 65

Candidate Starts for Rumpelstiltskin\_66:

(21, 45513), (30, 45606), (Start: 59 @45774 has 7 MA's), (Start: 65 @45792 has 18 MA's), (79, 45909), (82, 45936), (87, 46014), (103, 46161),

Gene: Sarshaun\_68 Start: 46459, Stop: 46857, Start Num: 65

Candidate Starts for Sarshaun\_68:

(21, 46180), (30, 46273), (Start: 59 @46441 has 7 MA's), (Start: 65 @46459 has 18 MA's), (79, 46576), (82, 46603), (87, 46681), (103, 46828),

Gene: Savannah\_53 Start: 35736, Stop: 36185, Start Num: 62

Candidate Starts for Savannah\_53:

(Start: 62 @35736 has 38 MA's), (82, 35895), (90, 36000), (91, 36006), (100, 36063), (104, 36180),

Gene: Scumberland\_55 Start: 35931, Stop: 36380, Start Num: 62

Candidate Starts for Scumberland\_55:

(3, 35505), (12, 35622), (13, 35625), (32, 35766), (41, 35838), (Start: 62 @35931 has 38 MA's), (90, 36195), (91, 36201), (100, 36258), (104, 36375),

Gene: Shotgun\_53 Start: 35535, Stop: 35984, Start Num: 62

Candidate Starts for Shotgun\_53:

(Start: 62 @35535 has 38 MA's), (82, 35694), (90, 35799), (91, 35805), (100, 35862), (104, 35979),

Gene: Smarties\_62 Start: 37502, Stop: 37951, Start Num: 62

Candidate Starts for Smarties\_62:

(52, 37460), (Start: 62 @37502 has 38 MA's), (71, 37553), (82, 37661), (90, 37766), (91, 37772), (104, 37946),

Gene: Teamocil\_56 Start: 35776, Stop: 36225, Start Num: 62

Candidate Starts for Teamocil\_56:

(52, 35737), (Start: 62 @35776 has 38 MA's), (71, 35827), (82, 35935), (90, 36040), (91, 36046), (101, 36124),

Gene: Terij\_52 Start: 35668, Stop: 36003, Start Num: 61

Candidate Starts for Terij\_52:

(3, 35263), (6, 35347), (7, 35350), (9, 35356), (19, 35413), (20, 35416), (46, 35608), (Start: 56 @35656 has 1 MA's), (57, 35659), (Start: 61 @35668 has 4 MA's), (78, 35785), (79, 35803), (90, 35935), (96, 35968),



Gene: Tourach\_66 Start: 46445, Stop: 46831, Start Num: 65

Candidate Starts for Tourach\_66:

(30, 46259), (Start: 59 @46427 has 7 MA's), (Start: 65 @46445 has 18 MA's), (79, 46562), (82, 46589), (87, 46667), (103, 46814),

Gene: Tyrumbra\_54 Start: 36909, Stop: 37358, Start Num: 62

Candidate Starts for Tyrumbra\_54:

(Start: 62 @36909 has 38 MA's), (71, 36960), (82, 37068), (90, 37173), (100, 37236), (104, 37353),

Gene: ValentiniPuff\_101 Start: 57583, Stop: 57990, Start Num: 58

Candidate Starts for ValentiniPuff\_101:

(Start: 58 @57583 has 1 MA's), (68, 57622), (69, 57628), (81, 57748), (94, 57883), (102, 57961),

Gene: Vetric\_67 Start: 46385, Stop: 46804, Start Num: 59

Candidate Starts for Vetric\_67:

(21, 46124), (30, 46217), (Start: 59 @46385 has 7 MA's), (Start: 65 @46403 has 18 MA's), (79, 46520), (82, 46547), (87, 46625), (103, 46772),

Gene: Warren\_41 Start: 25673, Stop: 26050, Start Num: 62

Candidate Starts for Warren\_41:

(Start: 62 @25673 has 38 MA's), (72, 25736), (75, 25763), (90, 25937), (91, 25943), (95, 25964), (102, 26039),

Gene: Wigglewigg\_67 Start: 46423, Stop: 46821, Start Num: 65

Candidate Starts for Wigglewigg\_67:

(21, 46144), (30, 46237), (Start: 59 @46405 has 7 MA's), (Start: 65 @46423 has 18 MA's), (79, 46540), (82, 46567), (87, 46645), (103, 46792),

Gene: Wildcat\_77 Start: 48619, Stop: 48984, Start Num: 53

Candidate Starts for Wildcat\_77:

(43, 48556), (Start: 53 @48619 has 5 MA's), (83, 48811), (95, 48931), (99, 48964),

Gene: Wilder\_68 Start: 46369, Stop: 46770, Start Num: 65

Candidate Starts for Wilder\_68:

(21, 46090), (30, 46183), (Start: 59 @46351 has 7 MA's), (Start: 65 @46369 has 18 MA's), (79, 46486), (82, 46513), (87, 46591), (103, 46738),

Gene: Winky\_67 Start: 46363, Stop: 46764, Start Num: 65

Candidate Starts for Winky\_67:

(21, 46084), (30, 46177), (Start: 59 @46345 has 7 MA's), (Start: 65 @46363 has 18 MA's), (79, 46480), (82, 46507), (87, 46585), (103, 46732),

Gene: Yeti\_54 Start: 35678, Stop: 36130, Start Num: 60

Candidate Starts for Yeti\_54:

(Start: 60 @35678 has 8 MA's), (71, 35732), (78, 35795), (82, 35840), (90, 35945), (91, 35951), (100, 36008), (104, 36125),

Gene: Zakai\_68 Start: 46689, Stop: 47090, Start Num: 65

Candidate Starts for Zakai\_68:

(21, 46410), (30, 46503), (Start: 59 @46671 has 7 MA's), (Start: 65 @46689 has 18 MA's), (79, 46806), (82, 46833), (87, 46911), (103, 47058),

Gene: ZhongYanYuan\_66 Start: 46258, Stop: 46644, Start Num: 65

Candidate Starts for ZhongYanYuan\_66:

(30, 46072), (50, 46201), (Start: 59 @46240 has 7 MA's), (Start: 65 @46258 has 18 MA's), (79, 46375), (82, 46402), (87, 46480), (103, 46627),