



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 224502 Report

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

Pham number 224502 has 83 members, 21 are drafts.

Phages represented in each track:

- Track 1 : GiKK\_10
- Track 2 : SteamedHams\_9, Tolls\_9, CanesSauce\_7, AndPeggy\_6, BillDoor\_9, Yarn\_6, ChocoMunchkin\_7
- Track 3 : CherryonLim\_8, SheckWes\_6, MAnor\_7, Mayweather\_8, Pons\_7
- Track 4 : Blondies\_7, SweatNTears\_9, Biskit\_8, Horseradish\_8, MScarn\_9, Troje\_7, SketchMex\_6, Buttrmlkdreams\_7, Yummy\_8
- Track 5 : Hexbug\_9
- Track 6 : Nodigi\_9, Orla\_9
- Track 7 : RanchParmCat\_10
- Track 8 : HippoPololi\_9
- Track 9 : GoldHunter\_8, RedBaron\_8, Quasar\_7, PsychoKiller\_7, Sopespian\_7, Socotra\_8, ChickenTender\_9, Agatha\_7, Starburst\_8, Burnsey\_7, Typhonomachy\_8, MunkgeeRoachy\_7, Elliott\_7, Carsonalex\_8, Axym\_7
- Track 10 : BigChungus\_6, Lauer\_6, Feastonyeet\_6
- Track 11 : KayGee\_7, Elinal\_8
- Track 12 : Gibbous\_7, Cleo\_7, Dre3\_7
- Track 13 : MaVan\_9
- Track 14 : Fribs8\_8
- Track 15 : Amok\_6, Emalyn\_6, GTE2\_05, AikoCarson\_6
- Track 16 : Vine\_8, Yucky\_9, Bavailard\_7, SummitAcademy\_6, PotPie\_7
- Track 17 : Cozz\_7
- Track 18 : Yakult\_8
- Track 19 : Nibbles\_9, Survivors\_9
- Track 20 : Button\_8
- Track 21 : Jamzy\_10
- Track 22 : Margaret\_10
- Track 23 : Nina\_8
- Track 24 : Zareef\_10
- Track 25 : Azira\_9
- Track 26 : Kuwabara\_5, Crater\_5, Apricot\_5, BearBQ\_5, MortyNRick\_5, Birdsong\_5
- Track 27 : Jankie\_5
- Track 28 : BaileyBlu\_5
- Track 29 : CallinAllBarbz\_5
- Track 30 : Neuville\_7, AnnabelLee\_7
- Track 31 : DS6A\_10

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

The start number called the most often in the published annotations is 24, it was called in 26 of the 62 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Agatha\_7, AikoCarson\_6, Amok\_6, AndPeggy\_6, Axym\_7, Bavidard\_7, BillDoor\_9, Biskit\_8, Blondies\_7, Burnsey\_7, Buttrmlkdreams\_7, CanesSauce\_7, Carsonalex\_8, ChickenTender\_9, ChocoMunchkin\_7, Cozz\_7, Elliott\_7, Emalyn\_6, GTE2\_05, GoldHunter\_8, Horseradish\_8, MScarn\_9, MunkgeeRoachy\_7, Nina\_8, PotPie\_7, PsychoKiller\_7, Quasar\_7, RedBaron\_8, SketchMex\_6, Socotra\_8, Sopespian\_7, Starburst\_8, SteamedHams\_9, SummitAcademy\_6, SweatNTears\_9, Tolls\_9, Troje\_7, Typhonomachy\_8, Vine\_8, Yarn\_6, Yucky\_9, Yummy\_8,

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

- BigChungus\_6, Feastonyeet\_6, Lauer\_6,

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

- AnnabelLee\_7, Apricot\_5, Azira\_9, BaileyBlu\_5, BearBQ\_5, Birdsong\_5, Button\_8, CallinAllBarbz\_5, CherryonLim\_8, Cleo\_7, Crater\_5, DS6A\_10, Dre3\_7, Elinal\_8, Fribs8\_8, GiKK\_10, Gibbous\_7, Hexbug\_9, HippoPololi\_9, Jamzy\_10, Jankie\_5, KayGee\_7, Kuwabara\_5, MAnor\_7, MaVan\_9, Margaret\_10, Mayweather\_8, MortyNRick\_5, Neuville\_7, Nibbles\_9, Nodigi\_9, Orla\_9, Pons\_7, RanchParmCat\_10, SheckWes\_6, Survivors\_9, Yakult\_8, Zareef\_10,

## **Summary by start number:**

Start 9:

- Found in 1 of 83 ( 1.2% ) of genes in pham
- Manual Annotations of this start: 1 of 62
- Called 100.0% of time when present
- Phage (with cluster) where this start called: DS6A\_10 (singleton),

Start 11:

- Found in 14 of 83 ( 16.9% ) of genes in pham
- Manual Annotations of this start: 3 of 62
- Called 21.4% of time when present
- Phage (with cluster) where this start called: BigChungus\_6 (CT), Feastonyeet\_6 (CT), Lauer\_6 (CT),

Start 12:

- Found in 7 of 83 ( 8.4% ) of genes in pham
- Manual Annotations of this start: 5 of 62
- Called 71.4% of time when present
- Phage (with cluster) where this start called: Azira\_9 (CT), HippoPololi\_9 (CT), MaVan\_9 (CT), Nibbles\_9 (CT), Survivors\_9 (CT),

Start 13:

- Found in 6 of 83 ( 7.2% ) of genes in pham
- Manual Annotations of this start: 5 of 62
- Called 100.0% of time when present

- Phage (with cluster) where this start called: Apricot\_5 (DN3), BearBQ\_5 (DN), Birdsong\_5 (DN), Crater\_5 (DN3), Kuwabara\_5 (DN4), MortyNRick\_5 (DN),

#### Start 14:

- Found in 7 of 83 ( 8.4% ) of genes in pham
- Manual Annotations of this start: 1 of 62
- Called 14.3% of time when present
- Phage (with cluster) where this start called: Fribs8\_8 (CT),

#### Start 16:

- Found in 2 of 83 ( 2.4% ) of genes in pham
- No Manual Annotations of this start.
- Called 100.0% of time when present
- Phage (with cluster) where this start called: AnnabelLee\_7 (FR), Neuville\_7 (FR),

#### Start 17:

- Found in 8 of 83 ( 9.6% ) of genes in pham
- Manual Annotations of this start: 8 of 62
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Button\_8 (CT), GiKK\_10 (CT), Hexbug\_9 (CT), Jamzy\_10 (CT), Margaret\_10 (CT), Nodigi\_9 (CT), Orla\_9 (CT), RanchParmCat\_10 (CT),

#### Start 18:

- Found in 10 of 83 ( 12.0% ) of genes in pham
- Manual Annotations of this start: 3 of 62
- Called 40.0% of time when present
- Phage (with cluster) where this start called: Cleo\_7 (CT), Dre3\_7 (CT), Gibbous\_7 (CT), Zareef\_10 (CT),

#### Start 19:

- Found in 1 of 83 ( 1.2% ) of genes in pham
- Manual Annotations of this start: 1 of 62
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Yakult\_8 (CT),

#### Start 21:

- Found in 2 of 83 ( 2.4% ) of genes in pham
- Manual Annotations of this start: 2 of 62
- Called 100.0% of time when present
- Phage (with cluster) where this start called: BaileyBlu\_5 (FP), CallinAllBarbz\_5 (FP),

#### Start 23:

- Found in 8 of 83 ( 9.6% ) 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: CherryonLim\_8 (CT), Elinal\_8 (CT), Jankie\_5 (FP), KayGee\_7 (CT), MAnor\_7 (CT), Mayweather\_8 (CT), Pons\_7 (CT), ShekWes\_6 (CT),

#### Start 24:

- Found in 45 of 83 ( 54.2% ) of genes in pham
- Manual Annotations of this start: 26 of 62

- Called 93.3% of time when present
- Phage (with cluster) where this start called: Agatha\_7 (CT), AikoCarson\_6 (CT), Amok\_6 (CT), AndPeggy\_6 (CT), Axym\_7 (CT), Bavidard\_7 (CT), BillDoor\_9 (CT), Biskit\_8 (CT), Blondies\_7 (CT), Burnsey\_7 (CT), Buttrmlkdreams\_7 (CT), CanesSauce\_7 (CT), Carsonalex\_8 (CT), ChickenTender\_9 (CT), ChocoMunchkin\_7 (CT), Cozz\_7 (CT), Elliott\_7 (CT), Emalyn\_6 (CT), GTE2\_05 (CT), GoldHunter\_8 (CT), Horseradish\_8 (CT), MScarn\_9 (CT), MunkgeeRoachy\_7 (CT), Nina\_8 (CT), PotPie\_7 (CT), PsychoKiller\_7 (CT), Quasar\_7 (CT), RedBaron\_8 (CT), SketchMex\_6 (CT), Socotra\_8 (CT), Sopespian\_7 (CT), Starburst\_8 (CT), SteamedHams\_9 (CT), SummitAcademy\_6 (CT), SweatNTears\_9 (CT), Tolls\_9 (CT), Troje\_7 (CT), Typhonomachy\_8 (CT), Vine\_8 (CT), Yarn\_6 (CT), Yucky\_9 (CT), Yummy\_8 (CT),

### **Summary by clusters:**

There are 7 clusters represented in this pham: FP, DN, FR, singleton, DN4, DN3, CT,

Info for manual annotations of cluster CT:

- Start number 11 was manually annotated 3 times for cluster CT.
- Start number 12 was manually annotated 5 times for cluster CT.
- Start number 14 was manually annotated 1 time for cluster CT.
- Start number 17 was manually annotated 8 times for cluster CT.
- Start number 18 was manually annotated 3 times for cluster CT.
- Start number 19 was manually annotated 1 time for cluster CT.
- Start number 23 was manually annotated 7 times for cluster CT.
- Start number 24 was manually annotated 26 times for cluster CT.

Info for manual annotations of cluster DN:

- Start number 13 was manually annotated 2 times for cluster DN.

Info for manual annotations of cluster DN3:

- Start number 13 was manually annotated 2 times for cluster DN3.

Info for manual annotations of cluster DN4:

- Start number 13 was manually annotated 1 time for cluster DN4.

Info for manual annotations of cluster FP:

- Start number 21 was manually annotated 2 times for cluster FP.

### **Gene Information:**

Gene: Agatha\_7 Start: 4894, Stop: 5358, Start Num: 24

Candidate Starts for Agatha\_7:

(Start: 24 @4894 has 26 MA's), (37, 5125), (52, 5329),

Gene: AikoCarson\_6 Start: 4622, Stop: 5080, Start Num: 24

Candidate Starts for AikoCarson\_6:

(Start: 24 @4622 has 26 MA's), (28, 4748), (37, 4853), (52, 5054),

Gene: Amok\_6 Start: 4623, Stop: 5081, Start Num: 24

Candidate Starts for Amok\_6:

(Start: 24 @4623 has 26 MA's), (28, 4749), (37, 4854), (52, 5055),

Gene: AndPeggy\_6 Start: 4931, Stop: 5392, Start Num: 24

Candidate Starts for AndPeggy\_6:

(Start: 24 @4931 has 26 MA's), (28, 5057), (37, 5162), (45, 5207), (52, 5363),

Gene: AnnabelLee\_7 Start: 4967, Stop: 5473, Start Num: 16

Candidate Starts for AnnabelLee\_7:

(16, 4967), (30, 5153), (39, 5246),

Gene: Apricot\_5 Start: 4287, Stop: 4802, Start Num: 13

Candidate Starts for Apricot\_5:

(Start: 11 @4278 has 3 MA's), (Start: 13 @4287 has 5 MA's), (29, 4479), (43, 4629),

Gene: Axym\_7 Start: 4894, Stop: 5358, Start Num: 24

Candidate Starts for Axym\_7:

(Start: 24 @4894 has 26 MA's), (37, 5125), (52, 5329),

Gene: Azira\_9 Start: 5719, Stop: 6273, Start Num: 12

Candidate Starts for Azira\_9:

(4, 5557), (8, 5683), (Start: 12 @5719 has 5 MA's), (Start: 14 @5740 has 1 MA's), (Start: 18 @5761 has 3 MA's), (40, 6073), (41, 6076), (53, 6250), (54, 6253),

Gene: BaileyBlu\_5 Start: 4160, Stop: 4618, Start Num: 21

Candidate Starts for BaileyBlu\_5:

(Start: 21 @4160 has 2 MA's), (51, 4547),

Gene: Bavilard\_7 Start: 5413, Stop: 5847, Start Num: 24

Candidate Starts for Bavilard\_7:

(6, 5278), (Start: 11 @5344 has 3 MA's), (Start: 24 @5413 has 26 MA's), (25, 5443), (33, 5602), (48, 5731),

Gene: BearBQ\_5 Start: 4287, Stop: 4802, Start Num: 13

Candidate Starts for BearBQ\_5:

(Start: 11 @4278 has 3 MA's), (Start: 13 @4287 has 5 MA's), (29, 4479), (43, 4629),

Gene: BigChungus\_6 Start: 4593, Stop: 5096, Start Num: 11

Candidate Starts for BigChungus\_6:

(6, 4527), (Start: 11 @4593 has 3 MA's), (Start: 24 @4662 has 26 MA's), (25, 4692), (33, 4851), (48, 4980),

Gene: BillDoor\_9 Start: 4896, Stop: 5357, Start Num: 24

Candidate Starts for BillDoor\_9:

(Start: 24 @4896 has 26 MA's), (28, 5022), (37, 5127), (45, 5172), (52, 5328),

Gene: Birdsong\_5 Start: 4287, Stop: 4802, Start Num: 13

Candidate Starts for Birdsong\_5:

(Start: 11 @4278 has 3 MA's), (Start: 13 @4287 has 5 MA's), (29, 4479), (43, 4629),

Gene: Biskit\_8 Start: 4888, Stop: 5349, Start Num: 24

Candidate Starts for Biskit\_8:

(Start: 24 @4888 has 26 MA's), (37, 5119), (42, 5152), (52, 5320),

Gene: Blondies\_7 Start: 4889, Stop: 5350, Start Num: 24  
Candidate Starts for Blondies\_7:  
(Start: 24 @4889 has 26 MA's), (37, 5120), (42, 5153), (52, 5321),

Gene: Burnsey\_7 Start: 4894, Stop: 5358, Start Num: 24  
Candidate Starts for Burnsey\_7:  
(Start: 24 @4894 has 26 MA's), (37, 5125), (52, 5329),

Gene: Button\_8 Start: 4950, Stop: 5435, Start Num: 17  
Candidate Starts for Button\_8:  
(7, 4845), (Start: 17 @4950 has 8 MA's), (26, 5034), (35, 5208), (44, 5253), (50, 5355), (52, 5406), (54, 5415),

Gene: Buttrmlkdreams\_7 Start: 4889, Stop: 5350, Start Num: 24  
Candidate Starts for Buttrmlkdreams\_7:  
(Start: 24 @4889 has 26 MA's), (37, 5120), (42, 5153), (52, 5321),

Gene: CallinAllBarbz\_5 Start: 4163, Stop: 4621, Start Num: 21  
Candidate Starts for CallinAllBarbz\_5:  
(10, 4088), (Start: 21 @4163 has 2 MA's), (47, 4499),

Gene: CanesSauce\_7 Start: 4931, Stop: 5392, Start Num: 24  
Candidate Starts for CanesSauce\_7:  
(Start: 24 @4931 has 26 MA's), (28, 5057), (37, 5162), (45, 5207), (52, 5363),

Gene: Carsonalex\_8 Start: 4951, Stop: 5415, Start Num: 24  
Candidate Starts for Carsonalex\_8:  
(Start: 24 @4951 has 26 MA's), (37, 5182), (52, 5386),

Gene: CherryonLim\_8 Start: 5387, Stop: 5818, Start Num: 23  
Candidate Starts for CherryonLim\_8:  
(20, 5372), (Start: 23 @5387 has 7 MA's), (25, 5414), (32, 5564), (33, 5573), (48, 5702),

Gene: ChickenTender\_9 Start: 4942, Stop: 5406, Start Num: 24  
Candidate Starts for ChickenTender\_9:  
(Start: 24 @4942 has 26 MA's), (37, 5173), (52, 5377),

Gene: ChocoMunchkin\_7 Start: 4931, Stop: 5392, Start Num: 24  
Candidate Starts for ChocoMunchkin\_7:  
(Start: 24 @4931 has 26 MA's), (28, 5057), (37, 5162), (45, 5207), (52, 5363),

Gene: Cleo\_7 Start: 5059, Stop: 5571, Start Num: 18  
Candidate Starts for Cleo\_7:  
(Start: 18 @5059 has 3 MA's), (36, 5332), (38, 5344), (40, 5371), (53, 5548), (54, 5551),

Gene: Cozz\_7 Start: 4895, Stop: 5359, Start Num: 24  
Candidate Starts for Cozz\_7:  
(6, 4757), (Start: 24 @4895 has 26 MA's), (37, 5126), (52, 5330),

Gene: Crater\_5 Start: 4287, Stop: 4802, Start Num: 13  
Candidate Starts for Crater\_5:  
(Start: 11 @4278 has 3 MA's), (Start: 13 @4287 has 5 MA's), (29, 4479), (43, 4629),

Gene: DS6A\_10 Start: 7559, Stop: 8122, Start Num: 9  
Candidate Starts for DS6A\_10:  
(Start: 9 @7559 has 1 MA's), (31, 7835), (34, 7868), (54, 8105),

Gene: Dre3\_7 Start: 5006, Stop: 5518, Start Num: 18  
Candidate Starts for Dre3\_7:  
(Start: 18 @5006 has 3 MA's), (36, 5279), (38, 5291), (40, 5318), (53, 5495), (54, 5498),

Gene: Elinal\_8 Start: 4639, Stop: 5073, Start Num: 23  
Candidate Starts for Elinal\_8:  
(20, 4624), (Start: 23 @4639 has 7 MA's), (25, 4669), (33, 4828), (48, 4957),

Gene: Elliott\_7 Start: 4894, Stop: 5358, Start Num: 24  
Candidate Starts for Elliott\_7:  
(Start: 24 @4894 has 26 MA's), (37, 5125), (52, 5329),

Gene: Emalyn\_6 Start: 4622, Stop: 5080, Start Num: 24  
Candidate Starts for Emalyn\_6:  
(Start: 24 @4622 has 26 MA's), (28, 4748), (37, 4853), (52, 5054),

Gene: Feastonyeet\_6 Start: 4593, Stop: 5096, Start Num: 11  
Candidate Starts for Feastonyeet\_6:  
(6, 4527), (Start: 11 @4593 has 3 MA's), (Start: 24 @4662 has 26 MA's), (25, 4692), (33, 4851), (48, 4980),

Gene: Fribs8\_8 Start: 5534, Stop: 6073, Start Num: 14  
Candidate Starts for Fribs8\_8:  
(Start: 12 @5513 has 5 MA's), (Start: 14 @5534 has 1 MA's), (15, 5549), (Start: 18 @5555 has 3 MA's), (36, 5834), (38, 5846), (40, 5873), (53, 6050), (54, 6053),

Gene: GTE2\_05 Start: 4581, Stop: 5042, Start Num: 24  
Candidate Starts for GTE2\_05:  
(Start: 24 @4581 has 26 MA's), (28, 4707), (37, 4812), (52, 5013),

Gene: GiKK\_10 Start: 5253, Stop: 5738, Start Num: 17  
Candidate Starts for GiKK\_10:  
(7, 5148), (Start: 17 @5253 has 8 MA's), (26, 5337), (35, 5511), (44, 5556), (49, 5646), (50, 5658), (52, 5709), (54, 5718),

Gene: Gibbous\_7 Start: 5006, Stop: 5518, Start Num: 18  
Candidate Starts for Gibbous\_7:  
(Start: 18 @5006 has 3 MA's), (36, 5279), (38, 5291), (40, 5318), (53, 5495), (54, 5498),

Gene: GoldHunter\_8 Start: 4894, Stop: 5358, Start Num: 24  
Candidate Starts for GoldHunter\_8:  
(Start: 24 @4894 has 26 MA's), (37, 5125), (52, 5329),

Gene: Hexbug\_9 Start: 5939, Stop: 6421, Start Num: 17  
Candidate Starts for Hexbug\_9:  
(Start: 17 @5939 has 8 MA's), (26, 6020), (44, 6239), (50, 6341), (52, 6392), (54, 6401),

Gene: HippoPololi\_9 Start: 5605, Stop: 6162, Start Num: 12  
Candidate Starts for HippoPololi\_9:



(Start: 12 @5605 has 5 MA's), (Start: 14 @5626 has 1 MA's), (Start: 18 @5647 has 3 MA's), (38, 5935), (40, 5962), (53, 6139), (54, 6142),

Gene: Horseradish\_8 Start: 4795, Stop: 5256, Start Num: 24  
Candidate Starts for Horseradish\_8:  
(Start: 24 @4795 has 26 MA's), (37, 5026), (42, 5059), (52, 5227),

Gene: Jamzy\_10 Start: 5261, Stop: 5749, Start Num: 17  
Candidate Starts for Jamzy\_10:  
(5, 5141), (7, 5156), (Start: 17 @5261 has 8 MA's), (26, 5348), (35, 5522), (44, 5567), (49, 5657), (50, 5669), (52, 5720), (54, 5729),

Gene: Jankie\_5 Start: 4178, Stop: 4630, Start Num: 23  
Candidate Starts for Jankie\_5:  
(Start: 23 @4178 has 7 MA's), (38, 4409),

Gene: KayGee\_7 Start: 4639, Stop: 5073, Start Num: 23  
Candidate Starts for KayGee\_7:  
(20, 4624), (Start: 23 @4639 has 7 MA's), (25, 4669), (33, 4828), (48, 4957),

Gene: Kuwabara\_5 Start: 4287, Stop: 4802, Start Num: 13  
Candidate Starts for Kuwabara\_5:  
(Start: 11 @4278 has 3 MA's), (Start: 13 @4287 has 5 MA's), (29, 4479), (43, 4629),

Gene: Lauer\_6 Start: 4623, Stop: 5126, Start Num: 11  
Candidate Starts for Lauer\_6:  
(6, 4557), (Start: 11 @4623 has 3 MA's), (Start: 24 @4692 has 26 MA's), (25, 4722), (33, 4881), (48, 5010),

Gene: MAnor\_7 Start: 4636, Stop: 5067, Start Num: 23  
Candidate Starts for MAnor\_7:  
(20, 4621), (Start: 23 @4636 has 7 MA's), (25, 4663), (32, 4813), (33, 4822), (48, 4951),

Gene: MScarn\_9 Start: 4889, Stop: 5350, Start Num: 24  
Candidate Starts for MScarn\_9:  
(Start: 24 @4889 has 26 MA's), (37, 5120), (42, 5153), (52, 5321),

Gene: MaVan\_9 Start: 5719, Stop: 6273, Start Num: 12  
Candidate Starts for MaVan\_9:  
(8, 5683), (Start: 12 @5719 has 5 MA's), (Start: 14 @5740 has 1 MA's), (Start: 18 @5761 has 3 MA's), (40, 6073), (41, 6076), (53, 6250), (54, 6253),

Gene: Margaret\_10 Start: 5637, Stop: 6125, Start Num: 17  
Candidate Starts for Margaret\_10:  
(5, 5517), (7, 5532), (Start: 17 @5637 has 8 MA's), (26, 5724), (27, 5796), (35, 5898), (44, 5943), (46, 5952), (50, 6045), (52, 6096), (54, 6105),

Gene: Mayweather\_8 Start: 5257, Stop: 5688, Start Num: 23  
Candidate Starts for Mayweather\_8:  
(20, 5242), (Start: 23 @5257 has 7 MA's), (25, 5284), (32, 5434), (33, 5443), (48, 5572),

Gene: MortyNRick\_5 Start: 4287, Stop: 4802, Start Num: 13  
Candidate Starts for MortyNRick\_5:

(Start: 11 @4278 has 3 MA's), (Start: 13 @4287 has 5 MA's), (29, 4479), (43, 4629),

Gene: MunkgeeRoachy\_7 Start: 4942, Stop: 5406, Start Num: 24

Candidate Starts for MunkgeeRoachy\_7:

(Start: 24 @4942 has 26 MA's), (37, 5173), (52, 5377),

Gene: Neuville\_7 Start: 4967, Stop: 5473, Start Num: 16

Candidate Starts for Neuville\_7:

(16, 4967), (30, 5153), (39, 5246),

Gene: Nibbles\_9 Start: 5719, Stop: 6273, Start Num: 12

Candidate Starts for Nibbles\_9:

(8, 5683), (Start: 12 @5719 has 5 MA's), (Start: 14 @5740 has 1 MA's), (Start: 18 @5761 has 3 MA's), (53, 6250), (54, 6253),

Gene: Nina\_8 Start: 5928, Stop: 6392, Start Num: 24

Candidate Starts for Nina\_8:

(20, 5910), (22, 5922), (Start: 24 @5928 has 26 MA's), (37, 6159), (52, 6363),

Gene: Nodigi\_9 Start: 5940, Stop: 6416, Start Num: 17

Candidate Starts for Nodigi\_9:

(Start: 17 @5940 has 8 MA's), (26, 6015), (44, 6234), (46, 6243), (50, 6336), (52, 6387), (54, 6396),

Gene: Orla\_9 Start: 5939, Stop: 6421, Start Num: 17

Candidate Starts for Orla\_9:

(Start: 17 @5939 has 8 MA's), (26, 6020), (44, 6239), (46, 6248), (50, 6341), (52, 6392), (54, 6401),

Gene: Pons\_7 Start: 4636, Stop: 5067, Start Num: 23

Candidate Starts for Pons\_7:

(20, 4621), (Start: 23 @4636 has 7 MA's), (25, 4663), (32, 4813), (33, 4822), (48, 4951),

Gene: PotPie\_7 Start: 5496, Stop: 5930, Start Num: 24

Candidate Starts for PotPie\_7:

(6, 5361), (Start: 11 @5427 has 3 MA's), (Start: 24 @5496 has 26 MA's), (25, 5526), (33, 5685), (48, 5814),

Gene: PsychoKiller\_7 Start: 4894, Stop: 5358, Start Num: 24

Candidate Starts for PsychoKiller\_7:

(Start: 24 @4894 has 26 MA's), (37, 5125), (52, 5329),

Gene: Quasar\_7 Start: 5515, Stop: 5979, Start Num: 24

Candidate Starts for Quasar\_7:

(Start: 24 @5515 has 26 MA's), (37, 5746), (52, 5950),

Gene: RanchParmCat\_10 Start: 5637, Stop: 6125, Start Num: 17

Candidate Starts for RanchParmCat\_10:

(5, 5517), (7, 5532), (Start: 17 @5637 has 8 MA's), (26, 5724), (27, 5796), (35, 5898), (46, 5952), (49, 6033), (50, 6045), (52, 6096), (54, 6105),

Gene: RedBaron\_8 Start: 4939, Stop: 5403, Start Num: 24

Candidate Starts for RedBaron\_8:

(Start: 24 @4939 has 26 MA's), (37, 5170), (52, 5374),

Gene: SheckWes\_6 Start: 4636, Stop: 5067, Start Num: 23  
Candidate Starts for SheckWes\_6:  
(20, 4621), (Start: 23 @4636 has 7 MA's), (25, 4663), (32, 4813), (33, 4822), (48, 4951),

Gene: SketchMex\_6 Start: 4888, Stop: 5349, Start Num: 24  
Candidate Starts for SketchMex\_6:  
(Start: 24 @4888 has 26 MA's), (37, 5119), (42, 5152), (52, 5320),

Gene: Socotra\_8 Start: 4894, Stop: 5358, Start Num: 24  
Candidate Starts for Socotra\_8:  
(Start: 24 @4894 has 26 MA's), (37, 5125), (52, 5329),

Gene: Sopespian\_7 Start: 4894, Stop: 5358, Start Num: 24  
Candidate Starts for Sopespian\_7:  
(Start: 24 @4894 has 26 MA's), (37, 5125), (52, 5329),

Gene: Starburst\_8 Start: 4894, Stop: 5358, Start Num: 24  
Candidate Starts for Starburst\_8:  
(Start: 24 @4894 has 26 MA's), (37, 5125), (52, 5329),

Gene: SteamedHams\_9 Start: 4931, Stop: 5392, Start Num: 24  
Candidate Starts for SteamedHams\_9:  
(Start: 24 @4931 has 26 MA's), (28, 5057), (37, 5162), (45, 5207), (52, 5363),

Gene: SummitAcademy\_6 Start: 4711, Stop: 5145, Start Num: 24  
Candidate Starts for SummitAcademy\_6:  
(6, 4576), (Start: 11 @4642 has 3 MA's), (Start: 24 @4711 has 26 MA's), (25, 4741), (33, 4900), (48, 5029),

Gene: Survivors\_9 Start: 5573, Stop: 6127, Start Num: 12  
Candidate Starts for Survivors\_9:  
(8, 5537), (Start: 12 @5573 has 5 MA's), (Start: 14 @5594 has 1 MA's), (Start: 18 @5615 has 3 MA's), (53, 6104), (54, 6107),

Gene: SweatNTears\_9 Start: 5415, Stop: 5876, Start Num: 24  
Candidate Starts for SweatNTears\_9:  
(Start: 24 @5415 has 26 MA's), (37, 5646), (42, 5679), (52, 5847),

Gene: Tolls\_9 Start: 4935, Stop: 5396, Start Num: 24  
Candidate Starts for Tolls\_9:  
(Start: 24 @4935 has 26 MA's), (28, 5061), (37, 5166), (45, 5211), (52, 5367),

Gene: Troje\_7 Start: 4889, Stop: 5350, Start Num: 24  
Candidate Starts for Troje\_7:  
(Start: 24 @4889 has 26 MA's), (37, 5120), (42, 5153), (52, 5321),

Gene: Typhonomachy\_8 Start: 4894, Stop: 5358, Start Num: 24  
Candidate Starts for Typhonomachy\_8:  
(Start: 24 @4894 has 26 MA's), (37, 5125), (52, 5329),

Gene: Vine\_8 Start: 5635, Stop: 6069, Start Num: 24  
Candidate Starts for Vine\_8:

(6, 5500), (Start: 11 @5566 has 3 MA's), (Start: 24 @5635 has 26 MA's), (25, 5665), (33, 5824), (48, 5953),

Gene: Yakult\_8 Start: 4830, Stop: 5309, Start Num: 19

Candidate Starts for Yakult\_8:

(1, 4506), (2, 4521), (3, 4545), (4, 4617), (8, 4743), (Start: 19 @4830 has 1 MA's), (26, 4905), (44, 5124), (46, 5133), (53, 5286),

Gene: Yarn\_6 Start: 4925, Stop: 5386, Start Num: 24

Candidate Starts for Yarn\_6:

(Start: 24 @4925 has 26 MA's), (28, 5051), (37, 5156), (45, 5201), (52, 5357),

Gene: Yucky\_9 Start: 5496, Stop: 5930, Start Num: 24

Candidate Starts for Yucky\_9:

(6, 5361), (Start: 11 @5427 has 3 MA's), (Start: 24 @5496 has 26 MA's), (25, 5526), (33, 5685), (48, 5814),

Gene: Yummy\_8 Start: 4795, Stop: 5256, Start Num: 24

Candidate Starts for Yummy\_8:

(Start: 24 @4795 has 26 MA's), (37, 5026), (42, 5059), (52, 5227),

Gene: Zareef\_10 Start: 5762, Stop: 6274, Start Num: 18

Candidate Starts for Zareef\_10:

(8, 5684), (Start: 12 @5720 has 5 MA's), (Start: 14 @5741 has 1 MA's), (Start: 18 @5762 has 3 MA's), (40, 6074), (41, 6077), (53, 6251), (54, 6254),