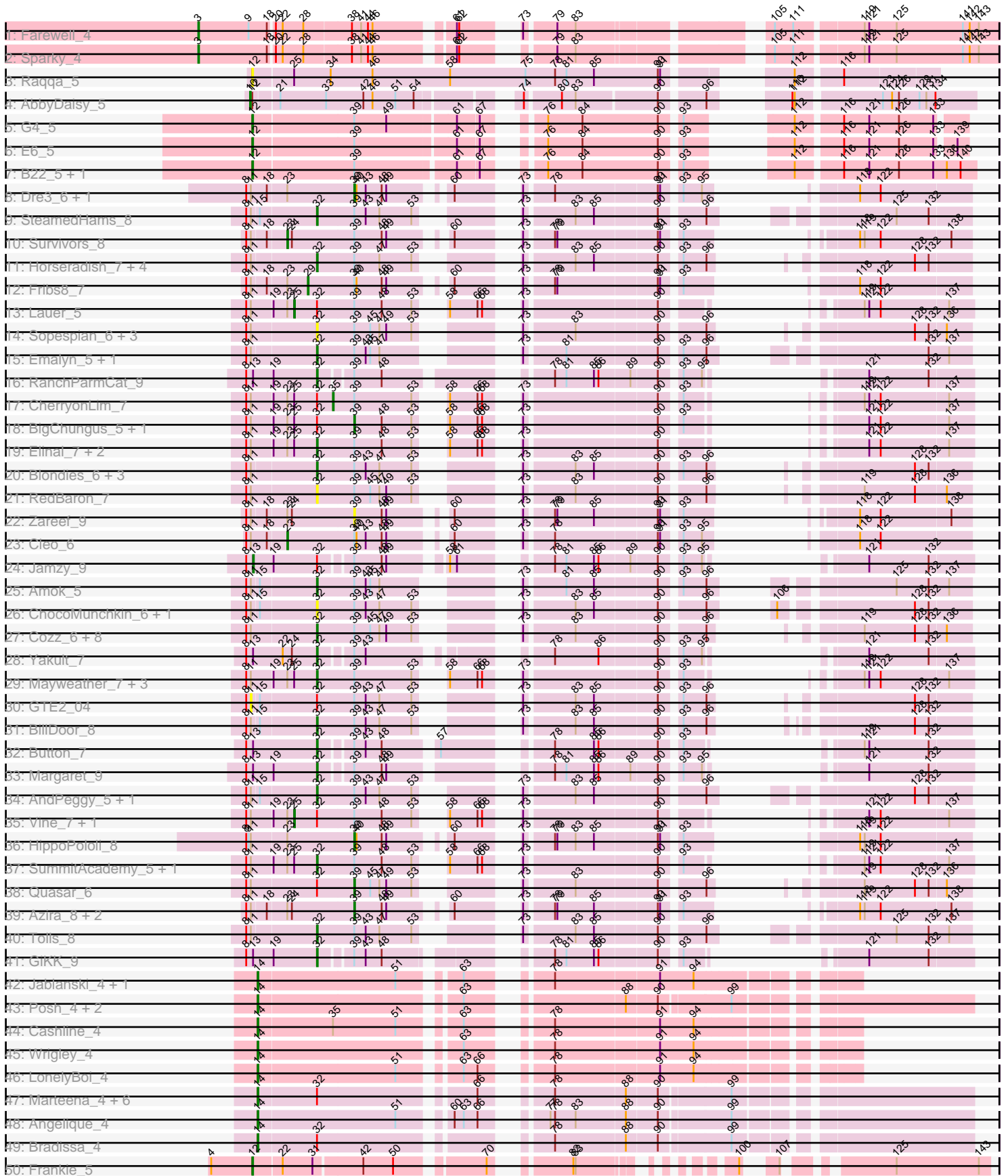
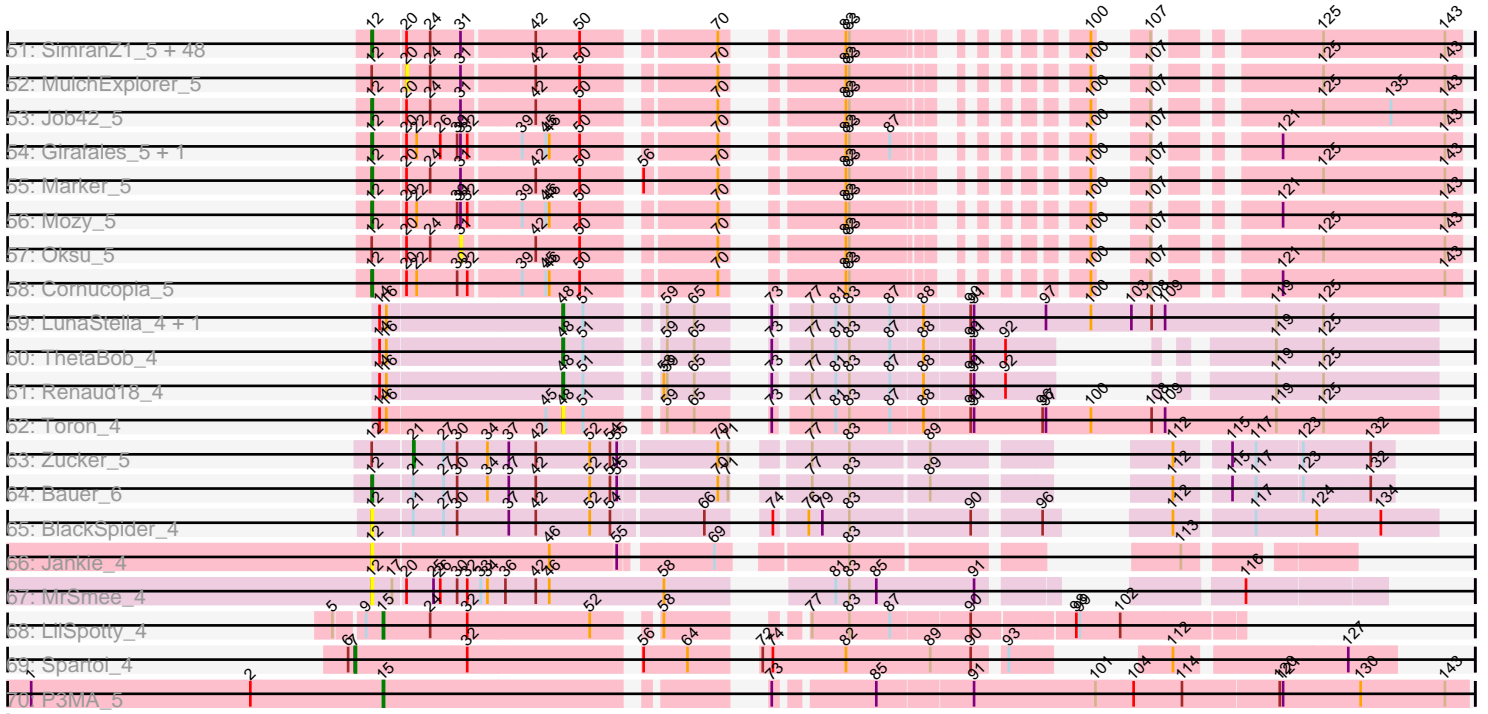


Pham 202723



# Pham 202723



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 202723 Report

This analysis was run 01/18/25 on database version 583.

Pham number 202723 has 162 members, 26 are drafts.

Phages represented in each track:

- Track 1 : Farewell\_4
- Track 2 : Sparky\_4
- Track 3 : Raqqa\_5
- Track 4 : AbbyDaisy\_5
- Track 5 : G4\_5
- Track 6 : E6\_5
- Track 7 : B22\_5, Doucette\_5
- Track 8 : Dre3\_6, Gibbous\_6
- Track 9 : SteamedHams\_8
- Track 10 : Survivors\_8
- Track 11 : Horseradish\_7, SweatNTears\_8, Biskit\_7, SketchMex\_5, Yummy\_7
- Track 12 : Fribs8\_7
- Track 13 : Lauer\_5
- Track 14 : Sopespian\_6, Carsonalex\_7, PsychoKiller\_6, Elliott\_6
- Track 15 : Emalyn\_5, AikoCarson\_5
- Track 16 : RanchParmCat\_9
- Track 17 : CherryonLim\_7
- Track 18 : BigChungus\_5, Feastonyeet\_5
- Track 19 : Elinal\_7, KayGee\_6, Bavidard\_6
- Track 20 : Blondies\_6, MScarn\_8, Troje\_6, Buttrmlkdreams\_6
- Track 21 : RedBaron\_7
- Track 22 : Zareef\_9
- Track 23 : Cleo\_6
- Track 24 : Jamzy\_9
- Track 25 : Amok\_5
- Track 26 : ChocoMunchkin\_6, CanesSauce\_6
- Track 27 : Cozz\_6, ChickenTender\_8, MunkgeeRoachy\_6, Agatha\_6, Typhonmachy\_7, GoldHunter\_7, Starburst\_7, Burnsey\_6, Axym\_6
- Track 28 : Yakult\_7
- Track 29 : Mayweather\_7, SheckWes\_5, MAnor\_6, Pons\_6
- Track 30 : GTE2\_04
- Track 31 : BillDoor\_8
- Track 32 : Button\_7
- Track 33 : Margaret\_9
- Track 34 : AndPeggy\_5, Yarn\_5
- Track 35 : Vine\_7, Yucky\_8
- Track 36 : HippoPololi\_8

- Track 37 : SummitAcademy\_5, PotPie\_6
- Track 38 : Quasar\_6
- Track 39 : Azira\_8, Nibbles\_8, MaVan\_8
- Track 40 : Tolls\_8
- Track 41 : GiKK\_9
- Track 42 : Jablanski\_4, Pytheas\_4
- Track 43 : Posh\_4, BeeGee\_4, Confidence\_4
- Track 44 : Cashline\_4
- Track 45 : Wrigley\_4
- Track 46 : LonelyBoi\_4
- Track 47 : Marteena\_4, EnalisNailo\_4, EMSquaredA\_4, Floral\_4, BritBrat\_4, Lilas\_4, Pollux\_4
- Track 48 : Angelique\_4
- Track 49 : Bradissa\_4
- Track 50 : Frankie\_5
- Track 51 : SimranZ1\_5, TootsiePop\_5, Leozinho\_5, Spikelee\_5, OwlsT2W\_5, Plumbus\_5, Alexphander\_5, Coco12\_5, BigPhil\_5, Bobi\_5, Beakin\_5, Kingsley\_5, Lorde\_5, RockyHorror\_5, Seagreen\_5, Boomer\_5, Enby\_5, BuzzLyseyear\_5, Aloeri\_5, Rialto\_5, JalFarm20\_5, Starceвич\_5, ChickenDinner\_5, Juice456\_5, DirtMcgirt\_5, Stap\_5, Piper2020\_5, Cerasum\_5, Ramsey\_5, Drago\_5, Hegedechwinu\_5, LittleShirley\_5, DocMcStuffins\_5, Pollywog\_5, Madiba\_5, Sarma624\_5, DosHalletts\_5, Brushbloom\_5, Mova\_5, Flathead\_5, UncleRicky\_5, DaWorst\_5, Kimberlium\_5, Awesomesauce\_5, Squirty\_5, Misha28\_5, Totinger\_5, Velveteen\_5, Tootsieroll\_5
- Track 52 : MulchExplorer\_5
- Track 53 : Job42\_5
- Track 54 : Girafales\_5, Quico\_5
- Track 55 : Marker\_5
- Track 56 : Mozy\_5
- Track 57 : Oksu\_5
- Track 58 : Cornucopia\_5
- Track 59 : LunaStella\_4, TChen\_4
- Track 60 : ThetaBob\_4
- Track 61 : Renaud18\_4
- Track 62 : Toron\_4
- Track 63 : Zucker\_5
- Track 64 : Bauer\_6
- Track 65 : BlackSpider\_4
- Track 66 : Jankie\_4
- Track 67 : MrSmee\_4
- Track 68 : LilSpotty\_4
- Track 69 : Spartoi\_4
- Track 70 : P3MA\_5

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

The start number called the most often in the published annotations is 12, it was called in 58 of the 136 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Alexphander\_5, Aloeri\_5, Awesomesauce\_5, B22\_5, Bauer\_6, Beakin\_5, BigPhil\_5, BlackSpider\_4, Bobi\_5, Boomer\_5, Brushbloom\_5, BuzzLyseyear\_5, Cerasum\_5, ChickenDinner\_5, Coco12\_5, Cornucopia\_5, DaWorst\_5, DirtMcgirt\_5, DocMcStuffins\_5, DosHalletts\_5, Doucette\_5, Drago\_5, E6\_5, Enby\_5, Flathead\_5, Frankie\_5, G4\_5, Girafales\_5, Hegedechwinu\_5, JalFarm20\_5, Jankie\_4, Job42\_5, Juice456\_5, Kimberlium\_5, Kingsley\_5, Leozinho\_5, LittleShirley\_5, Lorde\_5, Madiba\_5, Marker\_5, Misha28\_5, Mova\_5, Mozy\_5, MrSmee\_4, OwlsT2W\_5, Piper2020\_5, Plumbus\_5, Pollywog\_5, Quico\_5, Ramsey\_5, Raqqa\_5, Rialto\_5, RockyHorror\_5, Sarma624\_5, Seagreen\_5, SimranZ1\_5, Spikelee\_5, Squirty\_5, Stap\_5, Starcevich\_5, TootsiePop\_5, Tootsieroll\_5, Totinger\_5, UncleRicky\_5, Velveteen\_5,

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

- AbbyDaisy\_5, MulchExplorer\_5, Oksu\_5, Zucker\_5,

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

- Agatha\_6, AikoCarson\_5, Amok\_5, AndPeggy\_5, Angelique\_4, Axym\_6, Azira\_8, Bavailard\_6, BeeGee\_4, BigChungus\_5, BillDoor\_8, Biskit\_7, Blondies\_6, Bradissa\_4, BritBrat\_4, Burnsey\_6, Button\_7, Buttrmlkdreams\_6, CanesSauce\_6, Carsonalex\_7, Cashline\_4, CherryonLim\_7, ChickenTender\_8, ChocoMunchkin\_6, Cleo\_6, Confidence\_4, Cozz\_6, Dre3\_6, EMSquaredA\_4, Elinal\_7, Elliott\_6, Emalyn\_5, EnalisNailo\_4, Farewell\_4, Feastonyeet\_5, Floral\_4, Fribs8\_7, GTE2\_04, GiKK\_9, Gibbous\_6, GoldHunter\_7, HippoPololi\_8, Horseradish\_7, Jablanski\_4, Jamzy\_9, KayGee\_6, Lauer\_5, LilSpotty\_4, Lilas\_4, LonelyBoi\_4, LunaStella\_4, MAnor\_6, MScarn\_8, MaVan\_8, Margaret\_9, Marteena\_4, Mayweather\_7, MunkgeeRoachy\_6, Nibbles\_8, P3MA\_5, Pollux\_4, Pons\_6, Posh\_4, PotPie\_6, PsychoKiller\_6, Pytheas\_4, Quasar\_6, RanchParmCat\_9, RedBaron\_7, Renaud18\_4, SheckWes\_5, SketchMex\_5, Sopespian\_6, Sparky\_4, Spartoi\_4, Starburst\_7, SteamedHams\_8, SummitAcademy\_5, Survivors\_8, SweatNTears\_8, TChen\_4, ThetaBob\_4, Tolls\_8, Toron\_4, Troje\_6, Typhonomachy\_7, Vine\_7, Wrigley\_4, Yakult\_7, Yarn\_5, Yucky\_8, Yummy\_7, Zareef\_9,

### Summary by start number:

Start 3:

- Found in 2 of 162 ( 1.2% ) of genes in pham
- Manual Annotations of this start: 2 of 136
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Farewell\_4 (AF), Sparky\_4 (AF),

Start 7:

- Found in 1 of 162 ( 0.6% ) of genes in pham
- Manual Annotations of this start: 1 of 136
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Spartoi\_4 (singleton),

Start 10:

- Found in 1 of 162 ( 0.6% ) of genes in pham
- Manual Annotations of this start: 1 of 136
- Called 100.0% of time when present
- Phage (with cluster) where this start called: AbbyDaisy\_5 (AY),

Start 11:

- Found in 60 of 162 ( 37.0% ) of genes in pham
- No Manual Annotations of this start.
- Called 1.7% of time when present
- Phage (with cluster) where this start called: GTE2\_04 (CT),

#### Start 12:

- Found in 69 of 162 ( 42.6% ) of genes in pham
- Manual Annotations of this start: 58 of 136
- Called 94.2% of time when present
- Phage (with cluster) where this start called: Alexphander\_5 (F1), Aloeri\_5 (F1), Awesomesauce\_5 (F1), B22\_5 (BW), Bauer\_6 (FN), Beakin\_5 (F1), BigPhil\_5 (F1), BlackSpider\_4 (FN), Bobi\_5 (F1), Boomer\_5 (F1), Brushbloom\_5 (F1), BuzzLyseyear\_5 (F1), Cerasum\_5 (F1), ChickenDinner\_5 (F1), Coco12\_5 (F1), Cornucopia\_5 (F1), DaWorst\_5 (F1), DirtMcgirt\_5 (F1), DocMcStuffins\_5 (F1), DosHalletts\_5 (F1), Doucette\_5 (BW), Drago\_5 (F1), E6\_5 (BW), Enby\_5 (F1), Flathead\_5 (F1), Frankie\_5 (F1), G4\_5 (BW), Girafales\_5 (F1), Hegedechwinu\_5 (F1), JalFarm20\_5 (F1), Jankie\_4 (FP), Job42\_5 (F1), Juice456\_5 (F1), Kimberlium\_5 (F1), Kingsley\_5 (F1), Leozinho\_5 (F1), LittleShirley\_5 (F1), Lorde\_5 (F1), Madiba\_5 (F1), Marker\_5 (F1), Misha28\_5 (F1), Mova\_5 (F1), Mozy\_5 (F1), MrSmee\_4 (FQ), OwlsT2W\_5 (F1), Piper2020\_5 (F1), Plumbus\_5 (F1), Pollywog\_5 (F1), Quico\_5 (F1), Ramsey\_5 (F1), Raqqa\_5 (AY), Rialto\_5 (F1), RockyHorror\_5 (F1), Sarma624\_5 (F1), Seagreen\_5 (F1), SimranZ1\_5 (F1), Spikelee\_5 (F1), Squirty\_5 (F3), Stap\_5 (F1), Starcevich\_5 (F1), TootsiePop\_5 (F1), Tootsieroll\_5 (F1), Totinger\_5 (F1), UncleRicky\_5 (F1), Velveteen\_5 (F1),

#### Start 13:

- Found in 6 of 162 ( 3.7% ) of genes in pham
- Manual Annotations of this start: 1 of 136
- Called 16.7% of time when present
- Phage (with cluster) where this start called: Jamzy\_9 (CT),

#### Start 14:

- Found in 22 of 162 ( 13.6% ) of genes in pham
- Manual Annotations of this start: 17 of 136
- Called 77.3% of time when present
- Phage (with cluster) where this start called: Angelique\_4 (CY1), BeeGee\_4 (CY), Bradissa\_4 (CY1), BritBrat\_4 (CY2), Cashline\_4 (CY), Confidence\_4 (CY1), EMSquaredA\_4 (CY1), EnalisNailo\_4 (CY1), Floral\_4 (CY1), Jablanski\_4 (CY), Lilas\_4 (CY1), LonelyBoi\_4 (CY), Marteena\_4 (CY1), Pollux\_4 (CY1), Posh\_4 (CY), Pytheas\_4 (CY), Wrigley\_4 (CY),

#### Start 15:

- Found in 10 of 162 ( 6.2% ) of genes in pham
- Manual Annotations of this start: 2 of 136
- Called 20.0% of time when present
- Phage (with cluster) where this start called: LilSpotty\_4 (singleton), P3MA\_5 (singleton),

#### Start 20:

- Found in 60 of 162 ( 37.0% ) of genes in pham
- No Manual Annotations of this start.
- Called 1.7% of time when present
- Phage (with cluster) where this start called: MulchExplorer\_5 (F1),

Start 21:

- Found in 4 of 162 ( 2.5% ) of genes in pham
- Manual Annotations of this start: 1 of 136
- Called 25.0% of time when present
- Phage (with cluster) where this start called: Zucker\_5 (FN),

Start 23:

- Found in 25 of 162 ( 15.4% ) of genes in pham
- Manual Annotations of this start: 2 of 136
- Called 8.0% of time when present
- Phage (with cluster) where this start called: Cleo\_6 (CT), Survivors\_8 (CT),

Start 25:

- Found in 17 of 162 ( 10.5% ) of genes in pham
- Manual Annotations of this start: 2 of 136
- Called 17.6% of time when present
- Phage (with cluster) where this start called: Lauer\_5 (CT), Vine\_7 (CT), Yucky\_8 (CT),

Start 29:

- Found in 1 of 162 ( 0.6% ) of genes in pham
- Manual Annotations of this start: 1 of 136
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Fribs8\_7 (CT),

Start 31:

- Found in 57 of 162 ( 35.2% ) of genes in pham
- No Manual Annotations of this start.
- Called 1.8% of time when present
- Phage (with cluster) where this start called: Oksu\_5 (F1),

Start 32:

- Found in 71 of 162 ( 43.8% ) of genes in pham
- Manual Annotations of this start: 34 of 136
- Called 66.2% of time when present
- Phage (with cluster) where this start called: Agatha\_6 (CT), AikoCarson\_5 (CT), Amok\_5 (CT), AndPeggy\_5 (CT), Axym\_6 (CT), Bavidard\_6 (CT), BillDoor\_8 (CT), Biskit\_7 (CT), Blondies\_6 (CT), Burnsey\_6 (CT), Button\_7 (CT), Buttrmlkdreams\_6 (CT), CanesSauce\_6 (CT), Carsonalex\_7 (CT), ChickenTender\_8 (CT), ChocoMunchkin\_6 (CT), Cozz\_6 (CT), Elinal\_7 (CT), Elliott\_6 (CT), Emalyn\_5 (CT), GiKK\_9 (CT), GoldHunter\_7 (CT), Horseradish\_7 (CT), KayGee\_6 (CT), MAnor\_6 (CT), MScarn\_8 (CT), Margaret\_9 (CT), Mayweather\_7 (CT), MunkgeeRoachy\_6 (CT), Pons\_6 (CT), PotPie\_6 (CT), PsychoKiller\_6 (CT), RanchParmCat\_9 (CT), RedBaron\_7 (CT), SheckWes\_5 (CT), SketchMex\_5 (CT), Sopespian\_6 (CT), Starburst\_7 (CT), SteamedHams\_8 (CT), SummitAcademy\_5 (CT), SweatNTears\_8 (CT), Tolls\_8 (CT), Troje\_6 (CT), Typhonmarchy\_7 (CT), Yakult\_7 (CT), Yarn\_5 (CT), Yummy\_7 (CT),

Start 35:

- Found in 2 of 162 ( 1.2% ) of genes in pham
- Manual Annotations of this start: 1 of 136
- Called 50.0% of time when present

- Phage (with cluster) where this start called: CherryonLim\_7 (CT),

Start 39:

- Found in 74 of 162 ( 45.7% ) of genes in pham
- Manual Annotations of this start: 9 of 136
- Called 13.5% of time when present
- Phage (with cluster) where this start called: Azira\_8 (CT), BigChungus\_5 (CT), Dre3\_6 (CT), Feastonyeet\_5 (CT), Gibbous\_6 (CT), HippoPololi\_8 (CT), MaVan\_8 (CT), Nibbles\_8 (CT), Quasar\_6 (CT), Zareef\_9 (CT),

Start 48:

- Found in 30 of 162 ( 18.5% ) of genes in pham
- Manual Annotations of this start: 4 of 136
- Called 16.7% of time when present
- Phage (with cluster) where this start called: LunaStella\_4 (F4), Renaud18\_4 (F4), TChen\_4 (F4), ThetaBob\_4 (F4), Toron\_4 (F6),

### Summary by clusters:

There are 15 clusters represented in this pham: FP, F1, CY1, F3, F4, F6, AF, FQ, singleton, CY, BW, AY, CY2, FN, CT,

Info for manual annotations of cluster AF:

- Start number 3 was manually annotated 2 times for cluster AF.

Info for manual annotations of cluster AY:

- Start number 10 was manually annotated 1 time for cluster AY.

Info for manual annotations of cluster BW:

- Start number 12 was manually annotated 4 times for cluster BW.

Info for manual annotations of cluster CT:

- Start number 13 was manually annotated 1 time for cluster CT.
- Start number 23 was manually annotated 2 times for cluster CT.
- Start number 25 was manually annotated 2 times for cluster CT.
- Start number 29 was manually annotated 1 time for cluster CT.
- Start number 32 was manually annotated 34 times for cluster CT.
- Start number 35 was manually annotated 1 time for cluster CT.
- Start number 39 was manually annotated 9 times for cluster CT.

Info for manual annotations of cluster CY:

- Start number 14 was manually annotated 7 times for cluster CY.

Info for manual annotations of cluster CY1:

- Start number 14 was manually annotated 9 times for cluster CY1.

Info for manual annotations of cluster CY2:

- Start number 14 was manually annotated 1 time for cluster CY2.

Info for manual annotations of cluster F1:

- Start number 12 was manually annotated 52 times for cluster F1.

Info for manual annotations of cluster F3:



- Start number 12 was manually annotated 1 time for cluster F3.

Info for manual annotations of cluster F4:

- Start number 48 was manually annotated 4 times for cluster F4.

Info for manual annotations of cluster FN:

- Start number 12 was manually annotated 1 time for cluster FN.
- Start number 21 was manually annotated 1 time for cluster FN.

### **Gene Information:**

Gene: AbbyDaisy\_5 Start: 3558, Stop: 4358, Start Num: 10

Candidate Starts for AbbyDaisy\_5:

(Start: 10 @3558 has 1 MA's), (Start: 12 @3561 has 58 MA's), (Start: 21 @3591 has 1 MA's), (33, 3651), (42, 3699), (46, 3711), (51, 3741), (54, 3765), (74, 3867), (80, 3909), (83, 3927), (90, 4029), (96, 4080), (110, 4131), (112, 4134), (123, 4236), (124, 4248), (126, 4257), (129, 4284), (131, 4293), (134, 4305),

Gene: Agatha\_6 Start: 4221, Stop: 4844, Start Num: 32

Candidate Starts for Agatha\_6:

(8, 4131), (11, 4137), (Start: 32 @4221 has 34 MA's), (Start: 39 @4269 has 9 MA's), (45, 4290), (47, 4302), (49, 4311), (53, 4344), (73, 4416), (83, 4476), (90, 4578), (96, 4629), (119, 4707), (128, 4773), (132, 4791), (136, 4812),

Gene: AikoCarson\_5 Start: 3913, Stop: 4572, Start Num: 32

Candidate Starts for AikoCarson\_5:

(8, 3826), (11, 3832), (Start: 32 @3913 has 34 MA's), (Start: 39 @3961 has 9 MA's), (43, 3976), (45, 3982), (47, 3994), (73, 4108), (81, 4156), (90, 4270), (93, 4291), (96, 4321), (132, 4516), (137, 4543),

Gene: Alexphander\_5 Start: 3604, Stop: 4329, Start Num: 12

Candidate Starts for Alexphander\_5:

(Start: 12 @3604 has 58 MA's), (20, 3631), (24, 3652), (31, 3679), (42, 3739), (50, 3778), (70, 3877), (82, 3946), (83, 3949), (100, 4078), (107, 4099), (125, 4207), (143, 4315),

Gene: Aloeri\_5 Start: 3607, Stop: 4332, Start Num: 12

Candidate Starts for Aloeri\_5:

(Start: 12 @3607 has 58 MA's), (20, 3634), (24, 3655), (31, 3682), (42, 3742), (50, 3781), (70, 3880), (82, 3949), (83, 3952), (100, 4081), (107, 4102), (125, 4210), (143, 4318),

Gene: Amok\_5 Start: 3914, Stop: 4573, Start Num: 32

Candidate Starts for Amok\_5:

(8, 3827), (11, 3833), (Start: 15 @3842 has 2 MA's), (Start: 32 @3914 has 34 MA's), (Start: 39 @3962 has 9 MA's), (43, 3977), (45, 3983), (47, 3995), (73, 4109), (81, 4157), (85, 4193), (90, 4271), (93, 4292), (96, 4322), (125, 4475), (132, 4517), (137, 4544),

Gene: AndPeggy\_5 Start: 4225, Stop: 4881, Start Num: 32

Candidate Starts for AndPeggy\_5:

(8, 4138), (11, 4144), (Start: 15 @4153 has 2 MA's), (Start: 32 @4225 has 34 MA's), (Start: 39 @4273 has 9 MA's), (43, 4288), (47, 4306), (53, 4348), (73, 4420), (83, 4480), (85, 4504), (90, 4582), (96, 4633), (128, 4810), (132, 4828),

Gene: Angelique\_4 Start: 3707, Stop: 4519, Start Num: 14

Candidate Starts for Angelique\_4:

(Start: 14 @3707 has 17 MA's), (51, 3884), (60, 3935), (63, 3947), (66, 3965), (77, 4016), (78, 4022), (83, 4049), (88, 4112), (90, 4151), (99, 4238),

Gene: Awesomesauce\_5 Start: 3607, Stop: 4332, Start Num: 12

Candidate Starts for Awesomesauce\_5:

(Start: 12 @3607 has 58 MA's), (20, 3634), (24, 3655), (31, 3682), (42, 3742), (50, 3781), (70, 3880), (82, 3949), (83, 3952), (100, 4081), (107, 4102), (125, 4210), (143, 4318),

Gene: Axym\_6 Start: 4221, Stop: 4844, Start Num: 32

Candidate Starts for Axym\_6:

(8, 4131), (11, 4137), (Start: 32 @4221 has 34 MA's), (Start: 39 @4269 has 9 MA's), (45, 4290), (47, 4302), (49, 4311), (53, 4344), (73, 4416), (83, 4476), (90, 4578), (96, 4629), (119, 4707), (128, 4773), (132, 4791), (136, 4812),

Gene: Azira\_8 Start: 5151, Stop: 5714, Start Num: 39

Candidate Starts for Azira\_8:

(8, 5016), (11, 5022), (18, 5040), (Start: 23 @5064 has 2 MA's), (24, 5070), (Start: 39 @5151 has 9 MA's), (Start: 48 @5187 has 4 MA's), (49, 5193), (60, 5250), (73, 5304), (78, 5337), (79, 5340), (85, 5388), (90, 5466), (91, 5469), (93, 5487), (118, 5571), (119, 5577), (122, 5598), (138, 5688),

Gene: B22\_5 Start: 3905, Stop: 4687, Start Num: 12

Candidate Starts for B22\_5:

(Start: 12 @3905 has 58 MA's), (Start: 39 @4034 has 9 MA's), (61, 4157), (67, 4184), (76, 4229), (84, 4274), (90, 4373), (93, 4394), (112, 4460), (116, 4514), (121, 4547), (126, 4586), (133, 4631), (136, 4649), (140, 4667),

Gene: Bauer\_6 Start: 4443, Stop: 5192, Start Num: 12

Candidate Starts for Bauer\_6:

(Start: 12 @4443 has 58 MA's), (Start: 21 @4476 has 1 MA's), (27, 4503), (30, 4515), (34, 4542), (37, 4560), (42, 4584), (52, 4632), (54, 4650), (55, 4656), (70, 4737), (71, 4746), (77, 4785), (83, 4818), (89, 4884), (112, 5016), (115, 5055), (117, 5076), (123, 5115), (132, 5172),

Gene: Bavilard\_6 Start: 4775, Stop: 5368, Start Num: 32

Candidate Starts for Bavilard\_6:

(8, 4685), (11, 4691), (19, 4718), (Start: 23 @4736 has 2 MA's), (Start: 25 @4745 has 2 MA's), (Start: 32 @4775 has 34 MA's), (Start: 39 @4823 has 9 MA's), (Start: 48 @4859 has 4 MA's), (53, 4898), (58, 4910), (66, 4946), (68, 4952), (73, 4970), (90, 5132), (121, 5234), (122, 5249), (137, 5336),

Gene: Beakin\_5 Start: 3607, Stop: 4332, Start Num: 12

Candidate Starts for Beakin\_5:

(Start: 12 @3607 has 58 MA's), (20, 3634), (24, 3655), (31, 3682), (42, 3742), (50, 3781), (70, 3880), (82, 3949), (83, 3952), (100, 4081), (107, 4102), (125, 4210), (143, 4318),

Gene: BeeGee\_4 Start: 3710, Stop: 4522, Start Num: 14

Candidate Starts for BeeGee\_4:

(Start: 14 @3710 has 17 MA's), (63, 3950), (88, 4115), (90, 4154), (99, 4241),

Gene: BigChungus\_5 Start: 4072, Stop: 4617, Start Num: 39

Candidate Starts for BigChungus\_5:

(8, 3934), (11, 3940), (19, 3967), (Start: 23 @3985 has 2 MA's), (Start: 25 @3994 has 2 MA's), (Start: 32 @4024 has 34 MA's), (Start: 39 @4072 has 9 MA's), (Start: 48 @4108 has 4 MA's), (53, 4147), (58, 4159), (66, 4195), (68, 4201), (73, 4219), (90, 4381), (93, 4402), (121, 4483), (122, 4498), (137, 4585),

Gene: BigPhil\_5 Start: 3604, Stop: 4329, Start Num: 12

Candidate Starts for BigPhil\_5:

(Start: 12 @3604 has 58 MA's), (20, 3631), (24, 3652), (31, 3679), (42, 3739), (50, 3778), (70, 3877), (82, 3946), (83, 3949), (100, 4078), (107, 4099), (125, 4207), (143, 4315),

Gene: BillDoor\_8 Start: 4220, Stop: 4846, Start Num: 32

Candidate Starts for BillDoor\_8:

(8, 4133), (11, 4139), (Start: 15 @4148 has 2 MA's), (Start: 32 @4220 has 34 MA's), (Start: 39 @4268 has 9 MA's), (43, 4283), (47, 4301), (53, 4343), (73, 4415), (83, 4475), (85, 4499), (90, 4577), (93, 4598), (96, 4628), (128, 4775), (132, 4793),

Gene: Biskit\_7 Start: 4215, Stop: 4838, Start Num: 32

Candidate Starts for Biskit\_7:

(8, 4128), (11, 4134), (Start: 32 @4215 has 34 MA's), (Start: 39 @4263 has 9 MA's), (47, 4296), (53, 4338), (73, 4410), (83, 4470), (85, 4494), (90, 4572), (93, 4593), (96, 4623), (128, 4767), (132, 4785),

Gene: BlackSpider\_4 Start: 3452, Stop: 4255, Start Num: 12

Candidate Starts for BlackSpider\_4:

(Start: 12 @3452 has 58 MA's), (Start: 21 @3485 has 1 MA's), (27, 3512), (30, 3524), (37, 3569), (42, 3593), (52, 3641), (54, 3659), (66, 3734), (74, 3767), (76, 3791), (79, 3803), (83, 3827), (90, 3929), (96, 3980), (112, 4034), (117, 4094), (124, 4148), (134, 4205),

Gene: Blondies\_6 Start: 4216, Stop: 4839, Start Num: 32

Candidate Starts for Blondies\_6:

(8, 4129), (11, 4135), (Start: 32 @4216 has 34 MA's), (Start: 39 @4264 has 9 MA's), (43, 4279), (47, 4297), (53, 4339), (73, 4411), (83, 4471), (85, 4495), (90, 4573), (93, 4594), (96, 4624), (128, 4768), (132, 4786),

Gene: Bobi\_5 Start: 3604, Stop: 4329, Start Num: 12

Candidate Starts for Bobi\_5:

(Start: 12 @3604 has 58 MA's), (20, 3631), (24, 3652), (31, 3679), (42, 3739), (50, 3778), (70, 3877), (82, 3946), (83, 3949), (100, 4078), (107, 4099), (125, 4207), (143, 4315),

Gene: Boomer\_5 Start: 3604, Stop: 4329, Start Num: 12

Candidate Starts for Boomer\_5:

(Start: 12 @3604 has 58 MA's), (20, 3631), (24, 3652), (31, 3679), (42, 3739), (50, 3778), (70, 3877), (82, 3946), (83, 3949), (100, 4078), (107, 4099), (125, 4207), (143, 4315),

Gene: Bradissa\_4 Start: 3716, Stop: 4528, Start Num: 14

Candidate Starts for Bradissa\_4:

(Start: 14 @3716 has 17 MA's), (Start: 32 @3791 has 34 MA's), (78, 4031), (88, 4121), (90, 4160), (99, 4247),

Gene: BritBrat\_4 Start: 3716, Stop: 4528, Start Num: 14

Candidate Starts for BritBrat\_4:

(Start: 14 @3716 has 17 MA's), (Start: 32 @3791 has 34 MA's), (66, 3974), (78, 4031), (88, 4121), (90, 4160), (99, 4247),

Gene: Brushbloom\_5 Start: 3604, Stop: 4329, Start Num: 12

Candidate Starts for Brushbloom\_5:

(Start: 12 @3604 has 58 MA's), (20, 3631), (24, 3652), (31, 3679), (42, 3739), (50, 3778), (70, 3877), (82, 3946), (83, 3949), (100, 4078), (107, 4099), (125, 4207), (143, 4315),

Gene: Burnsey\_6 Start: 4221, Stop: 4844, Start Num: 32

Candidate Starts for Burnsey\_6:

(8, 4131), (11, 4137), (Start: 32 @4221 has 34 MA's), (Start: 39 @4269 has 9 MA's), (45, 4290), (47, 4302), (49, 4311), (53, 4344), (73, 4416), (83, 4476), (90, 4578), (96, 4629), (119, 4707), (128, 4773), (132, 4791), (136, 4812),

Gene: Button\_7 Start: 4307, Stop: 4906, Start Num: 32

Candidate Starts for Button\_7:

(8, 4214), (Start: 13 @4223 has 1 MA's), (Start: 32 @4307 has 34 MA's), (Start: 39 @4343 has 9 MA's), (43, 4358), (Start: 48 @4379 has 4 MA's), (57, 4439), (78, 4544), (85, 4595), (86, 4601), (90, 4673), (93, 4694), (119, 4766), (121, 4772), (132, 4850),

Gene: Buttrmlkdreams\_6 Start: 4216, Stop: 4839, Start Num: 32

Candidate Starts for Buttrmlkdreams\_6:

(8, 4129), (11, 4135), (Start: 32 @4216 has 34 MA's), (Start: 39 @4264 has 9 MA's), (43, 4279), (47, 4297), (53, 4339), (73, 4411), (83, 4471), (85, 4495), (90, 4573), (93, 4594), (96, 4624), (128, 4768), (132, 4786),

Gene: BuzzLyseyear\_5 Start: 3603, Stop: 4328, Start Num: 12

Candidate Starts for BuzzLyseyear\_5:

(Start: 12 @3603 has 58 MA's), (20, 3630), (24, 3651), (31, 3678), (42, 3738), (50, 3777), (70, 3876), (82, 3945), (83, 3948), (100, 4077), (107, 4098), (125, 4206), (143, 4314),

Gene: CanesSauce\_6 Start: 4225, Stop: 4881, Start Num: 32

Candidate Starts for CanesSauce\_6:

(8, 4138), (11, 4144), (Start: 15 @4153 has 2 MA's), (Start: 32 @4225 has 34 MA's), (Start: 39 @4273 has 9 MA's), (43, 4288), (47, 4306), (53, 4348), (73, 4420), (83, 4480), (85, 4504), (90, 4582), (96, 4633), (106, 4657), (128, 4810), (132, 4828),

Gene: Carsonalex\_7 Start: 4278, Stop: 4901, Start Num: 32

Candidate Starts for Carsonalex\_7:

(8, 4188), (11, 4194), (Start: 32 @4278 has 34 MA's), (Start: 39 @4326 has 9 MA's), (45, 4347), (47, 4359), (49, 4368), (53, 4401), (73, 4473), (83, 4533), (90, 4635), (96, 4686), (128, 4830), (132, 4848), (136, 4869),

Gene: Cashline\_4 Start: 3710, Stop: 4375, Start Num: 14

Candidate Starts for Cashline\_4:

(Start: 14 @3710 has 17 MA's), (Start: 35 @3806 has 1 MA's), (51, 3887), (63, 3950), (78, 4025), (91, 4157), (94, 4199),

Gene: Cerasum\_5 Start: 3604, Stop: 4329, Start Num: 12

Candidate Starts for Cerasum\_5:

(Start: 12 @3604 has 58 MA's), (20, 3631), (24, 3652), (31, 3679), (42, 3739), (50, 3778), (70, 3877), (82, 3946), (83, 3949), (100, 4078), (107, 4099), (125, 4207), (143, 4315),

Gene: CherryonLim\_7 Start: 4771, Stop: 5343, Start Num: 35

Candidate Starts for CherryonLim\_7:

(8, 4660), (11, 4666), (19, 4693), (Start: 23 @4711 has 2 MA's), (Start: 25 @4720 has 2 MA's), (Start: 32 @4750 has 34 MA's), (Start: 35 @4771 has 1 MA's), (Start: 39 @4798 has 9 MA's), (53, 4873), (58, 4885), (66, 4921), (68, 4927), (73, 4945), (90, 5107), (93, 5128), (119, 5203), (121, 5209), (122, 5224), (137, 5311),

Gene: ChickenDinner\_5 Start: 3607, Stop: 4332, Start Num: 12

Candidate Starts for ChickenDinner\_5:

(Start: 12 @3607 has 58 MA's), (20, 3634), (24, 3655), (31, 3682), (42, 3742), (50, 3781), (70, 3880), (82, 3949), (83, 3952), (100, 4081), (107, 4102), (125, 4210), (143, 4318),

Gene: ChickenTender\_8 Start: 4269, Stop: 4892, Start Num: 32

Candidate Starts for ChickenTender\_8:

(8, 4179), (11, 4185), (Start: 32 @4269 has 34 MA's), (Start: 39 @4317 has 9 MA's), (45, 4338), (47, 4350), (49, 4359), (53, 4392), (73, 4464), (83, 4524), (90, 4626), (96, 4677), (119, 4755), (128, 4821), (132, 4839), (136, 4860),

Gene: ChocoMunchkin\_6 Start: 4225, Stop: 4881, Start Num: 32

Candidate Starts for ChocoMunchkin\_6:

(8, 4138), (11, 4144), (Start: 15 @4153 has 2 MA's), (Start: 32 @4225 has 34 MA's), (Start: 39 @4273 has 9 MA's), (43, 4288), (47, 4306), (53, 4348), (73, 4420), (83, 4480), (85, 4504), (90, 4582), (96, 4633), (106, 4657), (128, 4810), (132, 4828),

Gene: Cleo\_6 Start: 4357, Stop: 5013, Start Num: 23

Candidate Starts for Cleo\_6:

(8, 4306), (11, 4312), (18, 4333), (Start: 23 @4357 has 2 MA's), (Start: 39 @4444 has 9 MA's), (40, 4447), (43, 4459), (Start: 48 @4480 has 4 MA's), (49, 4486), (60, 4543), (73, 4597), (78, 4630), (90, 4759), (91, 4762), (93, 4780), (95, 4804), (118, 4870), (122, 4897),

Gene: Coco12\_5 Start: 3604, Stop: 4329, Start Num: 12

Candidate Starts for Coco12\_5:

(Start: 12 @3604 has 58 MA's), (20, 3631), (24, 3652), (31, 3679), (42, 3739), (50, 3778), (70, 3877), (82, 3946), (83, 3949), (100, 4078), (107, 4099), (125, 4207), (143, 4315),

Gene: Confidence\_4 Start: 3710, Stop: 4522, Start Num: 14

Candidate Starts for Confidence\_4:

(Start: 14 @3710 has 17 MA's), (63, 3950), (88, 4115), (90, 4154), (99, 4241),

Gene: Cornucopia\_5 Start: 3606, Stop: 4331, Start Num: 12

Candidate Starts for Cornucopia\_5:

(Start: 12 @3606 has 58 MA's), (20, 3633), (22, 3642), (30, 3678), (Start: 32 @3687 has 34 MA's), (Start: 39 @3729 has 9 MA's), (45, 3750), (46, 3753), (50, 3780), (70, 3879), (82, 3948), (83, 3951), (100, 4080), (107, 4101), (121, 4173), (143, 4317),

Gene: Cozz\_6 Start: 4221, Stop: 4844, Start Num: 32

Candidate Starts for Cozz\_6:

(8, 4131), (11, 4137), (Start: 32 @4221 has 34 MA's), (Start: 39 @4269 has 9 MA's), (45, 4290), (47, 4302), (49, 4311), (53, 4344), (73, 4416), (83, 4476), (90, 4578), (96, 4629), (119, 4707), (128, 4773), (132, 4791), (136, 4812),

Gene: DaWorst\_5 Start: 3604, Stop: 4329, Start Num: 12

Candidate Starts for DaWorst\_5:

(Start: 12 @3604 has 58 MA's), (20, 3631), (24, 3652), (31, 3679), (42, 3739), (50, 3778), (70, 3877), (82, 3946), (83, 3949), (100, 4078), (107, 4099), (125, 4207), (143, 4315),

Gene: DirtMcgirt\_5 Start: 3605, Stop: 4330, Start Num: 12

Candidate Starts for DirtMcgirt\_5:

(Start: 12 @3605 has 58 MA's), (20, 3632), (24, 3653), (31, 3680), (42, 3740), (50, 3779), (70, 3878), (82, 3947), (83, 3950), (100, 4079), (107, 4100), (125, 4208), (143, 4316),

Gene: DocMcStuffins\_5 Start: 3607, Stop: 4332, Start Num: 12

Candidate Starts for DocMcStuffins\_5:

(Start: 12 @3607 has 58 MA's), (20, 3634), (24, 3655), (31, 3682), (42, 3742), (50, 3781), (70, 3880), (82, 3949), (83, 3952), (100, 4081), (107, 4102), (125, 4210), (143, 4318),

Gene: DosHalletts\_5 Start: 3604, Stop: 4329, Start Num: 12

Candidate Starts for DosHalletts\_5:

(Start: 12 @3604 has 58 MA's), (20, 3631), (24, 3652), (31, 3679), (42, 3739), (50, 3778), (70, 3877), (82, 3946), (83, 3949), (100, 4078), (107, 4099), (125, 4207), (143, 4315),

Gene: Doucette\_5 Start: 3905, Stop: 4690, Start Num: 12

Candidate Starts for Doucette\_5:

(Start: 12 @3905 has 58 MA's), (Start: 39 @4034 has 9 MA's), (61, 4160), (67, 4187), (76, 4232), (84, 4277), (90, 4376), (93, 4397), (112, 4463), (116, 4517), (121, 4550), (126, 4589), (133, 4634), (136, 4652), (140, 4670),

Gene: Drago\_5 Start: 3604, Stop: 4329, Start Num: 12

Candidate Starts for Drago\_5:

(Start: 12 @3604 has 58 MA's), (20, 3631), (24, 3652), (31, 3679), (42, 3739), (50, 3778), (70, 3877), (82, 3946), (83, 3949), (100, 4078), (107, 4099), (125, 4207), (143, 4315),

Gene: Dre3\_6 Start: 4388, Stop: 4960, Start Num: 39

Candidate Starts for Dre3\_6:

(8, 4250), (11, 4256), (18, 4277), (Start: 23 @4301 has 2 MA's), (Start: 39 @4388 has 9 MA's), (40, 4391), (43, 4403), (Start: 48 @4424 has 4 MA's), (49, 4430), (60, 4490), (73, 4544), (78, 4577), (90, 4706), (91, 4709), (93, 4727), (95, 4751), (118, 4817), (122, 4844),

Gene: E6\_5 Start: 3906, Stop: 4670, Start Num: 12

Candidate Starts for E6\_5:

(Start: 12 @3906 has 58 MA's), (Start: 39 @4035 has 9 MA's), (61, 4161), (67, 4188), (76, 4233), (84, 4278), (90, 4377), (93, 4398), (112, 4464), (116, 4518), (121, 4551), (126, 4590), (133, 4635), (139, 4656),

Gene: EMSquaredA\_4 Start: 3716, Stop: 4528, Start Num: 14

Candidate Starts for EMSquaredA\_4:

(Start: 14 @3716 has 17 MA's), (Start: 32 @3791 has 34 MA's), (66, 3974), (78, 4031), (88, 4121), (90, 4160), (99, 4247),

Gene: Elinal\_7 Start: 4002, Stop: 4595, Start Num: 32

Candidate Starts for Elinal\_7:

(8, 3912), (11, 3918), (19, 3945), (Start: 23 @3963 has 2 MA's), (Start: 25 @3972 has 2 MA's), (Start: 32 @4002 has 34 MA's), (Start: 39 @4050 has 9 MA's), (Start: 48 @4086 has 4 MA's), (53, 4125), (58, 4137), (66, 4173), (68, 4179), (73, 4197), (90, 4359), (121, 4461), (122, 4476), (137, 4563),

Gene: Elliott\_6 Start: 4221, Stop: 4844, Start Num: 32

Candidate Starts for Elliott\_6:

(8, 4131), (11, 4137), (Start: 32 @4221 has 34 MA's), (Start: 39 @4269 has 9 MA's), (45, 4290), (47, 4302), (49, 4311), (53, 4344), (73, 4416), (83, 4476), (90, 4578), (96, 4629), (128, 4773), (132, 4791), (136, 4812),

Gene: Emalyn\_5 Start: 3913, Stop: 4572, Start Num: 32

Candidate Starts for Emalyn\_5:

(8, 3826), (11, 3832), (Start: 32 @3913 has 34 MA's), (Start: 39 @3961 has 9 MA's), (43, 3976), (45, 3982), (47, 3994), (73, 4108), (81, 4156), (90, 4270), (93, 4291), (96, 4321), (132, 4516), (137, 4543),

Gene: EnalisNailo\_4 Start: 3716, Stop: 4528, Start Num: 14

Candidate Starts for EnalisNailo\_4:

(Start: 14 @3716 has 17 MA's), (Start: 32 @3791 has 34 MA's), (66, 3974), (78, 4031), (88, 4121), (90, 4160), (99, 4247),

Gene: Enby\_5 Start: 3604, Stop: 4329, Start Num: 12

Candidate Starts for Enby\_5:

(Start: 12 @3604 has 58 MA's), (20, 3631), (24, 3652), (31, 3679), (42, 3739), (50, 3778), (70, 3877), (82, 3946), (83, 3949), (100, 4078), (107, 4099), (125, 4207), (143, 4315),

Gene: Farewell\_4 Start: 3759, Stop: 4664, Start Num: 3

Candidate Starts for Farewell\_4:

(Start: 3 @3759 has 2 MA's), (9, 3825), (18, 3849), (20, 3855), (22, 3864), (28, 3891), (38, 3951), (41, 3963), (44, 3972), (46, 3978), (61, 4065), (62, 4068), (73, 4113), (79, 4149), (83, 4173), (105, 4383), (111, 4407), (119, 4488), (121, 4494), (125, 4530), (141, 4617), (142, 4626), (143, 4638),

Gene: Feastonyeet\_5 Start: 4072, Stop: 4617, Start Num: 39

Candidate Starts for Feastonyeet\_5:

(8, 3934), (11, 3940), (19, 3967), (Start: 23 @3985 has 2 MA's), (Start: 25 @3994 has 2 MA's), (Start: 32 @4024 has 34 MA's), (Start: 39 @4072 has 9 MA's), (Start: 48 @4108 has 4 MA's), (53, 4147), (58, 4159), (66, 4195), (68, 4201), (73, 4219), (90, 4381), (93, 4402), (121, 4483), (122, 4498), (137, 4585),

Gene: Flathead\_5 Start: 3604, Stop: 4329, Start Num: 12

Candidate Starts for Flathead\_5:

(Start: 12 @3604 has 58 MA's), (20, 3631), (24, 3652), (31, 3679), (42, 3739), (50, 3778), (70, 3877), (82, 3946), (83, 3949), (100, 4078), (107, 4099), (125, 4207), (143, 4315),

Gene: Floral\_4 Start: 3716, Stop: 4528, Start Num: 14

Candidate Starts for Floral\_4:

(Start: 14 @3716 has 17 MA's), (Start: 32 @3791 has 34 MA's), (66, 3974), (78, 4031), (88, 4121), (90, 4160), (99, 4247),

Gene: Frankie\_5 Start: 3798, Stop: 4523, Start Num: 12

Candidate Starts for Frankie\_5:

(4, 3744), (Start: 12 @3798 has 58 MA's), (22, 3834), (31, 3873), (42, 3933), (50, 3972), (70, 4071), (82, 4140), (83, 4143), (100, 4272), (107, 4293), (125, 4401), (143, 4509),

Gene: Fribs8\_7 Start: 4879, Stop: 5508, Start Num: 29

Candidate Starts for Fribs8\_7:

(8, 4804), (11, 4810), (18, 4828), (Start: 23 @4852 has 2 MA's), (Start: 29 @4879 has 1 MA's), (Start: 39 @4939 has 9 MA's), (40, 4942), (Start: 48 @4975 has 4 MA's), (49, 4981), (60, 5038), (73, 5092), (78, 5125), (79, 5128), (90, 5254), (91, 5257), (93, 5275), (118, 5365), (122, 5392),

Gene: G4\_5 Start: 3905, Stop: 4669, Start Num: 12

Candidate Starts for G4\_5:

(Start: 12 @3905 has 58 MA's), (Start: 39 @4034 has 9 MA's), (49, 4076), (61, 4160), (67, 4187), (76, 4232), (84, 4277), (90, 4376), (93, 4397), (112, 4463), (116, 4517), (121, 4550), (126, 4589), (133, 4634),

Gene: GTE2\_04 Start: 3827, Stop: 4531, Start Num: 11

Candidate Starts for GTE2\_04:

(8, 3821), (11, 3827), (Start: 15 @3836 has 2 MA's), (Start: 32 @3908 has 34 MA's), (Start: 39 @3956 has 9 MA's), (43, 3971), (47, 3989), (53, 4031), (73, 4103), (83, 4163), (85, 4187), (90, 4265), (93, 4286), (96, 4316), (128, 4460), (132, 4478),

Gene: GiKK\_9 Start: 4616, Stop: 5209, Start Num: 32

Candidate Starts for GiKK\_9:

(8, 4523), (Start: 13 @4532 has 1 MA's), (19, 4559), (Start: 32 @4616 has 34 MA's), (Start: 39 @4652 has 9 MA's), (43, 4667), (Start: 48 @4688 has 4 MA's), (78, 4847), (81, 4862), (85, 4898), (86, 4904), (90, 4976), (93, 4997), (121, 5075), (132, 5153),

Gene: Gibbous\_6 Start: 4388, Stop: 4960, Start Num: 39

Candidate Starts for Gibbous\_6:

(8, 4250), (11, 4256), (18, 4277), (Start: 23 @4301 has 2 MA's), (Start: 39 @4388 has 9 MA's), (40, 4391), (43, 4403), (Start: 48 @4424 has 4 MA's), (49, 4430), (60, 4490), (73, 4544), (78, 4577), (90, 4706), (91, 4709), (93, 4727), (95, 4751), (118, 4817), (122, 4844),

Gene: Girafales\_5 Start: 3602, Stop: 4327, Start Num: 12

Candidate Starts for Girafales\_5:

(Start: 12 @3602 has 58 MA's), (20, 3629), (22, 3638), (26, 3659), (30, 3674), (31, 3677), (Start: 32 @3683 has 34 MA's), (Start: 39 @3725 has 9 MA's), (45, 3746), (46, 3749), (50, 3776), (70, 3875), (82, 3944), (83, 3947), (87, 3983), (100, 4076), (107, 4097), (121, 4169), (143, 4313),

Gene: GoldHunter\_7 Start: 4221, Stop: 4844, Start Num: 32

Candidate Starts for GoldHunter\_7:

(8, 4131), (11, 4137), (Start: 32 @4221 has 34 MA's), (Start: 39 @4269 has 9 MA's), (45, 4290), (47, 4302), (49, 4311), (53, 4344), (73, 4416), (83, 4476), (90, 4578), (96, 4629), (119, 4707), (128, 4773), (132, 4791), (136, 4812),

Gene: Hegedechwinu\_5 Start: 3604, Stop: 4329, Start Num: 12

Candidate Starts for Hegedechwinu\_5:

(Start: 12 @3604 has 58 MA's), (20, 3631), (24, 3652), (31, 3679), (42, 3739), (50, 3778), (70, 3877), (82, 3946), (83, 3949), (100, 4078), (107, 4099), (125, 4207), (143, 4315),

Gene: HippoPololi\_8 Start: 5028, Stop: 5600, Start Num: 39

Candidate Starts for HippoPololi\_8:

(8, 4890), (9, 4893), (11, 4896), (Start: 23 @4941 has 2 MA's), (Start: 39 @5028 has 9 MA's), (40, 5031), (Start: 48 @5064 has 4 MA's), (49, 5070), (60, 5130), (73, 5184), (78, 5217), (79, 5220), (83, 5244), (85, 5268), (90, 5346), (91, 5349), (93, 5367), (118, 5457), (119, 5463), (122, 5484),

Gene: Horseradish\_7 Start: 4122, Stop: 4745, Start Num: 32

Candidate Starts for Horseradish\_7:

(8, 4035), (11, 4041), (Start: 32 @4122 has 34 MA's), (Start: 39 @4170 has 9 MA's), (47, 4203), (53, 4245), (73, 4317), (83, 4377), (85, 4401), (90, 4479), (93, 4500), (96, 4530), (128, 4674), (132, 4692),

Gene: Jablanski\_4 Start: 3710, Stop: 4375, Start Num: 14

Candidate Starts for Jablanski\_4:



(Start: 14 @3710 has 17 MA's), (51, 3887), (63, 3950), (78, 4025), (91, 4157), (94, 4199),

Gene: JalFarm20\_5 Start: 3604, Stop: 4329, Start Num: 12

Candidate Starts for JalFarm20\_5:

(Start: 12 @3604 has 58 MA's), (20, 3631), (24, 3652), (31, 3679), (42, 3739), (50, 3778), (70, 3877), (82, 3946), (83, 3949), (100, 4078), (107, 4099), (125, 4207), (143, 4315),

Gene: Jamzy\_9 Start: 4537, Stop: 5217, Start Num: 13

Candidate Starts for Jamzy\_9:

(8, 4528), (Start: 13 @4537 has 1 MA's), (19, 4564), (Start: 32 @4621 has 34 MA's), (Start: 39 @4657 has 9 MA's), (Start: 48 @4693 has 4 MA's), (49, 4699), (58, 4759), (61, 4768), (78, 4852), (81, 4867), (85, 4903), (86, 4909), (89, 4948), (90, 4981), (93, 5002), (95, 5026), (121, 5083), (132, 5161),

Gene: Jankie\_4 Start: 3408, Stop: 4106, Start Num: 12

Candidate Starts for Jankie\_4:

(Start: 12 @3408 has 58 MA's), (46, 3561), (55, 3618), (69, 3690), (83, 3780), (113, 3978),

Gene: Job42\_5 Start: 3603, Stop: 4328, Start Num: 12

Candidate Starts for Job42\_5:

(Start: 12 @3603 has 58 MA's), (20, 3630), (24, 3651), (31, 3678), (42, 3738), (50, 3777), (70, 3876), (82, 3945), (83, 3948), (100, 4077), (107, 4098), (125, 4206), (135, 4266), (143, 4314),

Gene: Juice456\_5 Start: 3605, Stop: 4330, Start Num: 12

Candidate Starts for Juice456\_5:

(Start: 12 @3605 has 58 MA's), (20, 3632), (24, 3653), (31, 3680), (42, 3740), (50, 3779), (70, 3878), (82, 3947), (83, 3950), (100, 4079), (107, 4100), (125, 4208), (143, 4316),

Gene: KayGee\_6 Start: 4002, Stop: 4595, Start Num: 32

Candidate Starts for KayGee\_6:

(8, 3912), (11, 3918), (19, 3945), (Start: 23 @3963 has 2 MA's), (Start: 25 @3972 has 2 MA's), (Start: 32 @4002 has 34 MA's), (Start: 39 @4050 has 9 MA's), (Start: 48 @4086 has 4 MA's), (53, 4125), (58, 4137), (66, 4173), (68, 4179), (73, 4197), (90, 4359), (121, 4461), (122, 4476), (137, 4563),

Gene: Kimberlium\_5 Start: 3605, Stop: 4330, Start Num: 12

Candidate Starts for Kimberlium\_5:

(Start: 12 @3605 has 58 MA's), (20, 3632), (24, 3653), (31, 3680), (42, 3740), (50, 3779), (70, 3878), (82, 3947), (83, 3950), (100, 4079), (107, 4100), (125, 4208), (143, 4316),

Gene: Kingsley\_5 Start: 3604, Stop: 4329, Start Num: 12

Candidate Starts for Kingsley\_5:

(Start: 12 @3604 has 58 MA's), (20, 3631), (24, 3652), (31, 3679), (42, 3739), (50, 3778), (70, 3877), (82, 3946), (83, 3949), (100, 4078), (107, 4099), (125, 4207), (143, 4315),

Gene: Lauer\_5 Start: 4024, Stop: 4647, Start Num: 25

Candidate Starts for Lauer\_5:

(8, 3964), (11, 3970), (19, 3997), (Start: 23 @4015 has 2 MA's), (Start: 25 @4024 has 2 MA's), (Start: 32 @4054 has 34 MA's), (Start: 39 @4102 has 9 MA's), (Start: 48 @4138 has 4 MA's), (53, 4177), (58, 4189), (66, 4225), (68, 4231), (73, 4249), (90, 4411), (119, 4507), (121, 4513), (122, 4528), (137, 4615),

Gene: Leozinho\_5 Start: 3604, Stop: 4329, Start Num: 12

Candidate Starts for Leozinho\_5:

(Start: 12 @3604 has 58 MA's), (20, 3631), (24, 3652), (31, 3679), (42, 3739), (50, 3778), (70, 3877), (82, 3946), (83, 3949), (100, 4078), (107, 4099), (125, 4207), (143, 4315),

Gene: LilSpotty\_4 Start: 3229, Stop: 3888, Start Num: 15

Candidate Starts for LilSpotty\_4:

(5, 3193), (9, 3214), (Start: 15 @3229 has 2 MA's), (24, 3271), (Start: 32 @3304 has 34 MA's), (52, 3412), (58, 3451), (77, 3529), (83, 3562), (87, 3598), (90, 3664), (98, 3748), (99, 3751), (102, 3787),

Gene: Lilas\_4 Start: 3716, Stop: 4528, Start Num: 14

Candidate Starts for Lilas\_4:

(Start: 14 @3716 has 17 MA's), (Start: 32 @3791 has 34 MA's), (66, 3974), (78, 4031), (88, 4121), (90, 4160), (99, 4247),

Gene: LittleShirley\_5 Start: 3605, Stop: 4330, Start Num: 12

Candidate Starts for LittleShirley\_5:

(Start: 12 @3605 has 58 MA's), (20, 3632), (24, 3653), (31, 3680), (42, 3740), (50, 3779), (70, 3878), (82, 3947), (83, 3950), (100, 4079), (107, 4100), (125, 4208), (143, 4316),

Gene: LonelyBoi\_4 Start: 3710, Stop: 4375, Start Num: 14

Candidate Starts for LonelyBoi\_4:

(Start: 14 @3710 has 17 MA's), (51, 3887), (63, 3950), (66, 3968), (78, 4025), (91, 4157), (94, 4199),

Gene: Lorde\_5 Start: 3604, Stop: 4329, Start Num: 12

Candidate Starts for Lorde\_5:

(Start: 12 @3604 has 58 MA's), (20, 3631), (24, 3652), (31, 3679), (42, 3739), (50, 3778), (70, 3877), (82, 3946), (83, 3949), (100, 4078), (107, 4099), (125, 4207), (143, 4315),

Gene: LunaStella\_4 Start: 3803, Stop: 4498, Start Num: 48

Candidate Starts for LunaStella\_4:

(Start: 14 @3644 has 17 MA's), (16, 3650), (Start: 48 @3803 has 4 MA's), (51, 3821), (59, 3869), (65, 3893), (73, 3926), (77, 3950), (81, 3971), (83, 3983), (87, 4019), (88, 4046), (90, 4085), (91, 4088), (97, 4151), (100, 4190), (103, 4226), (108, 4244), (109, 4256), (119, 4355), (125, 4397),

Gene: MAnor\_6 Start: 3999, Stop: 4592, Start Num: 32

Candidate Starts for MAnor\_6:

(8, 3909), (11, 3915), (19, 3942), (Start: 23 @3960 has 2 MA's), (Start: 25 @3969 has 2 MA's), (Start: 32 @3999 has 34 MA's), (Start: 39 @4047 has 9 MA's), (53, 4122), (58, 4134), (66, 4170), (68, 4176), (73, 4194), (90, 4356), (93, 4377), (119, 4452), (121, 4458), (122, 4473), (137, 4560),

Gene: MScarn\_8 Start: 4216, Stop: 4839, Start Num: 32

Candidate Starts for MScarn\_8:

(8, 4129), (11, 4135), (Start: 32 @4216 has 34 MA's), (Start: 39 @4264 has 9 MA's), (43, 4279), (47, 4297), (53, 4339), (73, 4411), (83, 4471), (85, 4495), (90, 4573), (93, 4594), (96, 4624), (128, 4768), (132, 4786),

Gene: MaVan\_8 Start: 5151, Stop: 5714, Start Num: 39

Candidate Starts for MaVan\_8:

(8, 5016), (11, 5022), (18, 5040), (Start: 23 @5064 has 2 MA's), (24, 5070), (Start: 39 @5151 has 9 MA's), (Start: 48 @5187 has 4 MA's), (49, 5193), (60, 5250), (73, 5304), (78, 5337), (79, 5340), (85, 5388), (90, 5466), (91, 5469), (93, 5487), (118, 5571), (119, 5577), (122, 5598), (138, 5688),

Gene: Madiba\_5 Start: 3603, Stop: 4328, Start Num: 12

Candidate Starts for Madiba\_5:

(Start: 12 @3603 has 58 MA's), (20, 3630), (24, 3651), (31, 3678), (42, 3738), (50, 3777), (70, 3876), (82, 3945), (83, 3948), (100, 4077), (107, 4098), (125, 4206), (143, 4314),

Gene: Margaret\_9 Start: 4991, Stop: 5593, Start Num: 32

Candidate Starts for Margaret\_9:

(8, 4898), (Start: 13 @4907 has 1 MA's), (19, 4934), (Start: 32 @4991 has 34 MA's), (Start: 39 @5027 has 9 MA's), (Start: 48 @5063 has 4 MA's), (49, 5069), (78, 5228), (81, 5243), (85, 5279), (86, 5285), (89, 5324), (90, 5357), (93, 5378), (95, 5402), (121, 5459), (132, 5537),

Gene: Marker\_5 Start: 3603, Stop: 4328, Start Num: 12

Candidate Starts for Marker\_5:

(Start: 12 @3603 has 58 MA's), (20, 3630), (24, 3651), (31, 3678), (42, 3738), (50, 3777), (56, 3816), (70, 3876), (82, 3945), (83, 3948), (100, 4077), (107, 4098), (125, 4206), (143, 4314),

Gene: Marteena\_4 Start: 3716, Stop: 4528, Start Num: 14

Candidate Starts for Marteena\_4:

(Start: 14 @3716 has 17 MA's), (Start: 32 @3791 has 34 MA's), (66, 3974), (78, 4031), (88, 4121), (90, 4160), (99, 4247),

Gene: Mayweather\_7 Start: 4620, Stop: 5213, Start Num: 32

Candidate Starts for Mayweather\_7:

(8, 4530), (11, 4536), (19, 4563), (Start: 23 @4581 has 2 MA's), (Start: 25 @4590 has 2 MA's), (Start: 32 @4620 has 34 MA's), (Start: 39 @4668 has 9 MA's), (53, 4743), (58, 4755), (66, 4791), (68, 4797), (73, 4815), (90, 4977), (93, 4998), (119, 5073), (121, 5079), (122, 5094), (137, 5181),

Gene: Misha28\_5 Start: 3607, Stop: 4332, Start Num: 12

Candidate Starts for Misha28\_5:

(Start: 12 @3607 has 58 MA's), (20, 3634), (24, 3655), (31, 3682), (42, 3742), (50, 3781), (70, 3880), (82, 3949), (83, 3952), (100, 4081), (107, 4102), (125, 4210), (143, 4318),

Gene: Mova\_5 Start: 3605, Stop: 4330, Start Num: 12

Candidate Starts for Mova\_5:

(Start: 12 @3605 has 58 MA's), (20, 3632), (24, 3653), (31, 3680), (42, 3740), (50, 3779), (70, 3878), (82, 3947), (83, 3950), (100, 4079), (107, 4100), (125, 4208), (143, 4316),

Gene: Mozy\_5 Start: 3603, Stop: 4328, Start Num: 12

Candidate Starts for Mozy\_5:

(Start: 12 @3603 has 58 MA's), (20, 3630), (22, 3639), (30, 3675), (31, 3678), (Start: 32 @3684 has 34 MA's), (Start: 39 @3726 has 9 MA's), (45, 3747), (46, 3750), (50, 3777), (70, 3876), (82, 3945), (83, 3948), (100, 4077), (107, 4098), (121, 4170), (143, 4314),

Gene: MrSmee\_4 Start: 3158, Stop: 3907, Start Num: 12

Candidate Starts for MrSmee\_4:

(Start: 12 @3158 has 58 MA's), (17, 3176), (20, 3185), (Start: 25 @3209 has 2 MA's), (26, 3215), (30, 3230), (Start: 32 @3239 has 34 MA's), (33, 3251), (34, 3257), (36, 3272), (42, 3299), (46, 3311), (58, 3413), (81, 3512), (83, 3524), (85, 3548), (91, 3635), (116, 3788),

Gene: MulchExplorer\_5 Start: 3632, Stop: 4330, Start Num: 20

Candidate Starts for MulchExplorer\_5:

(Start: 12 @3605 has 58 MA's), (20, 3632), (24, 3653), (31, 3680), (42, 3740), (50, 3779), (70, 3878), (82, 3947), (83, 3950), (100, 4079), (107, 4100), (125, 4208), (143, 4316),

Gene: MunkgeeRoachy\_6 Start: 4269, Stop: 4892, Start Num: 32

Candidate Starts for MunkgeeRoachy\_6:

(8, 4179), (11, 4185), (Start: 32 @4269 has 34 MA's), (Start: 39 @4317 has 9 MA's), (45, 4338), (47, 4350), (49, 4359), (53, 4392), (73, 4464), (83, 4524), (90, 4626), (96, 4677), (119, 4755), (128, 4821), (132, 4839), (136, 4860),

Gene: Nibbles\_8 Start: 5151, Stop: 5714, Start Num: 39

Candidate Starts for Nibbles\_8:

(8, 5016), (11, 5022), (18, 5040), (Start: 23 @5064 has 2 MA's), (24, 5070), (Start: 39 @5151 has 9 MA's), (Start: 48 @5187 has 4 MA's), (49, 5193), (60, 5250), (73, 5304), (78, 5337), (79, 5340), (85, 5388), (90, 5466), (91, 5469), (93, 5487), (118, 5571), (119, 5577), (122, 5598), (138, 5688),

Gene: Oksu\_5 Start: 3680, Stop: 4330, Start Num: 31

Candidate Starts for Oksu\_5:

(Start: 12 @3605 has 58 MA's), (20, 3632), (24, 3653), (31, 3680), (42, 3740), (50, 3779), (70, 3878), (82, 3947), (83, 3950), (100, 4079), (107, 4100), (125, 4208), (143, 4316),

Gene: OwlsT2W\_5 Start: 3604, Stop: 4329, Start Num: 12

Candidate Starts for OwlsT2W\_5:

(Start: 12 @3604 has 58 MA's), (20, 3631), (24, 3652), (31, 3679), (42, 3739), (50, 3778), (70, 3877), (82, 3946), (83, 3949), (100, 4078), (107, 4099), (125, 4207), (143, 4315),

Gene: P3MA\_5 Start: 3858, Stop: 4730, Start Num: 15

Candidate Starts for P3MA\_5:

(1, 3546), (2, 3741), (Start: 15 @3858 has 2 MA's), (73, 4140), (85, 4215), (91, 4296), (101, 4404), (104, 4437), (114, 4479), (120, 4563), (121, 4566), (130, 4635), (143, 4710),

Gene: Piper2020\_5 Start: 3607, Stop: 4332, Start Num: 12

Candidate Starts for Piper2020\_5:

(Start: 12 @3607 has 58 MA's), (20, 3634), (24, 3655), (31, 3682), (42, 3742), (50, 3781), (70, 3880), (82, 3949), (83, 3952), (100, 4081), (107, 4102), (125, 4210), (143, 4318),

Gene: Plumbus\_5 Start: 3605, Stop: 4330, Start Num: 12

Candidate Starts for Plumbus\_5:

(Start: 12 @3605 has 58 MA's), (20, 3632), (24, 3653), (31, 3680), (42, 3740), (50, 3779), (70, 3878), (82, 3947), (83, 3950), (100, 4079), (107, 4100), (125, 4208), (143, 4316),

Gene: Pollux\_4 Start: 3716, Stop: 4528, Start Num: 14

Candidate Starts for Pollux\_4:

(Start: 14 @3716 has 17 MA's), (Start: 32 @3791 has 34 MA's), (66, 3974), (78, 4031), (88, 4121), (90, 4160), (99, 4247),

Gene: Pollywog\_5 Start: 3604, Stop: 4329, Start Num: 12

Candidate Starts for Pollywog\_5:

(Start: 12 @3604 has 58 MA's), (20, 3631), (24, 3652), (31, 3679), (42, 3739), (50, 3778), (70, 3877), (82, 3946), (83, 3949), (100, 4078), (107, 4099), (125, 4207), (143, 4315),

Gene: Pons\_6 Start: 3999, Stop: 4592, Start Num: 32

Candidate Starts for Pons\_6:

(8, 3909), (11, 3915), (19, 3942), (Start: 23 @3960 has 2 MA's), (Start: 25 @3969 has 2 MA's), (Start: 32 @3999 has 34 MA's), (Start: 39 @4047 has 9 MA's), (53, 4122), (58, 4134), (66, 4170), (68, 4176), (73, 4194), (90, 4356), (93, 4377), (119, 4452), (121, 4458), (122, 4473), (137, 4560),

Gene: Posh\_4 Start: 3710, Stop: 4522, Start Num: 14

Candidate Starts for Posh\_4:

(Start: 14 @3710 has 17 MA's), (63, 3950), (88, 4115), (90, 4154), (99, 4241),

Gene: PotPie\_6 Start: 4858, Stop: 5451, Start Num: 32

Candidate Starts for PotPie\_6:

(8, 4768), (11, 4774), (19, 4801), (Start: 23 @4819 has 2 MA's), (Start: 25 @4828 has 2 MA's), (Start: 32 @4858 has 34 MA's), (Start: 39 @4906 has 9 MA's), (Start: 48 @4942 has 4 MA's), (53, 4981), (58, 4993), (66, 5029), (68, 5035), (73, 5053), (90, 5215), (93, 5236), (119, 5311), (121, 5317), (122, 5332), (137, 5419),

Gene: PsychoKiller\_6 Start: 4221, Stop: 4844, Start Num: 32

Candidate Starts for PsychoKiller\_6:

(8, 4131), (11, 4137), (Start: 32 @4221 has 34 MA's), (Start: 39 @4269 has 9 MA's), (45, 4290), (47, 4302), (49, 4311), (53, 4344), (73, 4416), (83, 4476), (90, 4578), (96, 4629), (128, 4773), (132, 4791), (136, 4812),

Gene: Pytheas\_4 Start: 3710, Stop: 4375, Start Num: 14

Candidate Starts for Pytheas\_4:

(Start: 14 @3710 has 17 MA's), (51, 3887), (63, 3950), (78, 4025), (91, 4157), (94, 4199),

Gene: Quasar\_6 Start: 4890, Stop: 5465, Start Num: 39

Candidate Starts for Quasar\_6:

(8, 4752), (11, 4758), (Start: 32 @4842 has 34 MA's), (Start: 39 @4890 has 9 MA's), (45, 4911), (47, 4923), (49, 4932), (53, 4965), (73, 5037), (83, 5097), (90, 5199), (96, 5250), (119, 5328), (128, 5394), (132, 5412), (136, 5433),

Gene: Quico\_5 Start: 3602, Stop: 4327, Start Num: 12

Candidate Starts for Quico\_5:

(Start: 12 @3602 has 58 MA's), (20, 3629), (22, 3638), (26, 3659), (30, 3674), (31, 3677), (Start: 32 @3683 has 34 MA's), (Start: 39 @3725 has 9 MA's), (45, 3746), (46, 3749), (50, 3776), (70, 3875), (82, 3944), (83, 3947), (87, 3983), (100, 4076), (107, 4097), (121, 4169), (143, 4313),

Gene: Ramsey\_5 Start: 3604, Stop: 4329, Start Num: 12

Candidate Starts for Ramsey\_5:

(Start: 12 @3604 has 58 MA's), (20, 3631), (24, 3652), (31, 3679), (42, 3739), (50, 3778), (70, 3877), (82, 3946), (83, 3949), (100, 4078), (107, 4099), (125, 4207), (143, 4315),

Gene: RanchParmCat\_9 Start: 4991, Stop: 5593, Start Num: 32

Candidate Starts for RanchParmCat\_9:

(8, 4898), (Start: 13 @4907 has 1 MA's), (19, 4934), (Start: 32 @4991 has 34 MA's), (Start: 39 @5027 has 9 MA's), (Start: 48 @5063 has 4 MA's), (78, 5228), (81, 5243), (85, 5279), (86, 5285), (89, 5324), (90, 5357), (93, 5378), (95, 5402), (121, 5459), (132, 5537),

Gene: Raqqa\_5 Start: 3858, Stop: 4661, Start Num: 12

Candidate Starts for Raqqa\_5:

(Start: 12 @3858 has 58 MA's), (Start: 25 @3909 has 2 MA's), (34, 3957), (46, 4011), (58, 4113), (75, 4212), (78, 4251), (81, 4266), (85, 4302), (90, 4386), (91, 4389), (112, 4488), (116, 4542),

Gene: RedBaron\_7 Start: 4266, Stop: 4889, Start Num: 32

Candidate Starts for RedBaron\_7:

(8, 4176), (11, 4182), (Start: 32 @4266 has 34 MA's), (Start: 39 @4314 has 9 MA's), (45, 4335), (47, 4347), (49, 4356), (53, 4389), (73, 4461), (83, 4521), (90, 4623), (96, 4674), (119, 4752), (128, 4818), (136, 4857),

Gene: Renaud18\_4 Start: 3803, Stop: 4378, Start Num: 48

Candidate Starts for Renaud18\_4:

(Start: 14 @3644 has 17 MA's), (16, 3650), (Start: 48 @3803 has 4 MA's), (51, 3821), (58, 3866), (59, 3869), (65, 3893), (73, 3926), (77, 3950), (81, 3971), (83, 3983), (87, 4019), (88, 4046), (90, 4085), (91, 4088), (92, 4115), (119, 4235), (125, 4277),

Gene: Rialto\_5 Start: 3605, Stop: 4330, Start Num: 12

Candidate Starts for Rialto\_5:

(Start: 12 @3605 has 58 MA's), (20, 3632), (24, 3653), (31, 3680), (42, 3740), (50, 3779), (70, 3878), (82, 3947), (83, 3950), (100, 4079), (107, 4100), (125, 4208), (143, 4316),

Gene: RockyHorror\_5 Start: 3604, Stop: 4329, Start Num: 12

Candidate Starts for RockyHorror\_5:

(Start: 12 @3604 has 58 MA's), (20, 3631), (24, 3652), (31, 3679), (42, 3739), (50, 3778), (70, 3877), (82, 3946), (83, 3949), (100, 4078), (107, 4099), (125, 4207), (143, 4315),

Gene: Sarma624\_5 Start: 3604, Stop: 4329, Start Num: 12

Candidate Starts for Sarma624\_5:

(Start: 12 @3604 has 58 MA's), (20, 3631), (24, 3652), (31, 3679), (42, 3739), (50, 3778), (70, 3877), (82, 3946), (83, 3949), (100, 4078), (107, 4099), (125, 4207), (143, 4315),

Gene: Seagreen\_5 Start: 3605, Stop: 4330, Start Num: 12

Candidate Starts for Seagreen\_5:

(Start: 12 @3605 has 58 MA's), (20, 3632), (24, 3653), (31, 3680), (42, 3740), (50, 3779), (70, 3878), (82, 3947), (83, 3950), (100, 4079), (107, 4100), (125, 4208), (143, 4316),

Gene: SheckWes\_5 Start: 3999, Stop: 4592, Start Num: 32

Candidate Starts for SheckWes\_5:

(8, 3909), (11, 3915), (19, 3942), (Start: 23 @3960 has 2 MA's), (Start: 25 @3969 has 2 MA's), (Start: 32 @3999 has 34 MA's), (Start: 39 @4047 has 9 MA's), (53, 4122), (58, 4134), (66, 4170), (68, 4176), (73, 4194), (90, 4356), (93, 4377), (119, 4452), (121, 4458), (122, 4473), (137, 4560),

Gene: SimranZ1\_5 Start: 3604, Stop: 4329, Start Num: 12

Candidate Starts for SimranZ1\_5:

(Start: 12 @3604 has 58 MA's), (20, 3631), (24, 3652), (31, 3679), (42, 3739), (50, 3778), (70, 3877), (82, 3946), (83, 3949), (100, 4078), (107, 4099), (125, 4207), (143, 4315),

Gene: SketchMex\_5 Start: 4215, Stop: 4838, Start Num: 32

Candidate Starts for SketchMex\_5:

(8, 4128), (11, 4134), (Start: 32 @4215 has 34 MA's), (Start: 39 @4263 has 9 MA's), (47, 4296), (53, 4338), (73, 4410), (83, 4470), (85, 4494), (90, 4572), (93, 4593), (96, 4623), (128, 4767), (132, 4785),

Gene: Sopespian\_6 Start: 4221, Stop: 4844, Start Num: 32

Candidate Starts for Sopespian\_6:

(8, 4131), (11, 4137), (Start: 32 @4221 has 34 MA's), (Start: 39 @4269 has 9 MA's), (45, 4290), (47, 4302), (49, 4311), (53, 4344), (73, 4416), (83, 4476), (90, 4578), (96, 4629), (128, 4773), (132, 4791), (136, 4812),

Gene: Sparky\_4 Start: 3760, Stop: 4665, Start Num: 3

Candidate Starts for Sparky\_4:

(Start: 3 @3760 has 2 MA's), (18, 3850), (20, 3856), (22, 3865), (28, 3892), (38, 3952), (41, 3964), (44, 3973), (46, 3979), (61, 4066), (62, 4069), (79, 4150), (83, 4174), (105, 4384), (111, 4408), (119, 4489),

(121, 4495), (125, 4531), (141, 4618), (142, 4627), (143, 4639),

Gene: Spartoi\_4 Start: 3328, Stop: 4098, Start Num: 7

Candidate Starts for Spartoi\_4:

(6, 3322), (Start: 7 @3328 has 1 MA's), (Start: 32 @3427 has 34 MA's), (56, 3565), (64, 3604), (72, 3643), (74, 3652), (82, 3715), (89, 3790), (90, 3826), (93, 3847), (112, 3916), (127, 4057),

Gene: Spikelee\_5 Start: 3604, Stop: 4329, Start Num: 12

Candidate Starts for Spikelee\_5:

(Start: 12 @3604 has 58 MA's), (20, 3631), (24, 3652), (31, 3679), (42, 3739), (50, 3778), (70, 3877), (82, 3946), (83, 3949), (100, 4078), (107, 4099), (125, 4207), (143, 4315),

Gene: Squirty\_5 Start: 3603, Stop: 4328, Start Num: 12

Candidate Starts for Squirty\_5:

(Start: 12 @3603 has 58 MA's), (20, 3630), (24, 3651), (31, 3678), (42, 3738), (50, 3777), (70, 3876), (82, 3945), (83, 3948), (100, 4077), (107, 4098), (125, 4206), (143, 4314),

Gene: Stap\_5 Start: 3604, Stop: 4329, Start Num: 12

Candidate Starts for Stap\_5:

(Start: 12 @3604 has 58 MA's), (20, 3631), (24, 3652), (31, 3679), (42, 3739), (50, 3778), (70, 3877), (82, 3946), (83, 3949), (100, 4078), (107, 4099), (125, 4207), (143, 4315),

Gene: Starburst\_7 Start: 4221, Stop: 4844, Start Num: 32

Candidate Starts for Starburst\_7:

(8, 4131), (11, 4137), (Start: 32 @4221 has 34 MA's), (Start: 39 @4269 has 9 MA's), (45, 4290), (47, 4302), (49, 4311), (53, 4344), (73, 4416), (83, 4476), (90, 4578), (96, 4629), (119, 4707), (128, 4773), (132, 4791), (136, 4812),

Gene: Starcevich\_5 Start: 3604, Stop: 4329, Start Num: 12

Candidate Starts for Starcevich\_5:

(Start: 12 @3604 has 58 MA's), (20, 3631), (24, 3652), (31, 3679), (42, 3739), (50, 3778), (70, 3877), (82, 3946), (83, 3949), (100, 4078), (107, 4099), (125, 4207), (143, 4315),

Gene: SteamedHams\_8 Start: 4225, Stop: 4881, Start Num: 32

Candidate Starts for SteamedHams\_8:

(8, 4138), (11, 4144), (Start: 15 @4153 has 2 MA's), (Start: 32 @4225 has 34 MA's), (Start: 39 @4273 has 9 MA's), (43, 4288), (47, 4306), (53, 4348), (73, 4420), (83, 4480), (85, 4504), (90, 4582), (96, 4633), (125, 4786), (132, 4828),

Gene: SummitAcademy\_5 Start: 4073, Stop: 4666, Start Num: 32

Candidate Starts for SummitAcademy\_5:

(8, 3983), (11, 3989), (19, 4016), (Start: 23 @4034 has 2 MA's), (Start: 25 @4043 has 2 MA's), (Start: 32 @4073 has 34 MA's), (Start: 39 @4121 has 9 MA's), (Start: 48 @4157 has 4 MA's), (53, 4196), (58, 4208), (66, 4244), (68, 4250), (73, 4268), (90, 4430), (93, 4451), (119, 4526), (121, 4532), (122, 4547), (137, 4634),

Gene: Survivors\_8 Start: 4918, Stop: 5568, Start Num: 23

Candidate Starts for Survivors\_8:

(8, 4870), (11, 4876), (18, 4894), (Start: 23 @4918 has 2 MA's), (24, 4924), (Start: 39 @5005 has 9 MA's), (Start: 48 @5041 has 4 MA's), (49, 5047), (60, 5104), (73, 5158), (78, 5191), (79, 5194), (90, 5320), (91, 5323), (93, 5341), (118, 5425), (119, 5431), (122, 5452), (138, 5542),

Gene: SweatNTears\_8 Start: 4742, Stop: 5365, Start Num: 32

Candidate Starts for SweatNTears\_8:

(8, 4655), (11, 4661), (Start: 32 @4742 has 34 MA's), (Start: 39 @4790 has 9 MA's), (47, 4823), (53, 4865), (73, 4937), (83, 4997), (85, 5021), (90, 5099), (93, 5120), (96, 5150), (128, 5294), (132, 5312),

Gene: TChen\_4 Start: 3803, Stop: 4498, Start Num: 48

Candidate Starts for TChen\_4:

(Start: 14 @3644 has 17 MA's), (16, 3650), (Start: 48 @3803 has 4 MA's), (51, 3821), (59, 3869), (65, 3893), (73, 3926), (77, 3950), (81, 3971), (83, 3983), (87, 4019), (88, 4046), (90, 4085), (91, 4088), (97, 4151), (100, 4190), (103, 4226), (108, 4244), (109, 4256), (119, 4355), (125, 4397),

Gene: ThetaBob\_4 Start: 3803, Stop: 4378, Start Num: 48

Candidate Starts for ThetaBob\_4:

(Start: 14 @3644 has 17 MA's), (16, 3650), (Start: 48 @3803 has 4 MA's), (51, 3821), (59, 3869), (65, 3893), (73, 3926), (77, 3950), (81, 3971), (83, 3983), (87, 4019), (88, 4046), (90, 4085), (91, 4088), (92, 4115), (119, 4235), (125, 4277),

Gene: Tolls\_8 Start: 4226, Stop: 4885, Start Num: 32

Candidate Starts for Tolls\_8:

(8, 4139), (11, 4145), (Start: 32 @4226 has 34 MA's), (Start: 39 @4274 has 9 MA's), (43, 4289), (47, 4307), (53, 4349), (73, 4421), (83, 4481), (85, 4505), (90, 4583), (96, 4634), (125, 4787), (132, 4829), (137, 4856),

Gene: TootsiePop\_5 Start: 3607, Stop: 4332, Start Num: 12

Candidate Starts for TootsiePop\_5:

(Start: 12 @3607 has 58 MA's), (20, 3634), (24, 3655), (31, 3682), (42, 3742), (50, 3781), (70, 3880), (82, 3949), (83, 3952), (100, 4081), (107, 4102), (125, 4210), (143, 4318),

Gene: Tootsieroll\_5 Start: 3604, Stop: 4329, Start Num: 12

Candidate Starts for Tootsieroll\_5:

(Start: 12 @3604 has 58 MA's), (20, 3631), (24, 3652), (31, 3679), (42, 3739), (50, 3778), (70, 3877), (82, 3946), (83, 3949), (100, 4078), (107, 4099), (125, 4207), (143, 4315),

Gene: Toron\_4 Start: 3803, Stop: 4498, Start Num: 48

Candidate Starts for Toron\_4:

(Start: 14 @3644 has 17 MA's), (16, 3650), (45, 3788), (Start: 48 @3803 has 4 MA's), (51, 3821), (59, 3869), (65, 3893), (73, 3926), (77, 3950), (81, 3971), (83, 3983), (87, 4019), (88, 4046), (90, 4085), (91, 4088), (96, 4148), (97, 4151), (100, 4190), (108, 4244), (109, 4256), (119, 4355), (125, 4397),

Gene: Totinger\_5 Start: 3605, Stop: 4330, Start Num: 12

Candidate Starts for Totinger\_5:

(Start: 12 @3605 has 58 MA's), (20, 3632), (24, 3653), (31, 3680), (42, 3740), (50, 3779), (70, 3878), (82, 3947), (83, 3950), (100, 4079), (107, 4100), (125, 4208), (143, 4316),

Gene: Troje\_6 Start: 4216, Stop: 4839, Start Num: 32

Candidate Starts for Troje\_6:

(8, 4129), (11, 4135), (Start: 32 @4216 has 34 MA's), (Start: 39 @4264 has 9 MA's), (43, 4279), (47, 4297), (53, 4339), (73, 4411), (83, 4471), (85, 4495), (90, 4573), (93, 4594), (96, 4624), (128, 4768), (132, 4786),

Gene: Typhonomachy\_7 Start: 4221, Stop: 4844, Start Num: 32

Candidate Starts for Typhonomachy\_7:

(8, 4131), (11, 4137), (Start: 32 @4221 has 34 MA's), (Start: 39 @4269 has 9 MA's), (45, 4290), (47, 4302), (49, 4311), (53, 4344), (73, 4416), (83, 4476), (90, 4578), (96, 4629), (119, 4707), (128, 4773),



(132, 4791), (136, 4812),

Gene: UncleRicky\_5 Start: 3604, Stop: 4329, Start Num: 12

Candidate Starts for UncleRicky\_5:

(Start: 12 @3604 has 58 MA's), (20, 3631), (24, 3652), (31, 3679), (42, 3739), (50, 3778), (70, 3877), (82, 3946), (83, 3949), (100, 4078), (107, 4099), (125, 4207), (143, 4315),

Gene: Velveteen\_5 Start: 3604, Stop: 4329, Start Num: 12

Candidate Starts for Velveteen\_5:

(Start: 12 @3604 has 58 MA's), (20, 3631), (24, 3652), (31, 3679), (42, 3739), (50, 3778), (70, 3877), (82, 3946), (83, 3949), (100, 4078), (107, 4099), (125, 4207), (143, 4315),

Gene: Vine\_7 Start: 4967, Stop: 5590, Start Num: 25

Candidate Starts for Vine\_7:

(8, 4907), (11, 4913), (19, 4940), (Start: 23 @4958 has 2 MA's), (Start: 25 @4967 has 2 MA's), (Start: 32 @4997 has 34 MA's), (Start: 39 @5045 has 9 MA's), (Start: 48 @5081 has 4 MA's), (53, 5120), (58, 5132), (66, 5168), (68, 5174), (73, 5192), (90, 5354), (121, 5456), (122, 5471), (137, 5558),

Gene: Wrigley\_4 Start: 3707, Stop: 4372, Start Num: 14

Candidate Starts for Wrigley\_4:

(Start: 14 @3707 has 17 MA's), (63, 3947), (78, 4022), (91, 4154), (94, 4196),

Gene: Yakult\_7 Start: 4190, Stop: 4777, Start Num: 32

Candidate Starts for Yakult\_7:

(8, 4097), (Start: 13 @4106 has 1 MA's), (22, 4145), (24, 4157), (Start: 32 @4190 has 34 MA's), (Start: 39 @4226 has 9 MA's), (43, 4241), (78, 4412), (86, 4469), (90, 4541), (93, 4562), (95, 4586), (121, 4643), (132, 4721),

Gene: Yarn\_5 Start: 4219, Stop: 4875, Start Num: 32

Candidate Starts for Yarn\_5:

(8, 4132), (11, 4138), (Start: 15 @4147 has 2 MA's), (Start: 32 @4219 has 34 MA's), (Start: 39 @4267 has 9 MA's), (43, 4282), (47, 4300), (53, 4342), (73, 4414), (83, 4474), (85, 4498), (90, 4576), (96, 4627), (128, 4804), (132, 4822),

Gene: Yucky\_8 Start: 4828, Stop: 5451, Start Num: 25

Candidate Starts for Yucky\_8:

(8, 4768), (11, 4774), (19, 4801), (Start: 23 @4819 has 2 MA's), (Start: 25 @4828 has 2 MA's), (Start: 32 @4858 has 34 MA's), (Start: 39 @4906 has 9 MA's), (Start: 48 @4942 has 4 MA's), (53, 4981), (58, 4993), (66, 5029), (68, 5035), (73, 5053), (90, 5215), (121, 5317), (122, 5332), (137, 5419),

Gene: Yummy\_7 Start: 4122, Stop: 4745, Start Num: 32

Candidate Starts for Yummy\_7:

(8, 4035), (11, 4041), (Start: 32 @4122 has 34 MA's), (Start: 39 @4170 has 9 MA's), (47, 4203), (53, 4245), (73, 4317), (83, 4377), (85, 4401), (90, 4479), (93, 4500), (96, 4530), (128, 4674), (132, 4692),

Gene: Zareef\_9 Start: 5152, Stop: 5715, Start Num: 39

Candidate Starts for Zareef\_9:

(8, 5017), (11, 5023), (18, 5041), (Start: 23 @5065 has 2 MA's), (24, 5071), (Start: 39 @5152 has 9 MA's), (Start: 48 @5188 has 4 MA's), (49, 5194), (60, 5251), (73, 5305), (78, 5338), (79, 5341), (85, 5389), (90, 5467), (91, 5470), (93, 5488), (118, 5572), (122, 5599), (138, 5689),

Gene: Zucker\_5 Start: 3788, Stop: 4504, Start Num: 21

Candidate Starts for Zucker\_5:

(Start: 12 @3755 has 58 MA's), (Start: 21 @3788 has 1 MA's), (27, 3815), (30, 3827), (34, 3854), (37, 3872), (42, 3896), (52, 3944), (54, 3962), (55, 3968), (70, 4049), (71, 4058), (77, 4097), (83, 4130), (89, 4196), (112, 4328), (115, 4367), (117, 4388), (123, 4427), (132, 4484),