



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 221276 Report

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

Pham number 221276 has 108 members, 11 are drafts.

Phages represented in each track:

- Track 1 : Navo\_53
- Track 2 : WhereRU\_52, Persimmon\_51, Bartholomune\_53, Braelyn\_54
- Track 3 : Anedea\_53
- Track 4 : Sushi23\_55, Teutsch\_55, Shuckle\_53, Scheme\_56, Larnav\_55, Tribute\_53, Peebs\_54, Pepperwood\_55
- Track 5 : Leo04\_56, Cross\_55, Watermoore\_55, Lululemon\_54, Samisti12\_55, BlueOtter\_55, Cursive\_53, HangryHippo\_55, PacManQ\_54
- Track 6 : Warpy\_59, Jay2Jay\_60
- Track 7 : Squillium\_54, Liandry\_54, PinkiePie\_53
- Track 8 : Marsus\_54
- Track 9 : EGole\_56
- Track 10 : Cadmus\_56, Daubenski\_56
- Track 11 : Bmoc\_53
- Track 12 : Angela\_52, MulchMansion\_52, LilMartin\_52
- Track 13 : Targaryen\_56
- Track 14 : Evy\_56
- Track 15 : Riptide\_53
- Track 16 : NootNoot\_51, Paradiddles\_51
- Track 17 : Mildred21\_53
- Track 18 : Stanimal\_57, Sollertia\_57, Genie2\_57
- Track 19 : PumpkinSpice\_56, Rikishi\_60, Jollison\_56, Quaran19\_57, Wipeout\_55, Birchlyn\_54, TomSawyer\_55, Gibbi\_61, Bordeaux\_55, MindFlayer\_55, Spelly\_57, Amabiko\_57, Battuta\_55, Starbow\_55, SaltySpittoon\_57, JimJam\_57
- Track 20 : Wofford\_56, Elmer\_59
- Track 21 : LukeCage\_56
- Track 22 : Karimac\_56, KentuckyRacer\_57, IchabodCrane\_54, CeilingFan\_56, Spilled\_58
- Track 23 : StarPlatinum\_57
- Track 24 : Yaboi\_57, BoomerJR\_57
- Track 25 : Mugiwara\_58
- Track 26 : Tomas\_59
- Track 27 : Enygma\_57
- Track 28 : Karp\_34, Stigma\_35
- Track 29 : Kenrey\_36, Phredrick\_34
- Track 30 : Westy\_35
- Track 31 : Jada\_34, Gilson\_36, Emma1919\_36, Forrest\_36
- Track 32 : Beuffert\_33, Blueeyedbeauty\_34

- Track 33 : TunaTartare\_34
- Track 34 : Belfort\_36, Comrade\_35, SparkleGoddess\_35
- Track 35 : Sham\_32
- Track 36 : Patelgo\_35
- Track 37 : SeresaTree\_35, Faust\_35
- Track 38 : Annadreamy\_32, Limpid\_32
- Track 39 : Moab\_35
- Track 40 : MeganTheeKilla\_34
- Track 41 : Francob\_34
- Track 42 : Muntaha\_31, Wakanda\_31
- Track 43 : Circinus\_32, BillNye\_30
- Track 44 : Trina\_77
- Track 45 : NiceHouse\_66
- Track 46 : Dorin\_51, Francesca\_50
- Track 47 : Nova53\_50

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

The start number called the most often in the published annotations is 15, it was called in 36 of the 97 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Amabiko\_57, Anedeia\_53, Angela\_52, Battuta\_55, Birchlyn\_54, Bmoc\_53, BoomerJR\_57, Bordeaux\_55, CeilingFan\_56, Elmer\_59, Enygma\_57, Genie2\_57, Gibbi\_61, IchabodCrane\_54, JimJam\_57, Jollison\_56, Karimac\_56, KentuckyRacer\_57, LilMartin\_52, LukeCage\_56, Marsus\_54, Mildred21\_53, MindFlayer\_55, Mugiwara\_58, MulchMansion\_52, PumpkinSpice\_56, Quaran19\_57, Rikishi\_60, Riptide\_53, SaltySpittoon\_57, Sollertia\_57, Spelly\_57, Spilled\_58, Stanimal\_57, StarPlatinum\_57, Starbow\_55, TomSawyer\_55, Tomas\_59, Wipeout\_55, Wofford\_56, Yaboi\_57,

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

- Trina\_77,

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

- Annadreamy\_32, Bartholomune\_53, Belfort\_36, Beuffert\_33, BillNye\_30, BlueOtter\_55, Blueeyedbeauty\_34, Braelyn\_54, Cadmus\_56, Circinus\_32, Comrade\_35, Cross\_55, Cursive\_53, Daubenski\_56, Dorin\_51, EGole\_56, Emma1919\_36, Evy\_56, Faust\_35, Forrest\_36, Francesca\_50, Francob\_34, Gilson\_36, HangryHippo\_55, Jada\_34, Jay2Jay\_60, Karp\_34, Kenrey\_36, Larnav\_55, Leo04\_56, Liandry\_54, Limpid\_32, Lululemon\_54, MeganTheeKilla\_34, Moab\_35, Muntaha\_31, Navo\_53, NiceHouse\_66, NootNoot\_51, Nova53\_50, PacManQ\_54, Paradiddles\_51, Patelgo\_35, Peebs\_54, Pepperwood\_55, Persimmon\_51, Phredrick\_34, PinkiePie\_53, Samisti12\_55, Scheme\_56, SeresaTree\_35, Sham\_32, Shuckle\_53, SparkleGoddess\_35, Squillium\_54, Stigma\_35, Sushi23\_55, Targaryen\_56, Teutsch\_55, Tribute\_53, TunaTartare\_34, Wakanda\_31, Warpy\_59, Watermoore\_55, Westy\_35, WhereRU\_52,

**Summary by start number:**

Start 6:

- Found in 2 of 108 ( 1.9% ) of genes in pham
- Manual Annotations of this start: 2 of 97
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Muntaha\_31 (BK2), Wakanda\_31 (BK2),

Start 7:

- Found in 2 of 108 ( 1.9% ) of genes in pham
- Manual Annotations of this start: 2 of 97
- Called 100.0% of time when present
- Phage (with cluster) where this start called: BillNye\_30 (BK2), Circinus\_32 (BK2),

Start 8:

- Found in 20 of 108 ( 18.5% ) of genes in pham
- Manual Annotations of this start: 18 of 97
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Belfort\_36 (BK1), Comrade\_35 (BK1), Emma1919\_36 (BK1), Faust\_35 (BK1), Forrest\_36 (BK1), Francob\_34 (BK1), Gilson\_36 (BK1), Jada\_34 (BK1), Karp\_34 (BK1), Kenrey\_36 (BK1), MeganTheeKilla\_34 (BK1), Moab\_35 (BK1), Patelgo\_35 (BK1), Phredrick\_34 (BK1), SeresaTree\_35 (BK1), Sham\_32 (BK1), SparkleGoddess\_35 (BK1), Stigma\_35 (BK1), TunaTartare\_34 (BK1), Westy\_35 (BK1),

Start 9:

- Found in 4 of 108 ( 3.7% ) of genes in pham
- Manual Annotations of this start: 4 of 97
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Annadreamy\_32 (BK1), Beuffert\_33 (BK1), Blueeyedbeauty\_34 (BK1), Limpid\_32 (BK1),

Start 12:

- Found in 2 of 108 ( 1.9% ) of genes in pham
- Manual Annotations of this start: 2 of 97
- Called 100.0% of time when present
- Phage (with cluster) where this start called: NiceHouse\_66 (CE), Trina\_77 (CE),

Start 13:

- Found in 5 of 108 ( 4.6% ) of genes in pham
- Manual Annotations of this start: 2 of 97
- Called 60.0% of time when present
- Phage (with cluster) where this start called: Dorin\_51 (CG), Francesca\_50 (CG), Nova53\_50 (CG),

Start 14:

- Found in 34 of 108 ( 31.5% ) of genes in pham
- Manual Annotations of this start: 29 of 97
- Called 94.1% of time when present
- Phage (with cluster) where this start called: Bartholomune\_53 (BE1), BlueOtter\_55 (BE1), Braelyn\_54 (BE1), Cadmus\_56 (BE1), Cross\_55 (BE1), Cursive\_53 (BE1), Daubenski\_56 (BE1), EGole\_56 (BE1), Evy\_56 (BE1), HangryHippo\_55 (BE1), Larnav\_55 (BE1), Leo04\_56 (BE1), Liandry\_54 (BE1), Lululemon\_54 (BE1), Navo\_53 (BE1), NootNoot\_51 (BE1), PacManQ\_54 (BE1), Paradiddles\_51 (BE1), Peebs\_54 (BE1), Pepperwood\_55 (BE1), Persimmon\_51 (BE1), PinkiePie\_53 (BE1),

Samisti12\_55 (BE1), Scheme\_56 (BE1), Shuckle\_53 (BE1), Squillium\_54 (BE1), Sushi23\_55 (BE1), Targaryen\_56 (BE1), Teutsch\_55 (BE1), Tribute\_53 (BE1), Watermoore\_55 (BE1), WhereRU\_52 (BE1),

Start 15:

- Found in 42 of 108 ( 38.9% ) of genes in pham
- Manual Annotations of this start: 36 of 97
- Called 97.6% of time when present
- Phage (with cluster) where this start called: Amabiko\_57 (BE2), Anedea\_53 (BE1), Angela\_52 (BE1), Battuta\_55 (BE2), Birchlyn\_54 (BE2), Bmoc\_53 (BE1), BoomerJR\_57 (BE2), Bordeaux\_55 (BE2), CeilingFan\_56 (BE2), Elmer\_59 (BE2), Enygma\_57 (BE2), Genie2\_57 (BE2), Gibbi\_61 (BE2), IchabodCrane\_54 (BE2), JimJam\_57 (BE2), Jollison\_56 (BE2), Karimac\_56 (BE2), KentuckyRacer\_57 (BE2), LilMartin\_52 (BE1), LukeCage\_56 (BE2), Marsus\_54 (BE1), Mildred21\_53 (BE1), MindFlayer\_55 (BE2), Mugiwara\_58 (BE2), MulchMansion\_52 (BE1), PumpkinSpice\_56 (BE2), Quarant19\_57 (BE2), Rikishi\_60 (BE2), Riptide\_53 (BE1), SaltySpittoon\_57 (BE2), Sollertia\_57 (BE2), Spelly\_57 (BE2), Spilled\_58 (BE2), Stanimal\_57 (BE2), StarPlatinum\_57 (BE2), Starbow\_55 (BE2), TomSawyer\_55 (BE2), Tomas\_59 (BE2), Wipeout\_55 (BE2), Wofford\_56 (BE2), Yaboi\_57 (BE2),

Start 23:

- Found in 14 of 108 ( 13.0% ) of genes in pham
- Manual Annotations of this start: 2 of 97
- Called 14.3% of time when present
- Phage (with cluster) where this start called: Jay2Jay\_60 (BE1), Warpy\_59 (BE1),

### Summary by clusters:

There are 6 clusters represented in this pham: CG, CE, BK1, BK2, BE2, BE1,

Info for manual annotations of cluster BE1:

- Start number 14 was manually annotated 29 times for cluster BE1.
- Start number 15 was manually annotated 6 times for cluster BE1.
- Start number 23 was manually annotated 2 times for cluster BE1.

Info for manual annotations of cluster BE2:

- Start number 15 was manually annotated 30 times for cluster BE2.

Info for manual annotations of cluster BK1:

- Start number 8 was manually annotated 18 times for cluster BK1.
- Start number 9 was manually annotated 4 times for cluster BK1.

Info for manual annotations of cluster BK2:

- Start number 6 was manually annotated 2 times for cluster BK2.
- Start number 7 was manually annotated 2 times for cluster BK2.

Info for manual annotations of cluster CE:

- Start number 12 was manually annotated 2 times for cluster CE.

Info for manual annotations of cluster CG:

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

### **Gene Information:**

Gene: Amabiko\_57 Start: 31721, Stop: 32224, Start Num: 15

Candidate Starts for Amabiko\_57:

(Start: 15 @31721 has 36 MA's), (68, 32117), (83, 32198), (84, 32213),

Gene: Anedea\_53 Start: 31253, Stop: 31759, Start Num: 15

Candidate Starts for Anedea\_53:

(2, 31166), (3, 31175), (4, 31181), (Start: 15 @31253 has 36 MA's), (19, 31283), (45, 31484), (46, 31487), (68, 31649), (76, 31697), (84, 31748),

Gene: Angela\_52 Start: 30731, Stop: 31234, Start Num: 15

Candidate Starts for Angela\_52:

(2, 30644), (3, 30653), (4, 30659), (Start: 15 @30731 has 36 MA's), (19, 30761), (46, 30965), (76, 31175), (84, 31223),

Gene: Annadreamy\_32 Start: 20312, Stop: 20857, Start Num: 9

Candidate Starts for Annadreamy\_32:

(Start: 9 @20312 has 4 MA's), (11, 20330), (42, 20561), (45, 20585), (52, 20633), (55, 20654), (56, 20675), (70, 20753), (74, 20789), (75, 20792), (82, 20822), (84, 20846),

Gene: Bartholomune\_53 Start: 31042, Stop: 31548, Start Num: 14

Candidate Starts for Bartholomune\_53:

(1, 30946), (2, 30958), (3, 30967), (4, 30973), (10, 31000), (Start: 14 @31042 has 29 MA's), (Start: 23 @31102 has 2 MA's), (26, 31135), (33, 31177), (46, 31279), (56, 31366), (63, 31417), (76, 31489), (84, 31537),

Gene: Battuta\_55 Start: 31695, Stop: 32198, Start Num: 15

Candidate Starts for Battuta\_55:

(Start: 15 @31695 has 36 MA's), (68, 32091), (83, 32172), (84, 32187),

Gene: Belfort\_36 Start: 22825, Stop: 23370, Start Num: 8

Candidate Starts for Belfort\_36:

(Start: 8 @22825 has 18 MA's), (34, 23005), (48, 23125), (52, 23146), (53, 23155), (55, 23167), (59, 23224), (73, 23290), (74, 23302), (82, 23335),

Gene: Beuffert\_33 Start: 21407, Stop: 21952, Start Num: 9

Candidate Starts for Beuffert\_33:

(Start: 9 @21407 has 4 MA's), (11, 21425), (42, 21656), (45, 21680), (52, 21728), (55, 21749), (56, 21770), (70, 21848), (74, 21884), (82, 21917), (84, 21941),

Gene: BillNye\_30 Start: 23720, Stop: 24247, Start Num: 7

Candidate Starts for BillNye\_30:

(Start: 7 @23720 has 2 MA's), (11, 23738), (36, 23918), (52, 24032), (55, 24053), (56, 24074), (74, 24182), (77, 24191), (81, 24209), (82, 24215),

Gene: Birchlyn\_54 Start: 29578, Stop: 30081, Start Num: 15

Candidate Starts for Birchlyn\_54:

(Start: 15 @29578 has 36 MA's), (68, 29974), (83, 30055), (84, 30070),

Gene: BlueOtter\_55 Start: 32406, Stop: 32912, Start Num: 14

Candidate Starts for BlueOtter\_55:

(Start: 14 @32406 has 29 MA's), (25, 32487), (27, 32502), (45, 32640), (63, 32781), (66, 32799), (76, 32853), (79, 32862), (84, 32901),

Gene: Blueeyedbeauty\_34 Start: 20804, Stop: 21349, Start Num: 9

Candidate Starts for Blueeyedbeauty\_34:

(Start: 9 @20804 has 4 MA's), (11, 20822), (42, 21053), (45, 21077), (52, 21125), (55, 21146), (56, 21167), (70, 21245), (74, 21281), (82, 21314), (84, 21338),

Gene: Bmoc\_53 Start: 31038, Stop: 31544, Start Num: 15

Candidate Starts for Bmoc\_53:

(Start: 15 @31038 has 36 MA's), (19, 31068), (45, 31269), (46, 31272), (56, 31359), (68, 31434), (76, 31482), (79, 31491), (84, 31533),

Gene: BoomerJR\_57 Start: 31584, Stop: 32087, Start Num: 15

Candidate Starts for BoomerJR\_57:

(Start: 15 @31584 has 36 MA's), (28, 31680), (36, 31749), (68, 31980), (84, 32076),

Gene: Bordeaux\_55 Start: 31850, Stop: 32353, Start Num: 15

Candidate Starts for Bordeaux\_55:

(Start: 15 @31850 has 36 MA's), (68, 32246), (83, 32327), (84, 32342),

Gene: Braelyn\_54 Start: 31809, Stop: 32315, Start Num: 14

Candidate Starts for Braelyn\_54:

(1, 31713), (2, 31725), (3, 31734), (4, 31740), (10, 31767), (Start: 14 @31809 has 29 MA's), (Start: 23 @31869 has 2 MA's), (26, 31902), (33, 31944), (46, 32046), (56, 32133), (63, 32184), (76, 32256), (84, 32304),

Gene: Cadmus\_56 Start: 31388, Stop: 31894, Start Num: 14

Candidate Starts for Cadmus\_56:

(Start: 14 @31388 has 29 MA's), (25, 31469), (27, 31484), (28, 31487), (34, 31532), (45, 31622), (63, 31763), (76, 31835), (84, 31883),

Gene: CeilingFan\_56 Start: 31610, Stop: 32113, Start Num: 15

Candidate Starts for CeilingFan\_56:

(Start: 15 @31610 has 36 MA's), (65, 31997), (68, 32006), (83, 32087), (84, 32102),

Gene: Circinus\_32 Start: 23856, Stop: 24383, Start Num: 7

Candidate Starts for Circinus\_32:

(Start: 7 @23856 has 2 MA's), (11, 23874), (36, 24054), (52, 24168), (55, 24189), (56, 24210), (74, 24318), (77, 24327), (81, 24345), (82, 24351),

Gene: Comrade\_35 Start: 22440, Stop: 22985, Start Num: 8

Candidate Starts for Comrade\_35:

(Start: 8 @22440 has 18 MA's), (34, 22620), (48, 22740), (52, 22761), (53, 22770), (55, 22782), (59, 22839), (73, 22905), (74, 22917), (82, 22950),

Gene: Cross\_55 Start: 32407, Stop: 32913, Start Num: 14

Candidate Starts for Cross\_55:

(Start: 14 @32407 has 29 MA's), (25, 32488), (27, 32503), (45, 32641), (63, 32782), (66, 32800), (76, 32854), (79, 32863), (84, 32902),

Gene: Cursive\_53 Start: 31932, Stop: 32438, Start Num: 14

Candidate Starts for Cursive\_53:

(Start: 14 @31932 has 29 MA's), (25, 32013), (27, 32028), (45, 32166), (63, 32307), (66, 32325), (76, 32379), (79, 32388), (84, 32427),

Gene: Daubenski\_56 Start: 32152, Stop: 32658, Start Num: 14

Candidate Starts for Daubenski\_56:

(Start: 14 @32152 has 29 MA's), (25, 32233), (27, 32248), (28, 32251), (34, 32296), (45, 32386), (63, 32527), (76, 32599), (84, 32647),

Gene: Dorin\_51 Start: 31412, Stop: 31951, Start Num: 13

Candidate Starts for Dorin\_51:

(Start: 13 @31412 has 2 MA's), (22, 31484), (29, 31529), (32, 31556), (40, 31622), (47, 31688), (53, 31721), (60, 31805), (61, 31811), (73, 31871),

Gene: EGole\_56 Start: 33311, Stop: 33868, Start Num: 14

Candidate Starts for EGole\_56:

(Start: 14 @33311 has 29 MA's), (25, 33392), (27, 33407), (45, 33545), (56, 33635), (66, 33725), (76, 33779), (79, 33788), (80, 33794), (85, 33857),

Gene: Elmer\_59 Start: 32757, Stop: 33260, Start Num: 15

Candidate Starts for Elmer\_59:

(Start: 15 @32757 has 36 MA's), (19, 32787), (22, 32811), (33, 32889), (34, 32898), (50, 33024), (52, 33036), (68, 33153), (84, 33249),

Gene: Emma1919\_36 Start: 21218, Stop: 21772, Start Num: 8

Candidate Starts for Emma1919\_36:

(Start: 8 @21218 has 18 MA's), (32, 21383), (34, 21398), (44, 21485), (48, 21527), (52, 21548), (54, 21560), (55, 21569), (73, 21692), (74, 21704), (82, 21737),

Gene: Enygma\_57 Start: 33532, Stop: 34035, Start Num: 15

Candidate Starts for Enygma\_57:

(Start: 15 @33532 has 36 MA's), (19, 33562), (24, 33601), (25, 33610), (57, 33865), (68, 33928), (79, 33985), (84, 34024),

Gene: Evy\_56 Start: 32408, Stop: 32914, Start Num: 14

Candidate Starts for Evy\_56:

(1, 32312), (2, 32324), (4, 32339), (10, 32366), (Start: 14 @32408 has 29 MA's), (Start: 23 @32468 has 2 MA's), (25, 32489), (28, 32507), (56, 32732), (63, 32783), (66, 32801), (76, 32855), (79, 32864), (84, 32903),

Gene: Faust\_35 Start: 21811, Stop: 22359, Start Num: 8

Candidate Starts for Faust\_35:

(Start: 8 @21811 has 18 MA's), (Start: 13 @21847 has 2 MA's), (33, 21985), (39, 22036), (52, 22135), (53, 22144), (54, 22147), (55, 22156), (56, 22177), (74, 22291), (75, 22294), (82, 22324),

Gene: Forrest\_36 Start: 21341, Stop: 21895, Start Num: 8

Candidate Starts for Forrest\_36:

(Start: 8 @21341 has 18 MA's), (32, 21506), (34, 21521), (44, 21608), (48, 21650), (52, 21671), (54, 21683), (55, 21692), (73, 21815), (74, 21827), (82, 21860),

Gene: Francesca\_50 Start: 31544, Stop: 32083, Start Num: 13

Candidate Starts for Francesca\_50:

(Start: 13 @31544 has 2 MA's), (22, 31616), (29, 31661), (32, 31688), (40, 31754), (47, 31820), (53, 31853), (60, 31937), (61, 31943), (73, 32003),



Gene: Francob\_34 Start: 21349, Stop: 21903, Start Num: 8  
Candidate Starts for Francob\_34:  
(Start: 8 @21349 has 18 MA's), (34, 21529), (38, 21568), (39, 21571), (52, 21679), (53, 21688), (61, 21766), (73, 21823),

Gene: Genie2\_57 Start: 31698, Stop: 32201, Start Num: 15  
Candidate Starts for Genie2\_57:  
(Start: 15 @31698 has 36 MA's), (28, 31794), (36, 31863), (42, 31905), (68, 32094), (84, 32190),

Gene: Gibbi\_61 Start: 31833, Stop: 32336, Start Num: 15  
Candidate Starts for Gibbi\_61:  
(Start: 15 @31833 has 36 MA's), (68, 32229), (83, 32310), (84, 32325),

Gene: Gilson\_36 Start: 21171, Stop: 21725, Start Num: 8  
Candidate Starts for Gilson\_36:  
(Start: 8 @21171 has 18 MA's), (32, 21336), (34, 21351), (44, 21438), (48, 21480), (52, 21501), (54, 21513), (55, 21522), (73, 21645), (74, 21657), (82, 21690),

Gene: HangryHippo\_55 Start: 32406, Stop: 32912, Start Num: 14  
Candidate Starts for HangryHippo\_55:  
(Start: 14 @32406 has 29 MA's), (25, 32487), (27, 32502), (45, 32640), (63, 32781), (66, 32799), (76, 32853), (79, 32862), (84, 32901),

Gene: IchabodCrane\_54 Start: 31422, Stop: 31925, Start Num: 15  
Candidate Starts for IchabodCrane\_54:  
(Start: 15 @31422 has 36 MA's), (65, 31809), (68, 31818), (83, 31899), (84, 31914),

Gene: Jada\_34 Start: 20523, Stop: 21077, Start Num: 8  
Candidate Starts for Jada\_34:  
(Start: 8 @20523 has 18 MA's), (32, 20688), (34, 20703), (44, 20790), (48, 20832), (52, 20853), (54, 20865), (55, 20874), (73, 20997), (74, 21009), (82, 21042),

Gene: Jay2Jay\_60 Start: 33276, Stop: 33767, Start Num: 23  
Candidate Starts for Jay2Jay\_60:  
(1, 33120), (2, 33132), (4, 33147), (10, 33174), (Start: 14 @33216 has 29 MA's), (Start: 23 @33276 has 2 MA's), (25, 33297), (56, 33540), (63, 33591), (66, 33609), (76, 33663), (79, 33672), (83, 33696), (86, 33750), (87, 33756),

Gene: JimJam\_57 Start: 31796, Stop: 32299, Start Num: 15  
Candidate Starts for JimJam\_57:  
(Start: 15 @31796 has 36 MA's), (68, 32192), (83, 32273), (84, 32288),

Gene: Jollison\_56 Start: 31678, Stop: 32181, Start Num: 15  
Candidate Starts for Jollison\_56:  
(Start: 15 @31678 has 36 MA's), (68, 32074), (83, 32155), (84, 32170),

Gene: Karimac\_56 Start: 31827, Stop: 32330, Start Num: 15  
Candidate Starts for Karimac\_56:  
(Start: 15 @31827 has 36 MA's), (65, 32214), (68, 32223), (83, 32304), (84, 32319),

Gene: Karp\_34 Start: 22040, Stop: 22585, Start Num: 8  
Candidate Starts for Karp\_34:

(Start: 8 @22040 has 18 MA's), (34, 22220), (52, 22361), (53, 22370), (55, 22382), (59, 22439), (73, 22505), (74, 22517), (82, 22550),

Gene: Kenrey\_36 Start: 21220, Stop: 21774, Start Num: 8

Candidate Starts for Kenrey\_36:

(Start: 8 @21220 has 18 MA's), (32, 21385), (34, 21400), (45, 21493), (52, 21550), (54, 21562), (55, 21571), (74, 21706), (75, 21709), (82, 21739),

Gene: KentuckyRacer\_57 Start: 31611, Stop: 32114, Start Num: 15

Candidate Starts for KentuckyRacer\_57:

(Start: 15 @31611 has 36 MA's), (65, 31998), (68, 32007), (83, 32088), (84, 32103),

Gene: Larnav\_55 Start: 32391, Stop: 32897, Start Num: 14

Candidate Starts for Larnav\_55:

(Start: 14 @32391 has 29 MA's), (25, 32472), (27, 32487), (45, 32625), (56, 32715), (63, 32766), (66, 32784), (76, 32838), (79, 32847), (84, 32886),

Gene: Leo04\_56 Start: 32906, Stop: 33412, Start Num: 14

Candidate Starts for Leo04\_56:

(Start: 14 @32906 has 29 MA's), (25, 32987), (27, 33002), (45, 33140), (63, 33281), (66, 33299), (76, 33353), (79, 33362), (84, 33401),

Gene: Liandry\_54 Start: 31746, Stop: 32297, Start Num: 14

Candidate Starts for Liandry\_54:

(1, 31650), (2, 31662), (3, 31671), (4, 31677), (10, 31704), (Start: 14 @31746 has 29 MA's), (Start: 23 @31806 has 2 MA's), (46, 31983), (56, 32070), (63, 32121), (66, 32139), (76, 32193), (83, 32226), (86, 32280), (87, 32286),

Gene: LilMartin\_52 Start: 30679, Stop: 31182, Start Num: 15

Candidate Starts for LilMartin\_52:

(2, 30592), (3, 30601), (4, 30607), (Start: 15 @30679 has 36 MA's), (19, 30709), (46, 30913), (76, 31123), (84, 31171),

Gene: Limpid\_32 Start: 20311, Stop: 20856, Start Num: 9

Candidate Starts for Limpid\_32:

(Start: 9 @20311 has 4 MA's), (11, 20329), (42, 20560), (45, 20584), (52, 20632), (55, 20653), (56, 20674), (70, 20752), (74, 20788), (75, 20791), (82, 20821), (84, 20845),

Gene: LukeCage\_56 Start: 31578, Stop: 32081, Start Num: 15

Candidate Starts for LukeCage\_56:

(Start: 15 @31578 has 36 MA's), (28, 31674), (36, 31743), (65, 31965), (68, 31974), (84, 32070),

Gene: Lululemon\_54 Start: 31787, Stop: 32293, Start Num: 14

Candidate Starts for Lululemon\_54:

(Start: 14 @31787 has 29 MA's), (25, 31868), (27, 31883), (45, 32021), (63, 32162), (66, 32180), (76, 32234), (79, 32243), (84, 32282),

Gene: Marsus\_54 Start: 30951, Stop: 31454, Start Num: 15

Candidate Starts for Marsus\_54:

(2, 30864), (3, 30873), (4, 30879), (Start: 15 @30951 has 36 MA's), (19, 30981), (46, 31185), (56, 31272), (76, 31395), (84, 31443),

Gene: MeganTheeKilla\_34 Start: 20532, Stop: 21086, Start Num: 8

Candidate Starts for MeganTheeKilla\_34:

(Start: 8 @20532 has 18 MA's), (32, 20697), (34, 20712), (44, 20799), (48, 20841), (52, 20862), (54, 20874), (55, 20883), (73, 21006), (74, 21018), (75, 21021), (82, 21051),

Gene: Mildred21\_53 Start: 30872, Stop: 31375, Start Num: 15

Candidate Starts for Mildred21\_53:

(Start: 15 @30872 has 36 MA's), (46, 31106), (68, 31268), (76, 31316), (78, 31322), (84, 31364),

Gene: MindFlayer\_55 Start: 31329, Stop: 31832, Start Num: 15

Candidate Starts for MindFlayer\_55:

(Start: 15 @31329 has 36 MA's), (68, 31725), (83, 31806), (84, 31821),

Gene: Moab\_35 Start: 22371, Stop: 22916, Start Num: 8

Candidate Starts for Moab\_35:

(Start: 8 @22371 has 18 MA's), (34, 22551), (38, 22590), (39, 22593), (52, 22692), (55, 22713), (59, 22770), (72, 22830), (74, 22848), (75, 22851), (82, 22881),

Gene: Mugiwara\_58 Start: 32077, Stop: 32580, Start Num: 15

Candidate Starts for Mugiwara\_58:

(Start: 15 @32077 has 36 MA's), (57, 32410), (68, 32473), (84, 32569),

Gene: MulchMansion\_52 Start: 30679, Stop: 31182, Start Num: 15

Candidate Starts for MulchMansion\_52:

(2, 30592), (3, 30601), (4, 30607), (Start: 15 @30679 has 36 MA's), (19, 30709), (46, 30913), (76, 31123), (84, 31171),

Gene: Muntaha\_31 Start: 22171, Stop: 22716, Start Num: 6

Candidate Starts for Muntaha\_31:

(Start: 6 @22171 has 2 MA's), (36, 22387), (52, 22501), (54, 22513), (55, 22522), (56, 22543), (62, 22594), (74, 22651), (81, 22678), (82, 22684),

Gene: Navo\_53 Start: 31704, Stop: 32210, Start Num: 14

Candidate Starts for Navo\_53:

(1, 31608), (2, 31620), (4, 31635), (Start: 14 @31704 has 29 MA's), (Start: 23 @31764 has 2 MA's), (56, 32028), (63, 32079), (76, 32151), (84, 32199),

Gene: NiceHouse\_66 Start: 37810, Stop: 38346, Start Num: 12

Candidate Starts for NiceHouse\_66:

(Start: 12 @37810 has 2 MA's), (18, 37843), (19, 37858), (21, 37882), (22, 37885), (24, 37900), (28, 37927), (45, 38068), (49, 38098), (51, 38107), (53, 38125), (56, 38158), (60, 38200), (67, 38233), (69, 38239), (84, 38335),

Gene: NootNoot\_51 Start: 30660, Stop: 31211, Start Num: 14

Candidate Starts for NootNoot\_51:

(1, 30564), (2, 30576), (4, 30591), (5, 30603), (10, 30618), (Start: 14 @30660 has 29 MA's), (Start: 23 @30720 has 2 MA's), (46, 30897), (56, 30984), (63, 31035), (66, 31053), (76, 31107), (83, 31140), (86, 31194), (87, 31200),

Gene: Nova53\_50 Start: 31545, Stop: 32081, Start Num: 13

Candidate Starts for Nova53\_50:

(Start: 13 @31545 has 2 MA's), (22, 31617), (28, 31659), (29, 31662), (31, 31686), (41, 31761), (43, 31788), (53, 31854), (60, 31935), (61, 31941), (73, 32001),

Gene: PacManQ\_54 Start: 31787, Stop: 32293, Start Num: 14

Candidate Starts for PacManQ\_54:

(Start: 14 @31787 has 29 MA's), (25, 31868), (27, 31883), (45, 32021), (63, 32162), (66, 32180), (76, 32234), (79, 32243), (84, 32282),

Gene: Paradiddles\_51 Start: 30921, Stop: 31472, Start Num: 14

Candidate Starts for Paradiddles\_51:

(1, 30825), (2, 30837), (4, 30852), (5, 30864), (10, 30879), (Start: 14 @30921 has 29 MA's), (Start: 23 @30981 has 2 MA's), (46, 31158), (56, 31245), (63, 31296), (66, 31314), (76, 31368), (83, 31401), (86, 31455), (87, 31461),

Gene: Patelgo\_35 Start: 22561, Stop: 23106, Start Num: 8

Candidate Starts for Patelgo\_35:

(Start: 8 @22561 has 18 MA's), (34, 22741), (38, 22780), (39, 22783), (52, 22882), (55, 22903), (59, 22960), (72, 23020), (74, 23038), (75, 23041), (82, 23071), (84, 23095),

Gene: Peebs\_54 Start: 32144, Stop: 32650, Start Num: 14

Candidate Starts for Peebs\_54:

(Start: 14 @32144 has 29 MA's), (25, 32225), (27, 32240), (45, 32378), (56, 32468), (63, 32519), (66, 32537), (76, 32591), (79, 32600), (84, 32639),

Gene: Pepperwood\_55 Start: 32277, Stop: 32783, Start Num: 14

Candidate Starts for Pepperwood\_55:

(Start: 14 @32277 has 29 MA's), (25, 32358), (27, 32373), (45, 32511), (56, 32601), (63, 32652), (66, 32670), (76, 32724), (79, 32733), (84, 32772),

Gene: Persimmon\_51 Start: 30635, Stop: 31141, Start Num: 14

Candidate Starts for Persimmon\_51:

(1, 30539), (2, 30551), (3, 30560), (4, 30566), (10, 30593), (Start: 14 @30635 has 29 MA's), (Start: 23 @30695 has 2 MA's), (26, 30728), (33, 30770), (46, 30872), (56, 30959), (63, 31010), (76, 31082), (84, 31130),

Gene: Phredrick\_34 Start: 20426, Stop: 20980, Start Num: 8

Candidate Starts for Phredrick\_34:

(Start: 8 @20426 has 18 MA's), (32, 20591), (34, 20606), (45, 20699), (52, 20756), (54, 20768), (55, 20777), (74, 20912), (75, 20915), (82, 20945),

Gene: PinkiePie\_53 Start: 31746, Stop: 32297, Start Num: 14

Candidate Starts for PinkiePie\_53:

(1, 31650), (2, 31662), (3, 31671), (4, 31677), (10, 31704), (Start: 14 @31746 has 29 MA's), (Start: 23 @31806 has 2 MA's), (46, 31983), (56, 32070), (63, 32121), (66, 32139), (76, 32193), (83, 32226), (86, 32280), (87, 32286),

Gene: PumpkinSpice\_56 Start: 31721, Stop: 32224, Start Num: 15

Candidate Starts for PumpkinSpice\_56:

(Start: 15 @31721 has 36 MA's), (68, 32117), (83, 32198), (84, 32213),

Gene: Quaran19\_57 Start: 31712, Stop: 32215, Start Num: 15

Candidate Starts for Quaran19\_57:

(Start: 15 @31712 has 36 MA's), (68, 32108), (83, 32189), (84, 32204),

Gene: Rikishi\_60 Start: 31627, Stop: 32130, Start Num: 15

Candidate Starts for Rikishi\_60:

(Start: 15 @31627 has 36 MA's), (68, 32023), (83, 32104), (84, 32119),

Gene: Riptide\_53 Start: 30474, Stop: 30980, Start Num: 15

Candidate Starts for Riptide\_53:

(2, 30387), (3, 30396), (4, 30402), (Start: 15 @30474 has 36 MA's), (19, 30504), (46, 30708), (47, 30729), (56, 30795), (68, 30870), (76, 30918), (84, 30969),

Gene: SaltySpittoon\_57 Start: 31721, Stop: 32224, Start Num: 15

Candidate Starts for SaltySpittoon\_57:

(Start: 15 @31721 has 36 MA's), (68, 32117), (83, 32198), (84, 32213),

Gene: Samisti12\_55 Start: 33580, Stop: 34086, Start Num: 14

Candidate Starts for Samisti12\_55:

(Start: 14 @33580 has 29 MA's), (25, 33661), (27, 33676), (45, 33814), (63, 33955), (66, 33973), (76, 34027), (79, 34036), (84, 34075),

Gene: Scheme\_56 Start: 32991, Stop: 33497, Start Num: 14

Candidate Starts for Scheme\_56:

(Start: 14 @32991 has 29 MA's), (25, 33072), (27, 33087), (45, 33225), (56, 33315), (63, 33366), (66, 33384), (76, 33438), (79, 33447), (84, 33486),

Gene: SeresaTree\_35 Start: 21201, Stop: 21749, Start Num: 8

Candidate Starts for SeresaTree\_35:

(Start: 8 @21201 has 18 MA's), (Start: 13 @21237 has 2 MA's), (33, 21375), (39, 21426), (52, 21525), (53, 21534), (54, 21537), (55, 21546), (56, 21567), (74, 21681), (75, 21684), (82, 21714),

Gene: Sham\_32 Start: 22298, Stop: 22846, Start Num: 8

Candidate Starts for Sham\_32:

(Start: 8 @22298 has 18 MA's), (29, 22439), (30, 22448), (33, 22472), (38, 22520), (39, 22523), (42, 22550), (52, 22622), (53, 22631), (55, 22643), (58, 22679), (74, 22778), (82, 22811), (84, 22835),

Gene: Shuckle\_53 Start: 32597, Stop: 33103, Start Num: 14

Candidate Starts for Shuckle\_53:

(Start: 14 @32597 has 29 MA's), (25, 32678), (27, 32693), (45, 32831), (56, 32921), (63, 32972), (66, 32990), (76, 33044), (79, 33053), (84, 33092),

Gene: Sollertia\_57 Start: 31698, Stop: 32201, Start Num: 15

Candidate Starts for Sollertia\_57:

(Start: 15 @31698 has 36 MA's), (28, 31794), (36, 31863), (42, 31905), (68, 32094), (84, 32190),

Gene: SparkleGoddess\_35 Start: 22442, Stop: 22987, Start Num: 8

Candidate Starts for SparkleGoddess\_35:

(Start: 8 @22442 has 18 MA's), (34, 22622), (48, 22742), (52, 22763), (53, 22772), (55, 22784), (59, 22841), (73, 22907), (74, 22919), (82, 22952),

Gene: Spelly\_57 Start: 31676, Stop: 32179, Start Num: 15

Candidate Starts for Spelly\_57:

(Start: 15 @31676 has 36 MA's), (68, 32072), (83, 32153), (84, 32168),

Gene: Spilled\_58 Start: 31793, Stop: 32296, Start Num: 15

Candidate Starts for Spilled\_58:

(Start: 15 @31793 has 36 MA's), (65, 32180), (68, 32189), (83, 32270), (84, 32285),

Gene: Squillium\_54 Start: 31747, Stop: 32298, Start Num: 14

Candidate Starts for Squillium\_54:

(1, 31651), (2, 31663), (3, 31672), (4, 31678), (10, 31705), (Start: 14 @31747 has 29 MA's), (Start: 23 @31807 has 2 MA's), (46, 31984), (56, 32071), (63, 32122), (66, 32140), (76, 32194), (83, 32227), (86, 32281), (87, 32287),

Gene: Stanimal\_57 Start: 31587, Stop: 32090, Start Num: 15

Candidate Starts for Stanimal\_57:

(Start: 15 @31587 has 36 MA's), (28, 31683), (36, 31752), (42, 31794), (68, 31983), (84, 32079),

Gene: StarPlatinum\_57 Start: 32221, Stop: 32724, Start Num: 15

Candidate Starts for StarPlatinum\_57:

(Start: 15 @32221 has 36 MA's), (36, 32386), (57, 32554), (65, 32608), (68, 32617), (84, 32713),

Gene: Starbow\_55 Start: 31697, Stop: 32200, Start Num: 15

Candidate Starts for Starbow\_55:

(Start: 15 @31697 has 36 MA's), (68, 32093), (83, 32174), (84, 32189),

Gene: Stigma\_35 Start: 22443, Stop: 22988, Start Num: 8

Candidate Starts for Stigma\_35:

(Start: 8 @22443 has 18 MA's), (34, 22623), (52, 22764), (53, 22773), (55, 22785), (59, 22842), (73, 22908), (74, 22920), (82, 22953),

Gene: Sushi23\_55 Start: 32502, Stop: 33008, Start Num: 14

Candidate Starts for Sushi23\_55:

(Start: 14 @32502 has 29 MA's), (25, 32583), (27, 32598), (45, 32736), (56, 32826), (63, 32877), (66, 32895), (76, 32949), (79, 32958), (84, 32997),

Gene: Targaryen\_56 Start: 33265, Stop: 33816, Start Num: 14

Candidate Starts for Targaryen\_56:

(1, 33169), (2, 33181), (4, 33196), (10, 33223), (Start: 14 @33265 has 29 MA's), (Start: 23 @33325 has 2 MA's), (25, 33346), (56, 33589), (63, 33640), (66, 33658), (76, 33712), (79, 33721), (83, 33745), (86, 33799), (87, 33805),

Gene: Teutsch\_55 Start: 32771, Stop: 33277, Start Num: 14

Candidate Starts for Teutsch\_55:

(Start: 14 @32771 has 29 MA's), (25, 32852), (27, 32867), (45, 33005), (56, 33095), (63, 33146), (66, 33164), (76, 33218), (79, 33227), (84, 33266),

Gene: TomSawyer\_55 Start: 31315, Stop: 31818, Start Num: 15

Candidate Starts for TomSawyer\_55:

(Start: 15 @31315 has 36 MA's), (68, 31711), (83, 31792), (84, 31807),

Gene: Tomas\_59 Start: 34046, Stop: 34549, Start Num: 15

Candidate Starts for Tomas\_59:

(5, 33989), (Start: 15 @34046 has 36 MA's), (19, 34076), (20, 34088), (28, 34142), (34, 34187), (36, 34211), (68, 34442), (71, 34451), (78, 34496), (83, 34523), (84, 34538),

Gene: Tribute\_53 Start: 31971, Stop: 32477, Start Num: 14

Candidate Starts for Tribute\_53:

(Start: 14 @31971 has 29 MA's), (25, 32052), (27, 32067), (45, 32205), (56, 32295), (63, 32346), (66, 32364), (76, 32418), (79, 32427), (84, 32466),

Gene: Trina\_77 Start: 41278, Stop: 41826, Start Num: 12

Candidate Starts for Trina\_77:

(Start: 12 @41278 has 2 MA's), (Start: 15 @41296 has 36 MA's), (16, 41302), (17, 41308), (22, 41353), (34, 41440), (35, 41467), (37, 41479), (39, 41485), (43, 41527), (64, 41701),

Gene: TunaTartare\_34 Start: 22591, Stop: 23139, Start Num: 8

Candidate Starts for TunaTartare\_34:

(Start: 8 @22591 has 18 MA's), (29, 22732), (30, 22741), (33, 22765), (39, 22816), (52, 22915), (53, 22924), (55, 22936), (72, 23053), (74, 23071), (82, 23104), (84, 23128),

Gene: Wakanda\_31 Start: 22109, Stop: 22654, Start Num: 6

Candidate Starts for Wakanda\_31:

(Start: 6 @22109 has 2 MA's), (36, 22325), (52, 22439), (54, 22451), (55, 22460), (56, 22481), (62, 22532), (74, 22589), (81, 22616), (82, 22622),

Gene: Warpy\_59 Start: 32789, Stop: 33280, Start Num: 23

Candidate Starts for Warpy\_59:

(1, 32633), (2, 32645), (4, 32660), (10, 32687), (Start: 14 @32729 has 29 MA's), (Start: 23 @32789 has 2 MA's), (25, 32810), (56, 33053), (63, 33104), (66, 33122), (76, 33176), (79, 33185), (83, 33209), (86, 33263), (87, 33269),

Gene: Watermoore\_55 Start: 32978, Stop: 33484, Start Num: 14

Candidate Starts for Watermoore\_55:

(Start: 14 @32978 has 29 MA's), (25, 33059), (27, 33074), (45, 33212), (63, 33353), (66, 33371), (76, 33425), (79, 33434), (84, 33473),

Gene: Westy\_35 Start: 22443, Stop: 22988, Start Num: 8

Candidate Starts for Westy\_35:

(Start: 8 @22443 has 18 MA's), (34, 22623), (48, 22743), (52, 22764), (53, 22773), (55, 22785), (59, 22842), (73, 22908), (74, 22920), (82, 22953),

Gene: WhereRU\_52 Start: 31226, Stop: 31732, Start Num: 14

Candidate Starts for WhereRU\_52:

(1, 31130), (2, 31142), (3, 31151), (4, 31157), (10, 31184), (Start: 14 @31226 has 29 MA's), (Start: 23 @31286 has 2 MA's), (26, 31319), (33, 31361), (46, 31463), (56, 31550), (63, 31601), (76, 31673), (84, 31721),

Gene: Wipeout\_55 Start: 32066, Stop: 32569, Start Num: 15

Candidate Starts for Wipeout\_55:

(Start: 15 @32066 has 36 MA's), (68, 32462), (83, 32543), (84, 32558),

Gene: Wofford\_56 Start: 32720, Stop: 33223, Start Num: 15

Candidate Starts for Wofford\_56:

(Start: 15 @32720 has 36 MA's), (19, 32750), (22, 32774), (33, 32852), (34, 32861), (50, 32987), (52, 32999), (68, 33116), (84, 33212),

Gene: Yaboi\_57 Start: 31675, Stop: 32178, Start Num: 15

Candidate Starts for Yaboi\_57:

(Start: 15 @31675 has 36 MA's), (28, 31771), (36, 31840), (68, 32071), (84, 32167),