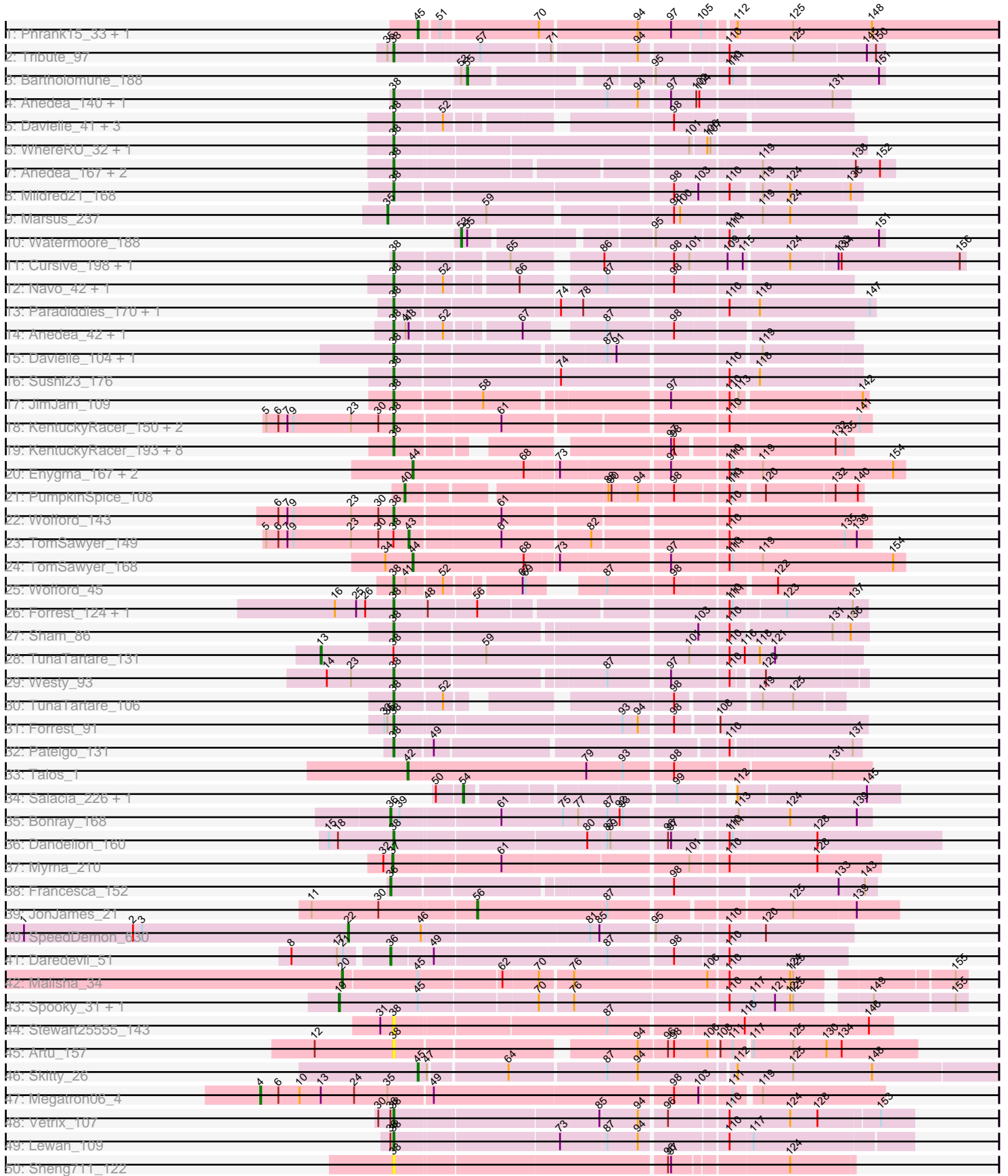


Pham 304928



Pham 304928



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 304928 Report

This analysis was run 06/08/26 on database version 649.

Pham number 304928 has 85 members, 4 are drafts.

Phages represented in each track:

- Track 1 : Phrank15\_33, LeBruni\_33
- Track 2 : Tribute\_97
- Track 3 : Bartholomune\_188
- Track 4 : Anedea\_140, Mildred21\_142
- Track 5 : Davielle\_41, Persimmon\_40, Leo04\_45, WhereRU\_41
- Track 6 : WhereRU\_32, Davielle\_32
- Track 7 : Anedea\_167, Wofford\_171, Riptide\_160
- Track 8 : Mildred21\_168
- Track 9 : Marsus\_237
- Track 10 : Watermoore\_188
- Track 11 : Cursive\_198, Cadmus\_194
- Track 12 : Navo\_42, Braelyn\_43
- Track 13 : Paradiddles\_170, Leo04\_177
- Track 14 : Anedea\_42, Marsus\_42
- Track 15 : Davielle\_104, WhereRU\_103
- Track 16 : Sushi23\_176
- Track 17 : JimJam\_109
- Track 18 : KentuckyRacer\_150, CeilingFan\_148, JimJam\_152
- Track 19 : KentuckyRacer\_193, Wipeout\_181, IchabodCrane\_184, Spilled\_194, Amabiko\_192, Mugiwara\_190, Brizzy\_188, JimJam\_195, TomSawyer\_193
- Track 20 : Enygma\_167, Brizzy\_163, Quarant19\_166
- Track 21 : PumpkinSpice\_108
- Track 22 : Wofford\_143
- Track 23 : TomSawyer\_149
- Track 24 : TomSawyer\_168
- Track 25 : Wofford\_45
- Track 26 : Forrest\_124, Jada\_120
- Track 27 : Sham\_86
- Track 28 : TunaTartare\_131
- Track 29 : Westy\_93
- Track 30 : TunaTartare\_106
- Track 31 : Forrest\_91
- Track 32 : Patelgo\_131
- Track 33 : Talos\_1
- Track 34 : Salacia\_226, Sebata\_227
- Track 35 : Bonray\_168
- Track 36 : Dandelion\_160

- Track 37 : Myrna\_210
- Track 38 : Francesca\_152
- Track 39 : JonJames\_21
- Track 40 : SpeedDemon\_630
- Track 41 : Daredevil\_51
- Track 42 : Malisha\_34
- Track 43 : Spooky\_31, Squiddly\_33
- Track 44 : Stewart25555\_143
- Track 45 : Artu\_157
- Track 46 : Skitty\_26
- Track 47 : Megatron06\_4
- Track 48 : Vetrix\_107
- Track 49 : Lewan\_109
- Track 50 : Sheng711\_122
- Track 51 : Douge\_125
- Track 52 : LilhomieP\_97
- Track 53 : Skinny\_102
- Track 54 : PegLeg\_102
- Track 55 : Patience\_5, Labelle\_5
- Track 56 : ArV2\_26

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

The start number called the most often in the published annotations is 38, it was called in 50 of the 81 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Amabiko\_192, Anedea\_140, Anedea\_167, Anedea\_42, Artu\_157, Braelyn\_43, Brizzy\_188, Cadmus\_194, CeilingFan\_148, Cursive\_198, Dandelion\_160, Davielle\_104, Davielle\_32, Davielle\_41, Douge\_125, Forrest\_124, Forrest\_91, IchabodCrane\_184, Jada\_120, JimJam\_109, JimJam\_152, JimJam\_195, KentuckyRacer\_150, KentuckyRacer\_193, Leo04\_177, Leo04\_45, Lewan\_109, Marsus\_42, Mildred21\_142, Mildred21\_168, Mugiwara\_190, Navo\_42, Paradiddles\_170, Patelgo\_131, Persimmon\_40, Riptide\_160, Sham\_86, Sheng711\_122, Spilled\_194, Stewart25555\_143, Sushi23\_176, TomSawyer\_193, Tribute\_97, TunaTartare\_106, Vetrix\_107, Westy\_93, WhereRU\_103, WhereRU\_32, WhereRU\_41, Wipeout\_181, Wofford\_143, Wofford\_171, Wofford\_45,

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

- TomSawyer\_149, TunaTartare\_131,

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

- ArV2\_26, Bartholomune\_188, Bonray\_168, Brizzy\_163, Daredevil\_51, Enygma\_167, Francesca\_152, JonJames\_21, Labelle\_5, LeBruni\_33, LilhomieP\_97, Malisha\_34, Marsus\_237, Megatron06\_4, Myrna\_210, Patience\_5, PegLeg\_102, Phrank15\_33, PumpkinSpice\_108, Quarant19\_166, Salacia\_226, Sebata\_227, Skinny\_102, Skitty\_26, SpeedDemon\_630, Spooky\_31, Squiddly\_33, Talos\_1, TomSawyer\_168, Watermoore\_188,

**Summary by start number:**

Start 4:

- Found in 1 of 85 ( 1.2% ) of genes in pham
- Manual Annotations of this start: 1 of 81
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Megatron06\_4 (H1),

Start 13:

- Found in 2 of 85 ( 2.4% ) of genes in pham
- Manual Annotations of this start: 1 of 81
- Called 50.0% of time when present
- Phage (with cluster) where this start called: TunaTartare\_131 (BK1),

Start 19:

- Found in 2 of 85 ( 2.4% ) of genes in pham
- Manual Annotations of this start: 2 of 81
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Spooky\_31 (DN2), Squiddly\_33 (DN2),

Start 20:

- Found in 1 of 85 ( 1.2% ) of genes in pham
- Manual Annotations of this start: 1 of 81
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Malisha\_34 (DN),

Start 22:

- Found in 1 of 85 ( 1.2% ) of genes in pham
- Manual Annotations of this start: 1 of 81
- Called 100.0% of time when present
- Phage (with cluster) where this start called: SpeedDemon\_630 (DL),

Start 27:

- Found in 2 of 85 ( 2.4% ) of genes in pham
- Manual Annotations of this start: 2 of 81
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Labelle\_5 (U), Patience\_5 (U),

Start 29:

- Found in 2 of 85 ( 2.4% ) of genes in pham
- Manual Annotations of this start: 1 of 81
- Called 50.0% of time when present
- Phage (with cluster) where this start called: LilhomieP\_97 (M1),

Start 32:

- Found in 2 of 85 ( 2.4% ) of genes in pham
- Manual Annotations of this start: 1 of 81
- Called 50.0% of time when present
- Phage (with cluster) where this start called: PegLeg\_102 (M1),

Start 35:

- Found in 4 of 85 ( 4.7% ) of genes in pham
- Manual Annotations of this start: 1 of 81
- Called 25.0% of time when present

- Phage (with cluster) where this start called: Marsus\_237 (BE1),

#### Start 36:

- Found in 7 of 85 ( 8.2% ) of genes in pham
- Manual Annotations of this start: 4 of 81
- Called 57.1% of time when present
- Phage (with cluster) where this start called: Bonray\_168 (C1), Daredevil\_51 (DL), Francesca\_152 (CG), Skinny\_102 (M1),

#### Start 37:

- Found in 1 of 85 ( 1.2% ) of genes in pham
- Manual Annotations of this start: 1 of 81
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Myrna\_210 (C2),

#### Start 38:

- Found in 55 of 85 ( 64.7% ) of genes in pham
- Manual Annotations of this start: 50 of 81
- Called 96.4% of time when present
- Phage (with cluster) where this start called: Amabiko\_192 (BE2), Anedea\_140 (BE1), Anedea\_167 (BE1), Anedea\_42 (BE1), Artu\_157 (FC), Braelyn\_43 (BE1), Brizzy\_188 (BE2), Cadmus\_194 (BE1), CeilingFan\_148 (BE2), Cursive\_198 (BE1), Dandelion\_160 (C1), Davielle\_104 (BE1), Davielle\_32 (BE1), Davielle\_41 (BE1), Douge\_125 (L4), Forrest\_124 (BK1), Forrest\_91 (BK1), IchabodCrane\_184 (BE2), Jada\_120 (BK1), JimJam\_109 (BE2), JimJam\_152 (BE2), JimJam\_195 (BE2), KentuckyRacer\_150 (BE2), KentuckyRacer\_193 (BE2), Leo04\_177 (BE1), Leo04\_45 (BE1), Lewan\_109 (L2), Marsus\_42 (BE1), Mildred21\_142 (BE1), Mildred21\_168 (BE1), Mugiwara\_190 (BE2), Navo\_42 (BE1), Paradiddles\_170 (BE1), Patelgo\_131 (BK1), Persimmon\_40 (BE1), Riptide\_160 (BE1), Sham\_86 (BK1), Sheng711\_122 (L4), Spilled\_194 (BE2), Stewart25555\_143 (FC), Sushi23\_176 (BE1), TomSawyer\_193 (BE2), Tribute\_97 (BE1), TunaTartare\_106 (BK1), Vatrix\_107 (L2), Westy\_93 (BK1), WhereRU\_103 (BE1), WhereRU\_32 (BE1), WhereRU\_41 (BE1), Wipeout\_181 (BE2), Wofford\_143 (BE2), Wofford\_171 (BE2), Wofford\_45 (BE2),

#### Start 40:

- Found in 1 of 85 ( 1.2% ) of genes in pham
- Manual Annotations of this start: 1 of 81
- Called 100.0% of time when present
- Phage (with cluster) where this start called: PumpkinSpice\_108 (BE2),

#### Start 42:

- Found in 1 of 85 ( 1.2% ) of genes in pham
- Manual Annotations of this start: 1 of 81
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Talos\_1 (BS),

#### Start 43:

- Found in 3 of 85 ( 3.5% ) of genes in pham
- Manual Annotations of this start: 1 of 81
- Called 33.3% of time when present
- Phage (with cluster) where this start called: TomSawyer\_149 (BE2),

#### Start 44:

- Found in 4 of 85 ( 4.7% ) of genes in pham
- Manual Annotations of this start: 4 of 81
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Brizzy\_163 (BE2), Enygma\_167 (BE2), Quaran19\_166 (BE2), TomSawyer\_168 (BE2),

Start 45:

- Found in 7 of 85 ( 8.2% ) of genes in pham
- Manual Annotations of this start: 3 of 81
- Called 57.1% of time when present
- Phage (with cluster) where this start called: ArV2\_26 (singleton), LeBruni\_33 (AY), Phrank15\_33 (AY), Skitty\_26 (FQ),

Start 53:

- Found in 2 of 85 ( 2.4% ) of genes in pham
- Manual Annotations of this start: 1 of 81
- Called 50.0% of time when present
- Phage (with cluster) where this start called: Watermoore\_188 (BE1),

Start 54:

- Found in 2 of 85 ( 2.4% ) of genes in pham
- Manual Annotations of this start: 2 of 81
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Salacia\_226 (C1), Sebata\_227 (C1),

Start 55:

- Found in 2 of 85 ( 2.4% ) of genes in pham
- Manual Annotations of this start: 1 of 81
- Called 50.0% of time when present
- Phage (with cluster) where this start called: Bartholomune\_188 (BE1),

Start 56:

- Found in 3 of 85 ( 3.5% ) of genes in pham
- Manual Annotations of this start: 1 of 81
- Called 33.3% of time when present
- Phage (with cluster) where this start called: JonJames\_21 (DD),

### **Summary by clusters:**

There are 20 clusters represented in this pham: DN, FQ, DL, DN2, CG, DD, H1, L2, singleton, AY, L4, FC, M1, BK1, BS, BE2, C2, C1, BE1, U,

Info for manual annotations of cluster AY:

- Start number 45 was manually annotated 2 times for cluster AY.

Info for manual annotations of cluster BE1:

- Start number 35 was manually annotated 1 time for cluster BE1.
- Start number 38 was manually annotated 23 times for cluster BE1.
- Start number 53 was manually annotated 1 time for cluster BE1.
- Start number 55 was manually annotated 1 time for cluster BE1.

Info for manual annotations of cluster BE2:

- Start number 38 was manually annotated 16 times for cluster BE2.

- Start number 40 was manually annotated 1 time for cluster BE2.
- Start number 43 was manually annotated 1 time for cluster BE2.
- Start number 44 was manually annotated 4 times for cluster BE2.

Info for manual annotations of cluster BK1:

- Start number 13 was manually annotated 1 time for cluster BK1.
- Start number 38 was manually annotated 7 times for cluster BK1.

Info for manual annotations of cluster BS:

- Start number 42 was manually annotated 1 time for cluster BS.

Info for manual annotations of cluster C1:

- Start number 36 was manually annotated 1 time for cluster C1.
- Start number 38 was manually annotated 1 time for cluster C1.
- Start number 54 was manually annotated 2 times for cluster C1.

Info for manual annotations of cluster C2:

- Start number 37 was manually annotated 1 time for cluster C2.

Info for manual annotations of cluster CG:

- Start number 36 was manually annotated 1 time for cluster CG.

Info for manual annotations of cluster DD:

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

Info for manual annotations of cluster DL:

- Start number 22 was manually annotated 1 time for cluster DL.
- Start number 36 was manually annotated 1 time for cluster DL.

Info for manual annotations of cluster DN:

- Start number 20 was manually annotated 1 time for cluster DN.

Info for manual annotations of cluster DN2:

- Start number 19 was manually annotated 2 times for cluster DN2.

Info for manual annotations of cluster FQ:

- Start number 45 was manually annotated 1 time for cluster FQ.

Info for manual annotations of cluster H1:

- Start number 4 was manually annotated 1 time for cluster H1.

Info for manual annotations of cluster L2:

- Start number 38 was manually annotated 2 times for cluster L2.

Info for manual annotations of cluster L4:

- Start number 38 was manually annotated 1 time for cluster L4.

Info for manual annotations of cluster M1:

- Start number 29 was manually annotated 1 time for cluster M1.
- Start number 32 was manually annotated 1 time for cluster M1.
- Start number 36 was manually annotated 1 time for cluster M1.

Info for manual annotations of cluster U:

•Start number 27 was manually annotated 2 times for cluster U.

**Gene Information:**

Gene: Amabiko\_192 Start: 96212, Stop: 96601, Start Num: 38

Candidate Starts for Amabiko\_192:

(Start: 38 @96212 has 50 MA's), (97, 96437), (98, 96440), (132, 96584), (135, 96593),

Gene: Anedea\_140 Start: 84644, Stop: 85069, Start Num: 38

Candidate Starts for Anedea\_140:

(Start: 38 @84644 has 50 MA's), (87, 84845), (94, 84875), (97, 84902), (102, 84926), (104, 84929), (131, 85052),

Gene: Anedea\_167 Start: 92344, Stop: 92802, Start Num: 38

Candidate Starts for Anedea\_167:

(Start: 38 @92344 has 50 MA's), (119, 92674), (138, 92764), (152, 92788),

Gene: Anedea\_42 Start: 21646, Stop: 22047, Start Num: 38

Candidate Starts for Anedea\_42:

(Start: 38 @21646 has 50 MA's), (41, 21658), (Start: 43 @21661 has 1 MA's), (52, 21691), (67, 21757), (87, 21820), (98, 21883),

Gene: ArV2\_26 Start: 20690, Stop: 21238, Start Num: 45

Candidate Starts for ArV2\_26:

(Start: 45 @20690 has 3 MA's), (60, 20753), (70, 20801), (93, 20879), (94, 20894), (112, 20984), (114, 20987), (148, 21116), (157, 21218),

Gene: Artu\_157 Start: 108175, Stop: 108654, Start Num: 38

Candidate Starts for Artu\_157:

(12, 108097), (Start: 38 @108175 has 50 MA's), (94, 108391), (96, 108418), (98, 108424), (106, 108457), (108, 108466), (111, 108478), (117, 108493), (125, 108532), (130, 108565), (134, 108580),

Gene: Bartholomune\_188 Start: 98185, Stop: 98556, Start Num: 55

Candidate Starts for Bartholomune\_188:

(Start: 53 @98179 has 1 MA's), (Start: 55 @98185 has 1 MA's), (95, 98344), (110, 98410), (111, 98413), (151, 98551),

Gene: Bonray\_168 Start: 94840, Stop: 95289, Start Num: 36

Candidate Starts for Bonray\_168:

(Start: 36 @94840 has 4 MA's), (39, 94849), (61, 94942), (75, 95002), (77, 95017), (87, 95044), (92, 95056), (93, 95059), (113, 95161), (124, 95209), (139, 95275),

Gene: Braelyn\_43 Start: 22198, Stop: 22599, Start Num: 38

Candidate Starts for Braelyn\_43:

(Start: 38 @22198 has 50 MA's), (52, 22243), (66, 22306), (87, 22372), (98, 22435),

Gene: Brizzy\_163 Start: 90852, Stop: 91316, Start Num: 44

Candidate Starts for Brizzy\_163:

(Start: 44 @90852 has 4 MA's), (68, 90960), (73, 90990), (97, 91092), (110, 91146), (111, 91149), (119, 91176), (154, 91305),

Gene: Brizzy\_188 Start: 96656, Stop: 97045, Start Num: 38

Candidate Starts for Brizzy\_188:

(Start: 38 @96656 has 50 MA's), (97, 96881), (98, 96884), (132, 97028), (135, 97037),

Gene: Cadmus\_194 Start: 103833, Stop: 104354, Start Num: 38

Candidate Starts for Cadmus\_194:

(Start: 38 @103833 has 50 MA's), (65, 103935), (86, 104010), (98, 104076), (101, 104091), (109, 104127), (115, 104142), (124, 104184), (133, 104229), (134, 104232), (156, 104349),

Gene: CeilingFan\_148 Start: 86515, Stop: 86958, Start Num: 38

Candidate Starts for CeilingFan\_148:

(5, 86389), (6, 86401), (7, 86410), (9, 86416), (23, 86473), (30, 86500), (Start: 38 @86515 has 50 MA's), (61, 86614), (110, 86821), (141, 86947),

Gene: Cursive\_198 Start: 103181, Stop: 103702, Start Num: 38

Candidate Starts for Cursive\_198:

(Start: 38 @103181 has 50 MA's), (65, 103283), (86, 103358), (98, 103424), (101, 103439), (109, 103475), (115, 103490), (124, 103532), (133, 103577), (134, 103580), (156, 103697),

Gene: Dandelion\_160 Start: 94845, Stop: 95354, Start Num: 38

Candidate Starts for Dandelion\_160:

(15, 94782), (18, 94791), (Start: 38 @94845 has 50 MA's), (80, 95025), (87, 95043), (89, 95046), (96, 95097), (97, 95100), (110, 95148), (111, 95151), (128, 95232),

Gene: Daredevil\_51 Start: 40951, Stop: 41370, Start Num: 36

Candidate Starts for Daredevil\_51:

(8, 40861), (17, 40906), (21, 40912), (Start: 36 @40951 has 4 MA's), (49, 40987), (87, 41149), (98, 41209), (110, 41257),

Gene: Davielle\_41 Start: 21615, Stop: 22016, Start Num: 38

Candidate Starts for Davielle\_41:

(Start: 38 @21615 has 50 MA's), (52, 21660), (98, 21852),

Gene: Davielle\_32 Start: 14821, Stop: 14384, Start Num: 38

Candidate Starts for Davielle\_32:

(Start: 38 @14821 has 50 MA's), (101, 14548), (106, 14533), (107, 14530),

Gene: Davielle\_104 Start: 73218, Stop: 73643, Start Num: 38

Candidate Starts for Davielle\_104:

(Start: 38 @73218 has 50 MA's), (87, 73410), (91, 73419), (119, 73548),

Gene: Douge\_125 Start: 66042, Stop: 66473, Start Num: 38

Candidate Starts for Douge\_125:

(28, 66024), (Start: 38 @66042 has 50 MA's), (63, 66147), (80, 66225), (87, 66243), (94, 66273), (98, 66303), (111, 66351), (125, 66405), (126, 66423),

Gene: Enygma\_167 Start: 93249, Stop: 93713, Start Num: 44

Candidate Starts for Enygma\_167:

(Start: 44 @93249 has 4 MA's), (68, 93357), (73, 93387), (97, 93489), (110, 93543), (111, 93546), (119, 93573), (154, 93702),

Gene: Forrest\_124 Start: 77019, Stop: 77447, Start Num: 38

Candidate Starts for Forrest\_124:

(16, 76962), (25, 76983), (26, 76992), (Start: 38 @77019 has 50 MA's), (48, 77049), (Start: 56 @77094 has 1 MA's), (110, 77319), (111, 77322), (123, 77370), (137, 77433),

Gene: Forrest\_91 Start: 63801, Stop: 64238, Start Num: 38

Candidate Starts for Forrest\_91:

(33, 63792), (Start: 35 @63795 has 1 MA's), (Start: 38 @63801 has 50 MA's), (93, 64017), (94, 64032), (98, 64062), (108, 64098),

Gene: Francesca\_152 Start: 89986, Stop: 90429, Start Num: 36

Candidate Starts for Francesca\_152:

(Start: 36 @89986 has 4 MA's), (98, 90241), (133, 90394), (143, 90418),

Gene: IchabodCrane\_184 Start: 95913, Stop: 96302, Start Num: 38

Candidate Starts for IchabodCrane\_184:

(Start: 38 @95913 has 50 MA's), (97, 96138), (98, 96141), (132, 96285), (135, 96294),

Gene: Jada\_120 Start: 75949, Stop: 76377, Start Num: 38

Candidate Starts for Jada\_120:

(16, 75892), (25, 75913), (26, 75922), (Start: 38 @75949 has 50 MA's), (48, 75979), (Start: 56 @76024 has 1 MA's), (110, 76249), (111, 76252), (123, 76300), (137, 76363),

Gene: JimJam\_109 Start: 73736, Stop: 74164, Start Num: 38

Candidate Starts for JimJam\_109:

(Start: 38 @73736 has 50 MA's), (58, 73817), (97, 73985), (110, 74039), (113, 74045), (142, 74159),

Gene: JimJam\_195 Start: 97834, Stop: 98223, Start Num: 38

Candidate Starts for JimJam\_195:

(Start: 38 @97834 has 50 MA's), (97, 98059), (98, 98062), (132, 98206), (135, 98215),

Gene: JimJam\_152 Start: 87443, Stop: 87886, Start Num: 38

Candidate Starts for JimJam\_152:

(5, 87317), (6, 87329), (7, 87338), (9, 87344), (23, 87401), (30, 87428), (Start: 38 @87443 has 50 MA's), (61, 87542), (110, 87749), (141, 87875),

Gene: JonJames\_21 Start: 7188, Stop: 7577, Start Num: 56

Candidate Starts for JonJames\_21:

(11, 7032), (30, 7098), (Start: 56 @7188 has 1 MA's), (87, 7314), (125, 7476), (139, 7536),

Gene: KentuckyRacer\_150 Start: 87011, Stop: 87454, Start Num: 38

Candidate Starts for KentuckyRacer\_150:

(5, 86885), (6, 86897), (7, 86906), (9, 86912), (23, 86969), (30, 86996), (Start: 38 @87011 has 50 MA's), (61, 87110), (110, 87317), (141, 87443),

Gene: KentuckyRacer\_193 Start: 97580, Stop: 97969, Start Num: 38

Candidate Starts for KentuckyRacer\_193:

(Start: 38 @97580 has 50 MA's), (97, 97805), (98, 97808), (132, 97952), (135, 97961),

Gene: Labelle\_5 Start: 2590, Stop: 3042, Start Num: 27

Candidate Starts for Labelle\_5:

(Start: 27 @2590 has 2 MA's), (87, 2803), (96, 2857), (110, 2911), (111, 2914), (127, 2989), (129, 2998),

Gene: LeBruni\_33 Start: 24490, Stop: 25041, Start Num: 45

Candidate Starts for LeBruni\_33:

(Start: 45 @24490 has 3 MA's), (51, 24508), (70, 24601), (94, 24694), (97, 24727), (105, 24757), (112, 24784), (125, 24838), (148, 24916),

Gene: Leo04\_177 Start: 96224, Stop: 96667, Start Num: 38

Candidate Starts for Leo04\_177:

(Start: 38 @96224 has 50 MA's), (74, 96377), (78, 96398), (110, 96530), (118, 96554), (147, 96662),

Gene: Leo04\_45 Start: 23281, Stop: 23682, Start Num: 38

Candidate Starts for Leo04\_45:

(Start: 38 @23281 has 50 MA's), (52, 23326), (98, 23518),

Gene: Lewan\_109 Start: 63302, Stop: 63781, Start Num: 38

Candidate Starts for Lewan\_109:

(Start: 36 @63299 has 4 MA's), (Start: 38 @63302 has 50 MA's), (73, 63455), (87, 63500), (94, 63530), (110, 63608), (117, 63629),

Gene: LilhomieP\_97 Start: 57511, Stop: 57948, Start Num: 29

Candidate Starts for LilhomieP\_97:

(Start: 29 @57511 has 1 MA's), (Start: 36 @57526 has 4 MA's), (72, 57676), (98, 57781), (101, 57796), (110, 57829), (117, 57850), (128, 57913),

Gene: Malisha\_34 Start: 26678, Stop: 27247, Start Num: 20

Candidate Starts for Malisha\_34:

(Start: 20 @26678 has 1 MA's), (Start: 45 @26750 has 3 MA's), (62, 26828), (70, 26861), (76, 26891), (106, 27020), (110, 27038), (124, 27098), (125, 27101), (155, 27236),

Gene: Marsus\_237 Start: 116691, Stop: 117125, Start Num: 35

Candidate Starts for Marsus\_237:

(Start: 35 @116691 has 1 MA's), (59, 116781), (98, 116952), (100, 116958), (119, 117033), (124, 117060),

Gene: Marsus\_42 Start: 21346, Stop: 21747, Start Num: 38

Candidate Starts for Marsus\_42:

(Start: 38 @21346 has 50 MA's), (41, 21358), (Start: 43 @21361 has 1 MA's), (52, 21391), (67, 21457), (87, 21520), (98, 21583),

Gene: Megatron06\_4 Start: 2094, Stop: 2681, Start Num: 4

Candidate Starts for Megatron06\_4:

(Start: 4 @2094 has 1 MA's), (6, 2112), (10, 2133), (Start: 13 @2154 has 1 MA's), (24, 2187), (Start: 35 @2220 has 1 MA's), (49, 2262), (98, 2490), (103, 2514), (111, 2541), (119, 2562),

Gene: Mildred21\_168 Start: 90931, Stop: 91365, Start Num: 38

Candidate Starts for Mildred21\_168:

(Start: 38 @90931 has 50 MA's), (98, 91192), (103, 91216), (110, 91243), (119, 91270), (124, 91297), (136, 91354),

Gene: Mildred21\_142 Start: 85401, Stop: 85826, Start Num: 38

Candidate Starts for Mildred21\_142:

(Start: 38 @85401 has 50 MA's), (87, 85602), (94, 85632), (97, 85659), (102, 85683), (104, 85686), (131, 85809),

Gene: Mugiwara\_190 Start: 97213, Stop: 97602, Start Num: 38  
Candidate Starts for Mugiwara\_190:  
(Start: 38 @97213 has 50 MA's), (97, 97438), (98, 97441), (132, 97585), (135, 97594),

Gene: Myrna\_210 Start: 122711, Stop: 123163, Start Num: 37  
Candidate Starts for Myrna\_210:  
(Start: 32 @122702 has 1 MA's), (Start: 37 @122711 has 1 MA's), (61, 122810), (101, 122984), (110, 123017), (128, 123101),

Gene: Navo\_42 Start: 22093, Stop: 22494, Start Num: 38  
Candidate Starts for Navo\_42:  
(Start: 38 @22093 has 50 MA's), (52, 22138), (66, 22201), (87, 22267), (98, 22330),

Gene: Paradiddles\_170 Start: 96596, Stop: 97039, Start Num: 38  
Candidate Starts for Paradiddles\_170:  
(Start: 38 @96596 has 50 MA's), (74, 96749), (78, 96770), (110, 96902), (118, 96926), (147, 97034),

Gene: Patelgo\_131 Start: 78593, Stop: 79012, Start Num: 38  
Candidate Starts for Patelgo\_131:  
(Start: 38 @78593 has 50 MA's), (49, 78629), (110, 78893), (137, 79004),

Gene: Patience\_5 Start: 2590, Stop: 3042, Start Num: 27  
Candidate Starts for Patience\_5:  
(Start: 27 @2590 has 2 MA's), (87, 2803), (96, 2857), (110, 2911), (111, 2914), (127, 2989), (129, 2998),

Gene: PegLeg\_102 Start: 57809, Stop: 58258, Start Num: 32  
Candidate Starts for PegLeg\_102:  
(Start: 32 @57809 has 1 MA's), (83, 57995), (84, 57998), (87, 58010), (94, 58040), (128, 58205), (144, 58253),

Gene: Persimmon\_40 Start: 21025, Stop: 21426, Start Num: 38  
Candidate Starts for Persimmon\_40:  
(Start: 38 @21025 has 50 MA's), (52, 21070), (98, 21262),

Gene: Phrank15\_33 Start: 23639, Stop: 24190, Start Num: 45  
Candidate Starts for Phrank15\_33:  
(Start: 45 @23639 has 3 MA's), (51, 23657), (70, 23750), (94, 23843), (97, 23876), (105, 23906), (112, 23933), (125, 23987), (148, 24065),

Gene: PumpkinSpice\_108 Start: 73788, Stop: 74195, Start Num: 40  
Candidate Starts for PumpkinSpice\_108:  
(Start: 40 @73788 has 1 MA's), (88, 73965), (90, 73968), (94, 73992), (98, 74025), (110, 74073), (111, 74076), (120, 74103), (132, 74169), (140, 74190),

Gene: Quaran19\_166 Start: 91061, Stop: 91525, Start Num: 44  
Candidate Starts for Quaran19\_166:  
(Start: 44 @91061 has 4 MA's), (68, 91169), (73, 91199), (97, 91301), (110, 91355), (111, 91358), (119, 91385), (154, 91514),

Gene: Riptide\_160 Start: 90983, Stop: 91441, Start Num: 38  
Candidate Starts for Riptide\_160:  
(Start: 38 @90983 has 50 MA's), (119, 91313), (138, 91403), (152, 91427),

Gene: Salacia\_226 Start: 127343, Stop: 126957, Start Num: 54  
Candidate Starts for Salacia\_226:  
(50, 127367), (Start: 54 @127343 has 2 MA's), (99, 127157), (112, 127112), (145, 126989),

Gene: Sebata\_227 Start: 127157, Stop: 126771, Start Num: 54  
Candidate Starts for Sebata\_227:  
(50, 127181), (Start: 54 @127157 has 2 MA's), (99, 126971), (112, 126926), (145, 126803),

Gene: Sham\_86 Start: 65422, Stop: 65853, Start Num: 38  
Candidate Starts for Sham\_86:  
(Start: 38 @65422 has 50 MA's), (103, 65698), (110, 65725), (131, 65821), (136, 65836),

Gene: Sheng711\_122 Start: 64965, Stop: 65390, Start Num: 38  
Candidate Starts for Sheng711\_122:  
(Start: 38 @64965 has 50 MA's), (96, 65220), (97, 65223), (124, 65328),

Gene: Skinny\_102 Start: 57955, Stop: 58377, Start Num: 36  
Candidate Starts for Skinny\_102:  
(Start: 29 @57940 has 1 MA's), (Start: 36 @57955 has 4 MA's), (72, 58105), (98, 58210), (101, 58225),  
(110, 58258), (117, 58279), (128, 58342),

Gene: Skitty\_26 Start: 20961, Stop: 21509, Start Num: 45  
Candidate Starts for Skitty\_26:  
(Start: 45 @20961 has 3 MA's), (47, 20970), (64, 21042), (87, 21135), (94, 21165), (112, 21255), (125,  
21309), (148, 21387),

Gene: SpeedDemon\_630 Start: 48321, Stop: 48788, Start Num: 22  
Candidate Starts for SpeedDemon\_630:  
(1, 48000), (2, 48108), (3, 48117), (Start: 22 @48321 has 1 MA's), (46, 48393), (81, 48549), (85,  
48558), (95, 48606), (110, 48672), (120, 48702),

Gene: Spilled\_194 Start: 96766, Stop: 97155, Start Num: 38  
Candidate Starts for Spilled\_194:  
(Start: 38 @96766 has 50 MA's), (97, 96991), (98, 96994), (132, 97138), (135, 97147),

Gene: Spooky\_31 Start: 24621, Stop: 25199, Start Num: 19  
Candidate Starts for Spooky\_31:  
(Start: 19 @24621 has 2 MA's), (Start: 45 @24699 has 3 MA's), (70, 24810), (76, 24840), (110, 24987),  
(117, 25011), (121, 25032), (124, 25047), (125, 25050), (149, 25113), (155, 25188),

Gene: Squiddly\_33 Start: 26033, Stop: 26611, Start Num: 19  
Candidate Starts for Squiddly\_33:  
(Start: 19 @26033 has 2 MA's), (Start: 45 @26111 has 3 MA's), (70, 26222), (76, 26252), (110, 26399),  
(117, 26423), (121, 26444), (124, 26459), (125, 26462), (149, 26525), (155, 26600),

Gene: Stewart25555\_143 Start: 101011, Stop: 101472, Start Num: 38  
Candidate Starts for Stewart25555\_143:  
(31, 100999), (Start: 38 @101011 has 50 MA's), (87, 101209), (116, 101332), (146, 101449),

Gene: Sushi23\_176 Start: 96586, Stop: 97014, Start Num: 38  
Candidate Starts for Sushi23\_176:  
(Start: 38 @96586 has 50 MA's), (74, 96739), (110, 96892), (118, 96916),

Gene: Talos\_1 Start: 667, Stop: 230, Start Num: 42  
Candidate Starts for Talos\_1:  
(Start: 42 @667 has 1 MA's), (79, 496), (93, 460), (98, 415), (131, 268),

Gene: TomSawyer\_149 Start: 86660, Stop: 87088, Start Num: 43  
Candidate Starts for TomSawyer\_149:  
(5, 86519), (6, 86531), (7, 86540), (9, 86546), (23, 86603), (30, 86630), (Start: 38 @86645 has 50 MA's), (Start: 43 @86660 has 1 MA's), (61, 86744), (82, 86828), (110, 86951), (135, 87062), (139, 87074),

Gene: TomSawyer\_168 Start: 92075, Stop: 92539, Start Num: 44  
Candidate Starts for TomSawyer\_168:  
(34, 92048), (Start: 44 @92075 has 4 MA's), (68, 92183), (73, 92213), (97, 92315), (110, 92369), (111, 92372), (119, 92399), (154, 92528),

Gene: TomSawyer\_193 Start: 97685, Stop: 98074, Start Num: 38  
Candidate Starts for TomSawyer\_193:  
(Start: 38 @97685 has 50 MA's), (97, 97910), (98, 97913), (132, 98057), (135, 98066),

Gene: Tribute\_97 Start: 71749, Stop: 72189, Start Num: 38  
Candidate Starts for Tribute\_97:  
(Start: 35 @71743 has 1 MA's), (Start: 38 @71749 has 50 MA's), (57, 71827), (71, 71893), (94, 71968), (110, 72043), (125, 72103), (145, 72172), (150, 72181),

Gene: TunaTartare\_131 Start: 79206, Stop: 79715, Start Num: 13  
Candidate Starts for TunaTartare\_131:  
(Start: 13 @79206 has 1 MA's), (Start: 38 @79278 has 50 MA's), (59, 79362), (101, 79554), (110, 79590), (116, 79605), (118, 79617), (121, 79632),

Gene: TunaTartare\_106 Start: 73259, Stop: 73636, Start Num: 38  
Candidate Starts for TunaTartare\_106:  
(Start: 38 @73259 has 50 MA's), (52, 73304), (98, 73487), (119, 73559), (125, 73589),

Gene: Vetrrix\_107 Start: 63521, Stop: 64000, Start Num: 38  
Candidate Starts for Vetrrix\_107:  
(30, 63506), (Start: 36 @63518 has 4 MA's), (Start: 38 @63521 has 50 MA's), (85, 63713), (94, 63749), (96, 63773), (110, 63827), (124, 63884), (128, 63911), (153, 63968),

Gene: Watermoore\_188 Start: 100639, Stop: 101016, Start Num: 53  
Candidate Starts for Watermoore\_188:  
(Start: 53 @100639 has 1 MA's), (Start: 55 @100645 has 1 MA's), (95, 100804), (110, 100870), (111, 100873), (151, 101011),

Gene: Westy\_93 Start: 66532, Stop: 66957, Start Num: 38  
Candidate Starts for Westy\_93:  
(14, 66466), (23, 66490), (Start: 38 @66532 has 50 MA's), (87, 66724), (97, 66781), (110, 66835), (120, 66862),

Gene: WhereRU\_32 Start: 14821, Stop: 14384, Start Num: 38  
Candidate Starts for WhereRU\_32:  
(Start: 38 @14821 has 50 MA's), (101, 14548), (106, 14533), (107, 14530),

Gene: WhereRU\_103 Start: 73218, Stop: 73643, Start Num: 38  
Candidate Starts for WhereRU\_103:  
(Start: 38 @73218 has 50 MA's), (87, 73410), (91, 73419), (119, 73548),

Gene: WhereRU\_41 Start: 21615, Stop: 22016, Start Num: 38  
Candidate Starts for WhereRU\_41:  
(Start: 38 @21615 has 50 MA's), (52, 21660), (98, 21852),

Gene: Wipeout\_181 Start: 97029, Stop: 97418, Start Num: 38  
Candidate Starts for Wipeout\_181:  
(Start: 38 @97029 has 50 MA's), (97, 97254), (98, 97257), (132, 97401), (135, 97410),

Gene: Wofford\_171 Start: 96384, Stop: 96842, Start Num: 38  
Candidate Starts for Wofford\_171:  
(Start: 38 @96384 has 50 MA's), (119, 96714), (138, 96804), (152, 96828),

Gene: Wofford\_143 Start: 88534, Stop: 88977, Start Num: 38  
Candidate Starts for Wofford\_143:  
(6, 88420), (7, 88429), (9, 88435), (23, 88492), (30, 88519), (Start: 38 @88534 has 50 MA's), (61, 88633), (110, 88840),

Gene: Wofford\_45 Start: 23131, Stop: 23520, Start Num: 38  
Candidate Starts for Wofford\_45:  
(Start: 38 @23131 has 50 MA's), (41, 23143), (52, 23176), (67, 23242), (69, 23245), (87, 23293), (98, 23356), (122, 23446),