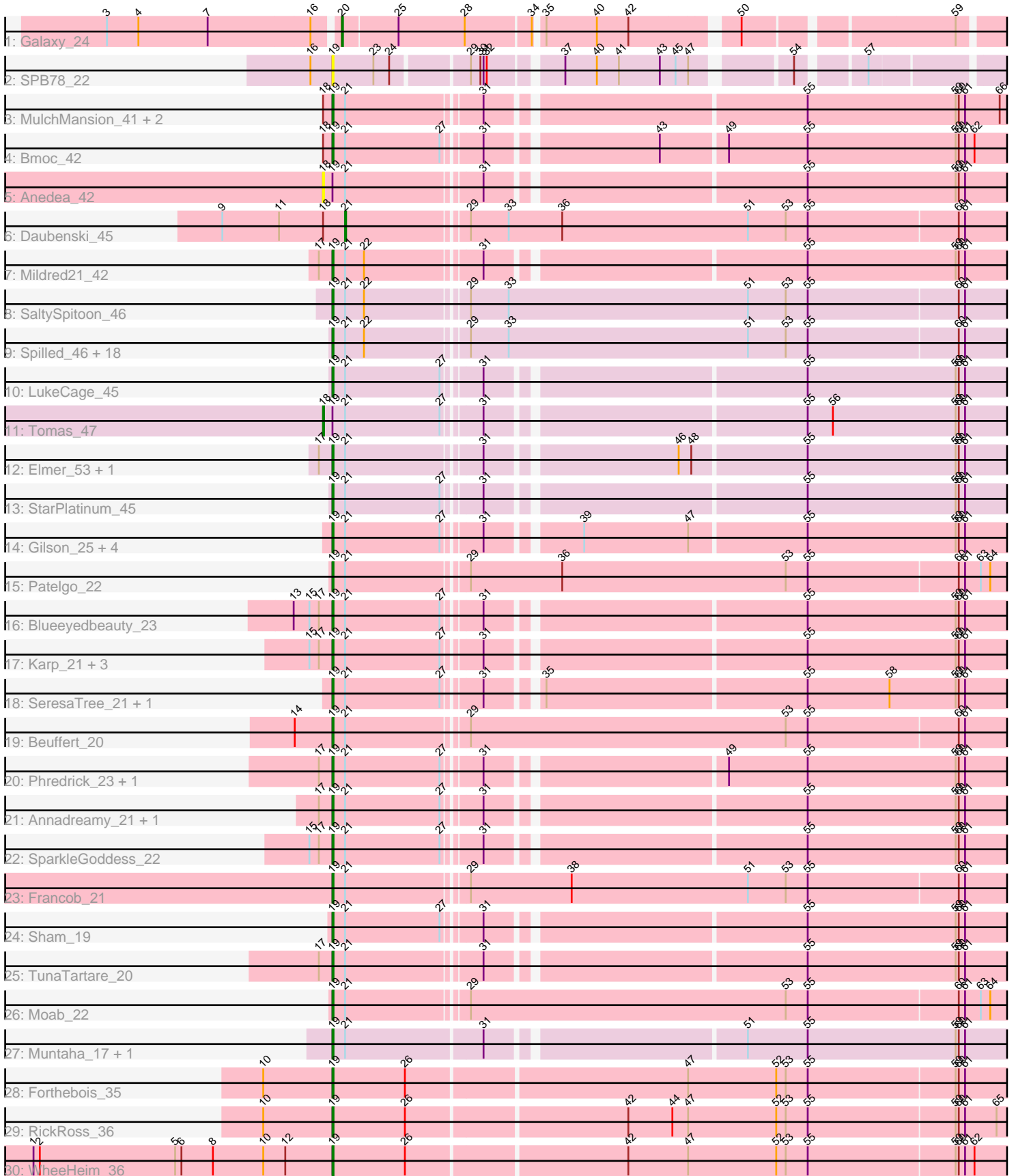


# Zoomed Pham 163615



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 163615 Report

This analysis was run 04/28/24 on database version 559.

Pham number 163615 has 62 members, 8 are drafts.

Phages represented in each track:

- Track 1 : Galaxy\_24
- Track 2 : SPB78\_22
- Track 3 : MulchMansion\_41, Angela\_41, LilMartin\_41
- Track 4 : Bmoc\_42
- Track 5 : Anedea\_42
- Track 6 : Daubenski\_45
- Track 7 : Mildred21\_42
- Track 8 : SaltySpittoon\_46
- Track 9 : Spilled\_46, Birchlyn\_43, KentuckyRacer\_50, Jollison\_51, Amabiko\_46, Karimac\_45, Spelly\_46, IchabodCrane\_43, MindFlayer\_44, Wipeout\_44, PumpkinSpice\_45, Gibbi\_49, JimJam\_46, Battuta\_44, Starbow\_44, TomSawyer\_44, Bordeaux\_44, CeilingFan\_48, Quarant19\_46
- Track 10 : LukeCage\_45
- Track 11 : Tomas\_47
- Track 12 : Elmer\_53, Wofford\_44
- Track 13 : StarPlatinum\_45
- Track 14 : Gilson\_25, Emma1919\_25, Forrest\_25, MeganTheeKilla\_23, Jada\_23
- Track 15 : Patelgo\_22
- Track 16 : Blueeyedbeauty\_23
- Track 17 : Karp\_21, Belfort\_23, Comrade\_22, Stigma\_22
- Track 18 : SeresaTree\_21, Faust\_21
- Track 19 : Beuffert\_20
- Track 20 : Phredrick\_23, Kenrey\_25
- Track 21 : Annadreamy\_21, Limpid\_21
- Track 22 : SparkleGoddess\_22
- Track 23 : Francob\_21
- Track 24 : Sham\_19
- Track 25 : TunaTartare\_20
- Track 26 : Moab\_22
- Track 27 : Muntaha\_17, Wakanda\_17
- Track 28 : Forthebois\_35
- Track 29 : RickRoss\_36
- Track 30 : WheeHeim\_36

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

The start number called the most often in the published annotations is 19, it was called in 51 of the 54 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Amabiko\_46, Angela\_41, Annadreamy\_21, Battuta\_44, Belfort\_23, Beuffert\_20, Birchlyn\_43, Blueeyedbeauty\_23, Bmoc\_42, Bordeaux\_44, CeilingFan\_48, Comrade\_22, Elmer\_53, Emma1919\_25, Faust\_21, Forrest\_25, Forthebois\_35, Francob\_21, Gibbi\_49, Gilson\_25, IchabodCrane\_43, Jada\_23, JimJam\_46, Jollison\_51, Karimac\_45, Karp\_21, Kenrey\_25, KentuckyRacer\_50, LilMartin\_41, Limpid\_21, LukeCage\_45, MeganTheeKilla\_23, Mildred21\_42, MindFlayer\_44, Moab\_22, MulchMansion\_41, Muntaha\_17, Patelgo\_22, Phredrick\_23, PumpkinSpice\_45, Quarant19\_46, RickRoss\_36, SPB78\_22, SaltySpittoon\_46, SeresaTree\_21, Sham\_19, SparkleGoddess\_22, Spelly\_46, Spilled\_46, StarPlatinum\_45, Starbow\_44, Stigma\_22, TomSawyer\_44, TunaTartare\_20, Wakanda\_17, WheeHeim\_36, Wipeout\_44, Wofford\_44,

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

- Anedeia\_42, Tomas\_47,

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

- Daubenski\_45, Galaxy\_24,

### Summary by start number:

Start 18:

- Found in 7 of 62 ( 11.3% ) of genes in pham
- Manual Annotations of this start: 1 of 54
- Called 28.6% of time when present
- Phage (with cluster) where this start called: Anedeia\_42 (BE1), Tomas\_47 (BE2),

Start 19:

- Found in 60 of 62 ( 96.8% ) of genes in pham
- Manual Annotations of this start: 51 of 54
- Called 96.7% of time when present
- Phage (with cluster) where this start called: Amabiko\_46 (BE2), Angela\_41 (BE1), Annadreamy\_21 (BK1), Battuta\_44 (BE2), Belfort\_23 (BK1), Beuffert\_20 (BK1), Birchlyn\_43 (BE2), Blueeyedbeauty\_23 (BK1), Bmoc\_42 (BE1), Bordeaux\_44 (BE2), CeilingFan\_48 (BE2), Comrade\_22 (BK1), Elmer\_53 (BE2), Emma1919\_25 (BK1), Faust\_21 (BK1), Forrest\_25 (BK1), Forthebois\_35 (BO), Francob\_21 (BK1), Gibbi\_49 (BE2), Gilson\_25 (BK1), IchabodCrane\_43 (BE2), Jada\_23 (BK1), JimJam\_46 (BE2), Jollison\_51 (BE2), Karimac\_45 (BE2), Karp\_21 (BK1), Kenrey\_25 (BK1), KentuckyRacer\_50 (BE2), LilMartin\_41 (BE1), Limpid\_21 (BK1), LukeCage\_45 (BE2), MeganTheeKilla\_23 (BK1), Mildred21\_42 (BE1), MindFlayer\_44 (BE2), Moab\_22 (BK1), MulchMansion\_41 (BE1), Muntaha\_17 (BK2), Patelgo\_22 (BK1), Phredrick\_23 (BK1), PumpkinSpice\_45 (BE2), Quarant19\_46 (BE2), RickRoss\_36 (BO), SPB78\_22 (BA), SaltySpittoon\_46 (BE2), SeresaTree\_21 (BK1), Sham\_19 (BK1), SparkleGoddess\_22 (BK1), Spelly\_46 (BE2), Spilled\_46 (BE2), StarPlatinum\_45 (BE2), Starbow\_44 (BE2), Stigma\_22 (BK1), TomSawyer\_44 (BE2), TunaTartare\_20 (BK1), Wakanda\_17 (BK2), WheeHeim\_36 (BO), Wipeout\_44 (BE2), Wofford\_44 (BE2),

Start 20:

- Found in 1 of 62 ( 1.6% ) of genes in pham
- Manual Annotations of this start: 1 of 54
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Galaxy\_24 (AS1),

Start 21:

- Found in 57 of 62 ( 91.9% ) of genes in pham
- Manual Annotations of this start: 1 of 54
- Called 1.8% of time when present
- Phage (with cluster) where this start called: Daubenski\_45 (BE1),

### **Summary by clusters:**

There are 7 clusters represented in this pham: AS1, BA, BO, BK1, BK2, BE2, BE1,

Info for manual annotations of cluster AS1:

- Start number 20 was manually annotated 1 time for cluster AS1.

Info for manual annotations of cluster BE1:

- Start number 19 was manually annotated 5 times for cluster BE1.
- Start number 21 was manually annotated 1 time for cluster BE1.

Info for manual annotations of cluster BE2:

- Start number 18 was manually annotated 1 time for cluster BE2.
- Start number 19 was manually annotated 19 times for cluster BE2.

Info for manual annotations of cluster BK1:

- Start number 19 was manually annotated 22 times for cluster BK1.

Info for manual annotations of cluster BK2:

- Start number 19 was manually annotated 2 times for cluster BK2.

Info for manual annotations of cluster BO:

- Start number 19 was manually annotated 3 times for cluster BO.

### **Gene Information:**

Gene: Amabiko\_46 Start: 21560, Stop: 22441, Start Num: 19

Candidate Starts for Amabiko\_46:

(Start: 19 @21560 has 51 MA's), (Start: 21 @21572 has 1 MA's), (22, 21590), (29, 21680), (33, 21716), (51, 21944), (53, 21980), (55, 22001), (60, 22142), (61, 22148), (83, 22259), (86, 22304), (87, 22358),

Gene: Anedea\_42 Start: 20430, Stop: 21461, Start Num: 18

Candidate Starts for Anedea\_42:

(Start: 18 @20430 has 1 MA's), (Start: 19 @20439 has 51 MA's), (Start: 21 @20451 has 1 MA's), (31, 20571), (55, 20856), (59, 20997), (60, 21000), (61, 21006), (74, 21168), (82, 21270), (87, 21369),

Gene: Angela\_41 Start: 20420, Stop: 21442, Start Num: 19

Candidate Starts for Angela\_41:

(Start: 18 @20411 has 1 MA's), (Start: 19 @20420 has 51 MA's), (Start: 21 @20432 has 1 MA's), (31, 20552), (55, 20837), (59, 20978), (60, 20981), (61, 20987), (66, 21020), (82, 21251), (87, 21350),

Gene: Annadreamy\_21 Start: 9808, Stop: 10824, Start Num: 19

Candidate Starts for Annadreamy\_21:

(17, 9796), (Start: 19 @9808 has 51 MA's), (Start: 21 @9820 has 1 MA's), (27, 9910), (31, 9940), (55, 10225), (59, 10366), (60, 10369), (61, 10375), (73, 10519), (83, 10630), (84, 10660), (88, 10768),

Gene: Battuta\_44 Start: 21536, Stop: 22417, Start Num: 19

Candidate Starts for Battuta\_44:

(Start: 19 @21536 has 51 MA's), (Start: 21 @21548 has 1 MA's), (22, 21566), (29, 21656), (33, 21692), (51, 21920), (53, 21956), (55, 21977), (60, 22118), (61, 22124), (83, 22235), (86, 22280), (87, 22334),

Gene: Belfort\_23 Start: 10560, Stop: 11573, Start Num: 19

Candidate Starts for Belfort\_23:

(15, 10539), (17, 10548), (Start: 19 @10560 has 51 MA's), (Start: 21 @10572 has 1 MA's), (27, 10662), (31, 10692), (55, 10977), (59, 11118), (60, 11121), (61, 11127), (73, 11271), (74, 11277), (83, 11379), (85, 11418), (87, 11478), (88, 11517),

Gene: Beuffert\_20 Start: 9455, Stop: 10507, Start Num: 19

Candidate Starts for Beuffert\_20:

(14, 9419), (Start: 19 @9455 has 51 MA's), (Start: 21 @9467 has 1 MA's), (29, 9575), (53, 9875), (55, 9896), (60, 10037), (61, 10043), (71, 10166), (76, 10226), (83, 10313), (88, 10451),

Gene: Birchlyn\_43 Start: 19417, Stop: 20298, Start Num: 19

Candidate Starts for Birchlyn\_43:

(Start: 19 @19417 has 51 MA's), (Start: 21 @19429 has 1 MA's), (22, 19447), (29, 19537), (33, 19573), (51, 19801), (53, 19837), (55, 19858), (60, 19999), (61, 20005), (83, 20116), (86, 20161), (87, 20215),

Gene: Blueeyedbeauty\_23 Start: 10302, Stop: 11318, Start Num: 19

Candidate Starts for Blueeyedbeauty\_23:

(13, 10266), (15, 10281), (17, 10290), (Start: 19 @10302 has 51 MA's), (Start: 21 @10314 has 1 MA's), (27, 10404), (31, 10434), (55, 10719), (59, 10860), (60, 10863), (61, 10869), (73, 11013), (79, 11079), (83, 11124),

Gene: Bmoc\_42 Start: 20722, Stop: 21744, Start Num: 19

Candidate Starts for Bmoc\_42:

(Start: 18 @20713 has 1 MA's), (Start: 19 @20722 has 51 MA's), (Start: 21 @20734 has 1 MA's), (27, 20824), (31, 20854), (43, 21004), (49, 21064), (55, 21139), (59, 21280), (60, 21283), (61, 21289), (62, 21298), (74, 21451), (82, 21553), (87, 21652),

Gene: Bordeaux\_44 Start: 21689, Stop: 22570, Start Num: 19

Candidate Starts for Bordeaux\_44:

(Start: 19 @21689 has 51 MA's), (Start: 21 @21701 has 1 MA's), (22, 21719), (29, 21809), (33, 21845), (51, 22073), (53, 22109), (55, 22130), (60, 22271), (61, 22277), (83, 22388), (86, 22433), (87, 22487),

Gene: CeilingFan\_48 Start: 21449, Stop: 22330, Start Num: 19

Candidate Starts for CeilingFan\_48:

(Start: 19 @21449 has 51 MA's), (Start: 21 @21461 has 1 MA's), (22, 21479), (29, 21569), (33, 21605), (51, 21833), (53, 21869), (55, 21890), (60, 22031), (61, 22037), (83, 22148), (86, 22193), (87,

22247),

Gene: Comrade\_22 Start: 10175, Stop: 11188, Start Num: 19

Candidate Starts for Comrade\_22:

(15, 10154), (17, 10163), (Start: 19 @10175 has 51 MA's), (Start: 21 @10187 has 1 MA's), (27, 10277), (31, 10307), (55, 10592), (59, 10733), (60, 10736), (61, 10742), (73, 10886), (74, 10892), (83, 10994), (85, 11033), (87, 11093), (88, 11132),

Gene: Daubenski\_45 Start: 21959, Stop: 22855, Start Num: 21

Candidate Starts for Daubenski\_45:

(9, 21842), (11, 21896), (Start: 18 @21938 has 1 MA's), (Start: 21 @21959 has 1 MA's), (29, 22067), (33, 22103), (36, 22154), (51, 22331), (53, 22367), (55, 22388), (60, 22529), (61, 22535), (83, 22661), (87, 22760),

Gene: Elmer\_53 Start: 22460, Stop: 23479, Start Num: 19

Candidate Starts for Elmer\_53:

(17, 22448), (Start: 19 @22460 has 51 MA's), (Start: 21 @22472 has 1 MA's), (31, 22592), (46, 22760), (48, 22772), (55, 22877), (59, 23018), (60, 23021), (61, 23027), (68, 23099), (77, 23201), (82, 23285), (89, 23435),

Gene: Emma1919\_25 Start: 10751, Stop: 11767, Start Num: 19

Candidate Starts for Emma1919\_25:

(Start: 19 @10751 has 51 MA's), (Start: 21 @10763 has 1 MA's), (27, 10853), (31, 10883), (39, 10961), (47, 11060), (55, 11168), (59, 11309), (60, 11312), (61, 11318), (83, 11573), (88, 11711),

Gene: Faust\_21 Start: 10072, Stop: 10977, Start Num: 19

Candidate Starts for Faust\_21:

(Start: 19 @10072 has 51 MA's), (Start: 21 @10084 has 1 MA's), (27, 10174), (31, 10204), (35, 10246), (55, 10489), (58, 10567), (59, 10630), (60, 10633), (61, 10639), (78, 10828),

Gene: Forrest\_25 Start: 10874, Stop: 11890, Start Num: 19

Candidate Starts for Forrest\_25:

(Start: 19 @10874 has 51 MA's), (Start: 21 @10886 has 1 MA's), (27, 10976), (31, 11006), (39, 11084), (47, 11183), (55, 11291), (59, 11432), (60, 11435), (61, 11441), (83, 11696), (88, 11834),

Gene: Forthebois\_35 Start: 16763, Stop: 17539, Start Num: 19

Candidate Starts for Forthebois\_35:

(10, 16697), (Start: 19 @16763 has 51 MA's), (26, 16832), (47, 17090), (52, 17174), (53, 17183), (55, 17204), (59, 17342), (60, 17345), (61, 17351), (69, 17420),

Gene: Francob\_21 Start: 9667, Stop: 10566, Start Num: 19

Candidate Starts for Francob\_21:

(Start: 19 @9667 has 51 MA's), (Start: 21 @9679 has 1 MA's), (29, 9787), (38, 9883), (51, 10051), (53, 10087), (55, 10108), (60, 10249), (61, 10255), (70, 10330), (83, 10372), (87, 10471),

Gene: Galaxy\_24 Start: 18066, Stop: 19004, Start Num: 20

Candidate Starts for Galaxy\_24:

(3, 17853), (4, 17883), (7, 17949), (16, 18045), (Start: 20 @18066 has 1 MA's), (25, 18117), (28, 18180), (34, 18240), (35, 18246), (40, 18294), (42, 18324), (50, 18414), (59, 18597), (85, 18873),

Gene: Gibbi\_49 Start: 21309, Stop: 22190, Start Num: 19

Candidate Starts for Gibbi\_49:

(Start: 19 @21309 has 51 MA's), (Start: 21 @21321 has 1 MA's), (22, 21339), (29, 21429), (33, 21465), (51, 21693), (53, 21729), (55, 21750), (60, 21891), (61, 21897), (83, 22008), (86, 22053), (87, 22107),

Gene: Gilson\_25 Start: 10704, Stop: 11720, Start Num: 19

Candidate Starts for Gilson\_25:

(Start: 19 @10704 has 51 MA's), (Start: 21 @10716 has 1 MA's), (27, 10806), (31, 10836), (39, 10914), (47, 11013), (55, 11121), (59, 11262), (60, 11265), (61, 11271), (83, 11526), (88, 11664),

Gene: IchabodCrane\_43 Start: 21263, Stop: 22144, Start Num: 19

Candidate Starts for IchabodCrane\_43:

(Start: 19 @21263 has 51 MA's), (Start: 21 @21275 has 1 MA's), (22, 21293), (29, 21383), (33, 21419), (51, 21647), (53, 21683), (55, 21704), (60, 21845), (61, 21851), (83, 21962), (86, 22007), (87, 22061),

Gene: Jada\_23 Start: 10056, Stop: 11072, Start Num: 19

Candidate Starts for Jada\_23:

(Start: 19 @10056 has 51 MA's), (Start: 21 @10068 has 1 MA's), (27, 10158), (31, 10188), (39, 10266), (47, 10365), (55, 10473), (59, 10614), (60, 10617), (61, 10623), (83, 10878), (88, 11016),

Gene: JimJam\_46 Start: 21637, Stop: 22518, Start Num: 19

Candidate Starts for JimJam\_46:

(Start: 19 @21637 has 51 MA's), (Start: 21 @21649 has 1 MA's), (22, 21667), (29, 21757), (33, 21793), (51, 22021), (53, 22057), (55, 22078), (60, 22219), (61, 22225), (83, 22336), (86, 22381), (87, 22435),

Gene: Jollison\_51 Start: 21517, Stop: 22398, Start Num: 19

Candidate Starts for Jollison\_51:

(Start: 19 @21517 has 51 MA's), (Start: 21 @21529 has 1 MA's), (22, 21547), (29, 21637), (33, 21673), (51, 21901), (53, 21937), (55, 21958), (60, 22099), (61, 22105), (83, 22216), (86, 22261), (87, 22315),

Gene: Karimac\_45 Start: 21666, Stop: 22547, Start Num: 19

Candidate Starts for Karimac\_45:

(Start: 19 @21666 has 51 MA's), (Start: 21 @21678 has 1 MA's), (22, 21696), (29, 21786), (33, 21822), (51, 22050), (53, 22086), (55, 22107), (60, 22248), (61, 22254), (83, 22365), (86, 22410), (87, 22464),

Gene: Karp\_21 Start: 9776, Stop: 10789, Start Num: 19

Candidate Starts for Karp\_21:

(15, 9755), (17, 9764), (Start: 19 @9776 has 51 MA's), (Start: 21 @9788 has 1 MA's), (27, 9878), (31, 9908), (55, 10193), (59, 10334), (60, 10337), (61, 10343), (73, 10487), (74, 10493), (83, 10595), (85, 10634), (87, 10694), (88, 10733),

Gene: Kenrey\_25 Start: 10757, Stop: 11773, Start Num: 19

Candidate Starts for Kenrey\_25:

(17, 10745), (Start: 19 @10757 has 51 MA's), (Start: 21 @10769 has 1 MA's), (27, 10859), (31, 10889), (49, 11099), (55, 11174), (59, 11315), (60, 11318), (61, 11324), (83, 11579), (88, 11717),

Gene: KentuckyRacer\_50 Start: 21450, Stop: 22331, Start Num: 19

Candidate Starts for KentuckyRacer\_50:

(Start: 19 @21450 has 51 MA's), (Start: 21 @21462 has 1 MA's), (22, 21480), (29, 21570), (33, 21606), (51, 21834), (53, 21870), (55, 21891), (60, 22032), (61, 22038), (83, 22149), (86, 22194), (87,

22248),

Gene: LilMartin\_41 Start: 20368, Stop: 21390, Start Num: 19

Candidate Starts for LilMartin\_41:

(Start: 18 @20359 has 1 MA's), (Start: 19 @20368 has 51 MA's), (Start: 21 @20380 has 1 MA's), (31, 20500), (55, 20785), (59, 20926), (60, 20929), (61, 20935), (66, 20968), (82, 21199), (87, 21298),

Gene: Limpid\_21 Start: 9807, Stop: 10823, Start Num: 19

Candidate Starts for Limpid\_21:

(17, 9795), (Start: 19 @9807 has 51 MA's), (Start: 21 @9819 has 1 MA's), (27, 9909), (31, 9939), (55, 10224), (59, 10365), (60, 10368), (61, 10374), (73, 10518), (83, 10629), (84, 10659), (88, 10767),

Gene: LukeCage\_45 Start: 21302, Stop: 22297, Start Num: 19

Candidate Starts for LukeCage\_45:

(Start: 19 @21302 has 51 MA's), (Start: 21 @21314 has 1 MA's), (27, 21404), (31, 21434), (55, 21719), (59, 21860), (60, 21863), (61, 21869), (74, 22019), (83, 22115), (86, 22160), (87, 22214),

Gene: MeganTheeKilla\_23 Start: 10065, Stop: 11081, Start Num: 19

Candidate Starts for MeganTheeKilla\_23:

(Start: 19 @10065 has 51 MA's), (Start: 21 @10077 has 1 MA's), (27, 10167), (31, 10197), (39, 10275), (47, 10374), (55, 10482), (59, 10623), (60, 10626), (61, 10632), (83, 10887), (88, 11025),

Gene: Mildred21\_42 Start: 20566, Stop: 21576, Start Num: 19

Candidate Starts for Mildred21\_42:

(17, 20554), (Start: 19 @20566 has 51 MA's), (Start: 21 @20578 has 1 MA's), (22, 20596), (31, 20698), (55, 20983), (59, 21124), (60, 21127), (61, 21133), (74, 21295), (82, 21394), (86, 21439), (87, 21493),

Gene: MindFlayer\_44 Start: 21170, Stop: 22051, Start Num: 19

Candidate Starts for MindFlayer\_44:

(Start: 19 @21170 has 51 MA's), (Start: 21 @21182 has 1 MA's), (22, 21200), (29, 21290), (33, 21326), (51, 21554), (53, 21590), (55, 21611), (60, 21752), (61, 21758), (83, 21869), (86, 21914), (87, 21968),

Gene: Moab\_22 Start: 10215, Stop: 11114, Start Num: 19

Candidate Starts for Moab\_22:

(Start: 19 @10215 has 51 MA's), (Start: 21 @10227 has 1 MA's), (29, 10335), (53, 10635), (55, 10656), (60, 10797), (61, 10803), (63, 10818), (64, 10827), (83, 10920), (87, 11019),

Gene: MulchMansion\_41 Start: 20368, Stop: 21390, Start Num: 19

Candidate Starts for MulchMansion\_41:

(Start: 18 @20359 has 1 MA's), (Start: 19 @20368 has 51 MA's), (Start: 21 @20380 has 1 MA's), (31, 20500), (55, 20785), (59, 20926), (60, 20929), (61, 20935), (66, 20968), (82, 21199), (87, 21298),

Gene: Muntaha\_17 Start: 8933, Stop: 9943, Start Num: 19

Candidate Starts for Muntaha\_17:

(Start: 19 @8933 has 51 MA's), (Start: 21 @8945 has 1 MA's), (31, 9071), (51, 9299), (55, 9356), (59, 9497), (60, 9500), (61, 9506), (74, 9665), (76, 9674), (81, 9752), (82, 9761), (87, 9860),

Gene: Patelgo\_22 Start: 9829, Stop: 10728, Start Num: 19

Candidate Starts for Patelgo\_22:

(Start: 19 @9829 has 51 MA's), (Start: 21 @9841 has 1 MA's), (29, 9949), (36, 10036), (53, 10249), (55, 10270), (60, 10411), (61, 10417), (63, 10432), (64, 10441), (83, 10534), (87, 10633),



Gene: Phredrick\_23 Start: 9963, Stop: 10979, Start Num: 19

Candidate Starts for Phredrick\_23:

(17, 9951), (Start: 19 @9963 has 51 MA's), (Start: 21 @9975 has 1 MA's), (27, 10065), (31, 10095), (49, 10305), (55, 10380), (59, 10521), (60, 10524), (61, 10530), (83, 10785), (88, 10923),

Gene: PumpkinSpice\_45 Start: 21560, Stop: 22441, Start Num: 19

Candidate Starts for PumpkinSpice\_45:

(Start: 19 @21560 has 51 MA's), (Start: 21 @21572 has 1 MA's), (22, 21590), (29, 21680), (33, 21716), (51, 21944), (53, 21980), (55, 22001), (60, 22142), (61, 22148), (83, 22259), (86, 22304), (87, 22358),

Gene: Quaran19\_46 Start: 21551, Stop: 22432, Start Num: 19

Candidate Starts for Quaran19\_46:

(Start: 19 @21551 has 51 MA's), (Start: 21 @21563 has 1 MA's), (22, 21581), (29, 21671), (33, 21707), (51, 21935), (53, 21971), (55, 21992), (60, 22133), (61, 22139), (83, 22250), (86, 22295), (87, 22349),

Gene: RickRoss\_36 Start: 16891, Stop: 17667, Start Num: 19

Candidate Starts for RickRoss\_36:

(10, 16825), (Start: 19 @16891 has 51 MA's), (26, 16960), (42, 17161), (44, 17203), (47, 17218), (52, 17302), (53, 17311), (55, 17332), (59, 17470), (60, 17473), (61, 17479), (65, 17509), (69, 17548),

Gene: SPB78\_22 Start: 19359, Stop: 20186, Start Num: 19

Candidate Starts for SPB78\_22:

(16, 19338), (Start: 19 @19359 has 51 MA's), (23, 19398), (24, 19413), (29, 19479), (30, 19488), (31, 19491), (32, 19494), (37, 19554), (40, 19584), (41, 19605), (43, 19644), (45, 19659), (47, 19671), (54, 19749), (57, 19803), (67, 19944), (77, 20043),

Gene: SaltySpittoon\_46 Start: 21560, Stop: 22441, Start Num: 19

Candidate Starts for SaltySpittoon\_46:

(Start: 19 @21560 has 51 MA's), (Start: 21 @21572 has 1 MA's), (22, 21590), (29, 21680), (33, 21716), (51, 21944), (53, 21980), (55, 22001), (60, 22142), (61, 22148), (83, 22259), (86, 22304), (87, 22358),

Gene: SeresaTree\_21 Start: 9462, Stop: 10367, Start Num: 19

Candidate Starts for SeresaTree\_21:

(Start: 19 @9462 has 51 MA's), (Start: 21 @9474 has 1 MA's), (27, 9564), (31, 9594), (35, 9636), (55, 9879), (58, 9957), (59, 10020), (60, 10023), (61, 10029), (78, 10218),

Gene: Sham\_19 Start: 9266, Stop: 10291, Start Num: 19

Candidate Starts for Sham\_19:

(Start: 19 @9266 has 51 MA's), (Start: 21 @9278 has 1 MA's), (27, 9368), (31, 9398), (55, 9683), (59, 9824), (60, 9827), (61, 9833), (72, 9947), (82, 10100),

Gene: SparkleGoddess\_22 Start: 10174, Stop: 11190, Start Num: 19

Candidate Starts for SparkleGoddess\_22:

(15, 10153), (17, 10162), (Start: 19 @10174 has 51 MA's), (Start: 21 @10186 has 1 MA's), (27, 10276), (31, 10306), (55, 10591), (59, 10732), (60, 10735), (61, 10741), (83, 10996), (85, 11035), (87, 11095), (88, 11134),

Gene: Spelly\_46 Start: 21515, Stop: 22396, Start Num: 19

Candidate Starts for Spelly\_46:

(Start: 19 @21515 has 51 MA's), (Start: 21 @21527 has 1 MA's), (22, 21545), (29, 21635), (33, 21671), (51, 21899), (53, 21935), (55, 21956), (60, 22097), (61, 22103), (83, 22214), (86, 22259), (87, 22313),

Gene: Spilled\_46 Start: 21269, Stop: 22150, Start Num: 19

Candidate Starts for Spilled\_46:

(Start: 19 @21269 has 51 MA's), (Start: 21 @21281 has 1 MA's), (22, 21299), (29, 21389), (33, 21425), (51, 21653), (53, 21689), (55, 21710), (60, 21851), (61, 21857), (83, 21968), (86, 22013), (87, 22067),

Gene: StarPlatinum\_45 Start: 21511, Stop: 22506, Start Num: 19

Candidate Starts for StarPlatinum\_45:

(Start: 19 @21511 has 51 MA's), (Start: 21 @21523 has 1 MA's), (27, 21613), (31, 21643), (55, 21928), (59, 22069), (60, 22072), (61, 22078), (73, 22222), (74, 22228), (83, 22324), (86, 22369), (87, 22423),

Gene: Starbow\_44 Start: 21536, Stop: 22417, Start Num: 19

Candidate Starts for Starbow\_44:

(Start: 19 @21536 has 51 MA's), (Start: 21 @21548 has 1 MA's), (22, 21566), (29, 21656), (33, 21692), (51, 21920), (53, 21956), (55, 21977), (60, 22118), (61, 22124), (83, 22235), (86, 22280), (87, 22334),

Gene: Stigma\_22 Start: 10178, Stop: 11191, Start Num: 19

Candidate Starts for Stigma\_22:

(15, 10157), (17, 10166), (Start: 19 @10178 has 51 MA's), (Start: 21 @10190 has 1 MA's), (27, 10280), (31, 10310), (55, 10595), (59, 10736), (60, 10739), (61, 10745), (73, 10889), (74, 10895), (83, 10997), (85, 11036), (87, 11096), (88, 11135),

Gene: TomSawyer\_44 Start: 21154, Stop: 22035, Start Num: 19

Candidate Starts for TomSawyer\_44:

(Start: 19 @21154 has 51 MA's), (Start: 21 @21166 has 1 MA's), (22, 21184), (29, 21274), (33, 21310), (51, 21538), (53, 21574), (55, 21595), (60, 21736), (61, 21742), (83, 21853), (86, 21898), (87, 21952),

Gene: Tomas\_47 Start: 23372, Stop: 24385, Start Num: 18

Candidate Starts for Tomas\_47:

(Start: 18 @23372 has 1 MA's), (Start: 19 @23381 has 51 MA's), (Start: 21 @23393 has 1 MA's), (27, 23483), (31, 23513), (55, 23798), (56, 23822), (59, 23939), (60, 23942), (61, 23948), (72, 24050), (80, 24164), (83, 24206), (87, 24305),

Gene: TunaTartare\_20 Start: 9544, Stop: 10569, Start Num: 19

Candidate Starts for TunaTartare\_20:

(17, 9532), (Start: 19 @9544 has 51 MA's), (Start: 21 @9556 has 1 MA's), (31, 9676), (55, 9961), (59, 10102), (60, 10105), (61, 10111), (72, 10225), (74, 10273), (82, 10378), (87, 10486),

Gene: Wakanda\_17 Start: 9090, Stop: 10106, Start Num: 19

Candidate Starts for Wakanda\_17:

(Start: 19 @9090 has 51 MA's), (Start: 21 @9102 has 1 MA's), (31, 9228), (51, 9456), (55, 9513), (59, 9654), (60, 9657), (61, 9663), (74, 9828), (76, 9837), (81, 9915), (82, 9924), (87, 10023),

Gene: WheeHeim\_36 Start: 16771, Stop: 17556, Start Num: 19

Candidate Starts for WheeHeim\_36:

(1, 16486), (2, 16492), (5, 16621), (6, 16627), (8, 16657), (10, 16705), (12, 16726), (Start: 19 @16771 has 51 MA's), (26, 16840), (42, 17041), (47, 17098), (52, 17182), (53, 17191), (55, 17212), (59, 17350), (60, 17353), (61, 17359), (62, 17368), (69, 17428), (75, 17521),

Gene: Wipeout\_44 Start: 21905, Stop: 22786, Start Num: 19

Candidate Starts for Wipeout\_44:

(Start: 19 @21905 has 51 MA's), (Start: 21 @21917 has 1 MA's), (22, 21935), (29, 22025), (33, 22061), (51, 22289), (53, 22325), (55, 22346), (60, 22487), (61, 22493), (83, 22604), (86, 22649), (87, 22703),

Gene: Wofford\_44 Start: 21938, Stop: 22957, Start Num: 19

Candidate Starts for Wofford\_44:

(17, 21926), (Start: 19 @21938 has 51 MA's), (Start: 21 @21950 has 1 MA's), (31, 22070), (46, 22238), (48, 22250), (55, 22355), (59, 22496), (60, 22499), (61, 22505), (68, 22577), (77, 22679), (82, 22763), (89, 22913),