



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 163687 Report

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

Pham number 163687 has 48 members, 12 are drafts.

Phages represented in each track:

- Track 1 : Phabia\_70, Wayne3\_72, Casend\_71, Quammi\_69, Teehee\_71, Jehoshaphat\_72, Rudy\_68
- Track 2 : Judebell\_73
- Track 3 : Phinky\_81
- Track 4 : BirdInFrench\_75, Wilca\_75
- Track 5 : Nike\_71
- Track 6 : DonaldDuck\_72, Viceroy\_69, Zhafia\_75, Sillytadpoles\_73, Llemily\_72
- Track 7 : Namago\_71, Blab\_68, StrawberryJamm\_75
- Track 8 : Hyperion\_70
- Track 9 : OneinaGillian\_74
- Track 10 : Fizzles\_70
- Track 11 : Kelcole\_74
- Track 12 : Altheas\_75
- Track 13 : Mashley\_72
- Track 14 : Tissue\_70, SallyK\_73, Kyva\_73
- Track 15 : Zagie\_71
- Track 16 : Fregley\_76, CandC\_73
- Track 17 : Wheelie\_70
- Track 18 : Tempo\_76
- Track 19 : RobinRose\_77, Romm\_77
- Track 20 : Rowlf\_71
- Track 21 : Pepe25\_73
- Track 22 : AluminumJesus\_68
- Track 23 : BabyDotz\_68
- Track 24 : Grassboy\_74
- Track 25 : Lonelysoil\_68
- Track 26 : Squash\_73
- Track 27 : Gazebo\_71
- Track 28 : Marcie\_81
- Track 29 : Rasputia\_119
- Track 30 : Hendrix\_122
- Track 31 : ValentiniPuff\_21

***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 17 of the 36 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Blab\_68, Casend\_71, Hendrix\_122, Hyperion\_70, Jehoshaphat\_72, Mashley\_72, Namago\_71, Nike\_71, Pepe25\_73, Phabia\_70, Quammi\_69, Rasputia\_119, Rudy\_68, Squash\_73, StrawberryJamm\_75, Teehee\_71, Wayne3\_72,

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

- AluminumJesus\_68, BabyDotz\_68, BirdInFrench\_75, CandC\_73, DonaldDuck\_72, Fregley\_76, Gazebo\_71, Grassboy\_74, Judebell\_73, Kelcole\_74, Kyva\_73, Llemily\_72, Lonelysoil\_68, RobinRose\_77, Romm\_77, Rowlf\_71, SallyK\_73, Sillytadpoles\_73, Tempo\_76, Tissue\_70, Viceroy\_69, Wheelie\_70, Wilca\_75, Zagie\_71, Zhafia\_75,

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

- Altheas\_75, Fizzles\_70, Marcie\_81, OneinaGillian\_74, Phinky\_81, ValentiniPuff\_21,

### Summary by start number:

Start 3:

- Found in 9 of 48 ( 18.8% ) of genes in pham
- Manual Annotations of this start: 5 of 36
- Called 88.9% of time when present
- Phage (with cluster) where this start called: BirdInFrench\_75 (EG), CandC\_73 (EG), Fregley\_76 (EG), Kelcole\_74 (EG), RobinRose\_77 (EG), Romm\_77 (EG), Tempo\_76 (EG), Wilca\_75 (EG),

Start 7:

- Found in 12 of 48 ( 25.0% ) of genes in pham
- Manual Annotations of this start: 1 of 36
- Called 8.3% of time when present
- Phage (with cluster) where this start called: OneinaGillian\_74 (EG),

Start 10:

- Found in 3 of 48 ( 6.2% ) of genes in pham
- No Manual Annotations of this start.
- Called 33.3% of time when present
- Phage (with cluster) where this start called: Altheas\_75 (EG),

Start 12:

- Found in 42 of 48 ( 87.5% ) of genes in pham
- Manual Annotations of this start: 17 of 36
- Called 40.5% of time when present
- Phage (with cluster) where this start called: Blab\_68 (EG), Casend\_71 (EG), Hendrix\_122 (GC), Hyperion\_70 (EG), Jehoshaphat\_72 (EG), Mashley\_72 (EG), Namago\_71 (EG), Nike\_71 (EG), Pepe25\_73 (EG), Phabia\_70 (EG), Quammi\_69 (EG), Rasputia\_119 (GC), Rudy\_68 (EG), Squash\_73 (EG), StrawberryJamm\_75 (EG), Teehee\_71 (EG), Wayne3\_72 (EG),

Start 20:

- Found in 35 of 48 ( 72.9% ) of genes in pham

- Manual Annotations of this start: 11 of 36
- Called 54.3% of time when present
- Phage (with cluster) where this start called: AluminumJesus\_68 (EG), BabyDotz\_68 (EG), DonaldDuck\_72 (EG), Gazebo\_71 (EG), Grassboy\_74 (EG), Judebell\_73 (EG), Kyva\_73 (EG), Llemily\_72 (EG), Lonelysoil\_68 (EG), Marcie\_81 (EG), Phinky\_81 (EG), Rowlf\_71 (EG), SallyK\_73 (EG), Sillytadpoles\_73 (EG), Tissue\_70 (EG), Viceroy\_69 (EG), Wheelie\_70 (EG), Zagie\_71 (EG), Zhafia\_75 (EG),

Start 28:

- Found in 1 of 48 ( 2.1% ) of genes in pham
- Manual Annotations of this start: 1 of 36
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Fizzles\_70 (EG),

Start 30:

- Found in 1 of 48 ( 2.1% ) of genes in pham
- Manual Annotations of this start: 1 of 36
- Called 100.0% of time when present
- Phage (with cluster) where this start called: ValentiniPuff\_21 (singleton),

### **Summary by clusters:**

There are 3 clusters represented in this pham: EG, GC, singleton,

Info for manual annotations of cluster EG:

- Start number 3 was manually annotated 5 times for cluster EG.
- Start number 7 was manually annotated 1 time for cluster EG.
- Start number 12 was manually annotated 15 times for cluster EG.
- Start number 20 was manually annotated 11 times for cluster EG.
- Start number 28 was manually annotated 1 time for cluster EG.

Info for manual annotations of cluster GC:

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

### **Gene Information:**

Gene: Altheas\_75 Start: 50727, Stop: 49027, Start Num: 10

Candidate Starts for Altheas\_75:

(6, 50745), (8, 50736), (10, 50727), (Start: 20 @50604 has 11 MA's), (25, 50547), (31, 50496), (33, 50466), (40, 50358), (45, 50283), (48, 50247), (53, 50154), (55, 50124), (59, 50055), (61, 49989), (62, 49965), (63, 49935), (67, 49770), (69, 49707), (71, 49686), (72, 49677), (74, 49587), (82, 49548), (84, 49530), (98, 49350), (105, 49251), (111, 49167),

Gene: AluminumJesus\_68 Start: 49210, Stop: 47717, Start Num: 20

Candidate Starts for AluminumJesus\_68:

(5, 49351), (Start: 7 @49342 has 1 MA's), (9, 49333), (11, 49315), (Start: 12 @49306 has 17 MA's), (Start: 20 @49210 has 11 MA's), (33, 49072), (35, 49060), (36, 49039), (41, 48946), (45, 48889), (46, 48871), (52, 48787), (57, 48703), (66, 48388), (69, 48325), (71, 48307), (73, 48250), (76, 48166), (86, 48040), (97, 47902),

Gene: BabyDotz\_68 Start: 50440, Stop: 48572, Start Num: 20

Candidate Starts for BabyDotz\_68:

(5, 50581), (Start: 7 @50572 has 1 MA's), (9, 50563), (11, 50545), (Start: 12 @50536 has 17 MA's), (Start: 20 @50440 has 11 MA's), (33, 50302), (35, 50290), (36, 50269), (41, 50176), (45, 50119), (46, 50101), (52, 50017), (56, 49942), (57, 49933), (66, 49618), (69, 49555), (71, 49537), (73, 49480), (76, 49396), (78, 49378), (86, 49270), (96, 49111), (108, 48934), (112, 48868), (116, 48757),

Gene: BirdInFrench\_75 Start: 50055, Stop: 48313, Start Num: 3

Candidate Starts for BirdInFrench\_75:

(1, 50307), (Start: 3 @50055 has 5 MA's), (4, 50016), (Start: 12 @49965 has 17 MA's), (13, 49926), (16, 49908), (18, 49866), (21, 49860), (27, 49779), (32, 49752), (36, 49722), (37, 49704), (43, 49611), (49, 49527), (50, 49518), (54, 49434), (58, 49362), (59, 49344), (61, 49278), (63, 49224), (65, 49074), (67, 49059), (71, 48975), (74, 48876), (85, 48801), (87, 48780), (88, 48753), (99, 48630), (102, 48612), (106, 48519), (109, 48489), (113, 48360),

Gene: Blab\_68 Start: 49597, Stop: 48008, Start Num: 12

Candidate Starts for Blab\_68:

(5, 49642), (Start: 7 @49633 has 1 MA's), (9, 49624), (11, 49606), (Start: 12 @49597 has 17 MA's), (Start: 20 @49501 has 11 MA's), (33, 49363), (35, 49351), (36, 49330), (41, 49237), (45, 49180), (46, 49162), (52, 49078), (56, 49003), (57, 48994), (66, 48679), (69, 48616), (71, 48598), (73, 48541), (76, 48457), (78, 48439), (86, 48331), (97, 48193),

Gene: CandC\_73 Start: 49420, Stop: 47504, Start Num: 3

Candidate Starts for CandC\_73:

(Start: 3 @49420 has 5 MA's), (Start: 12 @49330 has 17 MA's), (16, 49273), (18, 49231), (21, 49225), (29, 49135), (32, 49117), (34, 49069), (37, 48994), (41, 48919), (43, 48901), (44, 48883), (47, 48835), (53, 48733), (56, 48664), (59, 48619), (60, 48595), (61, 48553), (62, 48529), (63, 48499), (65, 48349), (67, 48334), (69, 48271), (71, 48235), (74, 48136), (75, 48115), (82, 48022), (85, 47986), (88, 47938), (95, 47836), (99, 47815), (100, 47812), (105, 47722), (113, 47551),

Gene: Casend\_71 Start: 50094, Stop: 48505, Start Num: 12

Candidate Starts for Casend\_71:

(11, 50103), (Start: 12 @50094 has 17 MA's), (Start: 20 @49998 has 11 MA's), (33, 49860), (35, 49848), (36, 49827), (41, 49734), (45, 49677), (46, 49659), (52, 49575), (56, 49500), (57, 49491), (66, 49176), (69, 49113), (71, 49095), (73, 49038), (76, 48954), (78, 48936), (107, 48552),

Gene: DonaldDuck\_72 Start: 49347, Stop: 47854, Start Num: 20

Candidate Starts for DonaldDuck\_72:

(11, 49452), (Start: 12 @49443 has 17 MA's), (Start: 20 @49347 has 11 MA's), (33, 49209), (35, 49197), (36, 49176), (41, 49083), (45, 49026), (46, 49008), (52, 48924), (56, 48849), (57, 48840), (66, 48525), (69, 48462), (71, 48444), (73, 48387), (76, 48303), (78, 48285), (107, 47901),

Gene: Fizzles\_70 Start: 49488, Stop: 48133, Start Num: 28

Candidate Starts for Fizzles\_70:

(2, 49803), (Start: 28 @49488 has 1 MA's), (40, 49314), (41, 49296), (53, 49110), (54, 49101), (55, 49080), (58, 49029), (60, 48987), (61, 48945), (62, 48921), (67, 48702), (68, 48657), (70, 48624), (71, 48618), (73, 48555), (74, 48519), (83, 48471), (89, 48354), (90, 48351), (93, 48315), (94, 48312), (101, 48249), (104, 48180),

Gene: Fregley\_76 Start: 49769, Stop: 47853, Start Num: 3

Candidate Starts for Fregley\_76:

(Start: 3 @49769 has 5 MA's), (Start: 12 @49679 has 17 MA's), (16, 49622), (18, 49580), (21, 49574), (29, 49484), (32, 49466), (34, 49418), (37, 49343), (41, 49268), (43, 49250), (44, 49232), (47, 49184), (53, 49082), (56, 49013), (59, 48968), (60, 48944), (61, 48902), (62, 48878), (63, 48848), (65, 48698),

(67, 48683), (69, 48620), (71, 48584), (74, 48485), (75, 48464), (82, 48371), (85, 48335), (88, 48287), (95, 48185), (99, 48164), (100, 48161), (105, 48071), (113, 47900),

Gene: Gazebo\_71 Start: 50158, Stop: 48665, Start Num: 20

Candidate Starts for Gazebo\_71:

(11, 50266), (Start: 12 @50257 has 17 MA's), (15, 50206), (17, 50191), (Start: 20 @50158 has 11 MA's), (33, 50020), (35, 50008), (36, 49987), (41, 49894), (46, 49819), (52, 49735), (57, 49651), (66, 49336), (69, 49273), (71, 49255), (73, 49198), (76, 49114), (78, 49096), (86, 48988), (97, 48850),

Gene: Grassboy\_74 Start: 50127, Stop: 48634, Start Num: 20

Candidate Starts for Grassboy\_74:

(11, 50232), (Start: 12 @50223 has 17 MA's), (15, 50172), (Start: 20 @50127 has 11 MA's), (33, 49989), (35, 49977), (36, 49956), (41, 49863), (46, 49788), (52, 49704), (56, 49629), (57, 49620), (66, 49305), (69, 49242), (71, 49224), (73, 49167), (76, 49083), (78, 49065), (86, 48957), (97, 48819),

Gene: Hendrix\_122 Start: 77168, Stop: 79243, Start Num: 12

Candidate Starts for Hendrix\_122:

(10, 77144), (Start: 12 @77168 has 17 MA's), (23, 77324), (34, 77450), (41, 77609), (47, 77693), (50, 77720), (55, 77915), (59, 77984), (61, 78050), (65, 78254), (67, 78269), (69, 78332), (71, 78443), (74, 78542), (76, 78581), (80, 78638), (86, 78716), (87, 78722), (88, 78749), (91, 78797), (92, 78815), (99, 78872), (102, 78890), (103, 78917), (108, 79022), (113, 79166), (114, 79190),

Gene: Hyperion\_70 Start: 49788, Stop: 48196, Start Num: 12

Candidate Starts for Hyperion\_70:

(11, 49797), (Start: 12 @49788 has 17 MA's), (15, 49737), (17, 49722), (Start: 20 @49689 has 11 MA's), (33, 49551), (35, 49539), (36, 49518), (41, 49425), (45, 49368), (46, 49350), (52, 49266), (57, 49182), (66, 48867), (69, 48804), (71, 48786), (73, 48729), (76, 48645), (78, 48627), (86, 48519), (97, 48381),

Gene: Jehoshaphat\_72 Start: 50362, Stop: 48773, Start Num: 12

Candidate Starts for Jehoshaphat\_72:

(11, 50371), (Start: 12 @50362 has 17 MA's), (Start: 20 @50266 has 11 MA's), (33, 50128), (35, 50116), (36, 50095), (41, 50002), (45, 49945), (46, 49927), (52, 49843), (56, 49768), (57, 49759), (66, 49444), (69, 49381), (71, 49363), (73, 49306), (76, 49222), (78, 49204), (107, 48820),

Gene: Judebell\_73 Start: 49490, Stop: 48006, Start Num: 20

Candidate Starts for Judebell\_73:

(11, 49595), (Start: 12 @49586 has 17 MA's), (Start: 20 @49490 has 11 MA's), (33, 49352), (35, 49340), (36, 49319), (41, 49226), (45, 49169), (46, 49151), (52, 49067), (56, 48992), (57, 48983), (66, 48668), (69, 48605), (71, 48587), (73, 48530), (76, 48446), (78, 48428), (86, 48320), (97, 48191),

Gene: Kelcole\_74 Start: 49992, Stop: 48076, Start Num: 3

Candidate Starts for Kelcole\_74:

(Start: 3 @49992 has 5 MA's), (Start: 12 @49902 has 17 MA's), (16, 49845), (18, 49803), (21, 49797), (29, 49707), (32, 49689), (34, 49641), (37, 49566), (41, 49491), (43, 49473), (44, 49455), (47, 49407), (53, 49305), (56, 49236), (59, 49191), (60, 49167), (61, 49125), (62, 49101), (63, 49071), (65, 48921), (67, 48906), (69, 48843), (71, 48807), (74, 48708), (75, 48687), (82, 48594), (85, 48558), (88, 48510), (95, 48408), (99, 48387), (100, 48384), (113, 48123),

Gene: Kyva\_73 Start: 50150, Stop: 48657, Start Num: 20

Candidate Starts for Kyva\_73:

(5, 50291), (Start: 7 @50282 has 1 MA's), (9, 50273), (11, 50255), (Start: 12 @50246 has 17 MA's), (Start: 20 @50150 has 11 MA's), (33, 50012), (35, 50000), (36, 49979), (41, 49886), (45, 49829), (46,

49811), (52, 49727), (56, 49652), (57, 49643), (66, 49328), (69, 49265), (71, 49247), (73, 49190), (76, 49106), (78, 49088), (86, 48980), (97, 48842),

Gene: Llemily\_72 Start: 49042, Stop: 47549, Start Num: 20

Candidate Starts for Llemily\_72:

(11, 49147), (Start: 12 @49138 has 17 MA's), (Start: 20 @49042 has 11 MA's), (33, 48904), (35, 48892), (36, 48871), (41, 48778), (45, 48721), (46, 48703), (52, 48619), (56, 48544), (57, 48535), (66, 48220), (69, 48157), (71, 48139), (73, 48082), (76, 47998), (78, 47980), (107, 47596),

Gene: Lonelysoil\_68 Start: 48799, Stop: 47306, Start Num: 20

Candidate Starts for Lonelysoil\_68:

(11, 48907), (Start: 12 @48898 has 17 MA's), (15, 48847), (17, 48832), (Start: 20 @48799 has 11 MA's), (33, 48661), (35, 48649), (36, 48628), (41, 48535), (45, 48478), (46, 48460), (52, 48376), (56, 48301), (57, 48292), (66, 47977), (69, 47914), (71, 47896), (73, 47839), (76, 47755), (78, 47737), (86, 47629), (97, 47491),

Gene: Marcie\_81 Start: 50907, Stop: 48991, Start Num: 20

Candidate Starts for Marcie\_81:

(Start: 7 @51054 has 1 MA's), (Start: 20 @50907 has 11 MA's), (33, 50769), (37, 50718), (40, 50661), (41, 50643), (44, 50607), (46, 50574), (47, 50565), (53, 50463), (58, 50367), (61, 50283), (63, 50229), (64, 50178), (71, 49965), (73, 49902), (79, 49797), (83, 49749), (87, 49701), (108, 49365), (112, 49299),

Gene: Mashley\_72 Start: 50310, Stop: 48718, Start Num: 12

Candidate Starts for Mashley\_72:

(11, 50319), (Start: 12 @50310 has 17 MA's), (15, 50259), (17, 50244), (Start: 20 @50211 has 11 MA's), (33, 50073), (35, 50061), (36, 50040), (41, 49947), (46, 49872), (52, 49788), (56, 49713), (57, 49704), (66, 49389), (69, 49326), (71, 49308), (76, 49167), (78, 49149), (86, 49041), (97, 48903),

Gene: Namago\_71 Start: 49201, Stop: 47612, Start Num: 12

Candidate Starts for Namago\_71:

(5, 49246), (Start: 7 @49237 has 1 MA's), (9, 49228), (11, 49210), (Start: 12 @49201 has 17 MA's), (Start: 20 @49105 has 11 MA's), (33, 48967), (35, 48955), (36, 48934), (41, 48841), (45, 48784), (46, 48766), (52, 48682), (56, 48607), (57, 48598), (66, 48283), (69, 48220), (71, 48202), (73, 48145), (76, 48061), (78, 48043), (86, 47935), (97, 47797),

Gene: Nike\_71 Start: 50502, Stop: 48910, Start Num: 12

Candidate Starts for Nike\_71:

(11, 50511), (Start: 12 @50502 has 17 MA's), (15, 50451), (17, 50436), (Start: 20 @50403 has 11 MA's), (33, 50265), (35, 50253), (36, 50232), (41, 50139), (45, 50082), (46, 50064), (52, 49980), (56, 49905), (57, 49896), (66, 49581), (69, 49518), (71, 49500), (73, 49443), (76, 49359), (78, 49341), (86, 49233), (97, 49095),

Gene: OneinaGillian\_74 Start: 49692, Stop: 47611, Start Num: 7

Candidate Starts for OneinaGillian\_74:

(Start: 7 @49692 has 1 MA's), (Start: 20 @49545 has 11 MA's), (33, 49407), (37, 49356), (40, 49299), (41, 49281), (44, 49245), (46, 49212), (47, 49203), (53, 49101), (55, 49056), (61, 48921), (63, 48867), (64, 48816), (71, 48603), (79, 48435), (83, 48387), (87, 48339), (108, 48003), (112, 47937), (118, 47754), (119, 47724),

Gene: Pepe25\_73 Start: 48884, Stop: 47232, Start Num: 12

Candidate Starts for Pepe25\_73:

(1, 49226), (Start: 3 @48974 has 5 MA's), (4, 48935), (Start: 12 @48884 has 17 MA's), (13, 48845), (16, 48827), (18, 48785), (21, 48779), (27, 48698), (32, 48671), (36, 48641), (37, 48623), (43, 48530), (49, 48446), (50, 48437), (53, 48362), (54, 48353), (58, 48281), (59, 48263), (61, 48197), (63, 48143), (65, 47993), (67, 47978), (71, 47894), (74, 47795), (85, 47720), (87, 47699), (88, 47672), (99, 47549), (102, 47531), (106, 47438), (109, 47408), (113, 47279),

Gene: Phabia\_70 Start: 49553, Stop: 47964, Start Num: 12

Candidate Starts for Phabia\_70:

(11, 49562), (Start: 12 @49553 has 17 MA's), (Start: 20 @49457 has 11 MA's), (33, 49319), (35, 49307), (36, 49286), (41, 49193), (45, 49136), (46, 49118), (52, 49034), (56, 48959), (57, 48950), (66, 48635), (69, 48572), (71, 48554), (73, 48497), (76, 48413), (78, 48395), (107, 48011),

Gene: Phinky\_81 Start: 52756, Stop: 50837, Start Num: 20

Candidate Starts for Phinky\_81:

(Start: 20 @52756 has 11 MA's), (33, 52618), (37, 52567), (38, 52558), (39, 52540), (43, 52474), (45, 52435), (46, 52417), (47, 52408), (51, 52360), (53, 52306), (55, 52276), (61, 52141), (62, 52117), (67, 51922), (69, 51859), (71, 51838), (73, 51775), (74, 51739), (75, 51718), (87, 51568), (110, 51217), (112, 51175), (115, 51067), (117, 51022), (120, 50908),

Gene: Quammi\_69 Start: 49253, Stop: 47664, Start Num: 12

Candidate Starts for Quammi\_69:

(11, 49262), (Start: 12 @49253 has 17 MA's), (Start: 20 @49157 has 11 MA's), (33, 49019), (35, 49007), (36, 48986), (41, 48893), (45, 48836), (46, 48818), (52, 48734), (56, 48659), (57, 48650), (66, 48335), (69, 48272), (71, 48254), (73, 48197), (76, 48113), (78, 48095), (107, 47711),

Gene: Rasputia\_119 Start: 74845, Stop: 76920, Start Num: 12

Candidate Starts for Rasputia\_119:

(10, 74821), (Start: 12 @74845 has 17 MA's), (23, 75001), (26, 75034), (34, 75127), (47, 75370), (50, 75397), (55, 75592), (58, 75643), (65, 75931), (67, 75946), (69, 76009), (71, 76120), (74, 76219), (76, 76258), (77, 76267), (80, 76315), (86, 76393), (87, 76399), (88, 76426), (91, 76474), (92, 76492), (99, 76549), (100, 76552), (102, 76567), (103, 76594), (108, 76699), (113, 76843), (114, 76867),

Gene: RobinRose\_77 Start: 50176, Stop: 48260, Start Num: 3

Candidate Starts for RobinRose\_77:

(Start: 3 @50176 has 5 MA's), (Start: 12 @50086 has 17 MA's), (16, 50029), (18, 49987), (21, 49981), (29, 49891), (32, 49873), (36, 49768), (37, 49750), (40, 49693), (42, 49666), (43, 49657), (47, 49591), (53, 49489), (55, 49444), (61, 49309), (62, 49285), (63, 49255), (67, 49090), (69, 49027), (71, 48991), (74, 48892), (76, 48853), (85, 48742), (88, 48694), (99, 48571), (100, 48568), (105, 48478), (113, 48307),

Gene: Romm\_77 Start: 50173, Stop: 48257, Start Num: 3

Candidate Starts for Romm\_77:

(Start: 3 @50173 has 5 MA's), (Start: 12 @50083 has 17 MA's), (16, 50026), (18, 49984), (21, 49978), (29, 49888), (32, 49870), (36, 49765), (37, 49747), (40, 49690), (42, 49663), (43, 49654), (47, 49588), (53, 49486), (55, 49441), (61, 49306), (62, 49282), (63, 49252), (67, 49087), (69, 49024), (71, 48988), (74, 48889), (76, 48850), (85, 48739), (88, 48691), (99, 48568), (100, 48565), (105, 48475), (113, 48304),

Gene: Rowlf\_71 Start: 49363, Stop: 47870, Start Num: 20

Candidate Starts for Rowlf\_71:

(5, 49504), (Start: 7 @49495 has 1 MA's), (9, 49486), (11, 49468), (Start: 12 @49459 has 17 MA's), (Start: 20 @49363 has 11 MA's), (33, 49225), (36, 49192), (45, 49042), (46, 49024), (52, 48940), (56, 48865), (57, 48856), (66, 48541), (69, 48478), (71, 48460), (73, 48403), (76, 48319), (78, 48301), (86,



48193), (97, 48055),

Gene: Rudy\_68 Start: 49289, Stop: 47700, Start Num: 12

Candidate Starts for Rudy\_68:

(11, 49298), (Start: 12 @49289 has 17 MA's), (Start: 20 @49193 has 11 MA's), (33, 49055), (35, 49043), (36, 49022), (41, 48929), (45, 48872), (46, 48854), (52, 48770), (56, 48695), (57, 48686), (66, 48371), (69, 48308), (71, 48290), (73, 48233), (76, 48149), (78, 48131), (107, 47747),

Gene: SallyK\_73 Start: 50894, Stop: 49401, Start Num: 20

Candidate Starts for SallyK\_73:

(5, 51035), (Start: 7 @51026 has 1 MA's), (9, 51017), (11, 50999), (Start: 12 @50990 has 17 MA's), (Start: 20 @50894 has 11 MA's), (33, 50756), (35, 50744), (36, 50723), (41, 50630), (45, 50573), (46, 50555), (52, 50471), (56, 50396), (57, 50387), (66, 50072), (69, 50009), (71, 49991), (73, 49934), (76, 49850), (78, 49832), (86, 49724), (97, 49586),

Gene: Sillytadpoles\_73 Start: 49030, Stop: 47537, Start Num: 20

Candidate Starts for Sillytadpoles\_73:

(11, 49135), (Start: 12 @49126 has 17 MA's), (Start: 20 @49030 has 11 MA's), (33, 48892), (35, 48880), (36, 48859), (41, 48766), (45, 48709), (46, 48691), (52, 48607), (56, 48532), (57, 48523), (66, 48208), (69, 48145), (71, 48127), (73, 48070), (76, 47986), (78, 47968), (107, 47584),

Gene: Squash\_73 Start: 50224, Stop: 48638, Start Num: 12

Candidate Starts for Squash\_73:

(11, 50233), (Start: 12 @50224 has 17 MA's), (Start: 20 @50128 has 11 MA's), (33, 49993), (35, 49981), (36, 49960), (45, 49810), (46, 49792), (52, 49708), (56, 49633), (57, 49624), (66, 49309), (69, 49246), (71, 49228), (73, 49171), (76, 49087), (78, 49069), (86, 48961), (97, 48823),

Gene: StrawberryJamm\_75 Start: 49393, Stop: 47804, Start Num: 12

Candidate Starts for StrawberryJamm\_75:

(5, 49438), (Start: 7 @49429 has 1 MA's), (9, 49420), (11, 49402), (Start: 12 @49393 has 17 MA's), (Start: 20 @49297 has 11 MA's), (33, 49159), (35, 49147), (36, 49126), (41, 49033), (45, 48976), (46, 48958), (52, 48874), (56, 48799), (57, 48790), (66, 48475), (69, 48412), (71, 48394), (73, 48337), (76, 48253), (78, 48235), (86, 48127), (97, 47989),

Gene: Teehee\_71 Start: 50359, Stop: 48770, Start Num: 12

Candidate Starts for Teehee\_71:

(11, 50368), (Start: 12 @50359 has 17 MA's), (Start: 20 @50263 has 11 MA's), (33, 50125), (35, 50113), (36, 50092), (41, 49999), (45, 49942), (46, 49924), (52, 49840), (56, 49765), (57, 49756), (66, 49441), (69, 49378), (71, 49360), (73, 49303), (76, 49219), (78, 49201), (107, 48817),

Gene: Tempo\_76 Start: 50116, Stop: 48200, Start Num: 3

Candidate Starts for Tempo\_76:

(Start: 3 @50116 has 5 MA's), (Start: 12 @50026 has 17 MA's), (16, 49969), (18, 49927), (21, 49921), (29, 49831), (32, 49813), (34, 49765), (37, 49690), (41, 49615), (43, 49597), (44, 49579), (47, 49531), (53, 49429), (56, 49360), (59, 49315), (60, 49291), (61, 49249), (62, 49225), (63, 49195), (67, 49030), (69, 48967), (71, 48931), (74, 48832), (75, 48811), (82, 48718), (85, 48682), (88, 48634), (95, 48532), (99, 48511), (100, 48508), (113, 48247),

Gene: Tissue\_70 Start: 49757, Stop: 48264, Start Num: 20

Candidate Starts for Tissue\_70:

(5, 49898), (Start: 7 @49889 has 1 MA's), (9, 49880), (11, 49862), (Start: 12 @49853 has 17 MA's), (Start: 20 @49757 has 11 MA's), (33, 49619), (35, 49607), (36, 49586), (41, 49493), (45, 49436), (46, 49418), (52, 49334), (56, 49259), (57, 49250), (66, 48935), (69, 48872), (71, 48854), (73, 48797), (76,

48713), (78, 48695), (86, 48587), (97, 48449),

Gene: ValentiniPuff\_21 Start: 13459, Stop: 14676, Start Num: 30

Candidate Starts for ValentiniPuff\_21:

(14, 13306), (19, 13366), (22, 13378), (24, 13405), (Start: 30 @13459 has 1 MA's), (46, 13651), (54, 13786), (56, 13831), (60, 13900), (61, 13942), (62, 13966), (70, 14254), (71, 14260), (81, 14383), (99, 14608),

Gene: Viceroy\_69 Start: 49163, Stop: 47670, Start Num: 20

Candidate Starts for Viceroy\_69:

(11, 49268), (Start: 12 @49259 has 17 MA's), (Start: 20 @49163 has 11 MA's), (33, 49025), (35, 49013), (36, 48992), (41, 48899), (45, 48842), (46, 48824), (52, 48740), (56, 48665), (57, 48656), (66, 48341), (69, 48278), (71, 48260), (73, 48203), (76, 48119), (78, 48101), (107, 47717),

Gene: Wayne3\_72 Start: 50122, Stop: 48533, Start Num: 12

Candidate Starts for Wayne3\_72:

(11, 50131), (Start: 12 @50122 has 17 MA's), (Start: 20 @50026 has 11 MA's), (33, 49888), (35, 49876), (36, 49855), (41, 49762), (45, 49705), (46, 49687), (52, 49603), (56, 49528), (57, 49519), (66, 49204), (69, 49141), (71, 49123), (73, 49066), (76, 48982), (78, 48964), (107, 48580),

Gene: Wheelie\_70 Start: 49347, Stop: 47854, Start Num: 20

Candidate Starts for Wheelie\_70:

(11, 49452), (Start: 12 @49443 has 17 MA's), (Start: 20 @49347 has 11 MA's), (33, 49209), (35, 49197), (36, 49176), (41, 49083), (46, 49008), (52, 48924), (57, 48840), (66, 48525), (69, 48462), (71, 48444), (73, 48387), (76, 48303), (86, 48177), (97, 48039),

Gene: Wilca\_75 Start: 50055, Stop: 48313, Start Num: 3

Candidate Starts for Wilca\_75:

(1, 50307), (Start: 3 @50055 has 5 MA's), (4, 50016), (Start: 12 @49965 has 17 MA's), (13, 49926), (16, 49908), (18, 49866), (21, 49860), (27, 49779), (32, 49752), (36, 49722), (37, 49704), (43, 49611), (49, 49527), (50, 49518), (54, 49434), (58, 49362), (59, 49344), (61, 49278), (63, 49224), (65, 49074), (67, 49059), (71, 48975), (74, 48876), (85, 48801), (87, 48780), (88, 48753), (99, 48630), (102, 48612), (106, 48519), (109, 48489), (113, 48360),

Gene: Zagie\_71 Start: 49571, Stop: 48078, Start Num: 20

Candidate Starts for Zagie\_71:

(5, 49715), (Start: 7 @49706 has 1 MA's), (9, 49697), (11, 49679), (Start: 12 @49670 has 17 MA's), (15, 49619), (17, 49604), (Start: 20 @49571 has 11 MA's), (33, 49433), (35, 49421), (36, 49400), (41, 49307), (45, 49250), (46, 49232), (52, 49148), (56, 49073), (57, 49064), (66, 48749), (69, 48686), (71, 48668), (73, 48611), (76, 48527), (78, 48509), (86, 48401), (97, 48263),

Gene: Zhafia\_75 Start: 49827, Stop: 48334, Start Num: 20

Candidate Starts for Zhafia\_75:

(11, 49932), (Start: 12 @49923 has 17 MA's), (Start: 20 @49827 has 11 MA's), (33, 49689), (35, 49677), (36, 49656), (41, 49563), (45, 49506), (46, 49488), (52, 49404), (56, 49329), (57, 49320), (66, 49005), (69, 48942), (71, 48924), (73, 48867), (76, 48783), (78, 48765), (107, 48381),