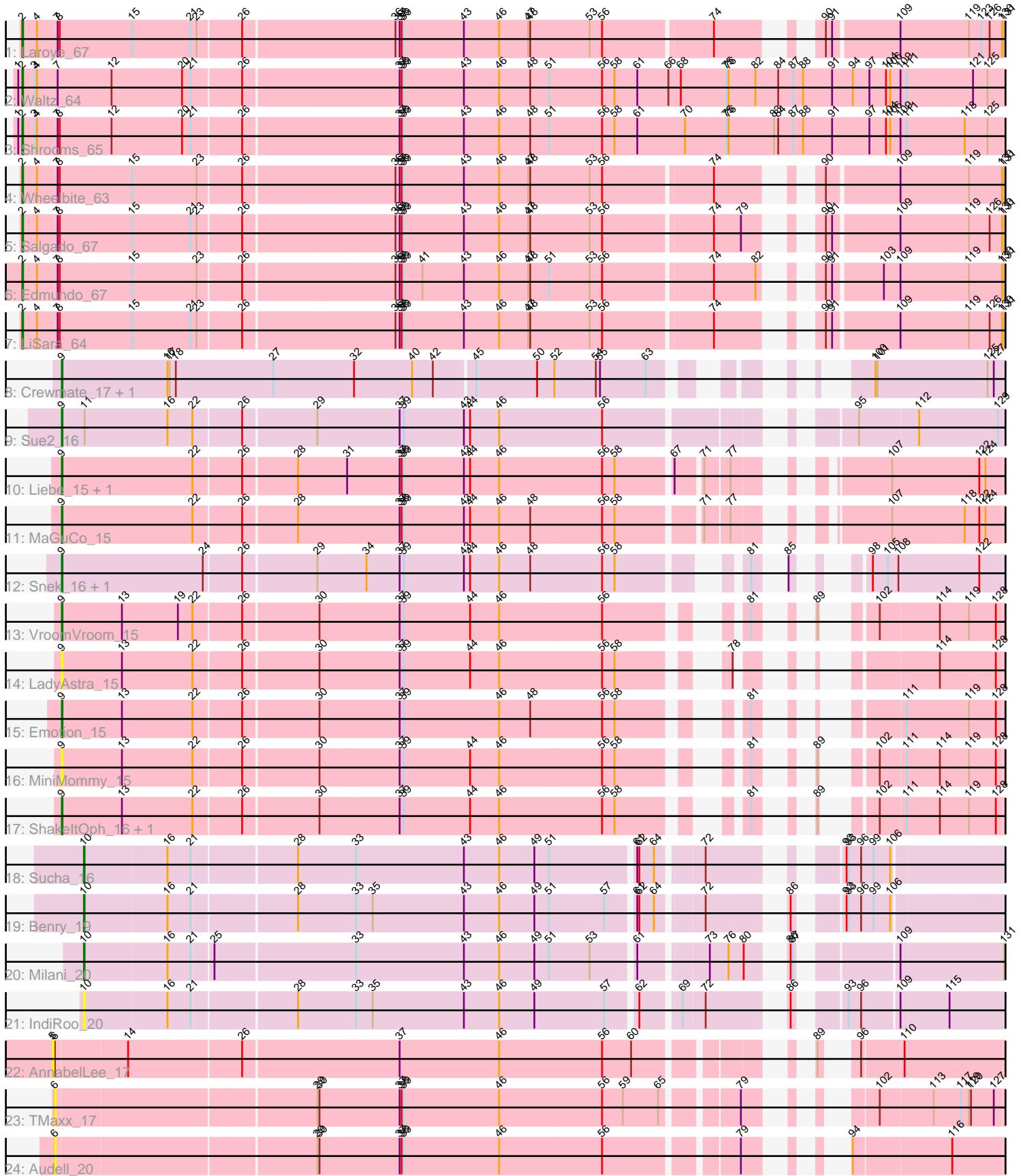


# Zoomed Pham 216457



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 216457 Report

This analysis was run 02/22/25 on database version 588.

Pham number 216457 has 28 members, 7 are drafts.

Phages represented in each track:

- Track 1 : Laroye\_67
- Track 2 : Waltz\_64
- Track 3 : Shrooms\_65
- Track 4 : Wheelbite\_63
- Track 5 : Salgado\_67
- Track 6 : Edmundo\_67
- Track 7 : LiSara\_64
- Track 8 : Crewmate\_17, ObiToo\_16
- Track 9 : Sue2\_16
- Track 10 : Liebe\_15, Maureen\_15
- Track 11 : MaGuCo\_15
- Track 12 : Snek\_16, Tweety19\_16
- Track 13 : VroomVroom\_15
- Track 14 : LadyAstra\_15
- Track 15 : Emotion\_15
- Track 16 : MiniMommy\_15
- Track 17 : ShakeltOph\_16, JasmineDragon\_15
- Track 18 : Sucha\_16
- Track 19 : Benry\_19
- Track 20 : Milani\_20
- Track 21 : IndiRoo\_20
- Track 22 : AnnabelLee\_17
- Track 23 : TMaxx\_17
- Track 24 : Audell\_20

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

The start number called the most often in the published annotations is 9, it was called in 11 of the 21 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Crewmate\_17, Emotion\_15, JasmineDragon\_15, LadyAstra\_15, Liebe\_15, MaGuCo\_15, Maureen\_15, MiniMommy\_15, ObiToo\_16, ShakeltOph\_16, Snek\_16, Sue2\_16, Tweety19\_16, VroomVroom\_15,

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

- 

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

- AnnabelLee\_17, Audell\_20, Benry\_19, Edmundo\_67, IndiRoo\_20, Laroye\_67, LiSara\_64, Milani\_20, Salgado\_67, Shrooms\_65, Sucha\_16, TMaxx\_17, Waltz\_64, Wheelbite\_63,

### Summary by start number:

Start 2:

- Found in 7 of 28 ( 25.0% ) of genes in pham
- Manual Annotations of this start: 7 of 21
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Edmundo\_67 (AL), Laroye\_67 (AL), LiSara\_64 (AL), Salgado\_67 (AL), Shrooms\_65 (AL), Waltz\_64 (AL), Wheelbite\_63 (AL),

Start 5:

- Found in 1 of 28 ( 3.6% ) of genes in pham
- No Manual Annotations of this start.
- Called 100.0% of time when present
- Phage (with cluster) where this start called: AnnabelLee\_17 (FR),

Start 6:

- Found in 3 of 28 ( 10.7% ) of genes in pham
- No Manual Annotations of this start.
- Called 66.7% of time when present
- Phage (with cluster) where this start called: Audell\_20 (FR), TMaxx\_17 (FR),

Start 9:

- Found in 14 of 28 ( 50.0% ) of genes in pham
- Manual Annotations of this start: 11 of 21
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Crewmate\_17 (AZ1), Emotion\_15 (AZ4), JasmineDragon\_15 (AZ4), LadyAstra\_15 (AZ4), Liebe\_15 (AZ2), MaGuCo\_15 (AZ2), Maureen\_15 (AZ2), MiniMommy\_15 (AZ4), ObiToo\_16 (AZ1), ShakeltOph\_16 (AZ4), Snek\_16 (AZ3), Sue2\_16 (AZ1), Tweety19\_16 (AZ3), VroomVroom\_15 (AZ4),

Start 10:

- Found in 4 of 28 ( 14.3% ) of genes in pham
- Manual Annotations of this start: 3 of 21
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Benry\_19 (EJ), IndiRoo\_20 (EJ), Milani\_20 (EJ), Sucha\_16 (EJ),

### Summary by clusters:

There are 7 clusters represented in this pham: FR, EJ, AL, AZ1, AZ2, AZ3, AZ4,

Info for manual annotations of cluster AL:

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

Info for manual annotations of cluster AZ1:

- Start number 9 was manually annotated 3 times for cluster AZ1.

Info for manual annotations of cluster AZ2:

- Start number 9 was manually annotated 3 times for cluster AZ2.

Info for manual annotations of cluster AZ3:

- Start number 9 was manually annotated 2 times for cluster AZ3.

Info for manual annotations of cluster AZ4:

- Start number 9 was manually annotated 3 times for cluster AZ4.

Info for manual annotations of cluster EJ:

- Start number 10 was manually annotated 3 times for cluster EJ.

### **Gene Information:**

Gene: AnnabelLee\_17 Start: 9567, Stop: 11855, Start Num: 5

Candidate Starts for AnnabelLee\_17:

(5, 9567), (6, 9570), (14, 9669), (26, 9828), (37, 10044), (46, 10188), (56, 10335), (60, 10377), (89, 10545), (96, 10566), (110, 10620), (132, 10761), (136, 10773), (143, 10806), (146, 10821), (160, 10875), (161, 10878), (165, 10902), (174, 10938), (175, 10947), (179, 10968), (181, 10977), (183, 10983), (185, 10989), (188, 11001), (189, 11004), (197, 11034), (199, 11043), (213, 11112), (218, 11139), (219, 11142), (234, 11208), (237, 11229), (239, 11253), (242, 11277), (246, 11316), (260, 11385), (262, 11394), (263, 11421), (273, 11505), (274, 11508), (285, 11601), (286, 11607), (294, 11658), (296, 11682), (297, 11691), (305, 11736), (314, 11850),

Gene: Audell\_20 Start: 12894, Stop: 15182, Start Num: 6

Candidate Starts for Audell\_20:

(6, 12894), (29, 13254), (30, 13257), (37, 13368), (38, 13371), (39, 13374), (46, 13512), (56, 13659), (79, 13830), (94, 13878), (116, 14010), (135, 14094), (138, 14106), (143, 14130), (152, 14172), (157, 14190), (161, 14202), (176, 14280), (177, 14283), (184, 14310), (189, 14328), (191, 14337), (198, 14361), (201, 14376), (202, 14382), (204, 14394), (205, 14400), (213, 14436), (219, 14466), (234, 14532), (256, 14688), (260, 14709), (261, 14712), (273, 14829), (274, 14832), (279, 14865), (294, 14982), (296, 15006), (310, 15123),

Gene: Benry\_19 Start: 11509, Stop: 13800, Start Num: 10

Candidate Starts for Benry\_19:

(Start: 10 @11509 has 3 MA's), (16, 11626), (21, 11659), (28, 11800), (33, 11878), (35, 11902), (43, 12034), (46, 12085), (49, 12136), (51, 12157), (57, 12235), (61, 12271), (62, 12274), (64, 12295), (72, 12352), (86, 12436), (92, 12481), (93, 12484), (96, 12502), (99, 12520), (106, 12544), (133, 12706), (147, 12772), (154, 12805), (161, 12826), (167, 12859), (168, 12862), (209, 13030), (214, 13048), (219, 13069), (236, 13147), (239, 13180), (248, 13279), (261, 13315), (262, 13321), (263, 13348), (267, 13387), (273, 13432), (276, 13444), (277, 13456), (278, 13465), (279, 13468), (295, 13582), (302, 13633), (303, 13639), (304, 13648),

Gene: Crewmate\_17 Start: 11180, Stop: 13486, Start Num: 9

Candidate Starts for Crewmate\_17:

(Start: 9 @11180 has 11 MA's), (16, 11333), (17, 11336), (18, 11345), (27, 11486), (32, 11603), (40, 11687), (42, 11717), (45, 11771), (50, 11858), (52, 11882), (54, 11942), (55, 11948), (63, 12014), (100, 12164), (101, 12167), (125, 12326), (127, 12335), (138, 12383), (150, 12437), (161, 12479), (169, 12518), (182, 12578), (187, 12593), (206, 12671), (215, 12719), (233, 12794), (235, 12806), (239, 12848), (240, 12857), (257, 12968), (273, 13100), (274, 13103), (288, 13214), (294, 13253), (301, 13307), (304, 13328), (306, 13343), (313, 13421),

Gene: Edmundo\_67 Start: 37140, Stop: 40157, Start Num: 2

Candidate Starts for Edmundo\_67:

(Start: 2 @37140 has 7 MA's), (4, 37161), (7, 37191), (8, 37194), (15, 37299), (23, 37392), (26, 37452), (36, 37662), (37, 37668), (38, 37671), (39, 37674), (41, 37701), (43, 37761), (46, 37812), (47, 37854), (48, 37857), (51, 37884), (53, 37941), (56, 37959), (74, 38109), (82, 38169), (90, 38202), (91, 38211), (103, 38277), (109, 38301), (119, 38397), (130, 38445), (131, 38448), (134, 38460), (137, 38481), (139, 38493), (151, 38544), (172, 38637), (174, 38652), (191, 38727), (200, 38760), (202, 38772), (203, 38781), (210, 38811), (213, 38826), (214, 38835), (217, 38850), (224, 38904), (237, 38943), (249, 39069), (274, 39219), (277, 39240), (282, 39273), (283, 39276), (284, 39294), (287, 39318), (290, 39330), (293, 39351), (309, 39486), (311, 39507), (312, 39528), (315, 39570), (316, 39573), (320, 39681), (321, 39705), (322, 39714), (324, 39768), (325, 39777), (327, 39840), (329, 39870), (330, 39879), (332, 39978), (333, 39984), (335, 40014), (336, 40053), (338, 40140),

Gene: Emotion\_15 Start: 9044, Stop: 11284, Start Num: 9

Candidate Starts for Emotion\_15:

(Start: 9 @9044 has 11 MA's), (13, 9131), (22, 9233), (26, 9299), (30, 9404), (37, 9515), (39, 9521), (46, 9659), (48, 9704), (56, 9806), (58, 9824), (81, 9938), (111, 10034), (119, 10121), (128, 10160), (136, 10184), (141, 10208), (143, 10217), (147, 10235), (153, 10262), (165, 10313), (168, 10325), (180, 10382), (194, 10436), (203, 10478), (232, 10607), (239, 10664), (260, 10796), (261, 10799), (273, 10916), (285, 11012), (286, 11018), (292, 11048),

Gene: IndiRoo\_20 Start: 11519, Stop: 13810, Start Num: 10

Candidate Starts for IndiRoo\_20:

(Start: 10 @11519 has 3 MA's), (16, 11636), (21, 11669), (28, 11810), (33, 11888), (35, 11912), (43, 12044), (46, 12095), (49, 12146), (57, 12245), (62, 12284), (69, 12332), (72, 12362), (86, 12446), (93, 12494), (96, 12512), (109, 12563), (115, 12629), (133, 12716), (147, 12782), (151, 12797), (154, 12815), (161, 12836), (167, 12869), (214, 13058), (219, 13079), (221, 13091), (222, 13100), (236, 13157), (239, 13190), (241, 13211), (248, 13289), (256, 13301), (262, 13331), (263, 13358), (273, 13442), (276, 13454), (278, 13475), (279, 13478), (295, 13592), (302, 13643), (304, 13658),

Gene: JasmineDragon\_15 Start: 8971, Stop: 11214, Start Num: 9

Candidate Starts for JasmineDragon\_15:

(Start: 9 @8971 has 11 MA's), (13, 9058), (22, 9160), (26, 9226), (30, 9331), (37, 9442), (39, 9448), (44, 9544), (46, 9586), (56, 9733), (58, 9751), (81, 9868), (89, 9895), (102, 9928), (111, 9964), (114, 10012), (119, 10051), (128, 10090), (141, 10138), (143, 10147), (144, 10156), (147, 10165), (157, 10207), (165, 10243), (168, 10255), (177, 10300), (178, 10306), (185, 10330), (194, 10366), (199, 10384), (203, 10408), (205, 10417), (208, 10429), (212, 10450), (213, 10453), (219, 10483), (261, 10729), (273, 10846), (285, 10942), (286, 10948), (292, 10978),

Gene: LadyAstra\_15 Start: 8974, Stop: 11217, Start Num: 9

Candidate Starts for LadyAstra\_15:

(Start: 9 @8974 has 11 MA's), (13, 9061), (22, 9163), (26, 9229), (30, 9334), (37, 9445), (39, 9451), (44, 9547), (46, 9589), (56, 9736), (58, 9754), (78, 9856), (114, 10012), (128, 10090), (141, 10138), (143, 10147), (147, 10165), (157, 10207), (160, 10216), (165, 10243), (173, 10273), (178, 10306), (203, 10408), (205, 10417), (208, 10429), (212, 10450), (213, 10453), (219, 10483), (238, 10591), (273, 10846), (276, 10858), (285, 10942), (286, 10948), (292, 10978),

Gene: Laroye\_67 Start: 36530, Stop: 39547, Start Num: 2

Candidate Starts for Laroye\_67:

(Start: 2 @36530 has 7 MA's), (4, 36551), (7, 36581), (8, 36584), (15, 36689), (21, 36773), (23, 36782), (26, 36842), (36, 37052), (37, 37058), (38, 37061), (39, 37064), (43, 37151), (46, 37202), (47, 37244), (48, 37247), (53, 37331), (56, 37349), (74, 37499), (90, 37592), (91, 37601), (109, 37691), (119, 37787), (123, 37805), (126, 37817), (130, 37835), (131, 37838), (134, 37850), (137, 37871), (139, 37883), (151, 37934), (172, 38027), (190, 38114), (200, 38150), (202, 38162), (203, 38171), (210, 38201), (213, 38216), (214, 38225), (224, 38294), (237, 38333), (249, 38459), (265, 38534), (274, 38609), (277, 38630), (282, 38663), (283, 38666), (287, 38708), (290, 38720), (293, 38741), (298, 38795), (311, 38897), (315, 38960), (320, 39071), (322, 39104), (324, 39158), (325, 39167), (329, 39260), (330, 39269), (332, 39368), (333, 39374), (335, 39404), (336, 39443), (338, 39530),

Gene: LiSara\_64 Start: 36692, Stop: 39709, Start Num: 2

Candidate Starts for LiSara\_64:

(Start: 2 @36692 has 7 MA's), (4, 36713), (7, 36743), (8, 36746), (15, 36851), (21, 36935), (23, 36944), (26, 37004), (36, 37214), (37, 37220), (38, 37223), (39, 37226), (43, 37313), (46, 37364), (47, 37406), (48, 37409), (53, 37493), (56, 37511), (74, 37661), (90, 37754), (91, 37763), (109, 37853), (119, 37949), (126, 37979), (130, 37997), (131, 38000), (134, 38012), (137, 38033), (139, 38045), (151, 38096), (172, 38189), (190, 38276), (200, 38312), (202, 38324), (203, 38333), (210, 38363), (213, 38378), (214, 38387), (224, 38456), (237, 38495), (249, 38621), (265, 38696), (274, 38771), (277, 38792), (282, 38825), (283, 38828), (287, 38870), (290, 38882), (293, 38903), (298, 38957), (311, 39059), (315, 39122), (320, 39233), (322, 39266), (324, 39320), (325, 39329), (328, 39398), (329, 39422), (330, 39431), (332, 39530), (333, 39536), (335, 39566), (336, 39605), (338, 39692),

Gene: Liebe\_15 Start: 9206, Stop: 11569, Start Num: 9

Candidate Starts for Liebe\_15:

(Start: 9 @9206 has 11 MA's), (22, 9395), (26, 9461), (28, 9536), (31, 9602), (37, 9677), (38, 9680), (39, 9683), (43, 9770), (44, 9779), (46, 9821), (56, 9968), (58, 9986), (67, 10061), (71, 10094), (77, 10127), (107, 10268), (122, 10391), (124, 10400), (136, 10439), (140, 10457), (143, 10472), (157, 10532), (159, 10538), (161, 10544), (162, 10556), (163, 10559), (175, 10613), (177, 10625), (180, 10637), (184, 10652), (202, 10724), (205, 10742), (207, 10751), (211, 10766), (213, 10778), (216, 10796), (219, 10808), (256, 11030), (273, 11171), (274, 11174), (279, 11207), (280, 11222), (281, 11228), (285, 11267), (294, 11324), (298, 11366), (306, 11414),

Gene: MaGuCo\_15 Start: 9140, Stop: 11503, Start Num: 9

Candidate Starts for MaGuCo\_15:

(Start: 9 @9140 has 11 MA's), (22, 9329), (26, 9395), (28, 9470), (37, 9611), (38, 9614), (39, 9617), (43, 9704), (44, 9713), (46, 9755), (48, 9800), (56, 9902), (58, 9920), (71, 10028), (77, 10061), (107, 10202), (118, 10304), (122, 10325), (124, 10334), (136, 10373), (140, 10391), (142, 10403), (143, 10406), (157, 10466), (159, 10472), (161, 10478), (162, 10490), (163, 10493), (168, 10514), (175, 10547), (177, 10559), (180, 10571), (184, 10586), (202, 10658), (204, 10670), (205, 10676), (207, 10685), (211, 10700), (213, 10712), (216, 10730), (219, 10742), (256, 10964), (273, 11105), (274, 11108), (279, 11141), (281, 11162), (285, 11201), (294, 11258), (298, 11300), (306, 11348),

Gene: Maureen\_15 Start: 9206, Stop: 11569, Start Num: 9

Candidate Starts for Maureen\_15:

(Start: 9 @9206 has 11 MA's), (22, 9395), (26, 9461), (28, 9536), (31, 9602), (37, 9677), (38, 9680), (39, 9683), (43, 9770), (44, 9779), (46, 9821), (56, 9968), (58, 9986), (67, 10061), (71, 10094), (77, 10127), (107, 10268), (122, 10391), (124, 10400), (136, 10439), (140, 10457), (143, 10472), (157, 10532), (159, 10538), (161, 10544), (162, 10556), (163, 10559), (175, 10613), (177, 10625), (180, 10637), (184, 10652), (202, 10724), (205, 10742), (207, 10751), (211, 10766), (213, 10778), (216, 10796), (219, 10808), (256, 11030), (273, 11171), (274, 11174), (279, 11207), (280, 11222), (281,

11228), (285, 11267), (294, 11324), (298, 11366), (306, 11414),

Gene: Milani\_20 Start: 12168, Stop: 14459, Start Num: 10

Candidate Starts for Milani\_20:

(Start: 10 @12168 has 3 MA's), (16, 12285), (21, 12318), (25, 12345), (33, 12537), (43, 12693), (46, 12744), (49, 12795), (51, 12816), (53, 12873), (61, 12930), (73, 13017), (76, 13044), (80, 13065), (86, 13095), (87, 13098), (109, 13212), (131, 13356), (154, 13464), (167, 13518), (194, 13629), (214, 13707), (219, 13728), (221, 13740), (223, 13761), (236, 13806), (243, 13872), (248, 13938), (261, 13974), (262, 13980), (263, 14007), (267, 14046), (273, 14091), (274, 14094), (276, 14103), (277, 14115), (278, 14124), (279, 14127), (295, 14241), (302, 14292), (303, 14298),

Gene: MiniMommy\_15 Start: 8972, Stop: 11215, Start Num: 9

Candidate Starts for MiniMommy\_15:

(Start: 9 @8972 has 11 MA's), (13, 9059), (22, 9161), (26, 9227), (30, 9332), (37, 9443), (39, 9449), (44, 9545), (46, 9587), (56, 9734), (58, 9752), (81, 9869), (89, 9896), (102, 9929), (111, 9965), (114, 10013), (119, 10052), (128, 10091), (136, 10115), (141, 10139), (143, 10148), (144, 10157), (147, 10166), (157, 10208), (165, 10244), (168, 10256), (177, 10301), (178, 10307), (185, 10331), (194, 10367), (199, 10385), (203, 10409), (205, 10418), (208, 10430), (212, 10451), (213, 10454), (219, 10484), (261, 10730), (273, 10847), (285, 10943), (286, 10949), (292, 10979),

Gene: ObiToo\_16 Start: 10917, Stop: 13223, Start Num: 9

Candidate Starts for ObiToo\_16:

(Start: 9 @10917 has 11 MA's), (16, 11070), (17, 11073), (18, 11082), (27, 11223), (32, 11340), (40, 11424), (42, 11454), (45, 11508), (50, 11595), (52, 11619), (54, 11679), (55, 11685), (63, 11751), (100, 11901), (101, 11904), (125, 12063), (127, 12072), (138, 12120), (150, 12174), (161, 12216), (169, 12255), (182, 12315), (187, 12330), (206, 12408), (215, 12456), (233, 12531), (235, 12543), (239, 12585), (240, 12594), (257, 12705), (273, 12837), (274, 12840), (288, 12951), (294, 12990), (301, 13044), (304, 13065), (306, 13080), (313, 13158),

Gene: Salgado\_67 Start: 36346, Stop: 39363, Start Num: 2

Candidate Starts for Salgado\_67:

(Start: 2 @36346 has 7 MA's), (4, 36367), (7, 36397), (8, 36400), (15, 36505), (21, 36589), (23, 36598), (26, 36658), (36, 36868), (37, 36874), (38, 36877), (39, 36880), (43, 36967), (46, 37018), (47, 37060), (48, 37063), (53, 37147), (56, 37165), (74, 37315), (79, 37354), (90, 37408), (91, 37417), (109, 37507), (119, 37603), (126, 37633), (130, 37651), (131, 37654), (134, 37666), (137, 37687), (139, 37699), (151, 37750), (172, 37843), (190, 37930), (200, 37966), (202, 37978), (203, 37987), (210, 38017), (213, 38032), (214, 38041), (224, 38110), (237, 38149), (249, 38275), (265, 38350), (274, 38425), (277, 38446), (282, 38479), (283, 38482), (287, 38524), (290, 38536), (293, 38557), (298, 38611), (311, 38713), (315, 38776), (320, 38887), (322, 38920), (324, 38974), (325, 38983), (329, 39076), (330, 39085), (332, 39184), (333, 39190), (335, 39220), (336, 39259), (338, 39346),

Gene: ShakeltOph\_16 Start: 8971, Stop: 11214, Start Num: 9

Candidate Starts for ShakeltOph\_16:

(Start: 9 @8971 has 11 MA's), (13, 9058), (22, 9160), (26, 9226), (30, 9331), (37, 9442), (39, 9448), (44, 9544), (46, 9586), (56, 9733), (58, 9751), (81, 9868), (89, 9895), (102, 9928), (111, 9964), (114, 10012), (119, 10051), (128, 10090), (141, 10138), (143, 10147), (144, 10156), (147, 10165), (157, 10207), (165, 10243), (168, 10255), (177, 10300), (178, 10306), (185, 10330), (194, 10366), (199, 10384), (203, 10408), (205, 10417), (208, 10429), (212, 10450), (213, 10453), (219, 10483), (261, 10729), (273, 10846), (285, 10942), (286, 10948), (292, 10978),

Gene: Shrooms\_65 Start: 34492, Stop: 37881, Start Num: 2

Candidate Starts for Shrooms\_65:

(1, 34486), (Start: 2 @34492 has 7 MA's), (3, 34510), (4, 34513), (7, 34543), (8, 34546), (12, 34621), (20, 34723), (21, 34735), (26, 34804), (37, 35020), (38, 35023), (39, 35026), (43, 35113), (46, 35164), (48, 35209), (51, 35236), (56, 35311), (58, 35329), (61, 35362), (70, 35431), (75, 35491), (76, 35494), (83, 35560), (84, 35566), (87, 35587), (88, 35602), (91, 35644), (97, 35698), (104, 35722), (106, 35728), (109, 35743), (111, 35752), (118, 35833), (125, 35866), (134, 35902), (139, 35935), (151, 35986), (156, 36016), (171, 36076), (172, 36079), (190, 36166), (193, 36178), (196, 36187), (203, 36223), (206, 36235), (210, 36253), (215, 36280), (223, 36331), (225, 36364), (226, 36409), (227, 36427), (228, 36433), (229, 36445), (230, 36463), (231, 36472), (237, 36517), (244, 36586), (247, 36631), (250, 36649), (251, 36673), (252, 36676), (253, 36685), (254, 36697), (255, 36709), (258, 36751), (259, 36817), (267, 36907), (271, 36940), (274, 36958), (282, 37012), (283, 37015), (289, 37066), (290, 37069), (293, 37090), (294, 37102), (296, 37126), (297, 37135), (301, 37156), (311, 37246), (312, 37267), (315, 37309), (318, 37327), (319, 37399), (320, 37420), (321, 37444), (322, 37453), (323, 37474), (324, 37507), (329, 37609), (331, 37654), (334, 37720), (336, 37777),

Gene: Snek\_16 Start: 9838, Stop: 12117, Start Num: 9

Candidate Starts for Snek\_16:

(Start: 9 @9838 has 11 MA's), (24, 10042), (26, 10093), (29, 10195), (34, 10261), (37, 10309), (39, 10315), (43, 10402), (44, 10411), (46, 10453), (48, 10498), (56, 10600), (58, 10618), (81, 10747), (85, 10762), (98, 10804), (105, 10825), (108, 10840), (122, 10951), (141, 11023), (143, 11032), (144, 11041), (148, 11053), (159, 11098), (161, 11104), (163, 11119), (168, 11140), (177, 11185), (198, 11263), (213, 11338), (216, 11356), (242, 11503), (261, 11614), (266, 11677), (269, 11698), (272, 11725), (275, 11740), (286, 11830), (292, 11860), (299, 11926), (313, 12052), (317, 12091),

Gene: Sucha\_16 Start: 10506, Stop: 12797, Start Num: 10

Candidate Starts for Sucha\_16:

(Start: 10 @10506 has 3 MA's), (16, 10623), (21, 10656), (28, 10797), (33, 10875), (43, 11031), (46, 11082), (49, 11133), (51, 11154), (61, 11268), (62, 11271), (64, 11292), (72, 11349), (92, 11478), (93, 11481), (96, 11499), (99, 11517), (106, 11541), (133, 11703), (151, 11784), (154, 11802), (161, 11823), (167, 11856), (168, 11859), (195, 11964), (201, 11988), (219, 12066), (220, 12069), (223, 12099), (236, 12144), (239, 12177), (248, 12276), (261, 12312), (262, 12318), (263, 12345), (267, 12384), (273, 12429), (276, 12441), (277, 12453), (278, 12462), (279, 12465), (295, 12579), (302, 12630), (304, 12645),

Gene: Sue2\_16 Start: 10752, Stop: 13142, Start Num: 9

Candidate Starts for Sue2\_16:

(Start: 9 @10752 has 11 MA's), (11, 10785), (16, 10905), (22, 10941), (26, 11007), (29, 11109), (37, 11223), (39, 11229), (43, 11316), (44, 11325), (46, 11367), (56, 11514), (95, 11790), (112, 11874), (129, 11985), (145, 12063), (147, 12069), (149, 12078), (155, 12105), (177, 12204), (202, 12303), (204, 12315), (210, 12342), (213, 12357), (214, 12366), (216, 12375), (223, 12420), (240, 12507), (245, 12552), (264, 12675), (270, 12732), (273, 12750), (274, 12753), (280, 12801), (288, 12864), (294, 12903), (313, 13077),

Gene: TMaxx\_17 Start: 9424, Stop: 11712, Start Num: 6

Candidate Starts for TMaxx\_17:

(6, 9424), (29, 9784), (30, 9787), (37, 9898), (38, 9901), (39, 9904), (46, 10042), (56, 10189), (59, 10219), (65, 10270), (79, 10360), (102, 10441), (113, 10516), (117, 10552), (119, 10564), (120, 10567), (127, 10600), (143, 10660), (158, 10723), (160, 10729), (161, 10732), (164, 10753), (166, 10759), (170, 10774), (175, 10801), (177, 10813), (179, 10822), (184, 10840), (188, 10855), (189, 10858), (191, 10867), (192, 10873), (196, 10885), (202, 10912), (205, 10930), (210, 10951), (213, 10966), (256, 11218), (260, 11239), (261, 11242), (273, 11359), (274, 11362), (285, 11455), (294, 11512), (296, 11536), (297, 11545), (300, 11563), (307, 11614), (308, 11629), (310, 11653),

Gene: Tweety19\_16 Start: 9837, Stop: 12116, Start Num: 9



Candidate Starts for Tweety19\_16:

(Start: 9 @9837 has 11 MA's), (24, 10041), (26, 10092), (29, 10194), (34, 10260), (37, 10308), (39, 10314), (43, 10401), (44, 10410), (46, 10452), (48, 10497), (56, 10599), (58, 10617), (81, 10746), (85, 10761), (98, 10803), (105, 10824), (108, 10839), (122, 10950), (141, 11022), (143, 11031), (144, 11040), (148, 11052), (159, 11097), (161, 11103), (163, 11118), (168, 11139), (177, 11184), (198, 11262), (213, 11337), (216, 11355), (242, 11502), (261, 11613), (266, 11676), (269, 11697), (272, 11724), (275, 11739), (286, 11829), (292, 11859), (299, 11925), (313, 12051), (317, 12090),

Gene: VroomVroom\_15 Start: 8983, Stop: 11226, Start Num: 9

Candidate Starts for VroomVroom\_15:

(Start: 9 @8983 has 11 MA's), (13, 9070), (19, 9151), (22, 9172), (26, 9238), (30, 9343), (37, 9454), (39, 9460), (44, 9556), (46, 9598), (56, 9745), (81, 9880), (89, 9907), (102, 9940), (114, 10024), (119, 10063), (128, 10102), (136, 10126), (141, 10150), (143, 10159), (147, 10177), (153, 10204), (157, 10219), (165, 10255), (168, 10267), (177, 10312), (178, 10318), (194, 10378), (199, 10396), (203, 10420), (212, 10462), (213, 10465), (219, 10495), (238, 10603), (273, 10858), (276, 10870), (285, 10954), (286, 10960), (292, 10990),

Gene: Waltz\_64 Start: 34787, Stop: 37879, Start Num: 2

Candidate Starts for Waltz\_64:

(1, 34781), (Start: 2 @34787 has 7 MA's), (3, 34805), (4, 34808), (7, 34838), (12, 34916), (20, 35018), (21, 35030), (26, 35099), (37, 35315), (38, 35318), (39, 35321), (43, 35408), (46, 35459), (48, 35504), (51, 35531), (56, 35606), (58, 35624), (61, 35657), (66, 35702), (68, 35720), (75, 35786), (76, 35789), (82, 35828), (84, 35861), (87, 35882), (88, 35897), (91, 35939), (94, 35969), (97, 35993), (104, 36017), (106, 36023), (109, 36038), (111, 36047), (121, 36140), (125, 36161), (134, 36197), (139, 36230), (151, 36281), (156, 36311), (172, 36374), (180, 36422), (186, 36443), (190, 36461), (193, 36473), (196, 36482), (200, 36497), (203, 36518), (213, 36563), (214, 36572), (218, 36590), (224, 36641), (236, 36671), (237, 36680), (244, 36749), (249, 36806), (271, 36938), (274, 36956), (282, 37010), (283, 37013), (289, 37064), (290, 37067), (297, 37133), (299, 37145), (311, 37244), (312, 37265), (315, 37307), (319, 37397), (320, 37418), (321, 37442), (322, 37451), (323, 37472), (324, 37505), (325, 37514), (329, 37607), (331, 37652), (334, 37718), (336, 37775), (337, 37841),

Gene: Wheelbite\_63 Start: 36504, Stop: 39521, Start Num: 2

Candidate Starts for Wheelbite\_63:

(Start: 2 @36504 has 7 MA's), (4, 36525), (7, 36555), (8, 36558), (15, 36663), (23, 36756), (26, 36816), (36, 37026), (37, 37032), (38, 37035), (39, 37038), (43, 37125), (46, 37176), (47, 37218), (48, 37221), (53, 37305), (56, 37323), (74, 37473), (90, 37566), (109, 37665), (119, 37761), (130, 37809), (131, 37812), (134, 37824), (137, 37845), (139, 37857), (151, 37908), (172, 38001), (174, 38016), (200, 38124), (202, 38136), (203, 38145), (210, 38175), (214, 38199), (217, 38214), (224, 38268), (237, 38307), (249, 38433), (268, 38538), (277, 38604), (283, 38640), (284, 38658), (287, 38682), (290, 38694), (291, 38703), (293, 38715), (298, 38769), (309, 38850), (311, 38871), (312, 38892), (315, 38934), (316, 38937), (320, 39045), (322, 39078), (323, 39099), (325, 39141), (326, 39147), (327, 39204), (329, 39234), (330, 39243), (332, 39342), (333, 39348), (336, 39417), (338, 39504),