

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 163688 Report

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

Pham number 163688 has 47 members, 6 are drafts.

Phages represented in each track:

- Track 1 : Applejack_53
- Track 2 : Tasp14_62
- Track 3 : Lamina13_61
- Track 4 : Conboy_80, MoyaNatalis_81, Linus_82, RosiePosie_82, JayCookie_82
- Track 5 : DrYang_79
- Track 6 : KBurroustX_81
- Track 7 : Chocolat_82, Scavito_83, Kabreeze_82, Chipper1996_830, HumptyDumpty_82, Mordred_82, JaNo_81, Tophat_83, EdgarPoe_81
- Track 8 : ArV1_069
- Track 9 : PrincessTrina_83
- Track 10 : Colucci_85
- Track 11 : Chubster_83
- Track 12 : Lymara_79
- Track 13 : Belphegor_65
- Track 14 : Akhila_67, MilanaBonita_66
- Track 15 : Wee_78, Taj_79
- Track 16 : Totinger_69
- Track 17 : Mova_70
- Track 18 : Mantra_64
- Track 19 : TootsiePop_75, Misha28_75
- Track 20 : Awesomesauce_76
- Track 21 : OwlsT2W_66
- Track 22 : SG4_70
- Track 23 : RedBird_75, Dorothy_75
- Track 24 : Bipolar_76
- Track 25 : ShiLan_65
- Track 26 : Filuzino_74
- Track 27 : Pollywog_67
- Track 28 : Starcevich_66
- Track 29 : Kersh_68
- Track 30 : Boilgate_58
- Track 31 : MooMoo_65

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

The start number called the most often in the published annotations is 46, it was called in 16 of the 41 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Chipper1996_830, Chocolat_82, Chubster_83, Conboy_80, DrYang_79, EdgarPoe_81, HumptyDumpty_82, JaNo_81, JayCookie_82, Kabreeze_82, Linus_82, Lymara_79, Mordred_82, MoyaNatalis_81, PrincessTrina_83, RosiePosie_82, Scavito_83, Tophat_83,

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

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

- Akhila_67, Applejack_53, ArV1_069, Awesomesauce_76, Belphegor_65, Bipolar_76, Boilgate_58, Colucci_85, Dorothy_75, Filuzino_74, KBurrousTX_81, Kersh_68, Lamina13_61, Mantra_64, MilanaBonita_66, Misha28_75, MooMoo_65, Mova_70, OwlsT2W_66, Pollywog_67, RedBird_75, SG4_70, ShiLan_65, Starcevich_66, Taj_79, Tasp14_62, TootsiePop_75, Totinger_69, Wee_78,

Summary by start number:

Start 5:

- Found in 2 of 47 (4.3%) of genes in pham
- Manual Annotations of this start: 2 of 41
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Dorothy_75 (F1), RedBird_75 (F1),

Start 6:

- Found in 3 of 47 (6.4%) of genes in pham
- Manual Annotations of this start: 3 of 41
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Awesomesauce_76 (F1), Misha28_75 (F1), TootsiePop_75 (F1),

Start 7:

- Found in 2 of 47 (4.3%) of genes in pham
- Manual Annotations of this start: 2 of 41
- Called 100.0% of time when present
- Phage (with cluster) where this start called: ShiLan_65 (F1), Starcevich_66 (F1),

Start 29:

- Found in 4 of 47 (8.5%) of genes in pham
- Manual Annotations of this start: 4 of 41
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Akhila_67 (F1), MilanaBonita_66 (F1), Taj_79 (F1), Wee_78 (F1),

Start 30:

- Found in 4 of 47 (8.5%) of genes in pham
- Manual Annotations of this start: 3 of 41
- Called 100.0% of time when present

- Phage (with cluster) where this start called: Kersh_68 (F1), Mantra_64 (F1), Mova_70 (F1), Totinger_69 (F1),

Start 46:

- Found in 18 of 47 (38.3%) of genes in pham
- Manual Annotations of this start: 16 of 41
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Chipper1996_830 (AR), Chocolat_82 (AR), Chubster_83 (AR), Conboy_80 (AR), DrYang_79 (AR), EdgarPoe_81 (AR), HumptyDumpty_82 (AR), JaNo_81 (AR), JayCookie_82 (AR), Kabreeze_82 (AR), Linus_82 (AR), Lymara_79 (AR), Mordred_82 (AR), MoyaNatalis_81 (AR), PrincessTrina_83 (AR), RosiePosie_82 (AR), Scavito_83 (AR), Tophat_83 (AR),

Start 55:

- Found in 1 of 47 (2.1%) of genes in pham
- Manual Annotations of this start: 1 of 41
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Bipolar_76 (F1),

Start 64:

- Found in 3 of 47 (6.4%) of genes in pham
- Manual Annotations of this start: 1 of 41
- Called 33.3% of time when present
- Phage (with cluster) where this start called: SG4_70 (F1),

Start 66:

- Found in 4 of 47 (8.5%) of genes in pham
- Manual Annotations of this start: 3 of 41
- Called 75.0% of time when present
- Phage (with cluster) where this start called: Filuzino_74 (F1), OwlsT2W_66 (F1), Pollywog_67 (F1),

Start 68:

- Found in 2 of 47 (4.3%) of genes in pham
- Manual Annotations of this start: 1 of 41
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Belphegor_65 (DE), Boilgate_58 (K8),

Start 69:

- Found in 3 of 47 (6.4%) of genes in pham
- Manual Annotations of this start: 2 of 41
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Applejack_53 (A1), Lamina13_61 (A1), Tasp14_62 (A1),

Start 72:

- Found in 22 of 47 (46.8%) of genes in pham
- Manual Annotations of this start: 3 of 41
- Called 18.2% of time when present
- Phage (with cluster) where this start called: ArV1_069 (AR), Colucci_85 (AR), KBurrousTX_81 (AR), MooMoo_65 (singleton),

Summary by clusters:

There are 6 clusters represented in this pham: F1, singleton, DE, A1, AR, K8,

Info for manual annotations of cluster A1:

- Start number 69 was manually annotated 2 times for cluster A1.

Info for manual annotations of cluster AR:

- Start number 46 was manually annotated 16 times for cluster AR.
- Start number 72 was manually annotated 2 times for cluster AR.

Info for manual annotations of cluster F1:

- Start number 5 was manually annotated 2 times for cluster F1.
- Start number 6 was manually annotated 3 times for cluster F1.
- Start number 7 was manually annotated 2 times for cluster F1.
- Start number 29 was manually annotated 4 times for cluster F1.
- Start number 30 was manually annotated 3 times for cluster F1.
- Start number 55 was manually annotated 1 time for cluster F1.
- Start number 64 was manually annotated 1 time for cluster F1.
- Start number 66 was manually annotated 3 times for cluster F1.

Info for manual annotations of cluster K8:

- Start number 68 was manually annotated 1 time for cluster K8.

Gene Information:

Gene: Akhila_67 Start: 42333, Stop: 45014, Start Num: 29

Candidate Starts for Akhila_67:

(20, 42243), (21, 42252), (Start: 29 @42333 has 4 MA's), (33, 42393), (36, 42429), (38, 42462), (52, 42663), (58, 42696), (78, 42873), (84, 42897), (92, 42960), (97, 42984), (98, 42987), (101, 43005), (102, 43008), (113, 43107), (116, 43128), (128, 43260), (138, 43341), (147, 43422), (156, 43536), (164, 43593), (170, 43665), (181, 43749), (184, 43767), (185, 43788), (187, 43857), (188, 43875), (195, 43908), (206, 44022), (207, 44028), (208, 44046), (211, 44067), (217, 44109), (222, 44151), (228, 44196), (231, 44208), (242, 44313), (246, 44334), (247, 44343), (248, 44355), (250, 44379), (253, 44421), (268, 44520), (281, 44706), (290, 44808), (293, 44820), (295, 44847),

Gene: Applejack_53 Start: 38217, Stop: 36658, Start Num: 69

Candidate Starts for Applejack_53:

(Start: 69 @38217 has 2 MA's), (86, 38109), (94, 38064), (106, 37980), (154, 37839), (171, 37689), (180, 37611), (196, 37506), (198, 37503), (215, 37401), (216, 37392), (242, 37185), (250, 37119), (267, 36978), (268, 36975), (281, 36921), (285, 36867), (290, 36834), (296, 36792), (297, 36759),

Gene: ArV1_069 Start: 53043, Stop: 54641, Start Num: 72

Candidate Starts for ArV1_069:

(Start: 72 @53043 has 3 MA's), (83, 53115), (87, 53151), (88, 53157), (90, 53175), (94, 53193), (103, 53250), (107, 53286), (110, 53316), (112, 53328), (144, 53391), (166, 53520), (175, 53589), (179, 53616), (192, 53697), (194, 53712), (199, 53727), (203, 53769), (204, 53778), (209, 53796), (212, 53814), (214, 53829), (223, 53913), (234, 53979), (236, 53985), (240, 54039), (243, 54066), (245, 54081), (248, 54105), (250, 54129), (251, 54150), (257, 54213), (266, 54267), (267, 54291), (278, 54405), (287, 54429), (290, 54447), (294, 54468), (299, 54537), (300, 54546), (302, 54588), (306, 54621),

Gene: Awesomesauce_76 Start: 46078, Stop: 48528, Start Num: 6

Candidate Starts for Awesomesauce_76:

(Start: 6 @46078 has 3 MA's), (8, 46108), (10, 46138), (12, 46174), (14, 46207), (18, 46438), (23, 46489), (24, 46492), (34, 46630), (37, 46672), (39, 46729), (63, 46999), (71, 47038), (93, 47203), (103, 47266), (115, 47398), (117, 47419), (119, 47455), (121, 47461), (125, 47500), (130, 47536), (135, 47569), (136, 47590), (151, 47725), (161, 47827), (162, 47830), (165, 47869), (174, 47950), (189, 48061), (190, 48064), (209, 48166), (218, 48223), (235, 48325), (237, 48337), (238, 48346), (239, 48367),

Gene: Belphegor_65 Start: 51910, Stop: 53616, Start Num: 68

Candidate Starts for Belphegor_65:

(67, 51907), (Start: 68 @51910 has 1 MA's), (73, 51937), (77, 51979), (83, 52006), (85, 52027), (86, 52036), (99, 52114), (104, 52165), (109, 52216), (143, 52267), (157, 52312), (175, 52456), (183, 52504), (201, 52600), (204, 52645), (214, 52702), (216, 52714), (242, 52918), (248, 52960), (259, 53080), (267, 53146), (285, 53383), (287, 53398), (290, 53416), (298, 53503), (300, 53515), (305, 53584),

Gene: Bipolar_76 Start: 46390, Stop: 48396, Start Num: 55

Candidate Starts for Bipolar_76:

(Start: 55 @46390 has 1 MA's), (Start: 66 @46483 has 3 MA's), (73, 46513), (75, 46543), (82, 46579), (86, 46612), (94, 46657), (101, 46699), (102, 46702), (105, 46735), (106, 46741), (117, 46822), (129, 46864), (134, 46879), (146, 46972), (160, 47062), (163, 47074), (177, 47206), (197, 47326), (216, 47449), (227, 47536), (242, 47671), (246, 47692), (247, 47701), (248, 47713), (250, 47737), (267, 47905), (268, 47908), (281, 48088), (282, 48118), (290, 48190), (293, 48202), (294, 48211), (295, 48229), (304, 48346),

Gene: Boilgate_58 Start: 41641, Stop: 43257, Start Num: 68

Candidate Starts for Boilgate_58:

(56, 41533), (60, 41566), (Start: 68 @41641 has 1 MA's), (73, 41668), (75, 41698), (86, 41767), (108, 41941), (142, 41992), (143, 41998), (160, 42073), (176, 42193), (210, 42400), (211, 42403), (219, 42451), (221, 42469), (242, 42622), (244, 42640), (247, 42655), (251, 42712), (272, 42904), (290, 43054), (296, 43096), (300, 43153), (305, 43222), (308, 43246),

Gene: Chipper1996_830 Start: 54205, Stop: 56127, Start Num: 46

Candidate Starts for Chipper1996_830:

(Start: 46 @54205 has 16 MA's), (57, 54277), (Start: 72 @54409 has 3 MA's), (83, 54481), (87, 54517), (90, 54541), (94, 54559), (103, 54616), (107, 54652), (110, 54682), (112, 54694), (166, 54886), (175, 54955), (179, 54982), (192, 55063), (194, 55078), (199, 55093), (204, 55144), (209, 55162), (214, 55195), (223, 55279), (229, 55306), (234, 55345), (236, 55351), (240, 55405), (241, 55426), (242, 55429), (243, 55432), (245, 55447), (250, 55495), (251, 55516), (257, 55579), (262, 55603), (263, 55621), (265, 55630), (267, 55657), (279, 55792), (280, 55810), (283, 55879), (286, 55903), (287, 55915), (288, 55924), (290, 55933), (299, 56023), (300, 56032), (306, 56107), (307, 56113),

Gene: Chocolat_82 Start: 53912, Stop: 55834, Start Num: 46

Candidate Starts for Chocolat_82:

(Start: 46 @53912 has 16 MA's), (57, 53984), (Start: 72 @54116 has 3 MA's), (83, 54188), (87, 54224), (90, 54248), (94, 54266), (103, 54323), (107, 54359), (110, 54389), (112, 54401), (166, 54593), (175, 54662), (179, 54689), (192, 54770), (194, 54785), (199, 54800), (204, 54851), (209, 54869), (214, 54902), (223, 54986), (229, 55013), (234, 55052), (236, 55058), (240, 55112), (241, 55133), (242, 55136), (243, 55139), (245, 55154), (250, 55202), (251, 55223), (257, 55286), (262, 55310), (263, 55328), (265, 55337), (267, 55364), (279, 55499), (280, 55517), (283, 55586), (286,

55610), (287, 55622), (288, 55631), (290, 55640), (299, 55730), (300, 55739), (306, 55814), (307, 55820),

Gene: Chubster_83 Start: 54594, Stop: 56483, Start Num: 46

Candidate Starts for Chubster_83:

(Start: 46 @54594 has 16 MA's), (57, 54666), (Start: 72 @54798 has 3 MA's), (83, 54837), (87, 54873), (90, 54897), (94, 54915), (103, 54972), (107, 55008), (110, 55038), (112, 55050), (166, 55242), (179, 55338), (192, 55419), (194, 55434), (199, 55449), (204, 55500), (209, 55518), (214, 55551), (223, 55635), (234, 55701), (236, 55707), (240, 55761), (241, 55782), (242, 55785), (243, 55788), (245, 55803), (250, 55851), (251, 55872), (257, 55935), (262, 55959), (263, 55977), (265, 55986), (267, 56013), (279, 56148), (280, 56166), (283, 56235), (286, 56259), (287, 56271), (288, 56280), (290, 56289), (298, 56376), (299, 56379), (300, 56388), (306, 56463), (307, 56469),

Gene: Colucci_85 Start: 54914, Stop: 56491, Start Num: 72

Candidate Starts for Colucci_85:

(Start: 72 @54914 has 3 MA's), (87, 55001), (88, 55007), (90, 55025), (103, 55100), (107, 55136), (110, 55166), (175, 55439), (179, 55466), (192, 55547), (194, 55562), (199, 55577), (203, 55619), (204, 55628), (209, 55646), (214, 55679), (234, 55829), (236, 55835), (240, 55889), (243, 55916), (245, 55931), (250, 55979), (251, 56000), (252, 56036), (257, 56063), (266, 56117), (267, 56141), (278, 56255), (286, 56267), (290, 56297), (299, 56387), (300, 56396), (306, 56471),

Gene: Conboy_80 Start: 53694, Stop: 55583, Start Num: 46

Candidate Starts for Conboy_80:

(Start: 46 @53694 has 16 MA's), (57, 53766), (Start: 72 @53898 has 3 MA's), (83, 53937), (87, 53973), (90, 53997), (94, 54015), (103, 54072), (107, 54108), (110, 54138), (112, 54150), (166, 54342), (175, 54411), (179, 54438), (192, 54519), (194, 54534), (199, 54549), (204, 54600), (209, 54618), (214, 54651), (223, 54735), (234, 54801), (236, 54807), (240, 54861), (241, 54882), (242, 54885), (243, 54888), (245, 54903), (250, 54951), (251, 54972), (257, 55035), (262, 55059), (263, 55077), (265, 55086), (267, 55113), (279, 55248), (280, 55266), (283, 55335), (286, 55359), (287, 55371), (288, 55380), (290, 55389), (299, 55479), (300, 55488), (306, 55563), (307, 55569),

Gene: Dorothy_75 Start: 45729, Stop: 48410, Start Num: 5

Candidate Starts for Dorothy_75:

(Start: 5 @45729 has 2 MA's), (8, 45768), (10, 45798), (12, 45834), (14, 45867), (18, 46098), (22, 46143), (23, 46149), (24, 46152), (26, 46170), (27, 46173), (32, 46272), (35, 46293), (40, 46425), (44, 46506), (59, 46587), (71, 46701), (79, 46758), (89, 46830), (103, 46914), (106, 46953), (111, 47022), (123, 47073), (167, 47187), (168, 47193), (169, 47211), (172, 47232), (191, 47379), (200, 47415), (209, 47484), (220, 47532), (224, 47565), (232, 47592), (242, 47685), (246, 47706), (247, 47715), (250, 47751), (260, 47853), (267, 47916), (268, 47919), (275, 47997), (281, 48105), (290, 48207), (293, 48219), (294, 48228), (295, 48246), (304, 48363),

Gene: DrYang_79 Start: 54332, Stop: 56248, Start Num: 46

Candidate Starts for DrYang_79:

(Start: 46 @54332 has 16 MA's), (57, 54404), (Start: 64 @54491 has 1 MA's), (Start: 72 @54536 has 3 MA's), (83, 54602), (87, 54638), (90, 54662), (91, 54668), (98, 54704), (103, 54737), (107, 54773), (110, 54803), (166, 55007), (175, 55076), (179, 55103), (192, 55184), (194, 55199), (199, 55214), (203, 55256), (204, 55265), (212, 55301), (214, 55316), (234, 55466), (236, 55472), (240, 55526), (241, 55547), (242, 55550), (243, 55553), (245, 55568), (249, 55595), (250, 55616), (251, 55637), (257, 55700), (262, 55724), (267, 55778), (274, 55847), (280, 55931), (283, 56000), (285, 56021), (287, 56036), (288, 56045), (290, 56054), (294, 56075), (296, 56096), (299, 56144), (300, 56153), (306, 56228),

Gene: EdgarPoe_81 Start: 54069, Stop: 55991, Start Num: 46

Candidate Starts for EdgarPoe_81:

(Start: 46 @54069 has 16 MA's), (57, 54141), (Start: 72 @54273 has 3 MA's), (83, 54345), (87, 54381), (90, 54405), (94, 54423), (103, 54480), (107, 54516), (110, 54546), (112, 54558), (166, 54750), (175, 54819), (179, 54846), (192, 54927), (194, 54942), (199, 54957), (204, 55008), (209, 55026), (214, 55059), (223, 55143), (229, 55170), (234, 55209), (236, 55215), (240, 55269), (241, 55290), (242, 55293), (243, 55296), (245, 55311), (250, 55359), (251, 55380), (257, 55443), (262, 55467), (263, 55485), (265, 55494), (267, 55521), (279, 55656), (280, 55674), (283, 55743), (286, 55767), (287, 55779), (288, 55788), (290, 55797), (299, 55887), (300, 55896), (306, 55971), (307, 55977),

Gene: Filuzino_74 Start: 46234, Stop: 48309, Start Num: 66

Candidate Starts for Filuzino_74:

(47, 46084), (50, 46099), (54, 46135), (Start: 66 @46234 has 3 MA's), (73, 46264), (75, 46294), (82, 46330), (86, 46363), (94, 46408), (101, 46450), (102, 46453), (114, 46555), (120, 46603), (126, 46657), (133, 46696), (141, 46771), (142, 46783), (146, 46828), (152, 46873), (160, 46978), (163, 46990), (177, 47122), (216, 47365), (227, 47452), (242, 47587), (246, 47608), (247, 47617), (250, 47653), (260, 47755), (267, 47818), (268, 47821), (273, 47884), (281, 48001), (290, 48103), (293, 48115), (295, 48142), (304, 48259),

Gene: HumptyDumpty_82 Start: 53872, Stop: 55794, Start Num: 46

Candidate Starts for HumptyDumpty_82:

(Start: 46 @53872 has 16 MA's), (57, 53944), (Start: 72 @54076 has 3 MA's), (83, 54148), (87, 54184), (90, 54208), (94, 54226), (103, 54283), (107, 54319), (110, 54349), (112, 54361), (166, 54553), (175, 54622), (179, 54649), (192, 54730), (194, 54745), (199, 54760), (204, 54811), (209, 54829), (214, 54862), (223, 54946), (229, 54973), (234, 55012), (236, 55018), (240, 55072), (241, 55093), (242, 55096), (243, 55099), (245, 55114), (250, 55162), (251, 55183), (257, 55246), (262, 55270), (263, 55288), (265, 55297), (267, 55324), (279, 55459), (280, 55477), (283, 55546), (286, 55570), (287, 55582), (288, 55591), (290, 55600), (299, 55690), (300, 55699), (306, 55774), (307, 55780),

Gene: JaNo_81 Start: 53843, Stop: 55765, Start Num: 46

Candidate Starts for JaNo_81:

(Start: 46 @53843 has 16 MA's), (57, 53915), (Start: 72 @54047 has 3 MA's), (83, 54119), (87, 54155), (90, 54179), (94, 54197), (103, 54254), (107, 54290), (110, 54320), (112, 54332), (166, 54524), (175, 54593), (179, 54620), (192, 54701), (194, 54716), (199, 54731), (204, 54782), (209, 54800), (214, 54833), (223, 54917), (229, 54944), (234, 54983), (236, 54989), (240, 55043), (241, 55064), (242, 55067), (243, 55070), (245, 55085), (250, 55133), (251, 55154), (257, 55217), (262, 55241), (263, 55259), (265, 55268), (267, 55295), (279, 55430), (280, 55448), (283, 55517), (286, 55541), (287, 55553), (288, 55562), (290, 55571), (299, 55661), (300, 55670), (306, 55745), (307, 55751),

Gene: JayCookie_82 Start: 54405, Stop: 56327, Start Num: 46

Candidate Starts for JayCookie_82:

(Start: 46 @54405 has 16 MA's), (57, 54477), (Start: 72 @54609 has 3 MA's), (83, 54681), (87, 54717), (90, 54741), (94, 54759), (103, 54816), (107, 54852), (110, 54882), (112, 54894), (166, 55086), (175, 55155), (179, 55182), (192, 55263), (194, 55278), (199, 55293), (204, 55344), (209, 55362), (214, 55395), (223, 55479), (234, 55545), (236, 55551), (240, 55605), (241, 55626), (242, 55629), (243, 55632), (245, 55647), (250, 55695), (251, 55716), (257, 55779), (262, 55803), (263, 55821), (265, 55830), (267, 55857), (279, 55992), (280, 56010), (283, 56079), (286, 56103), (287, 56115), (288, 56124), (290, 56133), (299, 56223), (300, 56232), (306, 56307), (307, 56313),

Gene: KBurrousTX_81 Start: 56110, Stop: 57699, Start Num: 72

Candidate Starts for KBurrousTX_81:

(65, 56071), (Start: 72 @56110 has 3 MA's), (83, 56176), (87, 56212), (88, 56218), (90, 56236), (103, 56311), (107, 56347), (110, 56377), (166, 56581), (175, 56650), (179, 56677), (192, 56758), (194, 56773), (199, 56788), (203, 56830), (204, 56839), (209, 56857), (212, 56875), (214, 56890), (234, 57040), (236, 57046), (240, 57100), (242, 57124), (245, 57142), (249, 57169), (250, 57190), (251, 57211), (254, 57256), (257, 57274), (266, 57331), (267, 57355), (269, 57361), (271, 57382), (287, 57493), (290, 57511), (294, 57532), (299, 57601), (300, 57610), (301, 57625), (306, 57685), (307, 57691),

Gene: Kabreeze_82 Start: 53929, Stop: 55851, Start Num: 46

Candidate Starts for Kabreeze_82:

(Start: 46 @53929 has 16 MA's), (57, 54001), (Start: 72 @54133 has 3 MA's), (83, 54205), (87, 54241), (90, 54265), (94, 54283), (103, 54340), (107, 54376), (110, 54406), (112, 54418), (166, 54610), (175, 54679), (179, 54706), (192, 54787), (194, 54802), (199, 54817), (204, 54868), (209, 54886), (214, 54919), (223, 55003), (229, 55030), (234, 55069), (236, 55075), (240, 55129), (241, 55150), (242, 55153), (243, 55156), (245, 55171), (250, 55219), (251, 55240), (257, 55303), (262, 55327), (263, 55345), (265, 55354), (267, 55381), (279, 55516), (280, 55534), (283, 55603), (286, 55627), (287, 55639), (288, 55648), (290, 55657), (299, 55747), (300, 55756), (306, 55831), (307, 55837),

Gene: Kersh_68 Start: 45094, Stop: 47070, Start Num: 30

Candidate Starts for Kersh_68:

(19, 44980), (Start: 30 @45094 has 3 MA's), (33, 45151), (35, 45163), (38, 45220), (41, 45361), (49, 45391), (51, 45406), (58, 45454), (62, 45505), (70, 45568), (76, 45616), (78, 45631), (81, 45640), (84, 45655), (87, 45679), (96, 45736), (97, 45742), (98, 45745), (101, 45763), (102, 45766), (178, 46036), (205, 46084), (214, 46120), (225, 46210), (230, 46228), (242, 46351), (244, 46369), (247, 46381), (248, 46393), (260, 46519), (267, 46582), (268, 46585), (281, 46765), (282, 46795), (290, 46867), (293, 46879), (296, 46909),

Gene: Lamina13_61 Start: 41357, Stop: 39765, Start Num: 69

Candidate Starts for Lamina13_61:

(Start: 69 @41357 has 2 MA's), (86, 41249), (94, 41204), (106, 41120), (154, 40979), (171, 40829), (180, 40751), (196, 40646), (198, 40643), (215, 40541), (216, 40532), (242, 40325), (247, 40295), (251, 40238), (267, 40100), (268, 40097), (281, 40043), (287, 39959), (288, 39950), (290, 39941), (294, 39920), (295, 39902), (297, 39866),

Gene: Linus_82 Start: 54377, Stop: 56299, Start Num: 46

Candidate Starts for Linus_82:

(Start: 46 @54377 has 16 MA's), (57, 54449), (Start: 72 @54581 has 3 MA's), (83, 54653), (87, 54689), (90, 54713), (94, 54731), (103, 54788), (107, 54824), (110, 54854), (112, 54866), (166, 55058), (175, 55127), (179, 55154), (192, 55235), (194, 55250), (199, 55265), (204, 55316), (209, 55334), (214, 55367), (223, 55451), (234, 55517), (236, 55523), (240, 55577), (241, 55598), (242, 55601), (243, 55604), (245, 55619), (250, 55667), (251, 55688), (257, 55751), (262, 55775), (263, 55793), (265, 55802), (267, 55829), (279, 55964), (280, 55982), (283, 56051), (286, 56075), (287, 56087), (288, 56096), (290, 56105), (299, 56195), (300, 56204), (306, 56279), (307, 56285),

Gene: Lymara_79 Start: 53015, Stop: 54817, Start Num: 46

Candidate Starts for Lymara_79:

(Start: 46 @53015 has 16 MA's), (Start: 64 @53174 has 1 MA's), (Start: 72 @53219 has 3 MA's), (80, 53285), (83, 53291), (87, 53327), (90, 53351), (94, 53369), (103, 53426), (107, 53462), (110, 53492), (112, 53504), (144, 53567), (166, 53696), (175, 53765), (179, 53792), (192, 53873), (194, 53888), (199, 53903), (204, 53954), (209, 53972), (214, 54005), (223, 54089), (229, 54116), (234, 54155), (236, 54161), (240, 54215), (241, 54236), (243, 54242), (245, 54257), (248, 54281), (250, 54305), (251, 54326), (257, 54389), (262, 54413), (267, 54467), (287, 54605), (290, 54623), (299, 54713),

(300, 54722), (302, 54764), (306, 54797),

Gene: Mantra_64 Start: 42536, Stop: 44860, Start Num: 30

Candidate Starts for Mantra_64:

(28, 42488), (Start: 30 @42536 has 3 MA's), (33, 42593), (38, 42662), (52, 42863), (58, 42896), (78, 43073), (84, 43097), (92, 43160), (96, 43178), (97, 43184), (101, 43205), (127, 43328), (150, 43532), (202, 43826), (216, 43922), (226, 44003), (227, 44009), (233, 44042), (242, 44141), (246, 44162), (247, 44171), (250, 44207), (260, 44309), (267, 44372), (268, 44375), (281, 44555), (289, 44654), (290, 44657), (293, 44669), (294, 44678), (296, 44699), (309, 44852),

Gene: MilanaBonita_66 Start: 42333, Stop: 45014, Start Num: 29

Candidate Starts for MilanaBonita_66:

(20, 42243), (21, 42252), (Start: 29 @42333 has 4 MA's), (33, 42393), (36, 42429), (38, 42462), (52, 42663), (58, 42696), (78, 42873), (84, 42897), (92, 42960), (97, 42984), (98, 42987), (101, 43005), (102, 43008), (113, 43107), (116, 43128), (128, 43260), (138, 43341), (147, 43422), (156, 43536), (164, 43593), (170, 43665), (181, 43749), (184, 43767), (185, 43788), (187, 43857), (188, 43875), (195, 43908), (206, 44022), (207, 44028), (208, 44046), (211, 44067), (217, 44109), (222, 44151), (228, 44196), (231, 44208), (242, 44313), (246, 44334), (247, 44343), (248, 44355), (250, 44379), (253, 44421), (268, 44520), (281, 44706), (290, 44808), (293, 44820), (295, 44847),

Gene: Misha28_75 Start: 46524, Stop: 48974, Start Num: 6

Candidate Starts for Misha28_75:

(1, 46422), (3, 46431), (4, 46458), (Start: 6 @46524 has 3 MA's), (9, 46560), (10, 46584), (12, 46620), (14, 46653), (18, 46884), (23, 46935), (24, 46938), (34, 47076), (37, 47118), (39, 47175), (63, 47445), (71, 47484), (93, 47649), (103, 47712), (115, 47844), (117, 47865), (119, 47901), (121, 47907), (125, 47946), (130, 47982), (135, 48015), (136, 48036), (151, 48171), (161, 48273), (162, 48276), (165, 48315), (174, 48396), (189, 48507), (190, 48510), (209, 48612), (218, 48669), (235, 48771), (237, 48783), (238, 48792), (239, 48813),

Gene: MooMoo_65 Start: 41964, Stop: 43592, Start Num: 72

Candidate Starts for MooMoo_65:

(Start: 72 @41964 has 3 MA's), (74, 41991), (79, 42021), (90, 42090), (100, 42144), (155, 42321), (159, 42378), (176, 42501), (182, 42534), (186, 42555), (188, 42588), (193, 42603), (213, 42708), (242, 42912), (243, 42915), (248, 42954), (276, 43245), (281, 43302), (290, 43389), (293, 43401), (295, 43428), (296, 43431), (300, 43488), (303, 43536), (305, 43557),

Gene: Mordred_82 Start: 53968, Stop: 55890, Start Num: 46

Candidate Starts for Mordred_82:

(Start: 46 @53968 has 16 MA's), (57, 54040), (Start: 72 @54172 has 3 MA's), (83, 54244), (87, 54280), (90, 54304), (94, 54322), (103, 54379), (107, 54415), (110, 54445), (112, 54457), (166, 54649), (175, 54718), (179, 54745), (192, 54826), (194, 54841), (199, 54856), (204, 54907), (209, 54925), (214, 54958), (223, 55042), (229, 55069), (234, 55108), (236, 55114), (240, 55168), (241, 55189), (242, 55192), (243, 55195), (245, 55210), (250, 55258), (251, 55279), (257, 55342), (262, 55366), (263, 55384), (265, 55393), (267, 55420), (279, 55555), (280, 55573), (283, 55642), (286, 55666), (287, 55678), (288, 55687), (290, 55696), (299, 55786), (300, 55795), (306, 55870), (307, 55876),

Gene: Mova_70 Start: 42582, Stop: 44489, Start Num: 30

Candidate Starts for Mova_70:

(15, 42405), (16, 42420), (17, 42429), (25, 42525), (Start: 30 @42582 has 3 MA's), (33, 42639), (38, 42708), (52, 42909), (58, 42942), (78, 43119), (84, 43143), (92, 43206), (101, 43251), (139, 43410), (158, 43464), (173, 43491), (216, 43611), (228, 43668), (242, 43776), (247, 43806), (250, 43842), (256, 43920), (258, 43926), (281, 44184), (289, 44283), (290, 44286), (293, 44298), (294, 44307),

(296, 44328), (309, 44481),

Gene: MoyaNatalis_81 Start: 53851, Stop: 55773, Start Num: 46

Candidate Starts for MoyaNatalis_81:

(Start: 46 @53851 has 16 MA's), (57, 53923), (Start: 72 @54055 has 3 MA's), (83, 54127), (87, 54163), (90, 54187), (94, 54205), (103, 54262), (107, 54298), (110, 54328), (112, 54340), (166, 54532), (175, 54601), (179, 54628), (192, 54709), (194, 54724), (199, 54739), (204, 54790), (209, 54808), (214, 54841), (223, 54925), (234, 54991), (236, 54997), (240, 55051), (241, 55072), (242, 55075), (243, 55078), (245, 55093), (250, 55141), (251, 55162), (257, 55225), (262, 55249), (263, 55267), (265, 55276), (267, 55303), (279, 55438), (280, 55456), (283, 55525), (286, 55549), (287, 55561), (288, 55570), (290, 55579), (299, 55669), (300, 55678), (306, 55753), (307, 55759),

Gene: OwlsT2W_66 Start: 42373, Stop: 44289, Start Num: 66

Candidate Starts for OwlsT2W_66:

(42, 42196), (43, 42202), (45, 42211), (48, 42220), (53, 42259), (61, 42316), (Start: 66 @42373 has 3 MA's), (75, 42430), (77, 42442), (86, 42499), (95, 42553), (121, 42766), (122, 42769), (124, 42790), (141, 42910), (145, 42952), (148, 42988), (160, 43132), (163, 43144), (177, 43276), (197, 43396), (216, 43519), (227, 43606), (242, 43741), (247, 43771), (250, 43807), (260, 43909), (270, 43990), (281, 44146), (284, 44206), (288, 44239), (291, 44248), (292, 44251),

Gene: Pollywog_67 Start: 43356, Stop: 45239, Start Num: 66

Candidate Starts for Pollywog_67:

(53, 43242), (Start: 66 @43356 has 3 MA's), (75, 43413), (82, 43449), (86, 43482), (94, 43527), (101, 43569), (102, 43572), (106, 43611), (137, 43734), (160, 43899), (163, 43911), (177, 44043), (197, 44163), (216, 44286), (227, 44373), (242, 44508), (247, 44538), (250, 44574), (255, 44652), (259, 44679), (261, 44685), (267, 44745), (268, 44748), (275, 44826), (281, 44934), (287, 45018), (290, 45036), (293, 45048), (295, 45075),

Gene: PrincessTrina_83 Start: 54273, Stop: 56075, Start Num: 46

Candidate Starts for PrincessTrina_83:

(Start: 46 @54273 has 16 MA's), (57, 54345), (Start: 72 @54477 has 3 MA's), (83, 54549), (87, 54585), (90, 54609), (94, 54627), (103, 54684), (107, 54720), (110, 54750), (112, 54762), (166, 54954), (175, 55023), (179, 55050), (192, 55131), (194, 55146), (199, 55161), (204, 55212), (209, 55230), (214, 55263), (223, 55347), (229, 55374), (234, 55413), (236, 55419), (240, 55473), (241, 55494), (242, 55497), (243, 55500), (245, 55515), (250, 55563), (251, 55584), (257, 55647), (262, 55671), (263, 55689), (265, 55698), (267, 55725), (287, 55863), (290, 55881), (299, 55971), (300, 55980), (306, 56055), (307, 56061),

Gene: RedBird_75 Start: 45596, Stop: 48277, Start Num: 5

Candidate Starts for RedBird_75:

(Start: 5 @45596 has 2 MA's), (8, 45635), (10, 45665), (12, 45701), (14, 45734), (18, 45965), (22, 46010), (23, 46016), (24, 46019), (26, 46037), (27, 46040), (32, 46139), (35, 46160), (40, 46292), (44, 46373), (59, 46454), (71, 46568), (79, 46625), (89, 46697), (103, 46781), (106, 46820), (111, 46889), (123, 46940), (167, 47054), (168, 47060), (169, 47078), (172, 47099), (191, 47246), (200, 47282), (209, 47351), (220, 47399), (224, 47432), (232, 47459), (242, 47552), (246, 47573), (247, 47582), (250, 47618), (260, 47720), (267, 47783), (268, 47786), (275, 47864), (281, 47972), (290, 48074), (293, 48086), (294, 48095), (295, 48113), (304, 48230),

Gene: RosiePosie_82 Start: 54057, Stop: 55946, Start Num: 46

Candidate Starts for RosiePosie_82:

(Start: 46 @54057 has 16 MA's), (57, 54129), (Start: 72 @54261 has 3 MA's), (83, 54300), (87, 54336), (90, 54360), (94, 54378), (103, 54435), (107, 54471), (110, 54501), (112, 54513), (166, 54705), (175, 54774), (179, 54801), (192, 54882), (194, 54897), (199, 54912), (204, 54963), (209,

54981), (214, 55014), (223, 55098), (234, 55164), (236, 55170), (240, 55224), (241, 55245), (242, 55248), (243, 55251), (245, 55266), (250, 55314), (251, 55335), (257, 55398), (262, 55422), (263, 55440), (265, 55449), (267, 55476), (279, 55611), (280, 55629), (283, 55698), (286, 55722), (287, 55734), (288, 55743), (290, 55752), (299, 55842), (300, 55851), (306, 55926), (307, 55932),

Gene: SG4_70 Start: 43702, Stop: 45480, Start Num: 64

Candidate Starts for SG4_70:

(Start: 64 @43702 has 1 MA's), (73, 43741), (75, 43771), (82, 43807), (86, 43840), (94, 43885), (154, 44110), (171, 44260), (180, 44338), (196, 44443), (198, 44446), (215, 44548), (216, 44557), (242, 44764), (246, 44785), (247, 44794), (250, 44830), (260, 44932), (267, 44995), (268, 44998), (270, 45013), (281, 45172), (290, 45274), (293, 45286), (294, 45295), (295, 45313), (304, 45430),

Gene: Scavito_83 Start: 54017, Stop: 55939, Start Num: 46

Candidate Starts for Scavito_83:

(Start: 46 @54017 has 16 MA's), (57, 54089), (Start: 72 @54221 has 3 MA's), (83, 54293), (87, 54329), (90, 54353), (94, 54371), (103, 54428), (107, 54464), (110, 54494), (112, 54506), (166, 54698), (175, 54767), (179, 54794), (192, 54875), (194, 54890), (199, 54905), (204, 54956), (209, 54974), (214, 55007), (223, 55091), (229, 55118), (234, 55157), (236, 55163), (240, 55217), (241, 55238), (242, 55241), (243, 55244), (245, 55259), (250, 55307), (251, 55328), (257, 55391), (262, 55415), (263, 55433), (265, 55442), (267, 55469), (279, 55604), (280, 55622), (283, 55691), (286, 55715), (287, 55727), (288, 55736), (290, 55745), (299, 55835), (300, 55844), (306, 55919), (307, 55925),

Gene: ShiLan_65 Start: 42785, Stop: 45667, Start Num: 7

Candidate Starts for ShiLan_65:

(Start: 7 @42785 has 2 MA's), (10, 42842), (11, 42854), (13, 42881), (14, 42911), (18, 43142), (22, 43187), (23, 43193), (24, 43196), (26, 43214), (27, 43217), (32, 43316), (35, 43337), (40, 43469), (44, 43550), (59, 43631), (71, 43745), (79, 43802), (89, 43874), (103, 43958), (106, 43997), (111, 44066), (118, 44117), (131, 44231), (132, 44237), (135, 44255), (136, 44276), (140, 44312), (145, 44360), (153, 44411), (160, 44513), (163, 44525), (177, 44657), (197, 44777), (216, 44900), (227, 44987), (242, 45122), (248, 45164), (260, 45299), (264, 45329), (268, 45365), (277, 45467), (281, 45524), (284, 45584), (288, 45617), (291, 45626), (292, 45629),

Gene: Starcevich_66 Start: 42297, Stop: 45341, Start Num: 7

Candidate Starts for Starcevich_66:

(2, 42183), (Start: 7 @42297 has 2 MA's), (10, 42354), (11, 42366), (13, 42393), (14, 42423), (18, 42654), (22, 42699), (23, 42705), (24, 42708), (26, 42726), (27, 42729), (34, 42846), (37, 42888), (39, 42945), (63, 43215), (71, 43254), (93, 43419), (103, 43482), (115, 43614), (117, 43635), (119, 43671), (121, 43677), (125, 43716), (130, 43752), (135, 43785), (136, 43806), (145, 43890), (149, 43935), (151, 43947), (160, 44049), (163, 44061), (177, 44193), (197, 44313), (216, 44436), (226, 44517), (227, 44523), (233, 44556), (242, 44655), (247, 44685), (250, 44721), (267, 44862), (268, 44865), (281, 45051), (290, 45138), (293, 45150),

Gene: Taj_79 Start: 46662, Stop: 48335, Start Num: 29

Candidate Starts for Taj_79:

(20, 46572), (21, 46581), (Start: 29 @46662 has 4 MA's), (31, 46692), (33, 46722), (35, 46734), (38, 46791), (52, 46992), (58, 47025), (78, 47202), (84, 47226), (92, 47289), (97, 47313), (98, 47316), (217, 47457), (222, 47499), (228, 47544), (231, 47556), (242, 47661), (246, 47682), (247, 47691), (248, 47703), (253, 47769), (267, 47865), (268, 47868), (278, 47970), (281, 48027), (290, 48129), (293, 48141), (294, 48150), (296, 48171), (304, 48285),

Gene: Tasp14_62 Start: 41981, Stop: 40389, Start Num: 69

Candidate Starts for Tasp14_62:

(Start: 69 @41981 has 2 MA's), (86, 41873), (94, 41828), (106, 41744), (154, 41603), (171, 41453), (180, 41375), (196, 41270), (198, 41267), (215, 41165), (216, 41156), (242, 40949), (247, 40919), (251, 40862), (267, 40724), (268, 40721), (281, 40667), (287, 40583), (288, 40574), (290, 40565), (294, 40544), (295, 40526), (297, 40490),

Gene: TootsiePop_75 Start: 46524, Stop: 48974, Start Num: 6

Candidate Starts for TootsiePop_75:

(1, 46422), (3, 46431), (4, 46458), (Start: 6 @46524 has 3 MA's), (9, 46560), (10, 46584), (12, 46620), (14, 46653), (18, 46884), (23, 46935), (24, 46938), (34, 47076), (37, 47118), (39, 47175), (63, 47445), (71, 47484), (93, 47649), (103, 47712), (115, 47844), (117, 47865), (119, 47901), (121, 47907), (125, 47946), (130, 47982), (135, 48015), (136, 48036), (151, 48171), (161, 48273), (162, 48276), (165, 48315), (174, 48396), (189, 48507), (190, 48510), (209, 48612), (218, 48669), (235, 48771), (237, 48783), (238, 48792), (239, 48813),

Gene: Tophat_83 Start: 54206, Stop: 56128, Start Num: 46

Candidate Starts for Tophat_83:

(Start: 46 @54206 has 16 MA's), (57, 54278), (Start: 72 @54410 has 3 MA's), (83, 54482), (87, 54518), (90, 54542), (94, 54560), (103, 54617), (107, 54653), (110, 54683), (112, 54695), (166, 54887), (175, 54956), (179, 54983), (192, 55064), (194, 55079), (199, 55094), (204, 55145), (209, 55163), (214, 55196), (223, 55280), (229, 55307), (234, 55346), (236, 55352), (240, 55406), (241, 55427), (242, 55430), (243, 55433), (245, 55448), (250, 55496), (251, 55517), (257, 55580), (262, 55604), (263, 55622), (265, 55631), (267, 55658), (279, 55793), (280, 55811), (283, 55880), (286, 55904), (287, 55916), (288, 55925), (290, 55934), (299, 56024), (300, 56033), (306, 56108), (307, 56114),

Gene: Totinger_69 Start: 41872, Stop: 44196, Start Num: 30

Candidate Starts for Totinger_69:

(15, 41695), (16, 41710), (17, 41719), (25, 41815), (Start: 30 @41872 has 3 MA's), (33, 41929), (38, 41998), (52, 42199), (58, 42232), (78, 42409), (84, 42433), (92, 42496), (96, 42514), (97, 42520), (101, 42541), (127, 42664), (150, 42868), (202, 43162), (216, 43258), (226, 43339), (227, 43345), (233, 43378), (242, 43477), (244, 43495), (248, 43519), (260, 43645), (267, 43708), (268, 43711), (281, 43891), (289, 43990), (290, 43993), (293, 44005), (294, 44014), (296, 44035), (309, 44188),

Gene: Wee_78 Start: 46738, Stop: 48411, Start Num: 29

Candidate Starts for Wee_78:

(20, 46648), (21, 46657), (Start: 29 @46738 has 4 MA's), (31, 46768), (33, 46798), (35, 46810), (38, 46867), (52, 47068), (58, 47101), (78, 47278), (84, 47302), (92, 47365), (97, 47389), (98, 47392), (217, 47533), (222, 47575), (228, 47620), (231, 47632), (242, 47737), (246, 47758), (247, 47767), (248, 47779), (253, 47845), (267, 47941), (268, 47944), (278, 48046), (281, 48103), (290, 48205), (293, 48217), (294, 48226), (296, 48247), (304, 48361),