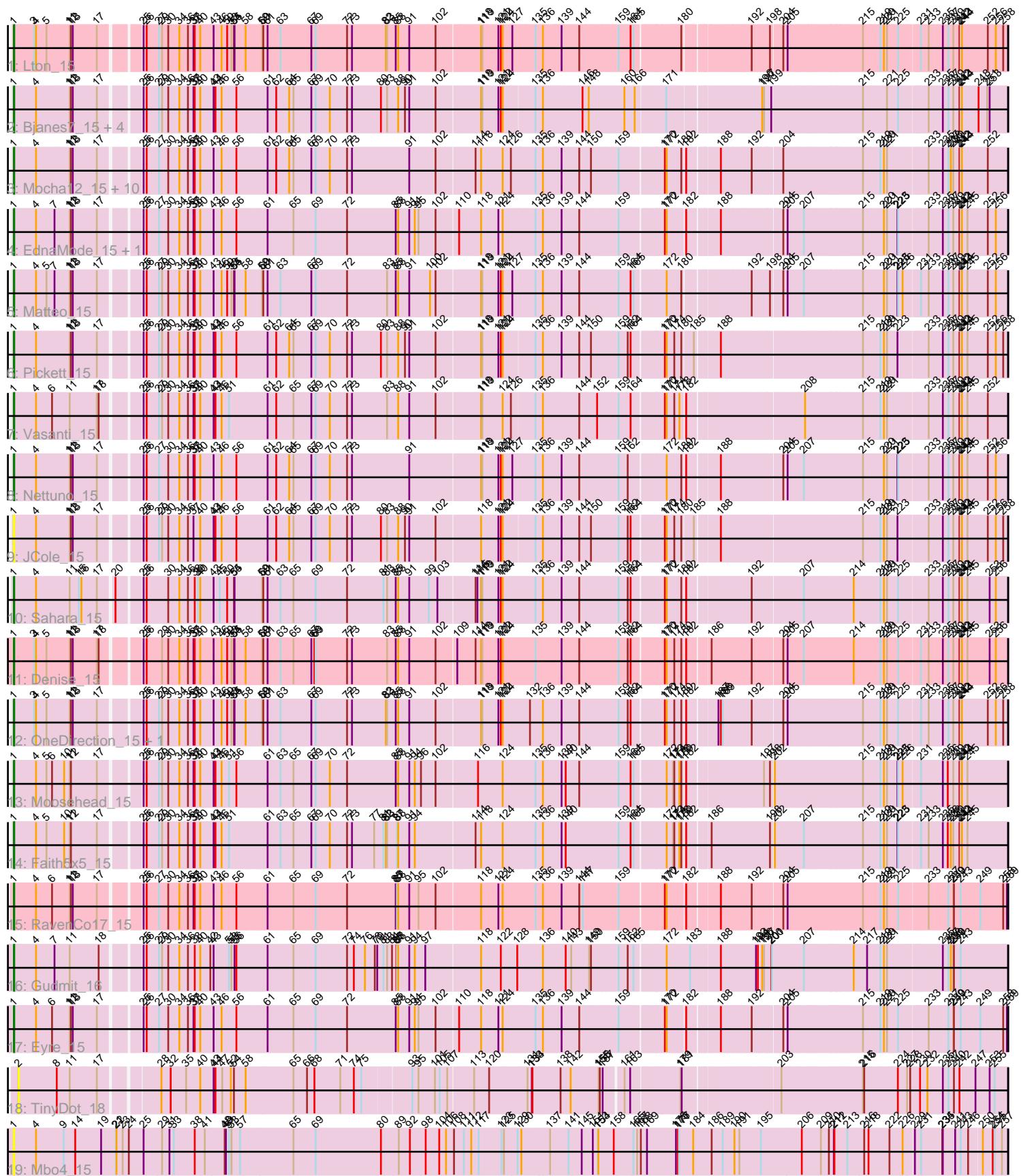


# Pham 2706



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 2706 Report

This analysis was run 04/05/24 on database version 557.

Pham number 2706 has 35 members, 5 are drafts.

Phages represented in each track:

- Track 1 : Lton\_15
- Track 2 : Bjanes7\_15, SoilAssassin\_15, LordFarquaad\_15, Yeet412\_15, Attis\_15
- Track 3 : Mocha12\_15, Whiteclaw\_15, Savage\_15, Clap\_15, Haley23\_15, Cynthia\_15, GemG\_15, TuertoX\_15, Ebert\_15, Gizermo\_15, Sproutie\_15
- Track 4 : EdnaMode\_15, Lamberg\_15
- Track 5 : Matteo\_15
- Track 6 : Pickett\_15
- Track 7 : Vasanti\_15
- Track 8 : Nettuno\_15
- Track 9 : JCole\_15
- Track 10 : Sahara\_15
- Track 11 : Denise\_15
- Track 12 : OneDirection\_15, Pepperoni\_15
- Track 13 : Moosehead\_15
- Track 14 : Faith5x5\_15
- Track 15 : RavenCo17\_15
- Track 16 : Gudmit\_16
- Track 17 : Eyre\_15
- Track 18 : TinyDot\_18
- Track 19 : Mbo4\_15

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

The start number called the most often in the published annotations is 1, it was called in 30 of the 30 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Attis\_15, Bjanes7\_15, Clap\_15, Cynthia\_15, Denise\_15, Ebert\_15, EdnaMode\_15, Eyre\_15, Faith5x5\_15, GemG\_15, Gizermo\_15, Gudmit\_16, Haley23\_15, JCole\_15, Lamberg\_15, LordFarquaad\_15, Lton\_15, Matteo\_15, Mbo4\_15, Mocha12\_15, Moosehead\_15, Nettuno\_15, OneDirection\_15, Pepperoni\_15, Pickett\_15, RavenCo17\_15, Sahara\_15, Savage\_15, SoilAssassin\_15, Sproutie\_15, TuertoX\_15, Vasanti\_15, Whiteclaw\_15, Yeet412\_15,

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

- 

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

- TinyDot\_18,

### **Summary by start number:**

Start 1:

- Found in 34 of 35 ( 97.1% ) of genes in pham
- Manual Annotations of this start: 30 of 30
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Attis\_15 (CZ2), Bjanes7\_15 (CZ2), Clap\_15 (CZ2), Cynthia\_15 (CZ2), Denise\_15 (CZ5), Ebert\_15 (CZ2), EdnaMode\_15 (CZ2), Eye\_15 (singleton), Faith5x5\_15 (CZ6), GemG\_15 (CZ2), Gizermo\_15 (CZ2), Gudmit\_16 (singleton), Haley23\_15 (CZ2), JCole\_15 (CZ2), Lamberg\_15 (CZ2), LordFarquaad\_15 (CZ2), Lton\_15 (CZ), Matteo\_15 (CZ2), Mbo4\_15 (singleton), Mocha12\_15 (CZ2), Moosehead\_15 (CZ6), Nettuno\_15 (CZ2), OneDirection\_15 (CZ6), Pepperoni\_15 (CZ), Pickett\_15 (CZ2), RavenCo17\_15 (CZ8), Sahara\_15 (CZ2), Savage\_15 (CZ2), SoilAssassin\_15 (CZ2), Sproutie\_15 (CZ2), TuertoX\_15 (CZ2), Vasanti\_15 (CZ2), Whiteclaw\_15 (CZ2), Yeet412\_15 (CZ2),

Start 2:

- Found in 1 of 35 ( 2.9% ) of genes in pham
- No Manual Annotations of this start.
- Called 100.0% of time when present
- Phage (with cluster) where this start called: TinyDot\_18 (singleton),

### **Summary by clusters:**

There are 6 clusters represented in this pham: CZ8, CZ2, CZ6, singleton, CZ5, CZ,

Info for manual annotations of cluster CZ:

- Start number 1 was manually annotated 1 time for cluster CZ.

Info for manual annotations of cluster CZ2:

- Start number 1 was manually annotated 22 times for cluster CZ2.

Info for manual annotations of cluster CZ5:

- Start number 1 was manually annotated 1 time for cluster CZ5.

Info for manual annotations of cluster CZ6:

- Start number 1 was manually annotated 3 times for cluster CZ6.

Info for manual annotations of cluster CZ8:

- Start number 1 was manually annotated 1 time for cluster CZ8.

### **Gene Information:**

Gene: Attis\_15 Start: 9497, Stop: 13906, Start Num: 1

Candidate Starts for Attis\_15:

(Start: 1 @9497 has 30 MA's), (4, 9596), (11, 9752), (12, 9758), (13, 9767), (17, 9884), (25, 10037), (26, 10052), (27, 10109), (29, 10124), (30, 10154), (34, 10208), (36, 10250), (37, 10277), (38, 10283), (40, 10310), (43, 10373), (44, 10382), (46, 10412), (56, 10484), (61, 10634), (62, 10676), (64, 10739), (65, 10760), (67, 10847), (69, 10868), (70, 10937), (72, 11021), (73, 11045), (80, 11186), (83, 11216), (88, 11270), (90, 11303), (91, 11324), (102, 11444), (118, 11648), (119, 11654), (121, 11729), (122, 11741), (124, 11750), (135, 11891), (136, 11927), (146, 12095), (148, 12122), (160, 12284), (166, 12329), (171, 12455), (196, 12833), (197, 12842), (199, 12875), (215, 13271), (221, 13376), (225, 13412), (233, 13538), (235, 13595), (237, 13622), (239, 13646), (242, 13676), (243, 13682), (244, 13688), (248, 13769), (251, 13811), (253, 13823),

Gene: Bjanes7\_15 Start: 9497, Stop: 13906, Start Num: 1

Candidate Starts for Bjanes7\_15:

(Start: 1 @9497 has 30 MA's), (4, 9596), (11, 9752), (12, 9758), (13, 9767), (17, 9884), (25, 10037), (26, 10052), (27, 10109), (29, 10124), (30, 10154), (34, 10208), (36, 10250), (37, 10277), (38, 10283), (40, 10310), (43, 10373), (44, 10382), (46, 10412), (56, 10484), (61, 10634), (62, 10676), (64, 10739), (65, 10760), (67, 10847), (69, 10868), (70, 10937), (72, 11021), (73, 11045), (80, 11186), (83, 11216), (88, 11270), (90, 11303), (91, 11324), (102, 11444), (118, 11648), (119, 11654), (121, 11729), (122, 11741), (124, 11750), (135, 11891), (136, 11927), (146, 12095), (148, 12122), (160, 12284), (166, 12329), (171, 12455), (196, 12833), (197, 12842), (199, 12875), (215, 13271), (221, 13376), (225, 13412), (233, 13538), (235, 13595), (237, 13622), (239, 13646), (242, 13676), (243, 13682), (244, 13688), (248, 13769), (251, 13811), (253, 13823),

Gene: Clap\_15 Start: 9564, Stop: 13913, Start Num: 1

Candidate Starts for Clap\_15:

(Start: 1 @9564 has 30 MA's), (4, 9663), (11, 9819), (12, 9825), (13, 9834), (17, 9951), (25, 10104), (26, 10119), (27, 10176), (30, 10221), (34, 10275), (36, 10317), (37, 10344), (38, 10350), (40, 10377), (43, 10440), (46, 10479), (56, 10551), (61, 10701), (62, 10743), (64, 10806), (65, 10827), (67, 10914), (69, 10935), (70, 11004), (72, 11088), (73, 11112), (91, 11391), (102, 11511), (114, 11691), (118, 11715), (124, 11817), (126, 11856), (135, 11967), (136, 12003), (139, 12078), (144, 12162), (150, 12213), (159, 12321), (170, 12483), (172, 12492), (180, 12546), (182, 12558), (188, 12663), (192, 12804), (204, 12927), (215, 13278), (219, 13356), (220, 13368), (221, 13383), (233, 13545), (235, 13602), (237, 13629), (238, 13641), (239, 13653), (242, 13683), (243, 13689), (244, 13695), (252, 13821),

Gene: Cynthia\_15 Start: 9564, Stop: 13913, Start Num: 1

Candidate Starts for Cynthia\_15:

(Start: 1 @9564 has 30 MA's), (4, 9663), (11, 9819), (12, 9825), (13, 9834), (17, 9951), (25, 10104), (26, 10119), (27, 10176), (30, 10221), (34, 10275), (36, 10317), (37, 10344), (38, 10350), (40, 10377), (43, 10440), (46, 10479), (56, 10551), (61, 10701), (62, 10743), (64, 10806), (65, 10827), (67, 10914), (69, 10935), (70, 11004), (72, 11088), (73, 11112), (91, 11391), (102, 11511), (114, 11691), (118, 11715), (124, 11817), (126, 11856), (135, 11967), (136, 12003), (139, 12078), (144, 12162), (150, 12213), (159, 12321), (170, 12483), (172, 12492), (180, 12546), (182, 12558), (188, 12663), (192, 12804), (204, 12927), (215, 13278), (219, 13356), (220, 13368), (221, 13383), (233, 13545), (235, 13602), (237, 13629), (238, 13641), (239, 13653), (242, 13683), (243, 13689), (244, 13695), (252, 13821),

Gene: Denise\_15 Start: 9594, Stop: 13949, Start Num: 1

Candidate Starts for Denise\_15:

(Start: 1 @9594 has 30 MA's), (3, 9684), (4, 9693), (5, 9741), (11, 9849), (12, 9855), (13, 9864), (17, 9981), (18, 9990), (25, 10134), (26, 10149), (29, 10221), (30, 10251), (34, 10305), (36, 10347), (37, 10374), (38, 10380), (40, 10407), (43, 10470), (46, 10509), (50, 10536), (53, 10557), (54, 10569), (55, 10572), (58, 10626), (59, 10704), (60, 10710), (61, 10731), (63, 10794), (65, 10857), (67, 10944), (68, 10959), (69, 10965), (72, 11118), (73, 11142), (83, 11313), (85, 11355), (88, 11367), (91, 11421),

(102, 11541), (109, 11634), (114, 11721), (118, 11745), (119, 11751), (121, 11826), (122, 11838), (124, 11847), (135, 12000), (139, 12111), (144, 12195), (159, 12354), (162, 12396), (164, 12405), (170, 12516), (172, 12525), (174, 12555), (180, 12579), (182, 12591), (186, 12660), (192, 12837), (204, 12957), (205, 12972), (207, 13041), (214, 13269), (219, 13392), (220, 13404), (221, 13419), (225, 13455), (231, 13545), (233, 13581), (235, 13638), (237, 13665), (239, 13689), (242, 13719), (243, 13725), (244, 13731), (245, 13758), (253, 13866), (256, 13896),

Gene: Ebert\_15 Start: 9564, Stop: 13913, Start Num: 1

Candidate Starts for Ebert\_15:

(Start: 1 @9564 has 30 MA's), (4, 9663), (11, 9819), (12, 9825), (13, 9834), (17, 9951), (25, 10104), (26, 10119), (27, 10176), (30, 10221), (34, 10275), (36, 10317), (37, 10344), (38, 10350), (40, 10377), (43, 10440), (46, 10479), (56, 10551), (61, 10701), (62, 10743), (64, 10806), (65, 10827), (67, 10914), (69, 10935), (70, 11004), (72, 11088), (73, 11112), (91, 11391), (102, 11511), (114, 11691), (118, 11715), (124, 11817), (126, 11856), (135, 11967), (136, 12003), (139, 12078), (144, 12162), (150, 12213), (159, 12321), (170, 12483), (172, 12492), (180, 12546), (182, 12558), (188, 12663), (192, 12804), (204, 12927), (215, 13278), (219, 13356), (220, 13368), (221, 13383), (233, 13545), (235, 13602), (237, 13629), (238, 13641), (239, 13653), (242, 13683), (243, 13689), (244, 13695), (252, 13821),

Gene: EdnaMode\_15 Start: 9497, Stop: 13849, Start Num: 1

Candidate Starts for EdnaMode\_15:

(Start: 1 @9497 has 30 MA's), (4, 9596), (7, 9683), (11, 9752), (12, 9758), (13, 9767), (17, 9884), (25, 10037), (26, 10052), (27, 10109), (30, 10154), (34, 10208), (36, 10250), (37, 10277), (38, 10283), (40, 10310), (43, 10373), (46, 10412), (56, 10484), (61, 10634), (65, 10760), (69, 10868), (72, 11021), (85, 11258), (88, 11270), (91, 11324), (94, 11345), (95, 11363), (102, 11444), (110, 11546), (118, 11648), (121, 11729), (124, 11750), (135, 11900), (136, 11936), (139, 12011), (144, 12095), (159, 12254), (170, 12416), (172, 12425), (182, 12491), (188, 12596), (204, 12857), (205, 12872), (207, 12941), (215, 13214), (220, 13304), (221, 13319), (223, 13352), (225, 13355), (233, 13481), (235, 13538), (237, 13565), (239, 13589), (242, 13619), (243, 13625), (244, 13631), (245, 13658), (252, 13757), (256, 13796),

Gene: Eyre\_15 Start: 10187, Stop: 14536, Start Num: 1

Candidate Starts for Eyre\_15:

(Start: 1 @10187 has 30 MA's), (4, 10286), (6, 10361), (11, 10442), (12, 10448), (13, 10457), (17, 10574), (25, 10727), (26, 10742), (27, 10799), (30, 10844), (34, 10898), (36, 10940), (37, 10967), (38, 10973), (40, 11000), (43, 11063), (46, 11102), (56, 11174), (61, 11324), (65, 11450), (69, 11558), (72, 11711), (85, 11948), (88, 11960), (91, 12014), (94, 12035), (95, 12053), (102, 12134), (110, 12236), (118, 12338), (121, 12419), (124, 12440), (135, 12590), (136, 12626), (139, 12701), (144, 12785), (159, 12944), (170, 13106), (172, 13115), (182, 13181), (188, 13286), (192, 13427), (204, 13550), (205, 13565), (215, 13901), (219, 13979), (220, 13991), (221, 14006), (225, 14042), (233, 14168), (237, 14252), (239, 14276), (240, 14279), (243, 14312), (249, 14408), (258, 14516), (259, 14531),

Gene: Faith5x5\_15 Start: 9469, Stop: 13809, Start Num: 1

Candidate Starts for Faith5x5\_15:

(Start: 1 @9469 has 30 MA's), (4, 9568), (5, 9616), (10, 9697), (11, 9724), (12, 9730), (17, 9856), (25, 10009), (26, 10024), (27, 10081), (29, 10096), (30, 10126), (34, 10180), (36, 10222), (37, 10249), (38, 10255), (40, 10282), (43, 10345), (44, 10354), (46, 10384), (51, 10420), (61, 10606), (63, 10669), (65, 10732), (67, 10819), (69, 10840), (70, 10909), (72, 10993), (73, 11017), (77, 11125), (81, 11170), (82, 11182), (83, 11188), (87, 11236), (88, 11242), (91, 11296), (94, 11317), (114, 11596), (118, 11620), (124, 11722), (135, 11866), (136, 11902), (139, 11977), (140, 11995), (159, 12220), (164, 12271), (165, 12280), (172, 12391), (173, 12415), (174, 12421), (178, 12442), (180, 12445), (182, 12457), (186, 12526), (198, 12781), (202, 12793), (207, 12901), (215, 13174), (219, 13252), (220, 13264), (221, 13279), (223, 13312), (225, 13315), (231, 13405), (233, 13441), (235, 13498), (236, 13522),

(238, 13537), (239, 13549), (242, 13579), (243, 13585), (244, 13591), (245, 13618),

Gene: GemG\_15 Start: 9564, Stop: 13913, Start Num: 1

Candidate Starts for GemG\_15:

(Start: 1 @9564 has 30 MA's), (4, 9663), (11, 9819), (12, 9825), (13, 9834), (17, 9951), (25, 10104), (26, 10119), (27, 10176), (30, 10221), (34, 10275), (36, 10317), (37, 10344), (38, 10350), (40, 10377), (43, 10440), (46, 10479), (56, 10551), (61, 10701), (62, 10743), (64, 10806), (65, 10827), (67, 10914), (69, 10935), (70, 11004), (72, 11088), (73, 11112), (91, 11391), (102, 11511), (114, 11691), (118, 11715), (124, 11817), (126, 11856), (135, 11967), (136, 12003), (139, 12078), (144, 12162), (150, 12213), (159, 12321), (170, 12483), (172, 12492), (180, 12546), (182, 12558), (188, 12663), (192, 12804), (204, 12927), (215, 13278), (219, 13356), (220, 13368), (221, 13383), (233, 13545), (235, 13602), (237, 13629), (238, 13641), (239, 13653), (242, 13683), (243, 13689), (244, 13695), (252, 13821),

Gene: Gizermo\_15 Start: 9564, Stop: 13913, Start Num: 1

Candidate Starts for Gizermo\_15:

(Start: 1 @9564 has 30 MA's), (4, 9663), (11, 9819), (12, 9825), (13, 9834), (17, 9951), (25, 10104), (26, 10119), (27, 10176), (30, 10221), (34, 10275), (36, 10317), (37, 10344), (38, 10350), (40, 10377), (43, 10440), (46, 10479), (56, 10551), (61, 10701), (62, 10743), (64, 10806), (65, 10827), (67, 10914), (69, 10935), (70, 11004), (72, 11088), (73, 11112), (91, 11391), (102, 11511), (114, 11691), (118, 11715), (124, 11817), (126, 11856), (135, 11967), (136, 12003), (139, 12078), (144, 12162), (150, 12213), (159, 12321), (170, 12483), (172, 12492), (180, 12546), (182, 12558), (188, 12663), (192, 12804), (204, 12927), (215, 13278), (219, 13356), (220, 13368), (221, 13383), (233, 13545), (235, 13602), (237, 13629), (238, 13641), (239, 13653), (242, 13683), (243, 13689), (244, 13695), (252, 13821),

Gene: Gudmit\_16 Start: 10286, Stop: 14710, Start Num: 1

Candidate Starts for Gudmit\_16:

(Start: 1 @10286 has 30 MA's), (4, 10385), (7, 10472), (11, 10541), (18, 10682), (25, 10826), (26, 10841), (27, 10898), (29, 10913), (30, 10943), (34, 10997), (36, 11039), (38, 11072), (40, 11099), (42, 11147), (43, 11162), (51, 11237), (53, 11249), (55, 11264), (56, 11273), (61, 11423), (65, 11549), (69, 11657), (72, 11810), (74, 11843), (76, 11897), (78, 11945), (79, 11957), (81, 11987), (83, 12005), (84, 12029), (86, 12050), (87, 12053), (88, 12059), (91, 12113), (94, 12134), (97, 12185), (118, 12437), (122, 12530), (128, 12608), (136, 12722), (140, 12815), (143, 12842), (149, 12920), (150, 12929), (159, 13037), (162, 13079), (165, 13097), (172, 13208), (183, 13313), (188, 13448), (193, 13613), (194, 13622), (196, 13643), (197, 13652), (200, 13685), (201, 13688), (207, 13802), (214, 14030), (217, 14093), (219, 14153), (220, 14165), (221, 14180), (235, 14399), (237, 14426), (238, 14438), (239, 14450), (240, 14453), (243, 14486),

Gene: Haley23\_15 Start: 9564, Stop: 13913, Start Num: 1

Candidate Starts for Haley23\_15:

(Start: 1 @9564 has 30 MA's), (4, 9663), (11, 9819), (12, 9825), (13, 9834), (17, 9951), (25, 10104), (26, 10119), (27, 10176), (30, 10221), (34, 10275), (36, 10317), (37, 10344), (38, 10350), (40, 10377), (43, 10440), (46, 10479), (56, 10551), (61, 10701), (62, 10743), (64, 10806), (65, 10827), (67, 10914), (69, 10935), (70, 11004), (72, 11088), (73, 11112), (91, 11391), (102, 11511), (114, 11691), (118, 11715), (124, 11817), (126, 11856), (135, 11967), (136, 12003), (139, 12078), (144, 12162), (150, 12213), (159, 12321), (170, 12483), (172, 12492), (180, 12546), (182, 12558), (188, 12663), (192, 12804), (204, 12927), (215, 13278), (219, 13356), (220, 13368), (221, 13383), (233, 13545), (235, 13602), (237, 13629), (238, 13641), (239, 13653), (242, 13683), (243, 13689), (244, 13695), (252, 13821),

Gene: JCole\_15 Start: 9564, Stop: 13904, Start Num: 1

Candidate Starts for JCole\_15:

(Start: 1 @9564 has 30 MA's), (4, 9663), (11, 9819), (12, 9825), (13, 9834), (17, 9951), (25, 10104), (26, 10119), (27, 10176), (29, 10191), (30, 10221), (34, 10275), (36, 10317), (37, 10344), (40, 10377), (43, 10440), (44, 10449), (46, 10479), (56, 10551), (61, 10701), (62, 10743), (64, 10806), (65, 10827), (67, 10914), (69, 10935), (70, 11004), (72, 11088), (73, 11112), (80, 11253), (83, 11283), (88, 11337), (90, 11370), (91, 11391), (102, 11511), (118, 11715), (121, 11796), (122, 11808), (124, 11817), (135, 11958), (136, 11994), (139, 12069), (144, 12153), (150, 12204), (159, 12312), (162, 12354), (164, 12363), (170, 12474), (172, 12483), (174, 12513), (180, 12537), (185, 12567), (188, 12654), (215, 13269), (219, 13347), (220, 13359), (221, 13374), (223, 13407), (233, 13536), (235, 13593), (237, 13620), (239, 13644), (242, 13674), (243, 13680), (244, 13686), (245, 13713), (252, 13812), (256, 13851), (258, 13884),

Gene: Lamberg\_15 Start: 9497, Stop: 13849, Start Num: 1

Candidate Starts for Lamberg\_15:

(Start: 1 @9497 has 30 MA's), (4, 9596), (7, 9683), (11, 9752), (12, 9758), (13, 9767), (17, 9884), (25, 10037), (26, 10052), (27, 10109), (30, 10154), (34, 10208), (36, 10250), (37, 10277), (38, 10283), (40, 10310), (43, 10373), (46, 10412), (56, 10484), (61, 10634), (65, 10760), (69, 10868), (72, 11021), (85, 11258), (88, 11270), (91, 11324), (94, 11345), (95, 11363), (102, 11444), (110, 11546), (118, 11648), (121, 11729), (124, 11750), (135, 11900), (136, 11936), (139, 12011), (144, 12095), (159, 12254), (170, 12416), (172, 12425), (182, 12491), (188, 12596), (204, 12857), (205, 12872), (207, 12941), (215, 13214), (220, 13304), (221, 13319), (223, 13352), (225, 13355), (233, 13481), (235, 13538), (237, 13565), (239, 13589), (242, 13619), (243, 13625), (244, 13631), (245, 13658), (252, 13757), (256, 13796),

Gene: LordFarquaad\_15 Start: 9497, Stop: 13906, Start Num: 1

Candidate Starts for LordFarquaad\_15:

(Start: 1 @9497 has 30 MA's), (4, 9596), (11, 9752), (12, 9758), (13, 9767), (17, 9884), (25, 10037), (26, 10052), (27, 10109), (29, 10124), (30, 10154), (34, 10208), (36, 10250), (37, 10277), (38, 10283), (40, 10310), (43, 10373), (44, 10382), (46, 10412), (56, 10484), (61, 10634), (62, 10676), (64, 10739), (65, 10760), (67, 10847), (69, 10868), (70, 10937), (72, 11021), (73, 11045), (80, 11186), (83, 11216), (88, 11270), (90, 11303), (91, 11324), (102, 11444), (118, 11648), (119, 11654), (121, 11729), (122, 11741), (124, 11750), (135, 11891), (136, 11927), (146, 12095), (148, 12122), (160, 12284), (166, 12329), (171, 12455), (196, 12833), (197, 12842), (199, 12875), (215, 13271), (221, 13376), (225, 13412), (233, 13538), (235, 13595), (237, 13622), (239, 13646), (242, 13676), (243, 13682), (244, 13688), (248, 13769), (251, 13811), (253, 13823),

Gene: Lton\_15 Start: 9526, Stop: 13878, Start Num: 1

Candidate Starts for Lton\_15:

(Start: 1 @9526 has 30 MA's), (3, 9616), (4, 9625), (5, 9673), (11, 9781), (12, 9787), (13, 9796), (17, 9913), (25, 10066), (26, 10081), (27, 10138), (29, 10153), (30, 10183), (34, 10237), (36, 10279), (37, 10306), (38, 10312), (40, 10339), (43, 10402), (46, 10441), (50, 10468), (53, 10489), (54, 10501), (55, 10504), (58, 10558), (59, 10636), (60, 10642), (61, 10663), (63, 10726), (67, 10876), (69, 10897), (72, 11050), (73, 11074), (82, 11239), (83, 11245), (85, 11287), (88, 11299), (91, 11353), (102, 11473), (118, 11677), (119, 11683), (121, 11758), (122, 11770), (124, 11779), (127, 11824), (135, 11932), (136, 11968), (139, 12043), (144, 12127), (159, 12286), (164, 12337), (165, 12346), (180, 12511), (192, 12766), (198, 12844), (204, 12886), (205, 12901), (215, 13243), (219, 13321), (220, 13333), (221, 13348), (225, 13384), (231, 13474), (233, 13510), (235, 13567), (237, 13594), (239, 13618), (242, 13648), (243, 13654), (244, 13660), (252, 13786), (256, 13825), (258, 13858),

Gene: Matteo\_15 Start: 9497, Stop: 13849, Start Num: 1

Candidate Starts for Matteo\_15:

(Start: 1 @9497 has 30 MA's), (4, 9596), (5, 9644), (7, 9683), (11, 9752), (12, 9758), (13, 9767), (17, 9884), (25, 10037), (26, 10052), (27, 10109), (29, 10124), (30, 10154), (34, 10208), (36, 10250), (37, 10277), (38, 10283), (40, 10310), (43, 10373), (46, 10412), (50, 10439), (53, 10460), (54, 10472), (55,

(10475), (58, 10529), (59, 10607), (60, 10613), (61, 10634), (63, 10697), (67, 10847), (69, 10868), (72, 11021), (83, 11216), (85, 11258), (88, 11270), (91, 11324), (100, 11417), (102, 11444), (118, 11648), (119, 11654), (121, 11729), (122, 11741), (124, 11750), (127, 11795), (135, 11903), (136, 11939), (139, 12014), (144, 12098), (159, 12257), (164, 12308), (165, 12317), (172, 12428), (180, 12482), (192, 12737), (198, 12815), (204, 12857), (205, 12872), (207, 12941), (215, 13214), (220, 13304), (221, 13319), (223, 13352), (225, 13355), (226, 13376), (231, 13445), (233, 13481), (235, 13538), (237, 13565), (239, 13589), (242, 13619), (243, 13625), (244, 13631), (245, 13658), (252, 13757), (256, 13796),

Gene: Mbo4\_15 Start: 10173, Stop: 14930, Start Num: 1

Candidate Starts for Mbo4\_15:

(Start: 1 @10173 has 30 MA's), (4, 10269), (9, 10401), (14, 10452), (19, 10578), (21, 10650), (22, 10653), (23, 10683), (24, 10713), (25, 10785), (29, 10872), (31, 10908), (33, 10929), (38, 11031), (41, 11079), (48, 11175), (49, 11181), (51, 11196), (53, 11208), (57, 11250), (65, 11508), (69, 11616), (80, 11934), (89, 12018), (92, 12072), (98, 12147), (104, 12213), (106, 12246), (108, 12285), (111, 12333), (112, 12369), (117, 12405), (123, 12516), (125, 12528), (129, 12594), (130, 12612), (137, 12750), (141, 12840), (145, 12903), (151, 12957), (153, 12981), (154, 12984), (158, 13059), (165, 13152), (167, 13170), (168, 13188), (169, 13218), (175, 13359), (176, 13368), (177, 13374), (184, 13443), (186, 13533), (189, 13587), (190, 13644), (191, 13668), (195, 13773), (206, 13971), (209, 14064), (210, 14103), (211, 14127), (212, 14130), (213, 14193), (216, 14274), (218, 14295), (222, 14397), (226, 14460), (229, 14508), (231, 14529), (234, 14622), (235, 14625), (241, 14685), (243, 14712), (246, 14748), (250, 14808), (254, 14856), (255, 14865), (257, 14901),

Gene: Mocha12\_15 Start: 9564, Stop: 13913, Start Num: 1

Candidate Starts for Mocha12\_15:

(Start: 1 @9564 has 30 MA's), (4, 9663), (11, 9819), (12, 9825), (13, 9834), (17, 9951), (25, 10104), (26, 10119), (27, 10176), (30, 10221), (34, 10275), (36, 10317), (37, 10344), (38, 10350), (40, 10377), (43, 10440), (46, 10479), (56, 10551), (61, 10701), (62, 10743), (64, 10806), (65, 10827), (67, 10914), (69, 10935), (70, 11004), (72, 11088), (73, 11112), (91, 11391), (102, 11511), (114, 11691), (118, 11715), (124, 11817), (126, 11856), (135, 11967), (136, 12003), (139, 12078), (144, 12162), (150, 12213), (159, 12321), (170, 12483), (172, 12492), (180, 12546), (182, 12558), (188, 12663), (192, 12804), (204, 12927), (215, 13278), (219, 13356), (220, 13368), (221, 13383), (233, 13545), (235, 13602), (237, 13629), (238, 13641), (239, 13653), (242, 13683), (243, 13689), (244, 13695), (252, 13821),

Gene: Moosehead\_15 Start: 9472, Stop: 13818, Start Num: 1

Candidate Starts for Moosehead\_15:

(Start: 1 @9472 has 30 MA's), (4, 9571), (5, 9619), (6, 9646), (10, 9700), (11, 9727), (12, 9733), (17, 9859), (25, 10012), (26, 10027), (27, 10084), (29, 10099), (30, 10129), (34, 10183), (36, 10225), (37, 10252), (38, 10258), (40, 10285), (43, 10348), (44, 10357), (46, 10387), (51, 10423), (56, 10459), (61, 10609), (63, 10672), (65, 10735), (67, 10822), (69, 10843), (70, 10912), (72, 10996), (85, 11233), (88, 11245), (91, 11299), (94, 11320), (96, 11350), (102, 11419), (116, 11608), (124, 11725), (135, 11875), (136, 11911), (139, 11986), (140, 12004), (144, 12070), (159, 12229), (164, 12280), (165, 12289), (172, 12400), (173, 12424), (174, 12430), (178, 12451), (180, 12454), (182, 12466), (197, 12763), (198, 12790), (202, 12802), (215, 13183), (219, 13261), (220, 13273), (221, 13288), (223, 13321), (225, 13324), (226, 13345), (231, 13414), (235, 13507), (236, 13531), (239, 13558), (242, 13588), (243, 13594), (244, 13600), (245, 13627),

Gene: Nettuno\_15 Start: 9497, Stop: 13852, Start Num: 1

Candidate Starts for Nettuno\_15:

(Start: 1 @9497 has 30 MA's), (4, 9596), (11, 9752), (12, 9758), (13, 9767), (17, 9884), (25, 10037), (26, 10052), (27, 10109), (30, 10154), (34, 10208), (36, 10250), (37, 10277), (38, 10283), (40, 10310), (43, 10373), (46, 10412), (56, 10484), (61, 10634), (62, 10676), (64, 10739), (65, 10760), (67, 10847),

(69, 10868), (70, 10937), (72, 11021), (73, 11045), (91, 11324), (118, 11648), (119, 11654), (121, 11729), (122, 11741), (124, 11750), (127, 11795), (135, 11903), (136, 11939), (139, 12014), (144, 12098), (159, 12257), (162, 12299), (172, 12428), (180, 12482), (182, 12494), (188, 12599), (204, 12860), (205, 12875), (207, 12944), (215, 13217), (220, 13307), (221, 13322), (223, 13355), (225, 13358), (233, 13484), (235, 13541), (237, 13568), (239, 13592), (242, 13622), (243, 13628), (244, 13634), (245, 13661), (252, 13760), (256, 13799),

Gene: OneDirection\_15 Start: 9470, Stop: 13819, Start Num: 1

Candidate Starts for OneDirection\_15:

(Start: 1 @9470 has 30 MA's), (3, 9560), (4, 9569), (5, 9617), (11, 9725), (12, 9731), (13, 9740), (17, 9857), (25, 10010), (26, 10025), (27, 10082), (29, 10097), (30, 10127), (34, 10181), (36, 10223), (37, 10250), (38, 10256), (40, 10283), (43, 10346), (46, 10385), (50, 10412), (53, 10433), (54, 10445), (55, 10448), (58, 10502), (59, 10580), (60, 10586), (61, 10607), (63, 10670), (67, 10820), (69, 10841), (72, 10994), (73, 11018), (82, 11183), (83, 11189), (85, 11231), (88, 11243), (91, 11297), (102, 11417), (118, 11621), (119, 11627), (121, 11702), (122, 11714), (124, 11723), (132, 11843), (136, 11906), (139, 11981), (144, 12065), (159, 12224), (162, 12266), (164, 12275), (170, 12386), (172, 12395), (174, 12425), (180, 12449), (182, 12461), (187, 12554), (188, 12566), (189, 12575), (192, 12707), (204, 12827), (205, 12842), (215, 13184), (219, 13262), (220, 13274), (221, 13289), (225, 13325), (231, 13415), (233, 13451), (235, 13508), (237, 13535), (239, 13559), (242, 13589), (243, 13595), (244, 13601), (252, 13727), (256, 13766), (258, 13799),

Gene: Pepperoni\_15 Start: 9820, Stop: 14169, Start Num: 1

Candidate Starts for Pepperoni\_15:

(Start: 1 @9820 has 30 MA's), (3, 9910), (4, 9919), (5, 9967), (11, 10075), (12, 10081), (13, 10090), (17, 10207), (25, 10360), (26, 10375), (27, 10432), (29, 10447), (30, 10477), (34, 10531), (36, 10573), (37, 10600), (38, 10606), (40, 10633), (43, 10696), (46, 10735), (50, 10762), (53, 10783), (54, 10795), (55, 10798), (58, 10852), (59, 10930), (60, 10936), (61, 10957), (63, 11020), (67, 11170), (69, 11191), (72, 11344), (73, 11368), (82, 11533), (83, 11539), (85, 11581), (88, 11593), (91, 11647), (102, 11767), (118, 11971), (119, 11977), (121, 12052), (122, 12064), (124, 12073), (132, 12193), (136, 12256), (139, 12331), (144, 12415), (159, 12574), (162, 12616), (164, 12625), (170, 12736), (172, 12745), (174, 12775), (180, 12799), (182, 12811), (187, 12904), (188, 12916), (189, 12925), (192, 13057), (204, 13177), (205, 13192), (215, 13534), (219, 13612), (220, 13624), (221, 13639), (225, 13675), (231, 13765), (233, 13801), (235, 13858), (237, 13885), (239, 13909), (242, 13939), (243, 13945), (244, 13951), (252, 14077), (256, 14116), (258, 14149),

Gene: Pickett\_15 Start: 9497, Stop: 13837, Start Num: 1

Candidate Starts for Pickett\_15:

(Start: 1 @9497 has 30 MA's), (4, 9596), (11, 9752), (12, 9758), (13, 9767), (17, 9884), (25, 10037), (26, 10052), (27, 10109), (29, 10124), (30, 10154), (34, 10208), (36, 10250), (37, 10277), (38, 10283), (40, 10310), (43, 10373), (44, 10382), (46, 10412), (56, 10484), (61, 10634), (62, 10676), (64, 10739), (65, 10760), (67, 10847), (69, 10868), (70, 10937), (72, 11021), (73, 11045), (80, 11186), (83, 11216), (88, 11270), (90, 11303), (91, 11324), (102, 11444), (118, 11648), (119, 11654), (121, 11729), (122, 11741), (124, 11750), (135, 11891), (136, 11927), (139, 12002), (144, 12086), (150, 12137), (159, 12245), (162, 12287), (164, 12296), (170, 12407), (172, 12416), (174, 12446), (180, 12470), (185, 12500), (188, 12587), (215, 13202), (219, 13280), (220, 13292), (221, 13307), (223, 13340), (233, 13469), (235, 13526), (237, 13553), (239, 13577), (242, 13607), (243, 13613), (244, 13619), (245, 13646), (252, 13745), (256, 13784), (258, 13817),

Gene: RavenCo17\_15 Start: 10368, Stop: 14717, Start Num: 1

Candidate Starts for RavenCo17\_15:

(Start: 1 @10368 has 30 MA's), (4, 10467), (6, 10542), (11, 10623), (12, 10629), (13, 10638), (17, 10755), (25, 10908), (26, 10923), (27, 10980), (30, 11025), (34, 11079), (36, 11121), (37, 11148), (38, 11154), (40, 11181), (43, 11244), (46, 11283), (56, 11355), (61, 11505), (65, 11631), (69, 11739), (72,

(11892), (85, 12129), (87, 12135), (88, 12141), (91, 12195), (95, 12234), (102, 12315), (118, 12519), (121, 12600), (124, 12621), (135, 12771), (136, 12807), (139, 12882), (144, 12966), (147, 12978), (159, 13125), (170, 13287), (172, 13296), (182, 13362), (188, 13467), (192, 13608), (204, 13731), (205, 13746), (215, 14082), (219, 14160), (220, 14172), (221, 14187), (225, 14223), (233, 14349), (237, 14433), (239, 14457), (240, 14460), (243, 14493), (249, 14589), (258, 14697), (259, 14712),

Gene: Sahara\_15 Start: 9584, Stop: 13939, Start Num: 1

Candidate Starts for Sahara\_15:

(Start: 1 @9584 has 30 MA's), (4, 9683), (11, 9839), (15, 9884), (16, 9896), (17, 9971), (20, 10034), (25, 10124), (26, 10139), (30, 10241), (34, 10295), (36, 10337), (38, 10370), (39, 10385), (40, 10397), (43, 10460), (45, 10490), (50, 10526), (54, 10559), (55, 10562), (59, 10694), (60, 10700), (61, 10721), (63, 10784), (65, 10847), (69, 10955), (72, 11108), (81, 11285), (83, 11303), (85, 11345), (88, 11357), (91, 11411), (99, 11498), (103, 11540), (114, 11711), (115, 11717), (118, 11735), (119, 11741), (121, 11816), (122, 11828), (124, 11837), (135, 11990), (136, 12026), (139, 12101), (144, 12185), (159, 12344), (162, 12386), (164, 12395), (170, 12506), (172, 12515), (180, 12569), (182, 12581), (192, 12827), (207, 13031), (214, 13259), (219, 13382), (220, 13394), (221, 13409), (225, 13445), (233, 13571), (235, 13628), (237, 13655), (239, 13679), (242, 13709), (243, 13715), (244, 13721), (245, 13748), (253, 13856), (256, 13886),

Gene: Savage\_15 Start: 9564, Stop: 13913, Start Num: 1

Candidate Starts for Savage\_15:

(Start: 1 @9564 has 30 MA's), (4, 9663), (11, 9819), (12, 9825), (13, 9834), (17, 9951), (25, 10104), (26, 10119), (27, 10176), (30, 10221), (34, 10275), (36, 10317), (37, 10344), (38, 10350), (40, 10377), (43, 10440), (46, 10479), (56, 10551), (61, 10701), (62, 10743), (64, 10806), (65, 10827), (67, 10914), (69, 10935), (70, 11004), (72, 11088), (73, 11112), (91, 11391), (102, 11511), (114, 11691), (118, 11715), (124, 11817), (126, 11856), (135, 11967), (136, 12003), (139, 12078), (144, 12162), (150, 12213), (159, 12321), (170, 12483), (172, 12492), (180, 12546), (182, 12558), (188, 12663), (192, 12804), (204, 12927), (215, 13278), (219, 13356), (220, 13368), (221, 13383), (233, 13545), (235, 13602), (237, 13629), (238, 13641), (239, 13653), (242, 13683), (243, 13689), (244, 13695), (252, 13821),

Gene: SoilAssassin\_15 Start: 9497, Stop: 13906, Start Num: 1

Candidate Starts for SoilAssassin\_15:

(Start: 1 @9497 has 30 MA's), (4, 9596), (11, 9752), (12, 9758), (13, 9767), (17, 9884), (25, 10037), (26, 10052), (27, 10109), (29, 10124), (30, 10154), (34, 10208), (36, 10250), (37, 10277), (38, 10283), (40, 10310), (43, 10373), (44, 10382), (46, 10412), (56, 10484), (61, 10634), (62, 10676), (64, 10739), (65, 10760), (67, 10847), (69, 10868), (70, 10937), (72, 11021), (73, 11045), (80, 11186), (83, 11216), (88, 11270), (90, 11303), (91, 11324), (102, 11444), (118, 11648), (119, 11654), (121, 11729), (122, 11741), (124, 11750), (135, 11891), (136, 11927), (146, 12095), (148, 12122), (160, 12284), (166, 12329), (171, 12455), (196, 12833), (197, 12842), (199, 12875), (215, 13271), (221, 13376), (225, 13412), (233, 13538), (235, 13595), (237, 13622), (239, 13646), (242, 13676), (243, 13682), (244, 13688), (248, 13769), (251, 13811), (253, 13823),

Gene: Sproutie\_15 Start: 9564, Stop: 13913, Start Num: 1

Candidate Starts for Sproutie\_15:

(Start: 1 @9564 has 30 MA's), (4, 9663), (11, 9819), (12, 9825), (13, 9834), (17, 9951), (25, 10104), (26, 10119), (27, 10176), (30, 10221), (34, 10275), (36, 10317), (37, 10344), (38, 10350), (40, 10377), (43, 10440), (46, 10479), (56, 10551), (61, 10701), (62, 10743), (64, 10806), (65, 10827), (67, 10914), (69, 10935), (70, 11004), (72, 11088), (73, 11112), (91, 11391), (102, 11511), (114, 11691), (118, 11715), (124, 11817), (126, 11856), (135, 11967), (136, 12003), (139, 12078), (144, 12162), (150, 12213), (159, 12321), (170, 12483), (172, 12492), (180, 12546), (182, 12558), (188, 12663), (192, 12804), (204, 12927), (215, 13278), (219, 13356), (220, 13368), (221, 13383), (233, 13545), (235, 13602), (237, 13629), (238, 13641), (239, 13653), (242, 13683), (243, 13689), (244, 13695), (252,

13821),

Gene: TinyDot\_18 Start: 10139, Stop: 14464, Start Num: 2

Candidate Starts for TinyDot\_18:

(2, 10139), (8, 10325), (11, 10379), (17, 10499), (28, 10739), (32, 10784), (35, 10859), (40, 10928), (43, 10991), (44, 11000), (47, 11033), (52, 11075), (54, 11090), (58, 11147), (65, 11378), (66, 11444), (68, 11480), (71, 11606), (74, 11669), (75, 11705), (93, 11909), (95, 11939), (101, 12002), (105, 12023), (107, 12059), (113, 12164), (120, 12230), (131, 12410), (133, 12431), (134, 12434), (138, 12551), (142, 12593), (155, 12704), (156, 12710), (157, 12722), (161, 12800), (163, 12821), (179, 13016), (181, 13022), (203, 13412), (215, 13787), (216, 13793), (224, 13937), (227, 13982), (228, 13997), (230, 14045), (232, 14081), (235, 14153), (237, 14180), (240, 14207), (242, 14234), (247, 14312), (253, 14381), (255, 14405),

Gene: TuertoX\_15 Start: 9564, Stop: 13913, Start Num: 1

Candidate Starts for TuertoX\_15:

(Start: 1 @9564 has 30 MA's), (4, 9663), (11, 9819), (12, 9825), (13, 9834), (17, 9951), (25, 10104), (26, 10119), (27, 10176), (30, 10221), (34, 10275), (36, 10317), (37, 10344), (38, 10350), (40, 10377), (43, 10440), (46, 10479), (56, 10551), (61, 10701), (62, 10743), (64, 10806), (65, 10827), (67, 10914), (69, 10935), (70, 11004), (72, 11088), (73, 11112), (91, 11391), (102, 11511), (114, 11691), (118, 11715), (124, 11817), (126, 11856), (135, 11967), (136, 12003), (139, 12078), (144, 12162), (150, 12213), (159, 12321), (170, 12483), (172, 12492), (180, 12546), (182, 12558), (188, 12663), (192, 12804), (204, 12927), (215, 13278), (219, 13356), (220, 13368), (221, 13383), (233, 13545), (235, 13602), (237, 13629), (238, 13641), (239, 13653), (242, 13683), (243, 13689), (244, 13695), (252, 13821),

Gene: Vasanti\_15 Start: 9513, Stop: 13859, Start Num: 1

Candidate Starts for Vasanti\_15:

(Start: 1 @9513 has 30 MA's), (4, 9612), (6, 9687), (11, 9768), (17, 9900), (18, 9909), (25, 10053), (26, 10068), (27, 10125), (29, 10140), (30, 10170), (34, 10224), (36, 10266), (37, 10293), (38, 10299), (40, 10326), (43, 10389), (44, 10398), (46, 10428), (51, 10464), (61, 10650), (62, 10692), (65, 10776), (67, 10863), (69, 10884), (70, 10953), (72, 11037), (73, 11061), (83, 11232), (88, 11286), (91, 11340), (102, 11460), (118, 11664), (119, 11670), (124, 11766), (126, 11805), (135, 11910), (136, 11946), (144, 12105), (152, 12183), (159, 12264), (164, 12315), (170, 12426), (172, 12435), (174, 12465), (178, 12486), (182, 12501), (208, 12957), (215, 13224), (219, 13302), (220, 13314), (221, 13329), (233, 13491), (235, 13548), (237, 13575), (239, 13599), (242, 13629), (243, 13635), (244, 13641), (245, 13668), (252, 13767),

Gene: Whiteclaw\_15 Start: 9564, Stop: 13913, Start Num: 1

Candidate Starts for Whiteclaw\_15:

(Start: 1 @9564 has 30 MA's), (4, 9663), (11, 9819), (12, 9825), (13, 9834), (17, 9951), (25, 10104), (26, 10119), (27, 10176), (30, 10221), (34, 10275), (36, 10317), (37, 10344), (38, 10350), (40, 10377), (43, 10440), (46, 10479), (56, 10551), (61, 10701), (62, 10743), (64, 10806), (65, 10827), (67, 10914), (69, 10935), (70, 11004), (72, 11088), (73, 11112), (91, 11391), (102, 11511), (114, 11691), (118, 11715), (124, 11817), (126, 11856), (135, 11967), (136, 12003), (139, 12078), (144, 12162), (150, 12213), (159, 12321), (170, 12483), (172, 12492), (180, 12546), (182, 12558), (188, 12663), (192, 12804), (204, 12927), (215, 13278), (219, 13356), (220, 13368), (221, 13383), (233, 13545), (235, 13602), (237, 13629), (238, 13641), (239, 13653), (242, 13683), (243, 13689), (244, 13695), (252, 13821),

Gene: Yeet412\_15 Start: 9497, Stop: 13906, Start Num: 1

Candidate Starts for Yeet412\_15:

(Start: 1 @9497 has 30 MA's), (4, 9596), (11, 9752), (12, 9758), (13, 9767), (17, 9884), (25, 10037), (26, 10052), (27, 10109), (29, 10124), (30, 10154), (34, 10208), (36, 10250), (37, 10277), (38, 10283),

(40, 10310), (43, 10373), (44, 10382), (46, 10412), (56, 10484), (61, 10634), (62, 10676), (64, 10739),  
(65, 10760), (67, 10847), (69, 10868), (70, 10937), (72, 11021), (73, 11045), (80, 11186), (83, 11216),  
(88, 11270), (90, 11303), (91, 11324), (102, 11444), (118, 11648), (119, 11654), (121, 11729), (122,  
11741), (124, 11750), (135, 11891), (136, 11927), (146, 12095), (148, 12122), (160, 12284), (166,  
12329), (171, 12455), (196, 12833), (197, 12842), (199, 12875), (215, 13271), (221, 13376), (225,  
13412), (233, 13538), (235, 13595), (237, 13622), (239, 13646), (242, 13676), (243, 13682), (244,  
13688), (248, 13769), (251, 13811), (253, 13823),