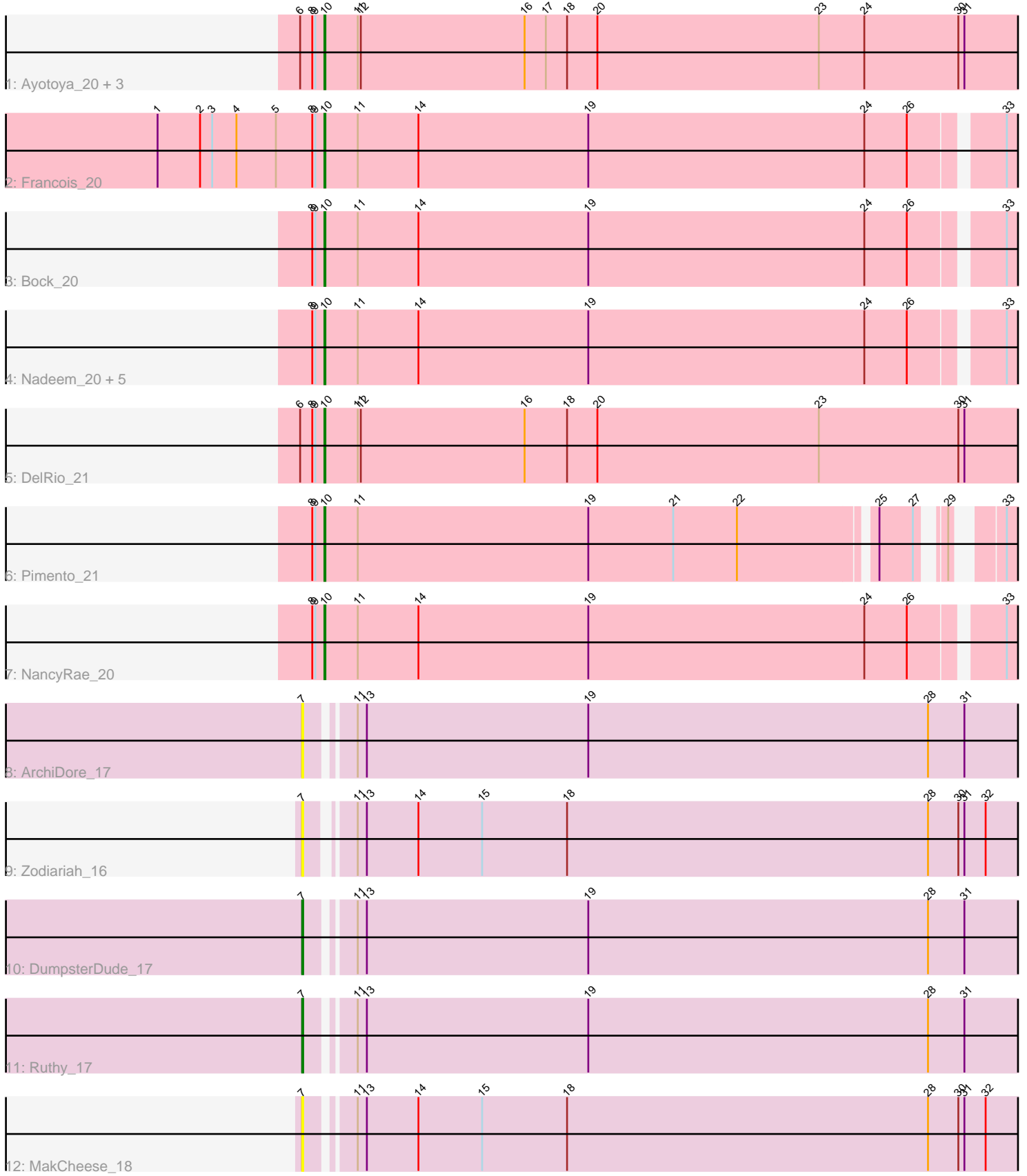


# Zoomed Pham 216581



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 216581 Report

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

Pham number 216581 has 20 members, 3 are drafts.

Phages represented in each track:

- Track 1 : Ayotoya\_20, Chop\_20, GrandSlam\_20, Hamood\_20
- Track 2 : Francois\_20
- Track 3 : Bock\_20
- Track 4 : Nadeem\_20, WheatThin\_20, BetterKatz\_20, Mulch\_20, Parada\_20, Brylie\_20
- Track 5 : DelRio\_21
- Track 6 : Pimento\_21
- Track 7 : NancyRae\_20
- Track 8 : ArchiDore\_17
- Track 9 : Zodiariah\_16
- Track 10 : DumpsterDude\_17
- Track 11 : Ruthy\_17
- Track 12 : MakCheese\_18

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

The start number called the most often in the published annotations is 10, it was called in 15 of the 17 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Ayotoya\_20, BetterKatz\_20, Bock\_20, Brylie\_20, Chop\_20, DelRio\_21, Francois\_20, GrandSlam\_20, Hamood\_20, Mulch\_20, Nadeem\_20, NancyRae\_20, Parada\_20, Pimento\_21, WheatThin\_20,

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

- 

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

- ArchiDore\_17, DumpsterDude\_17, MakCheese\_18, Ruthy\_17, Zodiariah\_16,

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

Start 7:

- Found in 5 of 20 ( 25.0% ) of genes in pham

- Manual Annotations of this start: 2 of 17
- Called 100.0% of time when present
- Phage (with cluster) where this start called: ArchiDore\_17 (DW), DumpsterDude\_17 (DW), MakCheese\_18 (DW), Ruthy\_17 (DW), Zodiariah\_16 (DW),

Start 10:

- Found in 15 of 20 ( 75.0% ) of genes in pham
- Manual Annotations of this start: 15 of 17
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Ayotoya\_20 (DI), BetterKatz\_20 (DI), Bock\_20 (DI), Brylie\_20 (DI), Chop\_20 (DI), DelRio\_21 (DI), Francois\_20 (DI), GrandSlam\_20 (DI), Hamood\_20 (DI), Mulch\_20 (DI), Nadeem\_20 (DI), NancyRae\_20 (DI), Parada\_20 (DI), Pimento\_21 (DI), WheatThin\_20 (DI),

### Summary by clusters:

There are 2 clusters represented in this pham: DW, DI,

Info for manual annotations of cluster DI:

- Start number 10 was manually annotated 15 times for cluster DI.

Info for manual annotations of cluster DW:

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

### Gene Information:

Gene: ArchiDore\_17 Start: 10209, Stop: 15176, Start Num: 7

Candidate Starts for ArchiDore\_17:

(Start: 7 @10209 has 2 MA's), (11, 10248), (13, 10257), (19, 10476), (28, 10812), (31, 10848), (35, 10968), (38, 11052), (39, 11055), (43, 11109), (45, 11139), (49, 11187), (51, 11211), (54, 11244), (55, 11250), (58, 11274), (60, 11301), (62, 11340), (68, 11514), (75, 11592), (76, 11610), (77, 11613), (80, 11649), (81, 11670), (88, 11805), (90, 11847), (91, 11850), (96, 11937), (97, 11946), (100, 11994), (107, 12066), (114, 12141), (121, 12222), (122, 12225), (127, 12297), (128, 12306), (129, 12348), (130, 12381), (132, 12411), (138, 12543), (140, 12576), (146, 12675), (147, 12696), (149, 12732), (151, 12786), (152, 12810), (153, 12840), (154, 12864), (156, 12900), (160, 12960), (161, 12996), (163, 13062), (168, 13158), (172, 13221), (181, 13389), (183, 13425), (184, 13506), (185, 13566), (186, 13611), (190, 13812), (193, 13965), (195, 14007), (197, 14076), (198, 14103), (208, 14397), (218, 14742), (220, 14835), (221, 14841), (222, 14886), (223, 14931), (224, 14952), (225, 14991), (226, 15012), (230, 15126), (232, 15165),

Gene: Ayotoya\_20 Start: 11819, Stop: 17074, Start Num: 10

Candidate Starts for Ayotoya\_20:

(6, 11795), (8, 11807), (9, 11810), (Start: 10 @11819 has 15 MA's), (11, 11852), (12, 11855), (16, 12017), (17, 12038), (18, 12059), (20, 12089), (23, 12308), (24, 12353), (30, 12446), (31, 12452), (34, 12539), (35, 12572), (38, 12656), (42, 12701), (43, 12713), (44, 12728), (45, 12743), (50, 12797), (57, 12875), (61, 12920), (62, 12944), (66, 13052), (67, 13094), (69, 13133), (75, 13196), (76, 13214), (81, 13274), (88, 13409), (94, 13517), (95, 13529), (97, 13550), (103, 13631), (108, 13673), (110, 13691), (112, 13721), (114, 13745), (117, 13793), (120, 13811), (121, 13826), (122, 13829), (128, 13910), (130, 13985), (133, 14021), (138, 14147), (139, 14168), (141, 14192), (143, 14204), (146, 14279), (147, 14300), (153, 14444), (155, 14477), (156, 14504), (157, 14510), (160, 14564), (161, 14600), (162, 14657), (164, 14687), (166, 14738), (170, 14795), (174, 14885), (177, 14912), (178, 14915),

(181, 14993), (182, 15002), (187, 15281), (190, 15410), (196, 15620), (199, 15713), (201, 15845), (202, 15866), (205, 15974), (209, 16073), (211, 16157), (219, 16703), (221, 16736), (222, 16781), (224, 16847), (227, 16937), (229, 17012), (231, 17057),

Gene: BetterKatz\_20 Start: 11757, Stop: 16547, Start Num: 10

Candidate Starts for BetterKatz\_20:

(8, 11745), (9, 11748), (Start: 10 @11757 has 15 MA's), (11, 11790), (14, 11850), (19, 12018), (24, 12291), (26, 12333), (33, 12414), (37, 12480), (48, 12606), (52, 12639), (56, 12684), (62, 12744), (63, 12777), (70, 12918), (71, 12927), (83, 13059), (85, 13104), (92, 13215), (95, 13266), (102, 13323), (105, 13365), (106, 13371), (118, 13485), (119, 13488), (128, 13593), (130, 13668), (131, 13680), (133, 13704), (143, 13887), (146, 13962), (147, 13983), (149, 14019), (153, 14127), (155, 14160), (156, 14187), (157, 14193), (159, 14205), (160, 14247), (161, 14283), (162, 14340), (164, 14370), (168, 14445), (170, 14478), (174, 14568), (178, 14598), (181, 14676), (182, 14685), (184, 14793), (187, 14964), (190, 15093), (193, 15231), (201, 15540), (202, 15561), (205, 15669), (207, 15765), (216, 16077), (217, 16080), (221, 16209), (222, 16254), (224, 16320), (225, 16359), (227, 16410), (229, 16485), (231, 16530),

Gene: Bock\_20 Start: 11507, Stop: 16297, Start Num: 10

Candidate Starts for Bock\_20:

(8, 11495), (9, 11498), (Start: 10 @11507 has 15 MA's), (11, 11540), (14, 11600), (19, 11768), (24, 12041), (26, 12083), (33, 12164), (37, 12230), (48, 12356), (52, 12389), (56, 12434), (62, 12494), (63, 12527), (70, 12668), (71, 12677), (83, 12809), (85, 12854), (92, 12965), (95, 13016), (102, 13073), (105, 13115), (106, 13121), (118, 13235), (119, 13238), (128, 13343), (130, 13418), (131, 13430), (133, 13454), (138, 13580), (139, 13601), (143, 13637), (146, 13712), (147, 13733), (149, 13769), (153, 13877), (155, 13910), (156, 13937), (157, 13943), (159, 13955), (160, 13997), (161, 14033), (162, 14090), (164, 14120), (168, 14195), (170, 14228), (174, 14318), (178, 14348), (181, 14426), (182, 14435), (184, 14543), (187, 14714), (190, 14843), (193, 14981), (201, 15290), (202, 15311), (205, 15419), (207, 15515), (216, 15827), (217, 15830), (221, 15959), (222, 16004), (224, 16070), (225, 16109), (227, 16160), (229, 16235), (231, 16280),

Gene: Brylie\_20 Start: 11504, Stop: 16288, Start Num: 10

Candidate Starts for Brylie\_20:

(8, 11492), (9, 11495), (Start: 10 @11504 has 15 MA's), (11, 11537), (14, 11597), (19, 11765), (24, 12038), (26, 12080), (33, 12161), (37, 12227), (48, 12353), (52, 12386), (56, 12431), (62, 12491), (63, 12524), (70, 12665), (71, 12674), (83, 12806), (85, 12851), (92, 12962), (95, 13013), (102, 13070), (105, 13112), (106, 13118), (118, 13232), (119, 13235), (128, 13340), (130, 13415), (131, 13427), (133, 13451), (143, 13634), (146, 13709), (147, 13730), (149, 13766), (153, 13874), (155, 13907), (156, 13934), (157, 13940), (159, 13952), (160, 13994), (161, 14030), (162, 14087), (164, 14117), (168, 14192), (170, 14225), (174, 14315), (178, 14345), (181, 14423), (182, 14432), (184, 14540), (187, 14711), (190, 14840), (193, 14978), (201, 15287), (202, 15308), (205, 15416), (207, 15506), (216, 15818), (217, 15821), (221, 15950), (222, 15995), (224, 16061), (225, 16100), (227, 16151), (229, 16226), (231, 16271),

Gene: Chop\_20 Start: 11567, Stop: 16822, Start Num: 10

Candidate Starts for Chop\_20:

(6, 11543), (8, 11555), (9, 11558), (Start: 10 @11567 has 15 MA's), (11, 11600), (12, 11603), (16, 11765), (17, 11786), (18, 11807), (20, 11837), (23, 12056), (24, 12101), (30, 12194), (31, 12200), (34, 12287), (35, 12320), (38, 12404), (42, 12449), (43, 12461), (44, 12476), (45, 12491), (50, 12545), (57, 12623), (61, 12668), (62, 12692), (66, 12800), (67, 12842), (69, 12881), (75, 12944), (76, 12962), (81, 13022), (88, 13157), (94, 13265), (95, 13277), (97, 13298), (103, 13379), (108, 13421), (110, 13439), (112, 13469), (114, 13493), (117, 13541), (120, 13559), (121, 13574), (122, 13577), (128, 13658), (130, 13733), (133, 13769), (138, 13895), (139, 13916), (141, 13940), (143, 13952), (146, 14027), (147, 14048), (153, 14192), (155, 14225), (156, 14252), (157, 14258), (160, 14312), (161, 14348),

(162, 14405), (164, 14435), (166, 14486), (170, 14543), (174, 14633), (177, 14660), (178, 14663), (181, 14741), (182, 14750), (187, 15029), (190, 15158), (196, 15368), (199, 15461), (201, 15593), (202, 15614), (205, 15722), (209, 15821), (211, 15905), (219, 16451), (221, 16484), (222, 16529), (224, 16595), (227, 16685), (229, 16760), (231, 16805),

Gene: DelRio\_21 Start: 12041, Stop: 17296, Start Num: 10

Candidate Starts for DelRio\_21:

(6, 12017), (8, 12029), (9, 12032), (Start: 10 @12041 has 15 MA's), (11, 12074), (12, 12077), (16, 12239), (18, 12281), (20, 12311), (23, 12530), (30, 12668), (31, 12674), (34, 12761), (35, 12794), (36, 12824), (38, 12878), (42, 12923), (43, 12935), (44, 12950), (45, 12965), (50, 13019), (57, 13097), (61, 13142), (62, 13166), (66, 13274), (67, 13316), (69, 13355), (75, 13418), (76, 13436), (79, 13460), (80, 13475), (81, 13496), (88, 13631), (94, 13739), (95, 13751), (97, 13772), (103, 13853), (108, 13895), (110, 13913), (112, 13943), (114, 13967), (117, 14015), (121, 14048), (122, 14051), (128, 14132), (130, 14207), (133, 14243), (138, 14369), (139, 14390), (141, 14414), (143, 14426), (146, 14501), (147, 14522), (153, 14666), (155, 14699), (156, 14726), (157, 14732), (160, 14786), (161, 14822), (162, 14879), (164, 14909), (166, 14960), (170, 15017), (174, 15107), (177, 15134), (178, 15137), (181, 15215), (182, 15224), (187, 15503), (190, 15632), (196, 15842), (199, 15935), (201, 16067), (202, 16088), (205, 16196), (209, 16295), (219, 16925), (221, 16958), (222, 17003), (224, 17069), (227, 17159), (229, 17234), (231, 17279),

Gene: DumpsterDude\_17 Start: 10190, Stop: 15148, Start Num: 7

Candidate Starts for DumpsterDude\_17:

(Start: 7 @10190 has 2 MA's), (11, 10229), (13, 10238), (19, 10457), (28, 10793), (31, 10829), (34, 10916), (35, 10949), (38, 11033), (39, 11036), (43, 11090), (45, 11120), (46, 11141), (47, 11150), (49, 11168), (51, 11192), (54, 11225), (55, 11231), (58, 11255), (60, 11282), (62, 11321), (68, 11495), (72, 11546), (75, 11573), (76, 11591), (77, 11594), (80, 11630), (81, 11651), (88, 11786), (91, 11831), (96, 11918), (97, 11927), (98, 11930), (100, 11975), (107, 12047), (113, 12107), (114, 12122), (115, 12146), (121, 12203), (122, 12206), (124, 12242), (127, 12278), (128, 12287), (129, 12329), (130, 12362), (138, 12524), (146, 12656), (147, 12677), (149, 12713), (151, 12767), (153, 12821), (154, 12845), (156, 12881), (160, 12941), (163, 13043), (167, 13136), (168, 13139), (169, 13169), (171, 13184), (173, 13238), (174, 13262), (175, 13268), (177, 13289), (179, 13346), (181, 13370), (185, 13547), (188, 13694), (190, 13790), (192, 13880), (193, 13937), (198, 14075), (208, 14369), (212, 14477), (218, 14714), (220, 14807), (221, 14813), (222, 14858), (223, 14903), (224, 14924), (225, 14963), (226, 14984), (230, 15098), (231, 15131), (232, 15137),

Gene: Francois\_20 Start: 11521, Stop: 16311, Start Num: 10

Candidate Starts for Francois\_20:

(1, 11356), (2, 11398), (3, 11410), (4, 11434), (5, 11473), (8, 11509), (9, 11512), (Start: 10 @11521 has 15 MA's), (11, 11554), (14, 11614), (19, 11782), (24, 12055), (26, 12097), (33, 12178), (37, 12244), (48, 12370), (52, 12403), (56, 12448), (62, 12508), (63, 12541), (70, 12682), (71, 12691), (83, 12823), (85, 12868), (92, 12979), (95, 13030), (102, 13087), (105, 13129), (106, 13135), (116, 13234), (118, 13249), (119, 13252), (128, 13357), (130, 13432), (131, 13444), (133, 13468), (138, 13594), (139, 13615), (141, 13639), (143, 13651), (146, 13726), (147, 13747), (149, 13783), (153, 13891), (155, 13924), (156, 13951), (157, 13957), (159, 13969), (160, 14011), (161, 14047), (162, 14104), (168, 14209), (170, 14242), (174, 14332), (177, 14359), (178, 14362), (181, 14440), (182, 14449), (184, 14557), (187, 14728), (190, 14857), (193, 14995), (201, 15304), (202, 15325), (205, 15433), (210, 15544), (216, 15841), (217, 15844), (221, 15973), (222, 16018), (224, 16084), (225, 16123), (227, 16174), (229, 16249), (231, 16294),

Gene: GrandSlam\_20 Start: 11567, Stop: 16822, Start Num: 10

Candidate Starts for GrandSlam\_20:

(6, 11543), (8, 11555), (9, 11558), (Start: 10 @11567 has 15 MA's), (11, 11600), (12, 11603), (16, 11765), (17, 11786), (18, 11807), (20, 11837), (23, 12056), (24, 12101), (30, 12194), (31, 12200), (34,

12287), (35, 12320), (38, 12404), (42, 12449), (43, 12461), (44, 12476), (45, 12491), (50, 12545), (57, 12623), (61, 12668), (62, 12692), (66, 12800), (67, 12842), (69, 12881), (75, 12944), (76, 12962), (81, 13022), (88, 13157), (94, 13265), (95, 13277), (97, 13298), (103, 13379), (108, 13421), (110, 13439), (112, 13469), (114, 13493), (117, 13541), (120, 13559), (121, 13574), (122, 13577), (128, 13658), (130, 13733), (133, 13769), (138, 13895), (139, 13916), (141, 13940), (143, 13952), (146, 14027), (147, 14048), (153, 14192), (155, 14225), (156, 14252), (157, 14258), (160, 14312), (161, 14348), (162, 14405), (164, 14435), (166, 14486), (170, 14543), (174, 14633), (177, 14660), (178, 14663), (181, 14741), (182, 14750), (187, 15029), (190, 15158), (196, 15368), (199, 15461), (201, 15593), (202, 15614), (205, 15722), (209, 15821), (211, 15905), (219, 16451), (221, 16484), (222, 16529), (224, 16595), (227, 16685), (229, 16760), (231, 16805),

Gene: Hamood\_20 Start: 11567, Stop: 16822, Start Num: 10

Candidate Starts for Hamood\_20:

(6, 11543), (8, 11555), (9, 11558), (Start: 10 @11567 has 15 MA's), (11, 11600), (12, 11603), (16, 11765), (17, 11786), (18, 11807), (20, 11837), (23, 12056), (24, 12101), (30, 12194), (31, 12200), (34, 12287), (35, 12320), (38, 12404), (42, 12449), (43, 12461), (44, 12476), (45, 12491), (50, 12545), (57, 12623), (61, 12668), (62, 12692), (66, 12800), (67, 12842), (69, 12881), (75, 12944), (76, 12962), (81, 13022), (88, 13157), (94, 13265), (95, 13277), (97, 13298), (103, 13379), (108, 13421), (110, 13439), (112, 13469), (114, 13493), (117, 13541), (120, 13559), (121, 13574), (122, 13577), (128, 13658), (130, 13733), (133, 13769), (138, 13895), (139, 13916), (141, 13940), (143, 13952), (146, 14027), (147, 14048), (153, 14192), (155, 14225), (156, 14252), (157, 14258), (160, 14312), (161, 14348), (162, 14405), (164, 14435), (166, 14486), (170, 14543), (174, 14633), (177, 14660), (178, 14663), (181, 14741), (182, 14750), (187, 15029), (190, 15158), (196, 15368), (199, 15461), (201, 15593), (202, 15614), (205, 15722), (209, 15821), (211, 15905), (219, 16451), (221, 16484), (222, 16529), (224, 16595), (227, 16685), (229, 16760), (231, 16805),

Gene: MakCheese\_18 Start: 9949, Stop: 14994, Start Num: 7

Candidate Starts for MakCheese\_18:

(Start: 7 @9949 has 2 MA's), (11, 9988), (13, 9997), (14, 10048), (15, 10111), (18, 10195), (28, 10552), (30, 10582), (31, 10588), (32, 10609), (34, 10675), (35, 10708), (38, 10792), (39, 10795), (41, 10822), (43, 10849), (45, 10879), (46, 10900), (49, 10927), (54, 10984), (55, 10990), (58, 11014), (60, 11041), (61, 11056), (62, 11080), (64, 11143), (68, 11254), (75, 11332), (76, 11350), (77, 11353), (80, 11389), (81, 11410), (84, 11476), (88, 11545), (89, 11581), (90, 11587), (91, 11590), (93, 11620), (96, 11677), (97, 11686), (98, 11689), (107, 11806), (108, 11809), (113, 11866), (114, 11881), (121, 11962), (122, 11965), (128, 12046), (129, 12088), (134, 12169), (138, 12283), (140, 12316), (141, 12328), (142, 12334), (146, 12415), (148, 12463), (149, 12472), (152, 12550), (153, 12580), (154, 12604), (156, 12640), (158, 12649), (160, 12700), (161, 12736), (163, 12802), (164, 12823), (167, 12895), (168, 12898), (169, 12928), (170, 12931), (173, 12997), (174, 13021), (176, 13039), (180, 13123), (181, 13129), (182, 13138), (185, 13306), (190, 13540), (191, 13600), (192, 13627), (194, 13705), (200, 13876), (203, 14047), (215, 14470), (218, 14560), (220, 14653), (221, 14659), (222, 14704), (223, 14749), (224, 14770), (225, 14809), (228, 14923), (229, 14932), (230, 14944), (232, 14983),

Gene: Mulch\_20 Start: 11504, Stop: 16288, Start Num: 10

Candidate Starts for Mulch\_20:

(8, 11492), (9, 11495), (Start: 10 @11504 has 15 MA's), (11, 11537), (14, 11597), (19, 11765), (24, 12038), (26, 12080), (33, 12161), (37, 12227), (48, 12353), (52, 12386), (56, 12431), (62, 12491), (63, 12524), (70, 12665), (71, 12674), (83, 12806), (85, 12851), (92, 12962), (95, 13013), (102, 13070), (105, 13112), (106, 13118), (118, 13232), (119, 13235), (128, 13340), (130, 13415), (131, 13427), (133, 13451), (143, 13634), (146, 13709), (147, 13730), (149, 13766), (153, 13874), (155, 13907), (156, 13934), (157, 13940), (159, 13952), (160, 13994), (161, 14030), (162, 14087), (164, 14117), (168, 14192), (170, 14225), (174, 14315), (178, 14345), (181, 14423), (182, 14432), (184, 14540), (187, 14711), (190, 14840), (193, 14978), (201, 15287), (202, 15308), (205, 15416), (207, 15506), (216, 15818), (217, 15821), (221, 15950), (222, 15995), (224, 16061), (225, 16100), (227, 16151),

(229, 16226), (231, 16271),

Gene: Nadeem\_20 Start: 11504, Stop: 16288, Start Num: 10

Candidate Starts for Nadeem\_20:

(8, 11492), (9, 11495), (Start: 10 @11504 has 15 MA's), (11, 11537), (14, 11597), (19, 11765), (24, 12038), (26, 12080), (33, 12161), (37, 12227), (48, 12353), (52, 12386), (56, 12431), (62, 12491), (63, 12524), (70, 12665), (71, 12674), (83, 12806), (85, 12851), (92, 12962), (95, 13013), (102, 13070), (105, 13112), (106, 13118), (118, 13232), (119, 13235), (128, 13340), (130, 13415), (131, 13427), (133, 13451), (143, 13634), (146, 13709), (147, 13730), (149, 13766), (153, 13874), (155, 13907), (156, 13934), (157, 13940), (159, 13952), (160, 13994), (161, 14030), (162, 14087), (164, 14117), (168, 14192), (170, 14225), (174, 14315), (178, 14345), (181, 14423), (182, 14432), (184, 14540), (187, 14711), (190, 14840), (193, 14978), (201, 15287), (202, 15308), (205, 15416), (207, 15506), (216, 15818), (217, 15821), (221, 15950), (222, 15995), (224, 16061), (225, 16100), (227, 16151), (229, 16226), (231, 16271),

Gene: NancyRae\_20 Start: 11504, Stop: 16294, Start Num: 10

Candidate Starts for NancyRae\_20:

(8, 11492), (9, 11495), (Start: 10 @11504 has 15 MA's), (11, 11537), (14, 11597), (19, 11765), (24, 12038), (26, 12080), (33, 12161), (37, 12227), (48, 12353), (52, 12386), (56, 12431), (62, 12491), (63, 12524), (70, 12665), (71, 12674), (83, 12806), (85, 12851), (92, 12962), (95, 13013), (102, 13070), (105, 13112), (106, 13118), (118, 13232), (119, 13235), (128, 13340), (130, 13415), (131, 13427), (133, 13451), (138, 13577), (143, 13634), (146, 13709), (147, 13730), (149, 13766), (153, 13874), (155, 13907), (156, 13934), (157, 13940), (160, 13994), (161, 14030), (162, 14087), (164, 14117), (168, 14192), (170, 14225), (174, 14315), (178, 14345), (181, 14423), (182, 14432), (184, 14540), (187, 14711), (190, 14840), (193, 14978), (201, 15287), (202, 15308), (205, 15416), (207, 15512), (216, 15824), (217, 15827), (221, 15956), (222, 16001), (224, 16067), (225, 16106), (227, 16157), (229, 16232), (231, 16277),

Gene: Parada\_20 Start: 11504, Stop: 16288, Start Num: 10

Candidate Starts for Parada\_20:

(8, 11492), (9, 11495), (Start: 10 @11504 has 15 MA's), (11, 11537), (14, 11597), (19, 11765), (24, 12038), (26, 12080), (33, 12161), (37, 12227), (48, 12353), (52, 12386), (56, 12431), (62, 12491), (63, 12524), (70, 12665), (71, 12674), (83, 12806), (85, 12851), (92, 12962), (95, 13013), (102, 13070), (105, 13112), (106, 13118), (118, 13232), (119, 13235), (128, 13340), (130, 13415), (131, 13427), (133, 13451), (143, 13634), (146, 13709), (147, 13730), (149, 13766), (153, 13874), (155, 13907), (156, 13934), (157, 13940), (159, 13952), (160, 13994), (161, 14030), (162, 14087), (164, 14117), (168, 14192), (170, 14225), (174, 14315), (178, 14345), (181, 14423), (182, 14432), (184, 14540), (187, 14711), (190, 14840), (193, 14978), (201, 15287), (202, 15308), (205, 15416), (207, 15506), (216, 15818), (217, 15821), (221, 15950), (222, 15995), (224, 16061), (225, 16100), (227, 16151), (229, 16226), (231, 16271),

Gene: Pimento\_21 Start: 11708, Stop: 15985, Start Num: 10

Candidate Starts for Pimento\_21:

(8, 11696), (9, 11699), (Start: 10 @11708 has 15 MA's), (11, 11741), (19, 11969), (21, 12053), (22, 12116), (25, 12242), (27, 12275), (29, 12290), (33, 12323), (40, 12413), (53, 12488), (56, 12512), (59, 12527), (65, 12611), (70, 12632), (71, 12641), (73, 12653), (74, 12665), (78, 12692), (81, 12713), (82, 12731), (85, 12743), (86, 12749), (99, 12878), (104, 12923), (123, 13073), (126, 13103), (135, 13268), (136, 13271), (137, 13274), (143, 13361), (144, 13364), (145, 13370), (150, 13481), (155, 13604), (160, 13691), (165, 13820), (168, 13889), (170, 13922), (178, 14042), (181, 14120), (182, 14129), (184, 14237), (187, 14408), (190, 14537), (193, 14675), (201, 14984), (202, 15005), (205, 15113), (207, 15203), (216, 15515), (217, 15518), (221, 15647), (222, 15692), (224, 15758), (225, 15797), (227, 15848), (229, 15923), (231, 15968),

Gene: Ruthy\_17 Start: 10300, Stop: 15261, Start Num: 7

Candidate Starts for Ruthy\_17:

(Start: 7 @10300 has 2 MA's), (11, 10339), (13, 10348), (19, 10567), (28, 10903), (31, 10939), (35, 11059), (38, 11143), (39, 11146), (43, 11200), (45, 11230), (47, 11260), (49, 11278), (51, 11302), (54, 11335), (55, 11341), (58, 11365), (60, 11392), (62, 11431), (68, 11605), (72, 11656), (75, 11683), (76, 11701), (77, 11704), (80, 11740), (81, 11761), (88, 11896), (91, 11941), (96, 12028), (97, 12037), (98, 12040), (100, 12085), (107, 12157), (109, 12175), (111, 12184), (116, 12274), (122, 12316), (124, 12352), (125, 12355), (127, 12388), (128, 12397), (129, 12439), (130, 12472), (138, 12634), (140, 12667), (146, 12766), (147, 12787), (149, 12823), (151, 12877), (152, 12901), (153, 12931), (154, 12955), (156, 12991), (160, 13051), (161, 13087), (163, 13153), (167, 13246), (168, 13249), (169, 13279), (171, 13294), (173, 13348), (174, 13372), (175, 13378), (177, 13399), (179, 13456), (181, 13480), (183, 13516), (184, 13597), (185, 13657), (186, 13702), (187, 13768), (189, 13837), (190, 13903), (192, 13993), (193, 14050), (198, 14188), (208, 14482), (212, 14590), (218, 14827), (220, 14920), (221, 14926), (222, 14971), (223, 15016), (224, 15037), (225, 15076), (230, 15211), (231, 15244), (232, 15250),

Gene: WheatThin\_20 Start: 11504, Stop: 16288, Start Num: 10

Candidate Starts for WheatThin\_20:

(8, 11492), (9, 11495), (Start: 10 @11504 has 15 MA's), (11, 11537), (14, 11597), (19, 11765), (24, 12038), (26, 12080), (33, 12161), (37, 12227), (48, 12353), (52, 12386), (56, 12431), (62, 12491), (63, 12524), (70, 12665), (71, 12674), (83, 12806), (85, 12851), (92, 12962), (95, 13013), (102, 13070), (105, 13112), (106, 13118), (118, 13232), (119, 13235), (128, 13340), (130, 13415), (131, 13427), (133, 13451), (143, 13634), (146, 13709), (147, 13730), (149, 13766), (153, 13874), (155, 13907), (156, 13934), (157, 13940), (159, 13952), (160, 13994), (161, 14030), (162, 14087), (164, 14117), (168, 14192), (170, 14225), (174, 14315), (178, 14345), (181, 14423), (182, 14432), (184, 14540), (187, 14711), (190, 14840), (193, 14978), (201, 15287), (202, 15308), (205, 15416), (207, 15506), (216, 15818), (217, 15821), (221, 15950), (222, 15995), (224, 16061), (225, 16100), (227, 16151), (229, 16226), (231, 16271),

Gene: Zodiariah\_16 Start: 9944, Stop: 15100, Start Num: 7

Candidate Starts for Zodiariah\_16:

(Start: 7 @9944 has 2 MA's), (11, 9980), (13, 9989), (14, 10040), (15, 10103), (18, 10187), (28, 10544), (30, 10574), (31, 10580), (32, 10601), (34, 10667), (35, 10700), (38, 10784), (39, 10787), (43, 10841), (45, 10871), (49, 10919), (54, 10976), (55, 10982), (58, 11006), (60, 11033), (62, 11072), (64, 11135), (68, 11246), (75, 11324), (76, 11342), (77, 11345), (80, 11381), (81, 11402), (84, 11468), (87, 11531), (88, 11537), (89, 11573), (90, 11579), (91, 11582), (93, 11612), (97, 11678), (101, 11735), (107, 11798), (114, 11873), (121, 11954), (126, 12002), (128, 12038), (129, 12080), (130, 12113), (131, 12125), (138, 12275), (140, 12308), (141, 12320), (142, 12326), (143, 12332), (151, 12518), (154, 12596), (160, 12692), (161, 12728), (163, 12794), (164, 12815), (167, 12887), (168, 12890), (169, 12920), (170, 12923), (173, 12989), (174, 13013), (176, 13031), (180, 13115), (181, 13121), (182, 13130), (185, 13298), (190, 13532), (191, 13592), (192, 13619), (204, 14123), (206, 14252), (213, 14501), (214, 14552), (220, 14759), (221, 14765), (222, 14810), (223, 14855), (224, 14876), (225, 14915), (229, 15038), (230, 15050), (232, 15089),