

Pham 224751

1: 8UZL_19	2	141	156	187	204	224	244	258	280	286	310	324	328	339	346	356																					
2: Maco6_17	2	141	148	156	187	204	224	244	258	280	286	310	324	328	339	346	356																				
3: FF47_19	2	141	148	156	187	204	224	244	258	280	286	310	324	328	339	346	356																				
4: Muddy_19	14	30	64	80	118	120	124	127	141	164	174	189	224	230	233	234	236	242	280	286	308	312	314	318	352	358	362	362									
5: Paito_16	1	21	30	31	38	41	100	108	118	124	135	145	164	174	180	190	200	222	230	233	234	236	242	280	286	294	306	307	328	340	350	352	371				
6: Avocado_16	1	21	30	31	38	41	100	108	118	124	135	145	164	174	180	190	200	222	230	233	234	236	242	280	286	294	306	307	328	340	350	354	352	364			
7: Pate1224_16	1	21	30	31	38	41	100	108	118	124	135	145	161	174	180	190	200	222	230	233	234	236	242	280	286	294	306	307	328	340	350	354	352	364			
8: FlagStaff_16	1	16	21	30	31	38	41	100	108	118	124	135	147	164	174	180	190	218	227	236	251	258	275	283	300	308	325	332	342	347	358	370	378				
9: Belladonna_21	2	31	38	41	100	108	118	124	135	145	164	174	180	190	200	216	226	236	240	281	286	295	300	308	329	342	347	358	370	378							
10: TM4_17	14	20	30	31	38	41	100	108	118	120	138	147	162	186	202	209	218	224	230	231	236	238	254	252	257	286	300	309	326	331	337	339	346	359	369	378	381
11: Reptar3000_22+2	14	20	31	32	39	41	100	108	118	120	138	147	162	186	202	209	218	224	230	231	236	238	254	252	257	286	300	309	326	331	337	346	359	369	378	381	
12: Kraw_22+1	14	20	31	32	39	41	100	108	118	120	138	147	162	186	202	209	218	224	230	231	236	238	254	252	257	286	300	309	326	331	337	346	359	369	378	381	
13: Fionnbarth_22+1	14	20	31	32	39	41	100	108	118	120	138	147	162	186	202	209	218	224	230	231	236	238	254	252	257	286	300	309	326	331	337	346	359	369	378	381	
14: OmniCritical_22+2	1	20	30	31	38	41	100	108	118	120	138	147	162	172	202	209	218	224	230	231	236	238	254	252	257	286	300	309	318	326	329	348	359	369	378	381	
15: Ruthier_21+	1	20	30	31	38	41	100	108	118	120	138	147	162	172	202	209	218	224	230	231	236	238	254	252	257	286	300	309	318	326	329	348	359	369	378	381	
16: Eponine_22	1	20	30	31	38	41	100	108	118	120	138	147	162	172	202	209	218	224	230	231	236	238	254	252	257	286	300	309	326	331	337	346	359	369	378	381	
17: Chancellor_22	1	20	30	31	38	41	100	108	118	120	138	147	162	172	202	209	218	224	230	231	236	238	254	252	257	286	300	309	326	331	337	346	359	369	378	381	
18: Lebo14_22	10	14	20	30	31	38	41	100	108	118	120	138	147	162	172	202	209	218	224	230	231	236	238	254	252	257	286	300	309	326	331	337	346	359	369	378	381
19: Slarp_22	14	20	30	31	38	41	100	108	118	120	138	147	162	186	202	209	218	224	230	231	236	238	254	252	257	286	300	309	326	331	337	346	359	369	378	381	
20: Bobquesha_22	14	20	30	31	38	41	100	108	118	120	138	147	162	172	202	209	218	224	230	231	236	238	254	252	257	286	291	300	309	318	326	329	348	359	369	378	381
21: Taquito_20	14	20	31	32	39	41	100	108	118	120	138	147	162	186	202	209	218	224	230	231	236	238	254	252	257	286	300	309	326	331	337	346	359	369	378	381	
22: Y10_22+2	14	20	30	31	38	41	100	108	118	120	138	147	162	172	202	209	218	224	230	231	236	238	254	252	257	286	300	309	326	331	337	346	359	369	378	381	
23: Cheethro_22	18	30	31	38	41	100	108	118	120	137	164	174	189	218	227	236	251	258	274	280	286	294	306	310	327	330	336	342	347	358	364	373	382				
24: Omnion_19	18	30	31	38	41	100	108	118	120	137	164	174	189	218	227	236	251	258	274	280	286	294	306	310	327	330	336	342	347	358	364	373	382				
25: Rando14_18	1	14	20	30	31	38	41	100	108	118	120	137	155	168	173	189	218	227	236	251	258	274	280	286	294	306	310	326	328	338	344	346	358	371	382		
26: Boilgate_18	1	14	20	30	31	38	41	100	108	118	120	137	155	168	173	189	218	227	236	251	258	274	280	286	294	306	310	326	328	338	344	346	358	371	382		

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 224751 Report

This analysis was run 03/28/25 on database version 593.

Pham number 224751 has 35 members, 6 are drafts.

Phages represented in each track:

- Track 1 : 8UZL_19
- Track 2 : Maco6_17
- Track 3 : FF47_19
- Track 4 : Muddy_19
- Track 5 : Paito_16
- Track 6 : Avocado_16
- Track 7 : Pace1224_16
- Track 8 : FlagStaff_16
- Track 9 : Belladonna_21
- Track 10 : TM4_17
- Track 11 : Reptar3000_22, MissDaisy_22, Patt_22
- Track 12 : Kraw_22, Malthus_22
- Track 13 : Fionnbharth_22, Wintermute_22
- Track 14 : OmniCritical_22, SamScheppers_20, Mitti_22
- Track 15 : Ruthiejr_21, Juliette_22
- Track 16 : Eponine_22
- Track 17 : Chancellor_22
- Track 18 : Lebo14_22
- Track 19 : Slarp_22
- Track 20 : Bobquesha_22
- Track 21 : Taquito_20
- Track 22 : Y10_22, JF1_22, Y2_22
- Track 23 : Cheetobro_22
- Track 24 : Omnicron_19
- Track 25 : Rando14_19
- Track 26 : Boilgate_18

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

The start number called the most often in the published annotations is 5, it was called in 24 of the 29 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Avocado_16, Bobquesha_22, Chancellor_22, Cheetobro_22, Eponine_22, Fionnbharth_22, FlagStaff_16, JF1_22, Juliette_22, Kraw_22, Lebo14_22, Malthus_22, MissDaisy_22, Mitti_22, OmniCritical_22, Omnicron_19, Pace1224_16, Patt_22, Rando14_19, Reptar3000_22, Ruthiejr_21, SamScheppers_20, Slarp_22, TM4_17, Taquito_20, Wintermute_22, Y10_22, Y2_22,

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

- Belladonna_21, Boilgate_18,

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

- 8UZL_19, FF47_19, Maco6_17, Muddy_19, Paito_16,

Summary by start number:

Start 4:

- Found in 1 of 35 (2.9%) of genes in pham
- Manual Annotations of this start: 1 of 29
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Paito_16 (G1),

Start 5:

- Found in 30 of 35 (85.7%) of genes in pham
- Manual Annotations of this start: 24 of 29
- Called 93.3% of time when present
- Phage (with cluster) where this start called: Avocado_16 (G2), Bobquesha_22 (K4), Chancellor_22 (K4), Cheetobro_22 (K4), Eponine_22 (K4), Fionnbharth_22 (K4), FlagStaff_16 (G2), JF1_22 (K4), Juliette_22 (K4), Kraw_22 (K4), Lebo14_22 (K4), Malthus_22 (K4), MissDaisy_22 (K4), Mitti_22 (K4), OmniCritical_22 (K4), Omnicron_19 (K5), Pace1224_16 (G2), Patt_22 (K4), Rando14_19 (K5), Reptar3000_22 (K4), Ruthiejr_21 (K4), SamScheppers_20 (K4), Slarp_22 (K4), TM4_17 (K2), Taquito_20 (K4), Wintermute_22 (K4), Y10_22 (K4), Y2_22 (K4),

Start 6:

- Found in 2 of 35 (5.7%) of genes in pham
- Manual Annotations of this start: 1 of 29
- Called 50.0% of time when present
- Phage (with cluster) where this start called: Belladonna_21 (K1),

Start 7:

- Found in 1 of 35 (2.9%) of genes in pham
- Manual Annotations of this start: 1 of 29
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Boilgate_18 (K8),

Start 27:

- Found in 7 of 35 (20.0%) of genes in pham
- Manual Annotations of this start: 2 of 29
- Called 57.1% of time when present
- Phage (with cluster) where this start called: 8UZL_19 (AB), FF47_19 (AB), Maco6_17 (AB), Muddy_19 (AB),

Summary by clusters:

There are 8 clusters represented in this pham: AB, G2, G1, K2, K1, K5, K4, K8,

Info for manual annotations of cluster AB:

- Start number 27 was manually annotated 2 times for cluster AB.

Info for manual annotations of cluster G1:

- Start number 4 was manually annotated 1 time for cluster G1.

Info for manual annotations of cluster G2:

- Start number 5 was manually annotated 2 times for cluster G2.

Info for manual annotations of cluster K1:

- Start number 6 was manually annotated 1 time for cluster K1.

Info for manual annotations of cluster K2:

- Start number 5 was manually annotated 1 time for cluster K2.

Info for manual annotations of cluster K4:

- Start number 5 was manually annotated 19 times for cluster K4.

Info for manual annotations of cluster K5:

- Start number 5 was manually annotated 2 times for cluster K5.

Info for manual annotations of cluster K8:

- Start number 7 was manually annotated 1 time for cluster K8.

Gene Information:

Gene: 8UZL_19 Start: 11439, Stop: 14888, Start Num: 27

Candidate Starts for 8UZL_19:

(Start: 27 @11439 has 2 MA's), (30, 11454), (34, 11502), (35, 11505), (37, 11550), (42, 11673), (69, 12000), (70, 12012), (73, 12033), (82, 12117), (87, 12171), (88, 12180), (95, 12234), (96, 12243), (97, 12267), (99, 12276), (103, 12318), (105, 12363), (106, 12375), (109, 12396), (114, 12420), (121, 12474), (126, 12528), (129, 12549), (130, 12561), (131, 12585), (133, 12594), (141, 12672), (156, 12798), (163, 12840), (179, 13008), (180, 13014), (187, 13059), (204, 13182), (211, 13260), (217, 13293), (219, 13320), (221, 13332), (246, 13440), (247, 13449), (256, 13542), (261, 13572), (263, 13608), (267, 13638), (269, 13656), (272, 13683), (273, 13686), (279, 13740), (280, 13743), (286, 13833), (288, 13881), (290, 13896), (292, 13914), (294, 13929), (295, 13989), (296, 14022), (297, 14031), (299, 14040), (303, 14076), (310, 14091), (328, 14286), (339, 14481), (347, 14577), (349, 14595), (352, 14637), (353, 14643), (355, 14670), (363, 14772), (365, 14781), (366, 14820),

Gene: Avocado_16 Start: 11691, Stop: 15731, Start Num: 5

Candidate Starts for Avocado_16:

(Start: 5 @11691 has 24 MA's), (8, 11784), (11, 11814), (17, 11961), (22, 12045), (Start: 27 @12093 has 2 MA's), (39, 12231), (40, 12252), (41, 12306), (47, 12399), (48, 12420), (49, 12441), (52, 12459), (55, 12483), (56, 12495), (61, 12567), (63, 12582), (64, 12615), (78, 12747), (80, 12771), (83, 12792), (85, 12825), (88, 12852), (93, 12894), (98, 12942), (111, 13080), (112, 13083), (119, 13125), (124, 13194), (125, 13197), (131, 13266), (135, 13308), (145, 13386), (160, 13503), (161, 13512), (164, 13527), (167, 13608), (169, 13617), (174, 13677), (190, 13791), (197, 13845), (200, 13869), (201, 13872), (202, 13875), (205, 13905), (209, 13935), (220, 14037), (222, 14058), (238, 14163), (239, 14166), (253, 14319), (255, 14337), (262, 14403), (263, 14418), (266, 14442), (271, 14484), (272,

14493), (280, 14553), (286, 14643), (294, 14739), (295, 14796), (296, 14829), (307, 14904), (328, 15099), (340, 15309), (345, 15378), (346, 15390), (347, 15399), (350, 15420), (362, 15579), (371, 15657),

Gene: Belladonna_21 Start: 12185, Stop: 15949, Start Num: 6

Candidate Starts for Belladonna_21:

(Start: 5 @12116 has 24 MA's), (Start: 6 @12185 has 1 MA's), (12, 12272), (16, 12347), (20, 12449), (23, 12476), (32, 12548), (33, 12560), (35, 12569), (39, 12641), (41, 12716), (46, 12800), (47, 12809), (48, 12830), (52, 12869), (56, 12905), (59, 12947), (64, 13025), (73, 13115), (81, 13190), (90, 13283), (92, 13292), (93, 13304), (94, 13313), (120, 13550), (123, 13589), (127, 13622), (135, 13709), (139, 13733), (147, 13817), (159, 13901), (161, 13913), (165, 13934), (190, 14090), (218, 14171), (225, 14219), (227, 14237), (232, 14258), (237, 14294), (246, 14345), (251, 14402), (258, 14480), (261, 14489), (268, 14567), (270, 14582), (275, 14624), (283, 14678), (300, 14918), (309, 14993), (325, 15104), (332, 15323), (334, 15335), (346, 15518), (347, 15527), (356, 15599), (359, 15629), (360, 15650), (370, 15770), (375, 15842), (377, 15860), (378, 15866),

Gene: Bobquesha_22 Start: 13067, Stop: 17233, Start Num: 5

Candidate Starts for Bobquesha_22:

(2, 13031), (Start: 5 @13067 has 24 MA's), (14, 13265), (32, 13493), (33, 13505), (35, 13514), (36, 13544), (40, 13607), (47, 13754), (48, 13775), (52, 13814), (53, 13817), (59, 13892), (64, 13970), (72, 14057), (73, 14060), (76, 14090), (79, 14123), (83, 14147), (91, 14231), (95, 14261), (98, 14288), (107, 14396), (110, 14417), (112, 14429), (115, 14441), (120, 14495), (135, 14654), (138, 14675), (147, 14783), (162, 14903), (186, 15152), (202, 15263), (207, 15314), (209, 15323), (213, 15368), (215, 15389), (227, 15488), (229, 15503), (231, 15509), (241, 15578), (243, 15599), (245, 15608), (247, 15620), (248, 15629), (254, 15701), (258, 15752), (259, 15755), (262, 15782), (275, 15881), (277, 15899), (286, 15974), (297, 16163), (300, 16175), (309, 16250), (326, 16430), (331, 16550), (337, 16658), (346, 16805), (357, 16925), (358, 16934), (359, 16937), (367, 17036), (369, 17063), (378, 17159), (381, 17222),

Gene: Boilgate_18 Start: 12212, Stop: 16429, Start Num: 7

Candidate Starts for Boilgate_18:

(1, 12077), (3, 12101), (Start: 5 @12122 has 24 MA's), (Start: 7 @12212 has 1 MA's), (14, 12323), (26, 12494), (29, 12512), (31, 12536), (32, 12551), (33, 12563), (38, 12632), (39, 12644), (40, 12665), (43, 12749), (46, 12803), (47, 12812), (48, 12833), (51, 12866), (52, 12872), (53, 12875), (54, 12890), (57, 12926), (59, 12950), (60, 12953), (64, 13028), (65, 13040), (72, 13115), (73, 13118), (74, 13121), (80, 13184), (92, 13295), (100, 13352), (104, 13406), (106, 13448), (115, 13496), (116, 13502), (118, 13517), (120, 13550), (122, 13583), (127, 13622), (128, 13625), (132, 13670), (135, 13709), (136, 13718), (138, 13730), (142, 13757), (149, 13850), (151, 13862), (155, 13919), (166, 14015), (175, 14090), (181, 14138), (182, 14144), (185, 14156), (191, 14192), (199, 14234), (231, 14432), (242, 14507), (254, 14624), (258, 14675), (259, 14678), (265, 14738), (266, 14741), (280, 14837), (285, 14915), (286, 14918), (295, 15074), (296, 15107), (297, 15116), (300, 15128), (302, 15152), (313, 15227), (316, 15236), (317, 15239), (319, 15263), (321, 15272), (322, 15275), (323, 15296), (326, 15368), (327, 15410), (328, 15440), (329, 15482), (333, 15554), (335, 15575), (338, 15662), (341, 15677), (346, 15758), (358, 15890), (374, 16112), (376, 16118), (383, 16232), (384, 16262), (385, 16280), (386, 16322), (387, 16355), (388, 16418),

Gene: Chancellor_22 Start: 13324, Stop: 17499, Start Num: 5

Candidate Starts for Chancellor_22:

(2, 13288), (Start: 5 @13324 has 24 MA's), (14, 13522), (33, 13762), (35, 13771), (40, 13864), (47, 14011), (48, 14032), (52, 14071), (53, 14074), (59, 14149), (64, 14227), (72, 14314), (73, 14317), (76, 14347), (79, 14380), (83, 14404), (91, 14488), (95, 14518), (98, 14545), (107, 14653), (110, 14674), (112, 14686), (115, 14698), (120, 14752), (135, 14911), (138, 14932), (147, 15040), (162, 15160), (202, 15520), (207, 15571), (209, 15580), (213, 15625), (215, 15646), (245, 15865), (247, 15877),

(248, 15886), (254, 15958), (258, 16009), (259, 16012), (262, 16039), (275, 16138), (277, 16156), (286, 16231), (297, 16420), (300, 16432), (309, 16507), (326, 16693), (331, 16813), (337, 16921), (346, 17071), (357, 17191), (358, 17200), (359, 17203), (361, 17224), (367, 17302), (369, 17329), (378, 17425), (381, 17488),

Gene: Cheetobro_22 Start: 13324, Stop: 17496, Start Num: 5

Candidate Starts for Cheetobro_22:

(2, 13288), (Start: 5 @13324 has 24 MA's), (14, 13522), (33, 13762), (35, 13771), (40, 13864), (47, 14011), (48, 14032), (52, 14071), (53, 14074), (59, 14149), (64, 14227), (72, 14314), (73, 14317), (76, 14347), (79, 14380), (83, 14404), (91, 14488), (95, 14518), (98, 14545), (107, 14653), (110, 14674), (112, 14686), (115, 14698), (120, 14752), (135, 14911), (138, 14932), (147, 15040), (162, 15160), (202, 15520), (207, 15571), (209, 15580), (213, 15625), (215, 15646), (245, 15865), (247, 15877), (248, 15886), (254, 15958), (258, 16009), (259, 16012), (262, 16039), (275, 16138), (277, 16156), (286, 16231), (297, 16420), (300, 16432), (309, 16507), (326, 16693), (331, 16813), (337, 16921), (346, 17068), (357, 17188), (358, 17197), (359, 17200), (367, 17299), (369, 17326), (378, 17422), (381, 17485),

Gene: Eponine_22 Start: 13193, Stop: 17389, Start Num: 5

Candidate Starts for Eponine_22:

(Start: 5 @13193 has 24 MA's), (14, 13391), (31, 13604), (33, 13631), (35, 13640), (39, 13712), (40, 13733), (46, 13871), (47, 13880), (48, 13901), (52, 13940), (58, 14009), (59, 14018), (64, 14096), (65, 14108), (73, 14186), (76, 14216), (79, 14249), (80, 14252), (83, 14273), (98, 14414), (100, 14423), (112, 14555), (115, 14567), (120, 14621), (123, 14660), (127, 14693), (135, 14780), (138, 14801), (154, 14978), (162, 15029), (172, 15188), (202, 15389), (207, 15440), (209, 15449), (213, 15494), (215, 15515), (217, 15521), (228, 15626), (231, 15635), (245, 15734), (247, 15746), (248, 15755), (254, 15827), (257, 15860), (258, 15878), (259, 15881), (262, 15908), (275, 16007), (277, 16025), (286, 16100), (297, 16289), (300, 16301), (309, 16376), (318, 16445), (326, 16577), (329, 16691), (346, 16958), (348, 16976), (358, 17087), (359, 17090), (367, 17189), (369, 17216), (370, 17219), (378, 17315), (381, 17378),

Gene: FF47_19 Start: 11405, Stop: 14815, Start Num: 27

Candidate Starts for FF47_19:

(Start: 27 @11405 has 2 MA's), (30, 11420), (34, 11468), (35, 11471), (37, 11516), (42, 11639), (69, 11966), (70, 11978), (73, 11999), (82, 12083), (87, 12137), (88, 12146), (95, 12200), (97, 12233), (99, 12242), (103, 12284), (105, 12329), (106, 12341), (109, 12362), (114, 12386), (121, 12440), (126, 12494), (129, 12515), (130, 12527), (131, 12551), (133, 12560), (141, 12638), (148, 12695), (156, 12764), (179, 12974), (184, 13013), (187, 13025), (196, 13088), (202, 13130), (204, 13148), (213, 13235), (217, 13259), (219, 13286), (221, 13298), (246, 13406), (247, 13415), (256, 13508), (261, 13538), (262, 13559), (263, 13574), (278, 13685), (282, 13706), (286, 13781), (294, 13877), (295, 13934), (296, 13967), (298, 13982), (328, 14213), (339, 14408), (347, 14504), (349, 14522), (352, 14564), (353, 14570), (355, 14597), (363, 14699), (365, 14708), (366, 14747),

Gene: Fionnbharth_22 Start: 13314, Stop: 17489, Start Num: 5

Candidate Starts for Fionnbharth_22:

(2, 13278), (Start: 5 @13314 has 24 MA's), (14, 13512), (33, 13752), (35, 13761), (40, 13854), (44, 13956), (47, 14001), (52, 14061), (59, 14139), (64, 14217), (72, 14304), (73, 14307), (76, 14337), (79, 14370), (83, 14394), (91, 14478), (95, 14508), (98, 14535), (107, 14643), (110, 14664), (112, 14676), (115, 14688), (120, 14742), (135, 14901), (138, 14922), (147, 15030), (162, 15150), (198, 15492), (202, 15510), (207, 15561), (209, 15570), (213, 15615), (215, 15636), (231, 15756), (245, 15855), (247, 15867), (248, 15876), (254, 15948), (258, 15999), (259, 16002), (262, 16029), (275, 16128), (277, 16146), (286, 16221), (297, 16410), (300, 16422), (309, 16497), (314, 16527), (326, 16683), (331, 16803), (337, 16911), (346, 17061), (358, 17190), (359, 17193), (367, 17292), (369, 17319), (378, 17415), (381, 17478),

Gene: FlagStaff_16 Start: 11630, Stop: 15664, Start Num: 5

Candidate Starts for FlagStaff_16:

(Start: 5 @11630 has 24 MA's), (8, 11723), (11, 11753), (17, 11900), (22, 11984), (Start: 27 @12032 has 2 MA's), (38, 12158), (39, 12170), (40, 12191), (47, 12338), (48, 12359), (49, 12380), (52, 12398), (55, 12422), (56, 12434), (61, 12506), (63, 12521), (64, 12554), (78, 12686), (80, 12710), (83, 12731), (84, 12752), (85, 12764), (88, 12791), (89, 12803), (93, 12833), (98, 12881), (112, 13022), (113, 13025), (119, 13064), (120, 13088), (124, 13133), (125, 13136), (135, 13247), (161, 13451), (167, 13547), (169, 13556), (174, 13616), (190, 13730), (193, 13751), (201, 13811), (205, 13844), (209, 13874), (217, 13946), (220, 13976), (222, 13997), (238, 14102), (239, 14105), (245, 14159), (253, 14258), (255, 14276), (262, 14342), (263, 14357), (266, 14381), (271, 14423), (272, 14432), (280, 14492), (286, 14582), (294, 14678), (295, 14735), (296, 14768), (304, 14828), (307, 14843), (328, 15038), (340, 15245), (345, 15314), (346, 15326), (350, 15356), (354, 15416), (362, 15512), (368, 15572), (371, 15590),

Gene: JF1_22 Start: 13313, Stop: 17488, Start Num: 5

Candidate Starts for JF1_22:

(2, 13277), (Start: 5 @13313 has 24 MA's), (14, 13511), (33, 13751), (35, 13760), (40, 13853), (44, 13955), (47, 14000), (52, 14060), (59, 14138), (64, 14216), (72, 14303), (73, 14306), (76, 14336), (79, 14369), (83, 14393), (91, 14477), (95, 14507), (98, 14534), (107, 14642), (110, 14663), (112, 14675), (115, 14687), (120, 14741), (135, 14900), (138, 14921), (147, 15029), (162, 15149), (198, 15491), (202, 15509), (207, 15560), (209, 15569), (213, 15614), (215, 15635), (231, 15755), (245, 15854), (247, 15866), (248, 15875), (254, 15947), (258, 15998), (259, 16001), (262, 16028), (275, 16127), (277, 16145), (286, 16220), (297, 16409), (300, 16421), (309, 16496), (314, 16526), (326, 16682), (331, 16802), (337, 16910), (346, 17060), (357, 17180), (358, 17189), (359, 17192), (367, 17291), (369, 17318), (378, 17414), (381, 17477),

Gene: Juliette_22 Start: 13193, Stop: 17389, Start Num: 5

Candidate Starts for Juliette_22:

(Start: 5 @13193 has 24 MA's), (14, 13391), (31, 13604), (33, 13631), (35, 13640), (39, 13712), (40, 13733), (46, 13871), (47, 13880), (48, 13901), (52, 13940), (58, 14009), (59, 14018), (64, 14096), (65, 14108), (73, 14186), (76, 14216), (79, 14249), (80, 14252), (83, 14273), (98, 14414), (100, 14423), (112, 14555), (115, 14567), (120, 14621), (123, 14660), (127, 14693), (135, 14780), (138, 14801), (154, 14978), (162, 15029), (172, 15188), (202, 15389), (207, 15440), (209, 15449), (213, 15494), (215, 15515), (217, 15521), (231, 15635), (245, 15734), (247, 15746), (248, 15755), (254, 15827), (257, 15860), (258, 15878), (259, 15881), (262, 15908), (275, 16007), (277, 16025), (286, 16100), (297, 16289), (300, 16301), (309, 16376), (318, 16445), (326, 16577), (329, 16691), (346, 16958), (348, 16976), (358, 17087), (359, 17090), (367, 17189), (369, 17216), (370, 17219), (378, 17315), (381, 17378),

Gene: Kraw_22 Start: 13237, Stop: 17412, Start Num: 5

Candidate Starts for Kraw_22:

(2, 13201), (Start: 5 @13237 has 24 MA's), (14, 13435), (33, 13675), (35, 13684), (40, 13777), (44, 13879), (47, 13924), (52, 13984), (59, 14062), (64, 14140), (72, 14227), (73, 14230), (76, 14260), (79, 14293), (83, 14317), (91, 14401), (95, 14431), (98, 14458), (107, 14566), (110, 14587), (112, 14599), (115, 14611), (120, 14665), (135, 14824), (138, 14845), (147, 14953), (162, 15073), (198, 15415), (202, 15433), (207, 15484), (209, 15493), (213, 15538), (215, 15559), (231, 15679), (245, 15778), (247, 15790), (248, 15799), (254, 15871), (258, 15922), (259, 15925), (262, 15952), (275, 16051), (277, 16069), (286, 16144), (297, 16333), (300, 16345), (309, 16420), (314, 16450), (326, 16606), (331, 16726), (337, 16834), (346, 16984), (358, 17113), (359, 17116), (367, 17215), (369, 17242), (378, 17338), (381, 17401),

Gene: Lebo14_22 Start: 13327, Stop: 17505, Start Num: 5

Candidate Starts for Lebo14_22:

(2, 13291), (Start: 5 @13327 has 24 MA's), (14, 13525), (33, 13765), (35, 13774), (40, 13867), (47, 14014), (48, 14035), (52, 14074), (53, 14077), (59, 14152), (64, 14230), (72, 14317), (73, 14320), (76, 14350), (79, 14383), (83, 14407), (91, 14491), (95, 14521), (98, 14548), (107, 14656), (110, 14677), (112, 14689), (115, 14701), (120, 14755), (135, 14914), (138, 14935), (147, 15043), (162, 15163), (202, 15523), (207, 15574), (209, 15583), (213, 15628), (215, 15649), (245, 15868), (247, 15880), (248, 15889), (254, 15961), (258, 16012), (259, 16015), (262, 16042), (266, 16078), (275, 16141), (277, 16159), (286, 16234), (297, 16423), (300, 16435), (309, 16510), (326, 16696), (331, 16816), (337, 16924), (346, 17077), (357, 17197), (358, 17206), (359, 17209), (367, 17308), (369, 17335), (378, 17431), (381, 17494),

Gene: Maco6_17 Start: 10697, Stop: 14146, Start Num: 27

Candidate Starts for Maco6_17:

(Start: 27 @10697 has 2 MA's), (30, 10712), (34, 10760), (35, 10763), (37, 10808), (42, 10931), (69, 11258), (70, 11270), (73, 11291), (82, 11375), (87, 11429), (88, 11438), (95, 11492), (96, 11501), (97, 11525), (99, 11534), (103, 11576), (105, 11621), (106, 11633), (109, 11654), (114, 11678), (119, 11708), (121, 11732), (129, 11807), (130, 11819), (131, 11843), (133, 11852), (141, 11930), (148, 11987), (156, 12056), (180, 12272), (187, 12317), (204, 12440), (211, 12518), (217, 12551), (219, 12578), (221, 12590), (246, 12698), (247, 12707), (256, 12800), (261, 12830), (263, 12866), (267, 12896), (269, 12914), (272, 12941), (273, 12944), (279, 12998), (280, 13001), (286, 13091), (288, 13139), (290, 13154), (292, 13172), (294, 13187), (295, 13247), (296, 13280), (297, 13289), (299, 13298), (303, 13334), (310, 13349), (324, 13421), (328, 13544), (339, 13739), (347, 13835), (349, 13853), (352, 13895), (353, 13901), (355, 13928), (363, 14030), (365, 14039), (366, 14078),

Gene: Malthus_22 Start: 13237, Stop: 17412, Start Num: 5

Candidate Starts for Malthus_22:

(2, 13201), (Start: 5 @13237 has 24 MA's), (14, 13435), (33, 13675), (35, 13684), (40, 13777), (44, 13879), (47, 13924), (52, 13984), (59, 14062), (64, 14140), (72, 14227), (73, 14230), (76, 14260), (79, 14293), (83, 14317), (91, 14401), (95, 14431), (98, 14458), (107, 14566), (110, 14587), (112, 14599), (115, 14611), (120, 14665), (135, 14824), (138, 14845), (147, 14953), (162, 15073), (198, 15415), (202, 15433), (207, 15484), (209, 15493), (213, 15538), (215, 15559), (231, 15679), (245, 15778), (247, 15790), (248, 15799), (254, 15871), (258, 15922), (259, 15925), (262, 15952), (275, 16051), (277, 16069), (286, 16144), (297, 16333), (300, 16345), (309, 16420), (314, 16450), (326, 16606), (331, 16726), (337, 16834), (346, 16984), (358, 17113), (359, 17116), (367, 17215), (369, 17242), (378, 17338), (381, 17401),

Gene: MissDaisy_22 Start: 13088, Stop: 17254, Start Num: 5

Candidate Starts for MissDaisy_22:

(2, 13052), (Start: 5 @13088 has 24 MA's), (14, 13286), (32, 13514), (33, 13526), (35, 13535), (36, 13565), (40, 13628), (47, 13775), (48, 13796), (52, 13835), (53, 13838), (59, 13913), (64, 13991), (72, 14078), (73, 14081), (76, 14111), (79, 14144), (83, 14168), (91, 14252), (95, 14282), (98, 14309), (107, 14417), (110, 14438), (112, 14450), (115, 14462), (120, 14516), (135, 14675), (138, 14696), (147, 14804), (162, 14924), (186, 15173), (202, 15284), (207, 15335), (209, 15344), (213, 15389), (215, 15410), (227, 15509), (229, 15524), (231, 15530), (241, 15599), (243, 15620), (245, 15629), (247, 15641), (248, 15650), (254, 15722), (258, 15773), (259, 15776), (262, 15803), (275, 15902), (277, 15920), (286, 15995), (297, 16184), (300, 16196), (309, 16271), (326, 16451), (331, 16571), (337, 16679), (339, 16739), (346, 16826), (351, 16856), (357, 16946), (358, 16955), (359, 16958), (367, 17057), (369, 17084), (378, 17180), (381, 17243),

Gene: Mitti_22 Start: 13237, Stop: 17412, Start Num: 5

Candidate Starts for Mitti_22:

(2, 13201), (Start: 5 @13237 has 24 MA's), (14, 13435), (33, 13675), (35, 13684), (40, 13777), (47, 13924), (48, 13945), (52, 13984), (53, 13987), (59, 14062), (64, 14140), (72, 14227), (73, 14230), (76,

14260), (79, 14293), (83, 14317), (91, 14401), (95, 14431), (98, 14458), (107, 14566), (110, 14587), (112, 14599), (115, 14611), (120, 14665), (135, 14824), (138, 14845), (147, 14953), (162, 15073), (202, 15433), (207, 15484), (209, 15493), (213, 15538), (215, 15559), (245, 15778), (247, 15790), (248, 15799), (254, 15871), (258, 15922), (259, 15925), (262, 15952), (275, 16051), (277, 16069), (286, 16144), (297, 16333), (300, 16345), (309, 16420), (326, 16606), (331, 16726), (337, 16834), (346, 16984), (357, 17104), (358, 17113), (359, 17116), (367, 17215), (369, 17242), (378, 17338), (381, 17401),

Gene: Muddy_19 Start: 11647, Stop: 15096, Start Num: 27

Candidate Starts for Muddy_19:

(Start: 27 @11647 has 2 MA's), (30, 11662), (34, 11710), (35, 11713), (37, 11758), (42, 11881), (67, 12187), (69, 12208), (70, 12220), (73, 12241), (82, 12325), (87, 12379), (88, 12388), (97, 12475), (99, 12484), (103, 12526), (105, 12571), (106, 12583), (109, 12604), (114, 12628), (121, 12682), (126, 12736), (129, 12757), (130, 12769), (131, 12793), (133, 12802), (141, 12880), (143, 12898), (148, 12937), (156, 13006), (165, 13060), (176, 13180), (179, 13216), (180, 13222), (184, 13255), (187, 13267), (204, 13390), (217, 13501), (219, 13528), (221, 13540), (246, 13648), (247, 13657), (256, 13750), (261, 13780), (263, 13816), (267, 13846), (269, 13864), (272, 13891), (273, 13894), (279, 13948), (280, 13951), (286, 14041), (288, 14089), (290, 14104), (292, 14122), (294, 14137), (295, 14197), (296, 14230), (297, 14239), (299, 14248), (303, 14284), (310, 14299), (328, 14494), (339, 14689), (347, 14785), (349, 14803), (352, 14845), (353, 14851), (355, 14878), (363, 14980), (365, 14989), (366, 15028),

Gene: OmniCritical_22 Start: 13225, Stop: 17397, Start Num: 5

Candidate Starts for OmniCritical_22:

(2, 13189), (Start: 5 @13225 has 24 MA's), (14, 13423), (33, 13663), (35, 13672), (40, 13765), (47, 13912), (48, 13933), (52, 13972), (53, 13975), (59, 14050), (64, 14128), (72, 14215), (73, 14218), (76, 14248), (79, 14281), (83, 14305), (91, 14389), (95, 14419), (98, 14446), (107, 14554), (110, 14575), (112, 14587), (115, 14599), (120, 14653), (135, 14812), (138, 14833), (147, 14941), (162, 15061), (202, 15421), (207, 15472), (209, 15481), (213, 15526), (215, 15547), (245, 15766), (247, 15778), (248, 15787), (254, 15859), (258, 15910), (259, 15913), (262, 15940), (275, 16039), (277, 16057), (286, 16132), (297, 16321), (300, 16333), (309, 16408), (326, 16594), (331, 16714), (337, 16822), (346, 16969), (357, 17089), (358, 17098), (359, 17101), (367, 17200), (369, 17227), (378, 17323), (381, 17386),

Gene: Omnicron_19 Start: 11169, Stop: 15011, Start Num: 5

Candidate Starts for Omnicron_19:

(Start: 5 @11169 has 24 MA's), (13, 11355), (15, 11367), (18, 11433), (19, 11445), (21, 11457), (24, 11475), (25, 11478), (39, 11631), (40, 11652), (41, 11706), (43, 11736), (44, 11754), (45, 11784), (46, 11790), (47, 11799), (48, 11820), (50, 11847), (59, 11937), (64, 12015), (67, 12048), (68, 12060), (71, 12093), (77, 12138), (80, 12171), (84, 12213), (85, 12225), (86, 12228), (101, 12348), (104, 12372), (110, 12438), (113, 12453), (115, 12462), (116, 12468), (120, 12516), (150, 12627), (152, 12636), (157, 12687), (158, 12693), (161, 12708), (164, 12723), (169, 12813), (171, 12846), (188, 12975), (190, 12987), (192, 12996), (195, 13014), (196, 13029), (197, 13041), (202, 13071), (206, 13110), (209, 13131), (210, 13140), (212, 13173), (214, 13185), (215, 13197), (217, 13203), (223, 13263), (224, 13272), (233, 13326), (235, 13338), (251, 13488), (258, 13569), (259, 13572), (264, 13626), (271, 13674), (272, 13683), (274, 13707), (285, 13827), (286, 13830), (293, 13917), (294, 13926), (295, 13986), (296, 14019), (298, 14034), (300, 14040), (306, 14085), (315, 14106), (320, 14133), (327, 14268), (330, 14343), (336, 14451), (341, 14520), (342, 14529), (343, 14532), (344, 14559), (346, 14601), (351, 14631), (356, 14688), (358, 14715), (364, 14775), (370, 14847), (373, 14868), (379, 14940), (380, 14964), (382, 15003),

Gene: Pace1224_16 Start: 11630, Stop: 15664, Start Num: 5

Candidate Starts for Pace1224_16:

(Start: 5 @11630 has 24 MA's), (8, 11723), (11, 11753), (17, 11900), (22, 11984), (Start: 27 @12032 has 2 MA's), (38, 12158), (39, 12170), (40, 12191), (47, 12338), (48, 12359), (49, 12380), (52, 12398), (55, 12422), (56, 12434), (61, 12506), (63, 12521), (64, 12554), (78, 12686), (80, 12710), (83, 12731), (84, 12752), (85, 12764), (88, 12791), (89, 12803), (93, 12833), (98, 12881), (112, 13022), (119, 13064), (120, 13088), (124, 13133), (125, 13136), (135, 13247), (161, 13451), (164, 13466), (167, 13547), (169, 13556), (174, 13616), (190, 13730), (193, 13751), (201, 13811), (205, 13844), (209, 13874), (217, 13946), (220, 13976), (222, 13997), (238, 14102), (239, 14105), (245, 14159), (253, 14258), (255, 14276), (262, 14342), (263, 14357), (266, 14381), (271, 14423), (272, 14432), (280, 14492), (286, 14582), (294, 14678), (295, 14735), (296, 14768), (304, 14828), (307, 14843), (328, 15038), (340, 15245), (345, 15314), (346, 15326), (350, 15356), (354, 15416), (362, 15512), (368, 15572), (371, 15590),

Gene: Paito_16 Start: 11582, Stop: 15610, Start Num: 4

Candidate Starts for Paito_16:

(Start: 4 @11582 has 1 MA's), (14, 11783), (18, 11885), (19, 11897), (22, 11918), (26, 11954), (28, 11969), (32, 12011), (39, 12104), (40, 12125), (46, 12263), (47, 12272), (49, 12314), (52, 12332), (53, 12335), (55, 12356), (56, 12368), (61, 12440), (64, 12488), (80, 12644), (102, 12848), (104, 12869), (108, 12920), (117, 12977), (120, 13013), (127, 13085), (130, 13106), (134, 13145), (135, 13172), (142, 13220), (144, 13241), (147, 13280), (161, 13376), (164, 13391), (172, 13538), (174, 13541), (189, 13649), (224, 13940), (230, 13982), (234, 14000), (239, 14030), (240, 14039), (258, 14246), (260, 14252), (262, 14276), (263, 14291), (265, 14312), (266, 14315), (272, 14366), (280, 14426), (284, 14507), (286, 14516), (287, 14549), (288, 14564), (294, 14612), (295, 14669), (296, 14702), (298, 14717), (308, 14780), (343, 15224), (344, 15251), (346, 15293), (347, 15302), (358, 15401), (362, 15458), (368, 15518), (371, 15536), (372, 15545),

Gene: Patt_22 Start: 13064, Stop: 17230, Start Num: 5

Candidate Starts for Patt_22:

(2, 13028), (Start: 5 @13064 has 24 MA's), (14, 13262), (32, 13490), (33, 13502), (35, 13511), (36, 13541), (40, 13604), (47, 13751), (48, 13772), (52, 13811), (53, 13814), (59, 13889), (64, 13967), (72, 14054), (73, 14057), (76, 14087), (79, 14120), (83, 14144), (91, 14228), (95, 14258), (98, 14285), (107, 14393), (110, 14414), (112, 14426), (115, 14438), (120, 14492), (135, 14651), (138, 14672), (147, 14780), (162, 14900), (186, 15149), (202, 15260), (207, 15311), (209, 15320), (213, 15365), (215, 15386), (227, 15485), (229, 15500), (231, 15506), (241, 15575), (243, 15596), (245, 15605), (247, 15617), (248, 15626), (254, 15698), (258, 15749), (259, 15752), (262, 15779), (275, 15878), (277, 15896), (286, 15971), (297, 16160), (300, 16172), (309, 16247), (326, 16427), (331, 16547), (337, 16655), (339, 16715), (346, 16802), (351, 16832), (357, 16922), (358, 16931), (359, 16934), (367, 17033), (369, 17060), (378, 17156), (381, 17219),

Gene: Rando14_19 Start: 11071, Stop: 14910, Start Num: 5

Candidate Starts for Rando14_19:

(Start: 5 @11071 has 24 MA's), (9, 11170), (13, 11257), (15, 11269), (18, 11335), (19, 11347), (21, 11359), (24, 11377), (39, 11533), (40, 11554), (43, 11638), (44, 11656), (45, 11686), (46, 11692), (47, 11701), (48, 11722), (50, 11749), (51, 11755), (54, 11779), (59, 11839), (64, 11917), (67, 11950), (68, 11962), (71, 11995), (80, 12073), (82, 12091), (84, 12115), (85, 12127), (86, 12130), (101, 12250), (104, 12274), (109, 12337), (110, 12340), (113, 12355), (120, 12418), (137, 12466), (153, 12559), (155, 12574), (169, 12715), (171, 12748), (188, 12877), (190, 12889), (192, 12898), (194, 12913), (196, 12931), (197, 12943), (202, 12973), (206, 13012), (208, 13030), (209, 13033), (215, 13099), (217, 13105), (220, 13135), (223, 13165), (228, 13210), (233, 13228), (235, 13240), (250, 13375), (251, 13390), (258, 13471), (259, 13474), (264, 13528), (271, 13576), (272, 13585), (274, 13609), (276, 13630), (285, 13729), (286, 13732), (290, 13795), (294, 13828), (295, 13888), (296, 13921), (298, 13936), (300, 13942), (306, 13987), (315, 14008), (320, 14035), (327, 14170), (330, 14245), (335, 14335), (341, 14422), (342, 14431), (343, 14434), (344, 14461), (345, 14491), (346, 14503), (351, 14533), (356, 14587), (357, 14605), (364, 14674), (370, 14746), (373, 14767), (379, 14839),

(380, 14863), (382, 14902),

Gene: Reptar3000_22 Start: 13066, Stop: 17232, Start Num: 5

Candidate Starts for Reptar3000_22:

(2, 13030), (Start: 5 @13066 has 24 MA's), (14, 13264), (32, 13492), (33, 13504), (35, 13513), (36, 13543), (40, 13606), (47, 13753), (48, 13774), (52, 13813), (53, 13816), (59, 13891), (64, 13969), (72, 14056), (73, 14059), (76, 14089), (79, 14122), (83, 14146), (91, 14230), (95, 14260), (98, 14287), (107, 14395), (110, 14416), (112, 14428), (115, 14440), (120, 14494), (135, 14653), (138, 14674), (147, 14782), (162, 14902), (186, 15151), (202, 15262), (207, 15313), (209, 15322), (213, 15367), (215, 15388), (227, 15487), (229, 15502), (231, 15508), (241, 15577), (243, 15598), (245, 15607), (247, 15619), (248, 15628), (254, 15700), (258, 15751), (259, 15754), (262, 15781), (275, 15880), (277, 15898), (286, 15973), (297, 16162), (300, 16174), (309, 16249), (326, 16429), (331, 16549), (337, 16657), (339, 16717), (346, 16804), (351, 16834), (357, 16924), (358, 16933), (359, 16936), (367, 17035), (369, 17062), (378, 17158), (381, 17221),

Gene: Ruthiejr_21 Start: 12924, Stop: 17120, Start Num: 5

Candidate Starts for Ruthiejr_21:

(Start: 5 @12924 has 24 MA's), (14, 13122), (31, 13335), (33, 13362), (35, 13371), (39, 13443), (40, 13464), (46, 13602), (47, 13611), (48, 13632), (52, 13671), (58, 13740), (59, 13749), (64, 13827), (65, 13839), (73, 13917), (76, 13947), (79, 13980), (80, 13983), (83, 14004), (98, 14145), (100, 14154), (112, 14286), (115, 14298), (120, 14352), (123, 14391), (127, 14424), (135, 14511), (138, 14532), (154, 14709), (162, 14760), (172, 14919), (202, 15120), (207, 15171), (209, 15180), (213, 15225), (215, 15246), (217, 15252), (231, 15366), (245, 15465), (247, 15477), (248, 15486), (254, 15558), (257, 15591), (258, 15609), (259, 15612), (262, 15639), (275, 15738), (277, 15756), (286, 15831), (297, 16020), (300, 16032), (309, 16107), (318, 16176), (326, 16308), (329, 16422), (346, 16689), (348, 16707), (358, 16818), (359, 16821), (367, 16920), (369, 16947), (370, 16950), (378, 17046), (381, 17109),

Gene: SamScheppers_20 Start: 12840, Stop: 17027, Start Num: 5

Candidate Starts for SamScheppers_20:

(2, 12804), (Start: 5 @12840 has 24 MA's), (14, 13038), (33, 13278), (35, 13287), (40, 13380), (47, 13527), (48, 13548), (52, 13587), (53, 13590), (59, 13665), (64, 13743), (72, 13830), (73, 13833), (76, 13863), (79, 13896), (83, 13920), (91, 14004), (95, 14034), (98, 14061), (107, 14169), (110, 14190), (112, 14202), (115, 14214), (120, 14268), (135, 14427), (138, 14448), (147, 14556), (162, 14676), (202, 15036), (207, 15087), (209, 15096), (213, 15141), (215, 15162), (245, 15381), (247, 15393), (248, 15402), (254, 15474), (258, 15525), (259, 15528), (262, 15555), (275, 15654), (277, 15672), (286, 15747), (297, 15936), (300, 15948), (309, 16023), (326, 16224), (331, 16344), (337, 16452), (346, 16599), (357, 16719), (358, 16728), (359, 16731), (367, 16830), (369, 16857), (378, 16953), (381, 17016),

Gene: Slarp_22 Start: 13324, Stop: 17499, Start Num: 5

Candidate Starts for Slarp_22:

(2, 13288), (Start: 5 @13324 has 24 MA's), (10, 13423), (14, 13522), (33, 13762), (35, 13771), (40, 13864), (47, 14011), (48, 14032), (52, 14071), (53, 14074), (59, 14149), (64, 14227), (72, 14314), (73, 14317), (76, 14347), (79, 14380), (83, 14404), (91, 14488), (95, 14518), (98, 14545), (107, 14653), (110, 14674), (112, 14686), (115, 14698), (120, 14752), (135, 14911), (138, 14932), (147, 15040), (162, 15160), (202, 15520), (207, 15571), (209, 15580), (213, 15625), (215, 15646), (245, 15865), (247, 15877), (248, 15886), (254, 15958), (258, 16009), (259, 16012), (262, 16039), (275, 16138), (277, 16156), (286, 16231), (297, 16420), (300, 16432), (309, 16507), (326, 16693), (331, 16813), (337, 16921), (346, 17071), (357, 17191), (358, 17200), (359, 17203), (367, 17302), (369, 17329), (378, 17425), (381, 17488),

Gene: TM4_17 Start: 10184, Stop: 13873, Start Num: 5

Candidate Starts for TM4_17:

(Start: 5 @10184 has 24 MA's), (Start: 6 @10256 has 1 MA's), (24, 10490), (32, 10541), (39, 10634), (40, 10655), (41, 10709), (47, 10802), (48, 10823), (49, 10844), (50, 10850), (59, 10940), (62, 10982), (64, 11018), (66, 11042), (67, 11051), (68, 11063), (70, 11087), (73, 11108), (75, 11132), (76, 11138), (80, 11174), (81, 11183), (82, 11192), (84, 11216), (85, 11228), (88, 11255), (109, 11438), (111, 11450), (113, 11456), (119, 11495), (120, 11519), (137, 11567), (140, 11579), (146, 11612), (148, 11618), (167, 11807), (168, 11813), (170, 11843), (173, 11870), (177, 11888), (178, 11894), (183, 11918), (195, 11987), (197, 12014), (203, 12047), (208, 12080), (209, 12083), (216, 12134), (223, 12167), (226, 12188), (236, 12212), (244, 12242), (249, 12263), (281, 12545), (286, 12638), (288, 12686), (289, 12689), (290, 12701), (295, 12782), (296, 12815), (297, 12824), (298, 12830), (301, 12863), (305, 12890), (311, 12908), (312, 12926), (315, 12932), (329, 13178), (341, 13358), (342, 13367), (347, 13448), (370, 13703), (378, 13796),

Gene: Taquito_20 Start: 12915, Stop: 17108, Start Num: 5

Candidate Starts for Taquito_20:

(Start: 5 @12915 has 24 MA's), (14, 13113), (33, 13353), (35, 13362), (39, 13434), (40, 13455), (46, 13593), (47, 13602), (48, 13623), (52, 13662), (58, 13731), (59, 13740), (64, 13818), (65, 13830), (73, 13908), (76, 13938), (79, 13971), (80, 13974), (83, 13995), (98, 14136), (100, 14145), (112, 14277), (115, 14289), (120, 14343), (123, 14382), (127, 14415), (135, 14502), (138, 14523), (154, 14700), (162, 14751), (172, 14910), (202, 15111), (207, 15162), (209, 15171), (213, 15216), (215, 15237), (245, 15456), (247, 15468), (248, 15477), (252, 15522), (254, 15549), (257, 15582), (258, 15600), (259, 15603), (262, 15630), (275, 15729), (277, 15747), (286, 15822), (291, 15894), (297, 16011), (300, 16023), (309, 16098), (318, 16167), (326, 16296), (329, 16410), (346, 16677), (348, 16695), (358, 16806), (359, 16809), (367, 16908), (369, 16935), (370, 16938), (378, 17034), (381, 17097),

Gene: Wintermute_22 Start: 13313, Stop: 17488, Start Num: 5

Candidate Starts for Wintermute_22:

(2, 13277), (Start: 5 @13313 has 24 MA's), (14, 13511), (33, 13751), (35, 13760), (40, 13853), (44, 13955), (47, 14000), (52, 14060), (59, 14138), (64, 14216), (72, 14303), (73, 14306), (76, 14336), (79, 14369), (83, 14393), (91, 14477), (95, 14507), (98, 14534), (107, 14642), (110, 14663), (112, 14675), (115, 14687), (120, 14741), (135, 14900), (138, 14921), (147, 15029), (162, 15149), (198, 15491), (202, 15509), (207, 15560), (209, 15569), (213, 15614), (215, 15635), (231, 15755), (245, 15854), (247, 15866), (248, 15875), (254, 15947), (258, 15998), (259, 16001), (262, 16028), (275, 16127), (277, 16145), (286, 16220), (297, 16409), (300, 16421), (309, 16496), (314, 16526), (326, 16682), (331, 16802), (337, 16910), (346, 17060), (358, 17189), (359, 17192), (367, 17291), (369, 17318), (378, 17414), (381, 17477),

Gene: Y10_22 Start: 13313, Stop: 17488, Start Num: 5

Candidate Starts for Y10_22:

(2, 13277), (Start: 5 @13313 has 24 MA's), (14, 13511), (33, 13751), (35, 13760), (40, 13853), (44, 13955), (47, 14000), (52, 14060), (59, 14138), (64, 14216), (72, 14303), (73, 14306), (76, 14336), (79, 14369), (83, 14393), (91, 14477), (95, 14507), (98, 14534), (107, 14642), (110, 14663), (112, 14675), (115, 14687), (120, 14741), (135, 14900), (138, 14921), (147, 15029), (162, 15149), (198, 15491), (202, 15509), (207, 15560), (209, 15569), (213, 15614), (215, 15635), (231, 15755), (245, 15854), (247, 15866), (248, 15875), (254, 15947), (258, 15998), (259, 16001), (262, 16028), (275, 16127), (277, 16145), (286, 16220), (297, 16409), (300, 16421), (309, 16496), (314, 16526), (326, 16682), (331, 16802), (337, 16910), (346, 17060), (357, 17180), (358, 17189), (359, 17192), (367, 17291), (369, 17318), (378, 17414), (381, 17477),

Gene: Y2_22 Start: 13313, Stop: 17488, Start Num: 5

Candidate Starts for Y2_22:

(2, 13277), (Start: 5 @13313 has 24 MA's), (14, 13511), (33, 13751), (35, 13760), (40, 13853), (44, 13955), (47, 14000), (52, 14060), (59, 14138), (64, 14216), (72, 14303), (73, 14306), (76, 14336), (79,

14369), (83, 14393), (91, 14477), (95, 14507), (98, 14534), (107, 14642), (110, 14663), (112, 14675),
(115, 14687), (120, 14741), (135, 14900), (138, 14921), (147, 15029), (162, 15149), (198, 15491),
(202, 15509), (207, 15560), (209, 15569), (213, 15614), (215, 15635), (231, 15755), (245, 15854),
(247, 15866), (248, 15875), (254, 15947), (258, 15998), (259, 16001), (262, 16028), (275, 16127),
(277, 16145), (286, 16220), (297, 16409), (300, 16421), (309, 16496), (314, 16526), (326, 16682),
(331, 16802), (337, 16910), (346, 17060), (357, 17180), (358, 17189), (359, 17192), (367, 17291),
(369, 17318), (378, 17414), (381, 17477),