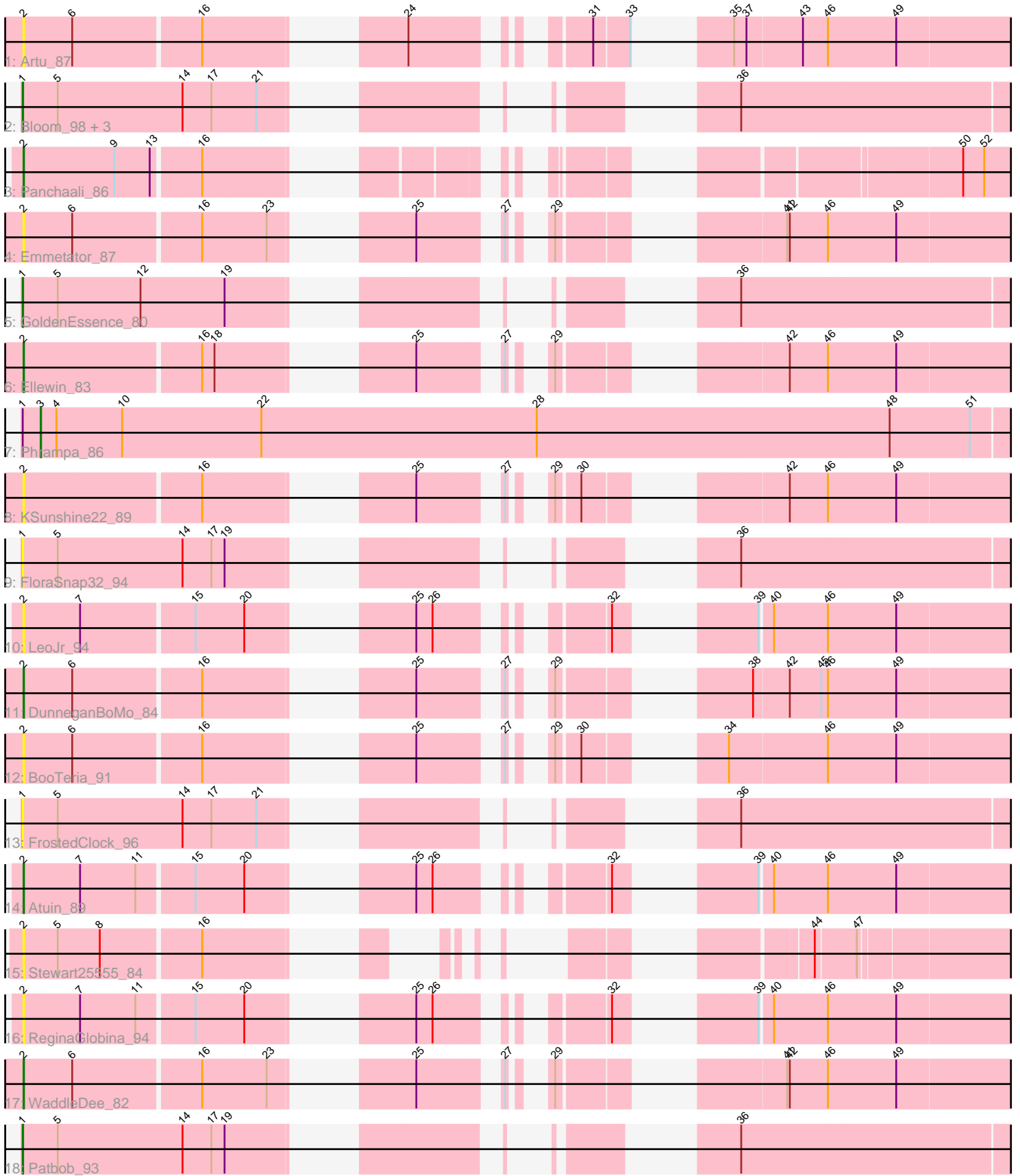


# Zoomed Pham 296952



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 296952 Report

This analysis was run 04/25/26 on database version 644.

Pham number 296952 has 21 members, 10 are drafts.

Phages represented in each track:

- Track 1 : Artu\_87
- Track 2 : Bloom\_98, Talia1610\_94, Racecar\_95, Mimi\_94
- Track 3 : Panchaali\_86
- Track 4 : Emmetator\_87
- Track 5 : GoldenEssence\_80
- Track 6 : Ellewin\_83
- Track 7 : Phrampa\_86
- Track 8 : KSunshine22\_89
- Track 9 : FloraSnap32\_94
- Track 10 : LeoJr\_94
- Track 11 : DunneganBoMo\_84
- Track 12 : BooTeria\_91
- Track 13 : FrostedClock\_96
- Track 14 : Atuin\_89
- Track 15 : Stewart25555\_84
- Track 16 : ReginaGlobina\_94
- Track 17 : WaddleDee\_82
- Track 18 : Patbob\_93

### ***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 5 of the 11 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Bloom\_98, FloraSnap32\_94, FrostedClock\_96, GoldenEssence\_80, Mimi\_94, Patbob\_93, Racecar\_95, Talia1610\_94,

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

- Phrampa\_86,

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

- Artu\_87, Atuin\_89, BooTeria\_91, DunneganBoMo\_84, Ellewin\_83, Emmetator\_87, KSunshine22\_89, LeoJr\_94, Panchaali\_86, ReginaGlobina\_94, Stewart25555\_84,

WaddleDee\_82,

### Summary by start number:

Start 1:

- Found in 9 of 21 ( 42.9% ) of genes in pham
- Manual Annotations of this start: 5 of 11
- Called 88.9% of time when present
- Phage (with cluster) where this start called: Bloom\_98 (FC), FloraSnap32\_94 (FC), FrostedClock\_96 (FC), GoldenEssence\_80 (FC), Mimi\_94 (FC), Patbob\_93 (FC), Racecar\_95 (FC), Talia1610\_94 (FC),

Start 2:

- Found in 12 of 21 ( 57.1% ) of genes in pham
- Manual Annotations of this start: 5 of 11
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Artu\_87 (FC), Atuin\_89 (FC), BooTeria\_91 (FC), DunneganBoMo\_84 (FC), Ellewin\_83 (FC), Emmetator\_87 (FC), KSunshine22\_89 (FC), LeoJr\_94 (FC), Panchaali\_86 (FC), ReginaGlobina\_94 (FC), Stewart25555\_84 (FC), WaddleDee\_82 (FC),

Start 3:

- Found in 1 of 21 ( 4.8% ) of genes in pham
- Manual Annotations of this start: 1 of 11
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Phrampa\_86 (FC),

### Summary by clusters:

There is one cluster represented in this pham: FC

Info for manual annotations of cluster FC:

- Start number 1 was manually annotated 5 times for cluster FC.
- Start number 2 was manually annotated 5 times for cluster FC.
- Start number 3 was manually annotated 1 time for cluster FC.

### Gene Information:

Gene: Artu\_87 Start: 60222, Stop: 73136, Start Num: 2

Candidate Starts for Artu\_87:

(Start: 2 @60222 has 5 MA's), (6, 60330), (16, 60600), (24, 60900), (31, 61179), (33, 61254), (35, 61338), (37, 61365), (43, 61488), (46, 61545), (49, 61701), (55, 62118), (56, 62181), (58, 62235), (64, 62508), (72, 62739), (79, 62895), (80, 62907), (81, 62922), (85, 63105), (86, 63138), (90, 63207), (91, 63210), (95, 63279), (96, 63351), (98, 63390), (99, 63405), (102, 63447), (110, 63717), (118, 63771), (128, 63879), (131, 63933), (137, 64041), (138, 64086), (142, 64140), (144, 64149), (145, 64203), (147, 64257), (150, 64344), (157, 64464), (161, 64581), (178, 64893), (181, 64956), (185, 65133), (189, 65256), (190, 65277), (193, 65319), (202, 65469), (204, 65523), (205, 65535), (207, 65598), (216, 65772), (219, 65847), (221, 65997), (225, 66162), (227, 66183), (228, 66216), (239, 66378), (240, 66432), (242, 66444), (253, 66660), (258, 66729), (259, 66771), (266, 67125), (268, 67158), (281, 67434), (286, 67701), (295, 67890), (296, 67956), (300, 68076), (308, 68316), (311, 68394), (315, 68538), (317, 68637), (319, 68676), (329, 68940), (335, 69141), (336, 69162), (337, 69201),

(338, 69204), (352, 69423), (376, 69528), (379, 69612), (399, 69930), (400, 70011), (401, 70059), (404, 70071), (413, 70218), (417, 70392), (423, 70515), (427, 70680), (441, 70974), (442, 70995), (452, 71172), (453, 71235), (457, 71397), (458, 71403), (465, 71502), (466, 71505), (470, 71616), (472, 71634), (473, 71694), (480, 71808), (483, 71838), (491, 72018), (496, 72123), (497, 72126), (499, 72159), (510, 72261), (519, 72477), (525, 72570), (528, 72666), (536, 72846), (537, 72852), (543, 72960), (548, 73065),

Gene: Atuin\_89 Start: 62854, Stop: 76545, Start Num: 2

Candidate Starts for Atuin\_89:

(Start: 2 @62854 has 5 MA's), (7, 62977), (11, 63103), (15, 63220), (20, 63328), (25, 63553), (26, 63589), (32, 63850), (39, 64027), (40, 64051), (46, 64174), (49, 64330), (65, 65092), (71, 65275), (74, 65299), (76, 65308), (84, 65635), (88, 65710), (92, 65782), (93, 65791), (97, 65929), (103, 66016), (112, 66313), (114, 66325), (115, 66331), (117, 66352), (119, 66385), (122, 66514), (124, 66526), (127, 66571), (133, 66652), (135, 66673), (139, 66796), (141, 66811), (153, 67168), (156, 67177), (158, 67231), (169, 67546), (174, 67615), (176, 67630), (179, 67672), (188, 67972), (190, 68011), (195, 68074), (199, 68128), (207, 68344), (209, 68398), (222, 68572), (224, 68602), (228, 68689), (235, 68797), (236, 68809), (243, 68851), (245, 68917), (258, 69094), (259, 69136), (263, 69337), (266, 69493), (267, 69514), (268, 69526), (277, 69658), (281, 69802), (284, 70009), (287, 70099), (289, 70141), (294, 70213), (296, 70324), (299, 70414), (302, 70483), (309, 70708), (311, 70759), (317, 71002), (324, 71140), (329, 71305), (333, 71428), (335, 71506), (336, 71527), (337, 71566), (350, 72103), (351, 72139), (352, 72187), (363, 72409), (383, 72913), (392, 73141), (395, 73225), (396, 73249), (397, 73267), (407, 73456), (408, 73459), (417, 73756), (425, 73927), (432, 74113), (433, 74119), (442, 74347), (443, 74356), (444, 74362), (445, 74371), (446, 74377), (447, 74404), (448, 74431), (450, 74458), (453, 74587), (455, 74641), (457, 74749), (458, 74755), (459, 74782), (463, 74803), (464, 74806), (467, 74884), (470, 74968), (472, 74986), (479, 75160), (488, 75274), (491, 75406), (493, 75475), (499, 75574), (502, 75604), (506, 75637), (509, 75655), (512, 75736), (514, 75802), (517, 75838), (531, 76204), (542, 76366), (543, 76375),

Gene: Bloom\_98 Start: 63725, Stop: 76525, Start Num: 1

Candidate Starts for Bloom\_98:

(Start: 1 @63725 has 5 MA's), (5, 63803), (14, 64088), (17, 64154), (21, 64256), (36, 64835), (62, 65864), (63, 65924), (67, 66173), (82, 66449), (162, 67709), (171, 67916), (172, 67919), (173, 67940), (186, 68291), (191, 68408), (197, 68483), (214, 68855), (220, 68978), (238, 69338), (244, 69461), (249, 69524), (250, 69533), (251, 69551), (252, 69584), (264, 69977), (270, 70148), (272, 70199), (273, 70220), (275, 70241), (278, 70328), (306, 70634), (318, 71054), (321, 71159), (339, 71639), (340, 71669), (345, 71954), (346, 72044), (348, 72101), (354, 72308), (370, 72512), (375, 72650), (378, 72773), (389, 73058), (402, 73433), (403, 73439), (405, 73448), (410, 73514), (412, 73535), (418, 73817), (426, 74042), (437, 74342), (477, 75182), (482, 75236), (483, 75239), (491, 75413), (494, 75518), (496, 75533), (497, 75536), (498, 75551), (500, 75569), (501, 75575), (505, 75623), (508, 75641), (522, 75932), (529, 76064), (532, 76202), (540, 76337), (543, 76352),

Gene: BooTeria\_91 Start: 60290, Stop: 73204, Start Num: 2

Candidate Starts for BooTeria\_91:

(Start: 2 @60290 has 5 MA's), (6, 60398), (16, 60668), (25, 60986), (27, 61136), (29, 61172), (30, 61220), (34, 61394), (46, 61613), (49, 61769), (55, 62186), (56, 62249), (58, 62303), (64, 62576), (72, 62807), (79, 62963), (80, 62975), (81, 62990), (85, 63173), (86, 63206), (90, 63275), (91, 63278), (95, 63347), (96, 63419), (98, 63458), (99, 63473), (102, 63515), (110, 63785), (116, 63830), (118, 63839), (130, 63992), (131, 64001), (136, 64055), (137, 64109), (138, 64154), (147, 64325), (148, 64358), (150, 64412), (157, 64532), (161, 64649), (178, 64961), (181, 65024), (185, 65201), (189, 65324), (190, 65345), (193, 65387), (202, 65537), (204, 65591), (205, 65603), (207, 65666), (216, 65840), (219, 65915), (221, 66065), (225, 66230), (227, 66251), (228, 66284), (239, 66446), (240, 66500), (242, 66512), (246, 66629), (253, 66728), (258, 66797), (259, 66839), (266, 67193), (268, 67226), (281, 67502), (286, 67769), (295, 67958), (296, 68024), (300, 68144), (308, 68384), (311, 68462),

(315, 68606), (317, 68705), (319, 68744), (329, 69008), (335, 69209), (336, 69230), (337, 69269), (338, 69272), (352, 69491), (376, 69596), (379, 69680), (399, 69998), (400, 70079), (401, 70127), (404, 70139), (413, 70286), (417, 70460), (423, 70583), (427, 70748), (441, 71042), (442, 71063), (452, 71240), (453, 71303), (457, 71465), (458, 71471), (465, 71570), (466, 71573), (469, 71672), (470, 71684), (471, 71699), (472, 71702), (473, 71762), (480, 71876), (483, 71906), (491, 72086), (496, 72191), (497, 72194), (499, 72227), (510, 72329), (519, 72545), (525, 72638), (528, 72734), (536, 72914), (537, 72920), (543, 73028), (548, 73133),

Gene: DunneganBoMo\_84 Start: 59721, Stop: 72473, Start Num: 2

Candidate Starts for DunneganBoMo\_84:

(Start: 2 @59721 has 5 MA's), (6, 59829), (16, 60099), (25, 60417), (27, 60567), (29, 60603), (38, 60879), (42, 60957), (45, 61029), (46, 61044), (49, 61200), (55, 61617), (56, 61680), (58, 61734), (64, 62007), (72, 62238), (79, 62394), (80, 62406), (81, 62421), (85, 62604), (86, 62637), (90, 62706), (91, 62709), (96, 62850), (98, 62889), (99, 62904), (102, 62946), (110, 63216), (118, 63270), (128, 63378), (137, 63540), (138, 63585), (142, 63639), (144, 63648), (145, 63702), (147, 63756), (150, 63843), (157, 63963), (161, 64080), (178, 64392), (181, 64455), (185, 64632), (189, 64755), (190, 64776), (193, 64818), (202, 64968), (204, 65022), (205, 65034), (207, 65097), (216, 65271), (219, 65346), (221, 65496), (225, 65661), (228, 65715), (229, 65727), (237, 65844), (245, 65889), (246, 65898), (253, 65997), (257, 66063), (258, 66066), (259, 66108), (265, 66390), (266, 66462), (268, 66495), (281, 66771), (286, 67038), (295, 67227), (296, 67293), (300, 67413), (308, 67653), (315, 67875), (317, 67974), (319, 68013), (329, 68277), (335, 68478), (336, 68499), (337, 68538), (338, 68541), (352, 68760), (376, 68865), (379, 68949), (399, 69267), (400, 69348), (401, 69396), (404, 69408), (413, 69555), (417, 69729), (423, 69852), (427, 70017), (441, 70311), (442, 70332), (452, 70509), (453, 70572), (457, 70734), (458, 70740), (465, 70839), (466, 70842), (469, 70941), (470, 70953), (471, 70968), (472, 70971), (473, 71031), (480, 71145), (483, 71175), (491, 71355), (496, 71460), (497, 71463), (499, 71496), (510, 71598), (519, 71814), (525, 71907), (528, 72003), (537, 72189), (543, 72297), (548, 72402),

Gene: Ellewin\_83 Start: 59301, Stop: 71885, Start Num: 2

Candidate Starts for Ellewin\_83:

(Start: 2 @59301 has 5 MA's), (16, 59679), (18, 59706), (25, 59997), (27, 60147), (29, 60183), (42, 60537), (46, 60624), (49, 60780), (55, 61197), (58, 61314), (64, 61587), (72, 61818), (79, 61974), (80, 61986), (81, 62001), (85, 62184), (90, 62286), (91, 62289), (94, 62343), (95, 62358), (96, 62430), (98, 62469), (99, 62484), (102, 62526), (120, 62904), (123, 63003), (128, 63066), (140, 63282), (142, 63327), (144, 63336), (145, 63390), (149, 63498), (150, 63531), (153, 63597), (161, 63768), (185, 64317), (189, 64440), (193, 64503), (202, 64653), (210, 64857), (215, 64878), (217, 64911), (225, 65073), (228, 65127), (229, 65139), (253, 65409), (258, 65478), (259, 65520), (266, 65874), (268, 65907), (281, 66183), (283, 66327), (292, 66552), (295, 66639), (296, 66705), (303, 66891), (311, 67143), (315, 67287), (317, 67386), (319, 67425), (320, 67464), (328, 67665), (329, 67689), (335, 67890), (336, 67911), (337, 67950), (338, 67953), (352, 68172), (376, 68277), (379, 68361), (399, 68679), (401, 68808), (404, 68820), (413, 68967), (415, 69024), (417, 69141), (423, 69264), (427, 69429), (429, 69435), (441, 69723), (442, 69744), (451, 69894), (452, 69921), (453, 69984), (457, 70146), (458, 70152), (465, 70251), (466, 70254), (469, 70353), (470, 70365), (472, 70383), (473, 70443), (480, 70557), (491, 70767), (496, 70872), (499, 70908), (510, 71010), (511, 71025), (515, 71160), (519, 71226), (525, 71319), (528, 71415), (536, 71595), (537, 71601), (543, 71709), (548, 71814),

Gene: Emmetator\_87 Start: 60555, Stop: 72476, Start Num: 2

Candidate Starts for Emmetator\_87:

(Start: 2 @60555 has 5 MA's), (6, 60663), (16, 60933), (23, 61077), (25, 61251), (27, 61401), (29, 61437), (41, 61785), (42, 61791), (46, 61878), (49, 62034), (55, 62451), (69, 62766), (77, 62832), (78, 62841), (108, 63057), (110, 63165), (137, 63327), (138, 63372), (142, 63426), (144, 63435), (145, 63489), (147, 63543), (150, 63630), (157, 63750), (161, 63867), (178, 64179), (181, 64242), (185,

64419), (189, 64542), (190, 64563), (193, 64605), (202, 64755), (204, 64809), (205, 64821), (207, 64884), (216, 65058), (219, 65133), (221, 65283), (225, 65448), (228, 65502), (239, 65664), (240, 65718), (242, 65730), (246, 65847), (247, 65892), (248, 65901), (253, 66000), (257, 66066), (258, 66069), (259, 66111), (265, 66393), (266, 66465), (268, 66498), (281, 66774), (286, 67041), (295, 67230), (296, 67296), (300, 67416), (308, 67656), (315, 67878), (317, 67977), (319, 68016), (328, 68256), (329, 68280), (332, 68370), (333, 68403), (335, 68481), (336, 68502), (337, 68541), (338, 68544), (352, 68763), (379, 68952), (399, 69270), (404, 69411), (413, 69558), (415, 69615), (417, 69732), (423, 69855), (427, 70020), (431, 70077), (439, 70305), (442, 70335), (451, 70485), (452, 70512), (453, 70575), (457, 70737), (458, 70743), (465, 70842), (466, 70845), (469, 70944), (470, 70956), (471, 70971), (472, 70974), (473, 71034), (480, 71148), (483, 71178), (491, 71358), (496, 71463), (497, 71466), (499, 71499), (510, 71601), (519, 71817), (525, 71910), (528, 72006), (536, 72186), (537, 72192), (543, 72300), (548, 72405),

Gene: FloraSnap32\_94 Start: 62765, Stop: 75421, Start Num: 1

Candidate Starts for FloraSnap32\_94:

(Start: 1 @62765 has 5 MA's), (5, 62843), (14, 63128), (17, 63194), (19, 63224), (36, 63875), (62, 64904), (63, 64964), (82, 65489), (162, 66749), (163, 66836), (171, 66956), (172, 66959), (173, 66980), (177, 67034), (187, 67382), (191, 67448), (197, 67523), (214, 67895), (220, 68018), (238, 68378), (244, 68501), (250, 68573), (251, 68591), (252, 68624), (264, 69017), (271, 69200), (273, 69260), (275, 69281), (278, 69368), (305, 69599), (306, 69674), (307, 69734), (312, 69839), (321, 70199), (331, 70439), (340, 70709), (356, 71336), (357, 71342), (360, 71384), (361, 71408), (371, 71516), (374, 71576), (378, 71714), (388, 71969), (406, 72401), (422, 72839), (426, 72974), (437, 73274), (452, 73529), (456, 73739), (477, 74114), (485, 74195), (491, 74333), (493, 74402), (496, 74453), (500, 74489), (508, 74558), (519, 74774), (523, 74855), (536, 75140), (545, 75287), (546, 75293),

Gene: FrostedClock\_96 Start: 63213, Stop: 76004, Start Num: 1

Candidate Starts for FrostedClock\_96:

(Start: 1 @63213 has 5 MA's), (5, 63291), (14, 63576), (17, 63642), (21, 63744), (36, 64323), (62, 65352), (63, 65412), (67, 65661), (82, 65937), (162, 67197), (171, 67404), (172, 67407), (173, 67428), (186, 67779), (191, 67896), (197, 67971), (214, 68343), (220, 68466), (238, 68826), (244, 68949), (249, 69012), (250, 69021), (251, 69039), (252, 69072), (264, 69465), (270, 69636), (272, 69687), (273, 69708), (275, 69729), (278, 69816), (306, 70122), (318, 70542), (321, 70647), (339, 71127), (340, 71157), (345, 71442), (346, 71532), (348, 71589), (354, 71796), (370, 72000), (375, 72138), (378, 72261), (389, 72546), (390, 72561), (391, 72576), (406, 72948), (422, 73386), (423, 73398), (426, 73521), (437, 73821), (452, 74076), (477, 74661), (482, 74715), (483, 74718), (491, 74892), (494, 74997), (496, 75012), (497, 75015), (498, 75030), (500, 75048), (501, 75054), (505, 75102), (508, 75120), (522, 75411), (529, 75543), (532, 75681), (540, 75816), (543, 75831),

Gene: GoldenEssence\_80 Start: 57521, Stop: 70312, Start Num: 1

Candidate Starts for GoldenEssence\_80:

(Start: 1 @57521 has 5 MA's), (5, 57599), (12, 57788), (19, 57980), (36, 58631), (62, 59660), (63, 59720), (67, 59969), (82, 60245), (107, 60854), (162, 61505), (171, 61712), (172, 61715), (177, 61790), (191, 62204), (197, 62279), (207, 62516), (208, 62564), (214, 62648), (220, 62771), (238, 63131), (244, 63254), (250, 63326), (251, 63344), (252, 63377), (264, 63770), (271, 63953), (273, 64013), (275, 64034), (278, 64121), (312, 64592), (321, 64952), (322, 64967), (331, 65222), (340, 65492), (345, 65777), (346, 65867), (349, 65927), (354, 66131), (375, 66473), (378, 66596), (388, 66851), (389, 66881), (398, 67106), (402, 67256), (403, 67262), (405, 67271), (410, 67337), (412, 67358), (418, 67640), (426, 67865), (437, 68165), (452, 68420), (456, 68630), (477, 69005), (485, 69086), (491, 69224), (496, 69344), (500, 69380), (501, 69386), (507, 69437), (508, 69449), (518, 69659), (523, 69746), (527, 69839), (536, 70031),

Gene: KSunshine22\_89 Start: 60934, Stop: 73530, Start Num: 2

Candidate Starts for KSunshine22\_89:

(Start: 2 @60934 has 5 MA's), (16, 61312), (25, 61630), (27, 61780), (29, 61816), (30, 61864), (42, 62170), (46, 62257), (49, 62413), (55, 62830), (58, 62947), (64, 63220), (72, 63451), (79, 63607), (80, 63619), (81, 63634), (85, 63817), (90, 63919), (91, 63922), (94, 63976), (95, 63991), (96, 64063), (98, 64102), (99, 64117), (102, 64159), (120, 64537), (123, 64636), (128, 64699), (140, 64915), (142, 64960), (144, 64969), (145, 65023), (149, 65131), (150, 65164), (153, 65230), (161, 65401), (185, 65950), (189, 66073), (193, 66136), (210, 66502), (215, 66523), (217, 66556), (225, 66718), (228, 66772), (229, 66784), (237, 66901), (245, 66946), (246, 66955), (253, 67054), (258, 67123), (259, 67165), (266, 67519), (268, 67552), (281, 67828), (283, 67972), (292, 68197), (295, 68284), (296, 68350), (303, 68536), (315, 68932), (317, 69031), (319, 69070), (320, 69109), (328, 69310), (329, 69334), (335, 69535), (336, 69556), (337, 69595), (338, 69598), (352, 69817), (376, 69922), (379, 70006), (399, 70324), (400, 70405), (401, 70453), (404, 70465), (413, 70612), (415, 70669), (417, 70786), (423, 70909), (427, 71074), (429, 71080), (441, 71368), (442, 71389), (451, 71539), (452, 71566), (453, 71629), (457, 71791), (458, 71797), (465, 71896), (466, 71899), (469, 71998), (470, 72010), (471, 72025), (472, 72028), (473, 72088), (480, 72202), (483, 72232), (491, 72412), (496, 72517), (497, 72520), (499, 72553), (510, 72655), (519, 72871), (525, 72964), (528, 73060), (536, 73240), (537, 73246), (543, 73354), (548, 73459),

Gene: LeoJr\_94 Start: 62982, Stop: 76781, Start Num: 2

Candidate Starts for LeoJr\_94:

(Start: 2 @62982 has 5 MA's), (7, 63105), (15, 63348), (20, 63456), (25, 63681), (26, 63717), (32, 63978), (39, 64155), (40, 64179), (46, 64302), (49, 64458), (71, 65403), (74, 65427), (76, 65436), (84, 65763), (88, 65838), (92, 65910), (93, 65919), (97, 66057), (103, 66144), (112, 66441), (114, 66453), (115, 66459), (117, 66480), (119, 66513), (122, 66642), (124, 66654), (127, 66699), (133, 66780), (135, 66801), (139, 66924), (141, 66939), (153, 67296), (156, 67305), (165, 67623), (169, 67674), (174, 67743), (176, 67758), (179, 67800), (188, 68100), (190, 68139), (199, 68256), (207, 68472), (209, 68526), (218, 68625), (222, 68700), (224, 68730), (228, 68817), (235, 68925), (236, 68937), (243, 69087), (245, 69153), (258, 69330), (259, 69372), (266, 69729), (267, 69750), (268, 69762), (277, 69894), (281, 70038), (284, 70245), (287, 70335), (289, 70377), (294, 70449), (296, 70560), (299, 70650), (302, 70719), (309, 70944), (311, 70995), (317, 71238), (324, 71376), (329, 71541), (333, 71664), (335, 71742), (336, 71763), (337, 71802), (350, 72339), (351, 72375), (352, 72423), (363, 72645), (383, 73149), (392, 73377), (395, 73461), (396, 73485), (397, 73503), (407, 73692), (408, 73695), (417, 73992), (425, 74163), (432, 74349), (433, 74355), (442, 74583), (443, 74592), (444, 74598), (445, 74607), (446, 74613), (447, 74640), (448, 74667), (450, 74694), (453, 74823), (455, 74877), (457, 74985), (458, 74991), (459, 75018), (463, 75039), (464, 75042), (467, 75120), (470, 75204), (472, 75222), (479, 75396), (488, 75510), (491, 75642), (493, 75711), (499, 75810), (502, 75840), (506, 75873), (509, 75891), (512, 75972), (514, 76038), (517, 76074), (531, 76440), (542, 76602), (543, 76611),

Gene: Mimi\_94 Start: 63072, Stop: 75872, Start Num: 1

Candidate Starts for Mimi\_94:

(Start: 1 @63072 has 5 MA's), (5, 63150), (14, 63435), (17, 63501), (21, 63603), (36, 64182), (62, 65211), (63, 65271), (67, 65520), (82, 65796), (162, 67056), (171, 67263), (172, 67266), (173, 67287), (186, 67638), (191, 67755), (197, 67830), (214, 68202), (220, 68325), (238, 68685), (244, 68808), (249, 68871), (250, 68880), (251, 68898), (252, 68931), (264, 69324), (270, 69495), (272, 69546), (273, 69567), (275, 69588), (278, 69675), (306, 69981), (318, 70401), (321, 70506), (339, 70986), (340, 71016), (345, 71301), (346, 71391), (348, 71448), (354, 71655), (370, 71859), (375, 71997), (378, 72120), (389, 72405), (402, 72780), (403, 72786), (405, 72795), (410, 72861), (412, 72882), (418, 73164), (426, 73389), (437, 73689), (477, 74529), (482, 74583), (483, 74586), (491, 74760), (494, 74865), (496, 74880), (497, 74883), (498, 74898), (500, 74916), (501, 74922), (505, 74970), (508, 74988), (522, 75279), (529, 75411), (532, 75549), (540, 75684), (543, 75699),

Gene: Panchaali\_86 Start: 60813, Stop: 73469, Start Num: 2

Candidate Starts for Panchaali\_86:

(Start: 2 @60813 has 5 MA's), (9, 61014), (13, 61095), (16, 61191), (50, 62340), (52, 62388), (53, 62547), (57, 62700), (65, 62985), (66, 63009), (75, 63189), (87, 63438), (104, 63675), (109, 63816), (111, 63873), (142, 64272), (146, 64356), (148, 64410), (156, 64539), (166, 64878), (168, 64908), (170, 64917), (175, 64989), (180, 65037), (183, 65160), (184, 65175), (200, 65490), (204, 65577), (215, 65760), (225, 65907), (226, 65913), (227, 65928), (229, 65970), (231, 66012), (232, 66033), (258, 66309), (259, 66351), (261, 66447), (266, 66705), (268, 66738), (274, 66828), (277, 66870), (281, 67014), (286, 67287), (291, 67383), (295, 67476), (296, 67542), (310, 67935), (311, 67980), (313, 68055), (316, 68217), (317, 68223), (324, 68361), (329, 68526), (330, 68574), (333, 68649), (335, 68727), (336, 68748), (337, 68787), (341, 68871), (343, 69096), (344, 69114), (347, 69159), (365, 69417), (367, 69465), (372, 69540), (380, 69807), (381, 69855), (385, 69930), (386, 69957), (393, 70137), (394, 70188), (409, 70485), (428, 71031), (430, 71055), (436, 71190), (437, 71268), (438, 71307), (442, 71343), (454, 71613), (460, 71790), (466, 71847), (468, 71940), (470, 71958), (473, 72036), (481, 72159), (491, 72357), (496, 72462), (499, 72498), (503, 72528), (510, 72600), (516, 72753), (521, 72849), (525, 72909), (528, 73005), (541, 73281),

Gene: Patbob\_93 Start: 63944, Stop: 76600, Start Num: 1

Candidate Starts for Patbob\_93:

(Start: 1 @63944 has 5 MA's), (5, 64022), (14, 64307), (17, 64373), (19, 64403), (36, 65054), (54, 65807), (62, 66083), (63, 66143), (67, 66392), (73, 66479), (107, 67277), (162, 67928), (171, 68135), (172, 68138), (173, 68159), (186, 68510), (191, 68627), (197, 68702), (214, 69074), (220, 69197), (238, 69557), (244, 69680), (250, 69752), (251, 69770), (252, 69803), (264, 70196), (271, 70379), (273, 70439), (275, 70460), (278, 70547), (305, 70778), (306, 70853), (312, 71018), (321, 71378), (340, 71888), (356, 72515), (357, 72521), (360, 72563), (361, 72587), (362, 72590), (369, 72683), (371, 72695), (373, 72731), (374, 72755), (378, 72893), (389, 73178), (406, 73580), (422, 74018), (423, 74030), (426, 74153), (437, 74453), (440, 74498), (456, 74918), (477, 75293), (491, 75512), (493, 75581), (496, 75632), (500, 75668), (508, 75737), (519, 75953), (523, 76034), (536, 76319),

Gene: Phrampa\_86 Start: 61282, Stop: 78105, Start Num: 3

Candidate Starts for Phrampa\_86:

(Start: 1 @61243 has 5 MA's), (Start: 3 @61282 has 1 MA's), (4, 61318), (10, 61468), (22, 61786), (28, 62413), (48, 63214), (51, 63397), (60, 63799), (89, 64750), (121, 65575), (130, 65722), (143, 65959), (152, 66328), (154, 66373), (155, 66376), (167, 66742), (171, 66787), (182, 67033), (192, 67321), (194, 67342), (196, 67363), (201, 67477), (211, 67720), (212, 67738), (213, 67741), (223, 68113), (241, 68440), (260, 68923), (262, 68992), (273, 69343), (275, 69364), (276, 69376), (279, 69454), (282, 69712), (285, 69970), (288, 70027), (289, 70054), (290, 70057), (291, 70078), (295, 70171), (296, 70237), (297, 70306), (298, 70357), (301, 70555), (325, 71620), (327, 71650), (340, 72415), (356, 73042), (357, 73048), (359, 73081), (360, 73090), (361, 73114), (364, 73132), (366, 73144), (374, 73282), (378, 73420), (402, 74080), (403, 74086), (405, 74095), (410, 74161), (411, 74164), (412, 74182), (414, 74251), (416, 74299), (418, 74464), (421, 74551), (434, 74839), (462, 75526), (484, 75931), (487, 75964), (492, 76099), (520, 76549), (530, 76822), (533, 76933), (534, 76942), (535, 76948), (538, 76996), (539, 77032), (540, 77056), (544, 77080), (547, 77125), (549, 77401), (550, 77458), (551, 77638), (552, 78040), (553, 78076), (554, 78100),

Gene: Racecar\_95 Start: 63725, Stop: 76525, Start Num: 1

Candidate Starts for Racecar\_95:

(Start: 1 @63725 has 5 MA's), (5, 63803), (14, 64088), (17, 64154), (21, 64256), (36, 64835), (62, 65864), (63, 65924), (67, 66173), (82, 66449), (162, 67709), (171, 67916), (172, 67919), (173, 67940), (186, 68291), (191, 68408), (197, 68483), (214, 68855), (220, 68978), (238, 69338), (244, 69461), (249, 69524), (250, 69533), (251, 69551), (252, 69584), (264, 69977), (270, 70148), (272, 70199), (273, 70220), (275, 70241), (278, 70328), (306, 70634), (318, 71054), (321, 71159), (339, 71639), (340, 71669), (345, 71954), (346, 72044), (348, 72101), (354, 72308), (370, 72512), (375, 72650), (378, 72773), (389, 73058), (402, 73433), (403, 73439), (405, 73448), (410, 73514), (412, 73535),

(418, 73817), (426, 74042), (437, 74342), (477, 75182), (482, 75236), (483, 75239), (491, 75413), (494, 75518), (496, 75533), (497, 75536), (498, 75551), (500, 75569), (501, 75575), (505, 75623), (508, 75641), (522, 75932), (529, 76064), (532, 76202), (540, 76337), (543, 76352),

Gene: ReginaGlobina\_94 Start: 63735, Stop: 76346, Start Num: 2

Candidate Starts for ReginaGlobina\_94:

(Start: 2 @63735 has 5 MA's), (7, 63858), (11, 63984), (15, 64101), (20, 64209), (25, 64434), (26, 64470), (32, 64731), (39, 64908), (40, 64932), (46, 65055), (49, 65211), (68, 66102), (71, 66156), (74, 66180), (76, 66189), (83, 66408), (101, 66690), (122, 66930), (125, 66960), (126, 66969), (127, 66987), (133, 67068), (135, 67089), (139, 67212), (141, 67227), (160, 67476), (169, 67692), (174, 67761), (188, 68121), (190, 68160), (199, 68277), (207, 68493), (209, 68547), (218, 68646), (222, 68721), (224, 68751), (228, 68838), (245, 68904), (258, 69081), (259, 69123), (266, 69480), (267, 69501), (268, 69513), (277, 69645), (281, 69789), (287, 70095), (289, 70137), (294, 70209), (296, 70320), (302, 70479), (311, 70815), (313, 70890), (317, 71058), (321, 71169), (324, 71196), (329, 71361), (333, 71484), (334, 71508), (336, 71583), (337, 71622), (341, 71706), (358, 72147), (368, 72288), (382, 72684), (383, 72714), (384, 72723), (392, 72942), (396, 73050), (397, 73068), (407, 73257), (408, 73260), (417, 73557), (425, 73728), (432, 73914), (433, 73920), (442, 74148), (443, 74157), (444, 74163), (445, 74172), (446, 74178), (447, 74205), (448, 74232), (450, 74259), (453, 74388), (455, 74442), (457, 74550), (458, 74556), (459, 74583), (463, 74604), (464, 74607), (467, 74685), (470, 74769), (472, 74787), (479, 74961), (488, 75075), (491, 75207), (493, 75276), (499, 75375), (502, 75405), (506, 75438), (509, 75456), (512, 75537), (514, 75603), (517, 75639), (531, 76005), (542, 76167), (543, 76176),

Gene: Stewart25555\_84 Start: 60244, Stop: 72339, Start Num: 2

Candidate Starts for Stewart25555\_84:

(Start: 2 @60244 has 5 MA's), (5, 60319), (8, 60412), (16, 60622), (44, 61297), (47, 61378), (59, 61996), (61, 62017), (65, 62248), (68, 62374), (70, 62407), (77, 62473), (100, 62875), (105, 62905), (106, 62914), (108, 62932), (113, 63013), (129, 63157), (132, 63172), (134, 63199), (142, 63367), (145, 63430), (151, 63529), (158, 63646), (159, 63700), (164, 63883), (174, 64024), (177, 64054), (190, 64426), (193, 64480), (195, 64489), (198, 64522), (203, 64630), (206, 64693), (209, 64801), (217, 64888), (229, 65119), (230, 65152), (233, 65188), (234, 65209), (236, 65230), (254, 65581), (255, 65599), (256, 65602), (269, 66103), (280, 66325), (286, 66640), (290, 66715), (292, 66742), (293, 66748), (295, 66829), (304, 67090), (308, 67255), (311, 67333), (313, 67408), (314, 67411), (317, 67576), (323, 67705), (326, 67744), (335, 68080), (336, 68101), (337, 68140), (342, 68314), (353, 68611), (355, 68665), (374, 68908), (375, 68959), (377, 69052), (381, 69175), (385, 69250), (386, 69277), (387, 69319), (393, 69457), (394, 69508), (409, 69805), (419, 70138), (420, 70147), (424, 70222), (430, 70345), (435, 70447), (447, 70687), (449, 70732), (461, 71080), (463, 71083), (466, 71134), (469, 71233), (470, 71245), (474, 71365), (475, 71395), (476, 71407), (478, 71413), (486, 71506), (489, 71545), (490, 71590), (495, 71743), (504, 71839), (512, 71959), (513, 72022), (524, 72184), (526, 72256), (528, 72289),

Gene: Talia1610\_94 Start: 63090, Stop: 75890, Start Num: 1

Candidate Starts for Talia1610\_94:

(Start: 1 @63090 has 5 MA's), (5, 63168), (14, 63453), (17, 63519), (21, 63621), (36, 64200), (62, 65229), (63, 65289), (67, 65538), (82, 65814), (162, 67074), (171, 67281), (172, 67284), (173, 67305), (186, 67656), (191, 67773), (197, 67848), (214, 68220), (220, 68343), (238, 68703), (244, 68826), (249, 68889), (250, 68898), (251, 68916), (252, 68949), (264, 69342), (270, 69513), (272, 69564), (273, 69585), (275, 69606), (278, 69693), (306, 69999), (318, 70419), (321, 70524), (339, 71004), (340, 71034), (345, 71319), (346, 71409), (348, 71466), (354, 71673), (370, 71877), (375, 72015), (378, 72138), (389, 72423), (402, 72798), (403, 72804), (405, 72813), (410, 72879), (412, 72900), (418, 73182), (426, 73407), (437, 73707), (477, 74547), (482, 74601), (483, 74604), (491, 74778), (494, 74883), (496, 74898), (497, 74901), (498, 74916), (500, 74934), (501, 74940), (505, 74988), (508, 75006), (522, 75297), (529, 75429), (532, 75567), (540, 75702), (543, 75717),

Gene: WaddleDee\_82 Start: 59576, Stop: 71659, Start Num: 2

Candidate Starts for WaddleDee\_82:

(Start: 2 @59576 has 5 MA's), (6, 59684), (16, 59954), (23, 60098), (25, 60272), (27, 60422), (29, 60458), (41, 60806), (42, 60812), (46, 60899), (49, 61055), (55, 61472), (69, 61787), (77, 61853), (78, 61862), (108, 62078), (110, 62186), (128, 62348), (137, 62510), (138, 62555), (142, 62609), (144, 62618), (145, 62672), (147, 62726), (150, 62813), (157, 62933), (161, 63050), (178, 63362), (181, 63425), (185, 63602), (189, 63725), (190, 63746), (193, 63788), (202, 63938), (204, 63992), (205, 64004), (207, 64067), (216, 64241), (219, 64316), (221, 64466), (225, 64631), (228, 64685), (239, 64847), (240, 64901), (242, 64913), (246, 65030), (247, 65075), (248, 65084), (253, 65183), (257, 65249), (258, 65252), (259, 65294), (265, 65576), (266, 65648), (268, 65681), (281, 65957), (286, 66224), (295, 66413), (296, 66479), (300, 66599), (308, 66839), (315, 67061), (317, 67160), (319, 67199), (329, 67463), (335, 67664), (336, 67685), (337, 67724), (338, 67727), (352, 67946), (376, 68051), (379, 68135), (399, 68453), (400, 68534), (401, 68582), (404, 68594), (413, 68741), (417, 68915), (423, 69038), (427, 69203), (441, 69497), (442, 69518), (452, 69695), (453, 69758), (457, 69920), (458, 69926), (465, 70025), (466, 70028), (469, 70127), (470, 70139), (471, 70154), (472, 70157), (473, 70217), (480, 70331), (483, 70361), (491, 70541), (496, 70646), (497, 70649), (499, 70682), (510, 70784), (519, 71000), (525, 71093), (528, 71189), (537, 71375), (543, 71483), (548, 71588),