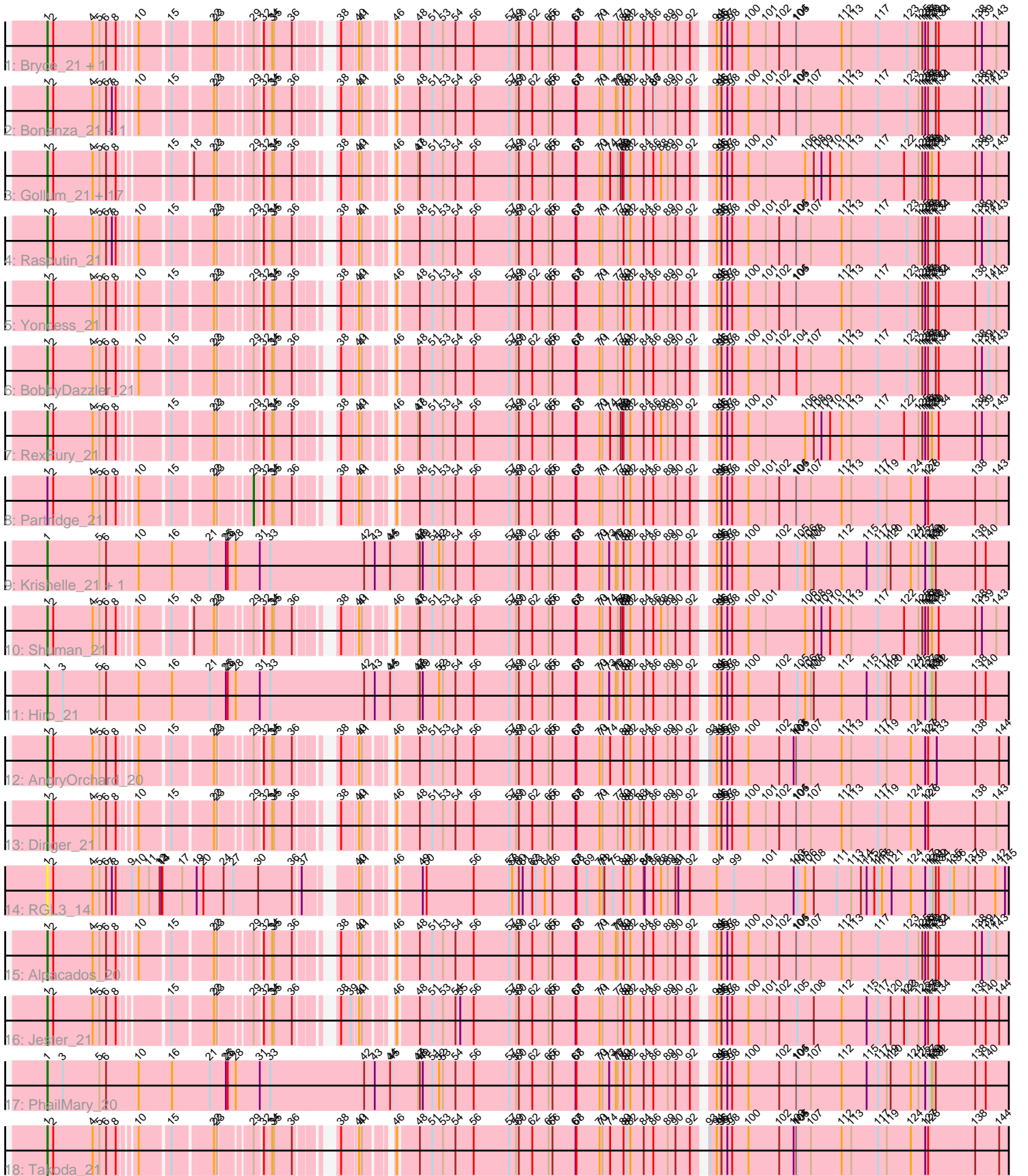


# Zoomed Pham 165155



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 165155 Report

This analysis was run 07/09/24 on database version 566.

Pham number 165155 has 38 members, 2 are drafts.

Phages represented in each track:

- Track 1 : Bryce\_21, Harlequin\_21
- Track 2 : Bonanza\_21, Yogi\_21
- Track 3 : Gollum\_21, Alatin\_21, CosmicSans\_21, Rhodalysa\_21, Natosaleda\_21, Bradshaw\_21, Erik\_21, Naiad\_21, Lillie\_21, RER2\_14, Nancinator\_21, Belenaria\_21, StCroix\_21, Phrankenstein\_21, Espica\_21, TWAMP\_21, Swann\_21, UhSalsa\_21
- Track 4 : Rasputin\_21
- Track 5 : Yoncess\_21
- Track 6 : BobbyDazzler\_21
- Track 7 : RexFury\_21
- Track 8 : Partridge\_21
- Track 9 : Krishelle\_21, AppleCloud\_19
- Track 10 : Shuman\_21
- Track 11 : Hiro\_21
- Track 12 : AngryOrchard\_20
- Track 13 : Dinger\_21
- Track 14 : RGL3\_14
- Track 15 : Alpacados\_20
- Track 16 : Jester\_21
- Track 17 : PhailMary\_20
- Track 18 : Takoda\_21

### ***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 35 of the 36 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Alatin\_21, Alpacados\_20, AngryOrchard\_20, AppleCloud\_19, Belenaria\_21, BobbyDazzler\_21, Bonanza\_21, Bradshaw\_21, Bryce\_21, CosmicSans\_21, Dinger\_21, Erik\_21, Espica\_21, Gollum\_21, Harlequin\_21, Hiro\_21, Jester\_21, Krishelle\_21, Lillie\_21, Naiad\_21, Nancinator\_21, Natosaleda\_21, PhailMary\_20, Phrankenstein\_21, RER2\_14, RGL3\_14, Rasputin\_21, RexFury\_21, Rhodalysa\_21, Shuman\_21, StCroix\_21, Swann\_21, TWAMP\_21, Takoda\_21, UhSalsa\_21, Yogi\_21, Yoncess\_21,

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

- Partridge\_21,

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

- 

### Summary by start number:

Start 1:

- Found in 38 of 38 ( 100.0% ) of genes in pham
- Manual Annotations of this start: 35 of 36
- Called 97.4% of time when present
- Phage (with cluster) where this start called: Alatin\_21 (CA), Alpacados\_20 (CA), AngryOrchard\_20 (CA), AppleCloud\_19 (CA), Belenaria\_21 (CA), BobbyDazzler\_21 (CA), Bonanza\_21 (CA), Bradshaw\_21 (CA), Bryce\_21 (CA), CosmicSans\_21 (CA), Dinger\_21 (CA), Erik\_21 (CA), Espica\_21 (CA), Gollum\_21 (CA), Harlequin\_21 (CA), Hiro\_21 (CA), Jester\_21 (CA), Krishelle\_21 (CA), Lillie\_21 (CA), Naiad\_21 (CA), Nancinator\_21 (CA), Natosaleda\_21 (CA), PhailMary\_20 (CA), Phrankenstien\_21 (CA), RER2\_14 (CA), RGL3\_14 (CA), Rasputin\_21 (CA), RexFury\_21 (CA), Rhodalysa\_21 (CA), Shuman\_21 (CA), StCroix\_21 (CA), Swann\_21 (CA), TWAMP\_21 (CA), Takoda\_21 (CA), UhSalsa\_21 (CA), Yogi\_21 (CA), Yoncess\_21 (CA),

Start 29:

- Found in 33 of 38 ( 86.8% ) of genes in pham
- Manual Annotations of this start: 1 of 36
- Called 3.0% of time when present
- Phage (with cluster) where this start called: Partridge\_21 (CA),

### Summary by clusters:

There is one cluster represented in this pham: CA

Info for manual annotations of cluster CA:

- Start number 1 was manually annotated 35 times for cluster CA.
- Start number 29 was manually annotated 1 time for cluster CA.

### Gene Information:

Gene: Alatin\_21 Start: 12124, Stop: 15471, Start Num: 1

Candidate Starts for Alatin\_21:

(Start: 1 @12124 has 35 MA's), (2, 12142), (4, 12265), (5, 12286), (6, 12307), (8, 12337), (15, 12451), (18, 12499), (22, 12547), (23, 12556), (Start: 29 @12631 has 1 MA's), (32, 12652), (34, 12673), (35, 12679), (36, 12727), (38, 12799), (40, 12838), (41, 12847), (46, 12901), (47, 12955), (48, 12961), (51, 13000), (53, 13033), (54, 13072), (56, 13129), (57, 13240), (59, 13261), (60, 13270), (62, 13312), (65, 13363), (66, 13375), (67, 13447), (68, 13450), (70, 13522), (71, 13531), (74, 13555), (77, 13579), (78, 13588), (79, 13594), (80, 13597), (81, 13606), (82, 13618), (84, 13660), (86, 13690), (88, 13714), (89, 13735), (90, 13759), (92, 13804), (94, 13855), (95, 13867), (96, 13870), (97, 13888), (98, 13903), (100, 13954), (101, 14008), (106, 14131), (108, 14158), (109, 14182), (110, 14209), (112, 14245), (113, 14275), (117, 14359), (122, 14440), (125, 14485), (126, 14497), (127, 14506), (128, 14515),

(129, 14521), (130, 14527), (134, 14548), (138, 14662), (139, 14683), (143, 14728), (146, 14782), (149, 14827), (150, 14899), (151, 14923), (153, 14968), (154, 14986), (156, 15061), (157, 15094), (158, 15136), (159, 15214), (160, 15229), (162, 15253), (165, 15409), (166, 15421), (167, 15427),

Gene: Alpacados\_20 Start: 12060, Stop: 15407, Start Num: 1

Candidate Starts for Alpacados\_20:

(Start: 1 @12060 has 35 MA's), (2, 12078), (4, 12201), (5, 12222), (6, 12243), (8, 12273), (10, 12312), (15, 12387), (22, 12483), (23, 12492), (Start: 29 @12567 has 1 MA's), (32, 12588), (34, 12609), (35, 12615), (36, 12663), (38, 12735), (40, 12774), (41, 12783), (46, 12837), (48, 12897), (51, 12936), (53, 12969), (54, 13008), (56, 13065), (57, 13176), (59, 13197), (60, 13206), (62, 13248), (65, 13299), (66, 13311), (67, 13383), (68, 13386), (70, 13458), (71, 13467), (76, 13509), (77, 13515), (80, 13533), (81, 13542), (82, 13554), (84, 13596), (86, 13626), (89, 13671), (90, 13695), (92, 13740), (94, 13791), (95, 13803), (96, 13806), (97, 13824), (98, 13839), (100, 13890), (101, 13944), (102, 13986), (104, 14040), (105, 14043), (107, 14085), (112, 14181), (113, 14211), (117, 14295), (123, 14385), (125, 14421), (126, 14433), (127, 14442), (128, 14451), (129, 14457), (132, 14475), (134, 14484), (138, 14598), (139, 14619), (141, 14640), (143, 14664), (146, 14718), (149, 14763), (150, 14835), (151, 14859), (153, 14904), (154, 14922), (156, 14997), (157, 15030), (158, 15072), (160, 15165), (162, 15189), (165, 15345), (167, 15363),

Gene: AngryOrchard\_20 Start: 12043, Stop: 15390, Start Num: 1

Candidate Starts for AngryOrchard\_20:

(Start: 1 @12043 has 35 MA's), (2, 12061), (4, 12184), (5, 12205), (6, 12226), (8, 12256), (10, 12295), (15, 12370), (22, 12466), (23, 12475), (Start: 29 @12550 has 1 MA's), (32, 12571), (34, 12592), (35, 12598), (36, 12646), (38, 12718), (40, 12757), (41, 12766), (46, 12820), (48, 12880), (51, 12919), (53, 12952), (54, 12991), (56, 13048), (57, 13159), (59, 13180), (60, 13189), (62, 13231), (65, 13282), (66, 13294), (67, 13366), (68, 13369), (70, 13441), (71, 13450), (74, 13474), (80, 13516), (81, 13525), (82, 13537), (84, 13579), (86, 13609), (89, 13654), (90, 13678), (92, 13723), (93, 13753), (94, 13774), (95, 13786), (96, 13789), (97, 13807), (98, 13822), (100, 13873), (102, 13969), (103, 14014), (104, 14023), (105, 14026), (107, 14068), (112, 14164), (113, 14194), (117, 14278), (119, 14305), (124, 14380), (127, 14425), (128, 14434), (133, 14461), (138, 14581), (144, 14656), (146, 14701), (149, 14746), (150, 14818), (151, 14842), (153, 14887), (154, 14905), (156, 14980), (157, 15013), (158, 15055), (160, 15148), (162, 15172), (165, 15328), (167, 15346),

Gene: AppleCloud\_19 Start: 11777, Stop: 15436, Start Num: 1

Candidate Starts for AppleCloud\_19:

(Start: 1 @11777 has 35 MA's), (5, 11939), (6, 11960), (10, 12062), (16, 12164), (21, 12278), (25, 12326), (26, 12332), (28, 12356), (31, 12428), (33, 12461), (42, 12752), (43, 12785), (44, 12833), (45, 12839), (47, 12920), (48, 12926), (49, 12935), (51, 12965), (52, 12986), (53, 12998), (54, 13037), (56, 13094), (57, 13205), (59, 13226), (60, 13235), (62, 13277), (65, 13328), (66, 13340), (67, 13412), (68, 13415), (70, 13487), (71, 13496), (73, 13517), (76, 13538), (77, 13544), (80, 13562), (81, 13571), (82, 13583), (84, 13625), (86, 13655), (89, 13700), (90, 13724), (92, 13769), (94, 13820), (95, 13832), (96, 13835), (97, 13853), (98, 13868), (100, 13919), (102, 14015), (105, 14072), (106, 14096), (107, 14114), (108, 14123), (112, 14210), (115, 14288), (117, 14324), (119, 14351), (120, 14363), (124, 14426), (125, 14450), (127, 14471), (129, 14486), (130, 14492), (131, 14495), (132, 14504), (138, 14627), (140, 14660), (146, 14747), (148, 14789), (149, 14792), (150, 14864), (151, 14888), (152, 14909), (153, 14933), (154, 14951), (156, 15026), (157, 15059), (158, 15101), (161, 15197), (162, 15218), (164, 15269), (165, 15374), (167, 15392),

Gene: Belenaria\_21 Start: 12124, Stop: 15471, Start Num: 1

Candidate Starts for Belenaria\_21:

(Start: 1 @12124 has 35 MA's), (2, 12142), (4, 12265), (5, 12286), (6, 12307), (8, 12337), (15, 12451), (18, 12499), (22, 12547), (23, 12556), (Start: 29 @12631 has 1 MA's), (32, 12652), (34, 12673), (35, 12679), (36, 12727), (38, 12799), (40, 12838), (41, 12847), (46, 12901), (47, 12955), (48, 12961), (51,

13000), (53, 13033), (54, 13072), (56, 13129), (57, 13240), (59, 13261), (60, 13270), (62, 13312), (65, 13363), (66, 13375), (67, 13447), (68, 13450), (70, 13522), (71, 13531), (74, 13555), (77, 13579), (78, 13588), (79, 13594), (80, 13597), (81, 13606), (82, 13618), (84, 13660), (86, 13690), (88, 13714), (89, 13735), (90, 13759), (92, 13804), (94, 13855), (95, 13867), (96, 13870), (97, 13888), (98, 13903), (100, 13954), (101, 14008), (106, 14131), (108, 14158), (109, 14182), (110, 14209), (112, 14245), (113, 14275), (117, 14359), (122, 14440), (125, 14485), (126, 14497), (127, 14506), (128, 14515), (129, 14521), (130, 14527), (134, 14548), (138, 14662), (139, 14683), (143, 14728), (146, 14782), (149, 14827), (150, 14899), (151, 14923), (153, 14968), (154, 14986), (156, 15061), (157, 15094), (158, 15136), (159, 15214), (160, 15229), (162, 15253), (165, 15409), (166, 15421), (167, 15427),

Gene: BobbyDazzler\_21 Start: 12169, Stop: 15516, Start Num: 1

Candidate Starts for BobbyDazzler\_21:

(Start: 1 @12169 has 35 MA's), (2, 12187), (4, 12310), (5, 12331), (6, 12352), (8, 12382), (10, 12421), (15, 12496), (22, 12592), (23, 12601), (Start: 29 @12676 has 1 MA's), (32, 12697), (34, 12718), (35, 12724), (36, 12772), (38, 12844), (40, 12883), (41, 12892), (46, 12946), (48, 13006), (51, 13045), (53, 13078), (54, 13117), (56, 13174), (57, 13285), (59, 13306), (60, 13315), (62, 13357), (65, 13408), (66, 13420), (67, 13492), (68, 13495), (70, 13567), (71, 13576), (77, 13624), (80, 13642), (81, 13651), (82, 13663), (84, 13705), (86, 13735), (89, 13780), (90, 13804), (92, 13849), (94, 13900), (95, 13912), (96, 13915), (97, 13933), (98, 13948), (100, 13999), (101, 14053), (102, 14095), (104, 14149), (107, 14194), (112, 14290), (113, 14320), (117, 14404), (123, 14494), (125, 14530), (126, 14542), (127, 14551), (128, 14560), (129, 14566), (132, 14584), (134, 14593), (138, 14707), (139, 14728), (141, 14749), (143, 14773), (146, 14827), (149, 14872), (150, 14944), (151, 14968), (153, 15013), (154, 15031), (156, 15106), (157, 15139), (158, 15181), (160, 15274), (162, 15298), (165, 15454), (167, 15472),

Gene: Bonanza\_21 Start: 12098, Stop: 15445, Start Num: 1

Candidate Starts for Bonanza\_21:

(Start: 1 @12098 has 35 MA's), (2, 12116), (4, 12239), (5, 12260), (6, 12281), (7, 12299), (8, 12311), (10, 12350), (15, 12425), (22, 12521), (23, 12530), (Start: 29 @12605 has 1 MA's), (32, 12626), (34, 12647), (35, 12653), (36, 12701), (38, 12773), (40, 12812), (41, 12821), (46, 12875), (48, 12935), (51, 12974), (53, 13007), (54, 13046), (56, 13103), (57, 13214), (59, 13235), (60, 13244), (62, 13286), (65, 13337), (66, 13349), (67, 13421), (68, 13424), (70, 13496), (71, 13505), (76, 13547), (77, 13553), (80, 13571), (81, 13580), (82, 13592), (84, 13634), (86, 13664), (87, 13667), (89, 13709), (90, 13733), (92, 13778), (94, 13829), (95, 13841), (96, 13844), (97, 13862), (98, 13877), (100, 13928), (101, 13982), (102, 14024), (104, 14078), (105, 14081), (107, 14123), (112, 14219), (113, 14249), (117, 14333), (123, 14423), (125, 14459), (126, 14471), (127, 14480), (128, 14489), (129, 14495), (132, 14513), (134, 14522), (138, 14636), (139, 14657), (141, 14678), (143, 14702), (146, 14756), (149, 14801), (150, 14873), (151, 14897), (153, 14942), (154, 14960), (156, 15035), (157, 15068), (158, 15110), (160, 15203), (162, 15227), (165, 15383), (167, 15401),

Gene: Bradshaw\_21 Start: 12124, Stop: 15471, Start Num: 1

Candidate Starts for Bradshaw\_21:

(Start: 1 @12124 has 35 MA's), (2, 12142), (4, 12265), (5, 12286), (6, 12307), (8, 12337), (15, 12451), (18, 12499), (22, 12547), (23, 12556), (Start: 29 @12631 has 1 MA's), (32, 12652), (34, 12673), (35, 12679), (36, 12727), (38, 12799), (40, 12838), (41, 12847), (46, 12901), (47, 12955), (48, 12961), (51, 13000), (53, 13033), (54, 13072), (56, 13129), (57, 13240), (59, 13261), (60, 13270), (62, 13312), (65, 13363), (66, 13375), (67, 13447), (68, 13450), (70, 13522), (71, 13531), (74, 13555), (77, 13579), (78, 13588), (79, 13594), (80, 13597), (81, 13606), (82, 13618), (84, 13660), (86, 13690), (88, 13714), (89, 13735), (90, 13759), (92, 13804), (94, 13855), (95, 13867), (96, 13870), (97, 13888), (98, 13903), (100, 13954), (101, 14008), (106, 14131), (108, 14158), (109, 14182), (110, 14209), (112, 14245), (113, 14275), (117, 14359), (122, 14440), (125, 14485), (126, 14497), (127, 14506), (128, 14515), (129, 14521), (130, 14527), (134, 14548), (138, 14662), (139, 14683), (143, 14728), (146, 14782), (149, 14827), (150, 14899), (151, 14923), (153, 14968), (154, 14986), (156, 15061), (157, 15094),

(158, 15136), (159, 15214), (160, 15229), (162, 15253), (165, 15409), (166, 15421), (167, 15427),

Gene: Bryce\_21 Start: 12098, Stop: 15445, Start Num: 1

Candidate Starts for Bryce\_21:

(Start: 1 @12098 has 35 MA's), (2, 12116), (4, 12239), (5, 12260), (6, 12281), (8, 12311), (10, 12350), (15, 12425), (22, 12521), (23, 12530), (Start: 29 @12605 has 1 MA's), (32, 12626), (34, 12647), (35, 12653), (36, 12701), (38, 12773), (40, 12812), (41, 12821), (46, 12875), (48, 12935), (51, 12974), (53, 13007), (54, 13046), (56, 13103), (57, 13214), (59, 13235), (60, 13244), (62, 13286), (65, 13337), (66, 13349), (67, 13421), (68, 13424), (70, 13496), (71, 13505), (77, 13553), (80, 13571), (81, 13580), (82, 13592), (84, 13634), (86, 13664), (89, 13709), (90, 13733), (92, 13778), (94, 13829), (95, 13841), (96, 13844), (97, 13862), (98, 13877), (100, 13928), (101, 13982), (102, 14024), (104, 14078), (105, 14081), (112, 14219), (113, 14249), (117, 14333), (123, 14423), (125, 14459), (126, 14471), (127, 14480), (128, 14489), (129, 14495), (132, 14513), (134, 14522), (138, 14636), (139, 14657), (143, 14702), (146, 14756), (149, 14801), (150, 14873), (151, 14897), (153, 14942), (154, 14960), (156, 15035), (157, 15068), (158, 15110), (160, 15203), (162, 15227), (165, 15383), (167, 15401),

Gene: CosmicSans\_21 Start: 12124, Stop: 15471, Start Num: 1

Candidate Starts for CosmicSans\_21:

(Start: 1 @12124 has 35 MA's), (2, 12142), (4, 12265), (5, 12286), (6, 12307), (8, 12337), (15, 12451), (18, 12499), (22, 12547), (23, 12556), (Start: 29 @12631 has 1 MA's), (32, 12652), (34, 12673), (35, 12679), (36, 12727), (38, 12799), (40, 12838), (41, 12847), (46, 12901), (47, 12955), (48, 12961), (51, 13000), (53, 13033), (54, 13072), (56, 13129), (57, 13240), (59, 13261), (60, 13270), (62, 13312), (65, 13363), (66, 13375), (67, 13447), (68, 13450), (70, 13522), (71, 13531), (74, 13555), (77, 13579), (78, 13588), (79, 13594), (80, 13597), (81, 13606), (82, 13618), (84, 13660), (86, 13690), (88, 13714), (89, 13735), (90, 13759), (92, 13804), (94, 13855), (95, 13867), (96, 13870), (97, 13888), (98, 13903), (100, 13954), (101, 14008), (106, 14131), (108, 14158), (109, 14182), (110, 14209), (112, 14245), (113, 14275), (117, 14359), (122, 14440), (125, 14485), (126, 14497), (127, 14506), (128, 14515), (129, 14521), (130, 14527), (134, 14548), (138, 14662), (139, 14683), (143, 14728), (146, 14782), (149, 14827), (150, 14899), (151, 14923), (153, 14968), (154, 14986), (156, 15061), (157, 15094), (158, 15136), (159, 15214), (160, 15229), (162, 15253), (165, 15409), (166, 15421), (167, 15427),

Gene: Dinger\_21 Start: 12094, Stop: 15441, Start Num: 1

Candidate Starts for Dinger\_21:

(Start: 1 @12094 has 35 MA's), (2, 12112), (4, 12235), (5, 12256), (6, 12277), (8, 12307), (10, 12346), (15, 12421), (22, 12517), (23, 12526), (Start: 29 @12601 has 1 MA's), (32, 12622), (34, 12643), (35, 12649), (36, 12697), (38, 12769), (40, 12808), (41, 12817), (46, 12871), (48, 12931), (51, 12970), (53, 13003), (54, 13042), (56, 13099), (57, 13210), (59, 13231), (60, 13240), (62, 13282), (65, 13333), (66, 13345), (67, 13417), (68, 13420), (70, 13492), (71, 13501), (77, 13549), (80, 13567), (81, 13576), (82, 13588), (83, 13618), (84, 13630), (86, 13660), (89, 13705), (90, 13729), (92, 13774), (94, 13825), (95, 13837), (96, 13840), (97, 13858), (98, 13873), (100, 13924), (101, 13978), (102, 14020), (104, 14074), (105, 14077), (107, 14119), (112, 14215), (113, 14245), (117, 14329), (119, 14356), (124, 14431), (127, 14476), (128, 14485), (138, 14632), (143, 14698), (146, 14752), (147, 14761), (149, 14797), (150, 14869), (151, 14893), (153, 14938), (154, 14956), (156, 15031), (157, 15064), (158, 15106), (160, 15199), (162, 15223), (165, 15379), (167, 15397),

Gene: Erik\_21 Start: 12123, Stop: 15470, Start Num: 1

Candidate Starts for Erik\_21:

(Start: 1 @12123 has 35 MA's), (2, 12141), (4, 12264), (5, 12285), (6, 12306), (8, 12336), (15, 12450), (18, 12498), (22, 12546), (23, 12555), (Start: 29 @12630 has 1 MA's), (32, 12651), (34, 12672), (35, 12678), (36, 12726), (38, 12798), (40, 12837), (41, 12846), (46, 12900), (47, 12954), (48, 12960), (51, 12999), (53, 13032), (54, 13071), (56, 13128), (57, 13239), (59, 13260), (60, 13269), (62, 13311), (65, 13362), (66, 13374), (67, 13446), (68, 13449), (70, 13521), (71, 13530), (74, 13554), (77, 13578), (78, 13587), (79, 13593), (80, 13596), (81, 13605), (82, 13617), (84, 13659), (86, 13689), (88, 13713), (89,

13734), (90, 13758), (92, 13803), (94, 13854), (95, 13866), (96, 13869), (97, 13887), (98, 13902), (100, 13953), (101, 14007), (106, 14130), (108, 14157), (109, 14181), (110, 14208), (112, 14244), (113, 14274), (117, 14358), (122, 14439), (125, 14484), (126, 14496), (127, 14505), (128, 14514), (129, 14520), (130, 14526), (134, 14547), (138, 14661), (139, 14682), (143, 14727), (146, 14781), (149, 14826), (150, 14898), (151, 14922), (153, 14967), (154, 14985), (156, 15060), (157, 15093), (158, 15135), (159, 15213), (160, 15228), (162, 15252), (165, 15408), (166, 15420), (167, 15426),

Gene: Espica\_21 Start: 12124, Stop: 15471, Start Num: 1

Candidate Starts for Espica\_21:

(Start: 1 @12124 has 35 MA's), (2, 12142), (4, 12265), (5, 12286), (6, 12307), (8, 12337), (15, 12451), (18, 12499), (22, 12547), (23, 12556), (Start: 29 @12631 has 1 MA's), (32, 12652), (34, 12673), (35, 12679), (36, 12727), (38, 12799), (40, 12838), (41, 12847), (46, 12901), (47, 12955), (48, 12961), (51, 13000), (53, 13033), (54, 13072), (56, 13129), (57, 13240), (59, 13261), (60, 13270), (62, 13312), (65, 13363), (66, 13375), (67, 13447), (68, 13450), (70, 13522), (71, 13531), (74, 13555), (77, 13579), (78, 13588), (79, 13594), (80, 13597), (81, 13606), (82, 13618), (84, 13660), (86, 13690), (88, 13714), (89, 13735), (90, 13759), (92, 13804), (94, 13855), (95, 13867), (96, 13870), (97, 13888), (98, 13903), (100, 13954), (101, 14008), (106, 14131), (108, 14158), (109, 14182), (110, 14209), (112, 14245), (113, 14275), (117, 14359), (122, 14440), (125, 14485), (126, 14497), (127, 14506), (128, 14515), (129, 14521), (130, 14527), (134, 14548), (138, 14662), (139, 14683), (143, 14728), (146, 14782), (149, 14827), (150, 14899), (151, 14923), (153, 14968), (154, 14986), (156, 15061), (157, 15094), (158, 15136), (159, 15214), (160, 15229), (162, 15253), (165, 15409), (166, 15421), (167, 15427),

Gene: Gollum\_21 Start: 12124, Stop: 15471, Start Num: 1

Candidate Starts for Gollum\_21:

(Start: 1 @12124 has 35 MA's), (2, 12142), (4, 12265), (5, 12286), (6, 12307), (8, 12337), (15, 12451), (18, 12499), (22, 12547), (23, 12556), (Start: 29 @12631 has 1 MA's), (32, 12652), (34, 12673), (35, 12679), (36, 12727), (38, 12799), (40, 12838), (41, 12847), (46, 12901), (47, 12955), (48, 12961), (51, 13000), (53, 13033), (54, 13072), (56, 13129), (57, 13240), (59, 13261), (60, 13270), (62, 13312), (65, 13363), (66, 13375), (67, 13447), (68, 13450), (70, 13522), (71, 13531), (74, 13555), (77, 13579), (78, 13588), (79, 13594), (80, 13597), (81, 13606), (82, 13618), (84, 13660), (86, 13690), (88, 13714), (89, 13735), (90, 13759), (92, 13804), (94, 13855), (95, 13867), (96, 13870), (97, 13888), (98, 13903), (100, 13954), (101, 14008), (106, 14131), (108, 14158), (109, 14182), (110, 14209), (112, 14245), (113, 14275), (117, 14359), (122, 14440), (125, 14485), (126, 14497), (127, 14506), (128, 14515), (129, 14521), (130, 14527), (134, 14548), (138, 14662), (139, 14683), (143, 14728), (146, 14782), (149, 14827), (150, 14899), (151, 14923), (153, 14968), (154, 14986), (156, 15061), (157, 15094), (158, 15136), (159, 15214), (160, 15229), (162, 15253), (165, 15409), (166, 15421), (167, 15427),

Gene: Harlequin\_21 Start: 12074, Stop: 15421, Start Num: 1

Candidate Starts for Harlequin\_21:

(Start: 1 @12074 has 35 MA's), (2, 12092), (4, 12215), (5, 12236), (6, 12257), (8, 12287), (10, 12326), (15, 12401), (22, 12497), (23, 12506), (Start: 29 @12581 has 1 MA's), (32, 12602), (34, 12623), (35, 12629), (36, 12677), (38, 12749), (40, 12788), (41, 12797), (46, 12851), (48, 12911), (51, 12950), (53, 12983), (54, 13022), (56, 13079), (57, 13190), (59, 13211), (60, 13220), (62, 13262), (65, 13313), (66, 13325), (67, 13397), (68, 13400), (70, 13472), (71, 13481), (77, 13529), (80, 13547), (81, 13556), (82, 13568), (84, 13610), (86, 13640), (89, 13685), (90, 13709), (92, 13754), (94, 13805), (95, 13817), (96, 13820), (97, 13838), (98, 13853), (100, 13904), (101, 13958), (102, 14000), (104, 14054), (105, 14057), (112, 14195), (113, 14225), (117, 14309), (123, 14399), (125, 14435), (126, 14447), (127, 14456), (128, 14465), (129, 14471), (132, 14489), (134, 14498), (138, 14612), (139, 14633), (143, 14678), (146, 14732), (149, 14777), (150, 14849), (151, 14873), (153, 14918), (154, 14936), (156, 15011), (157, 15044), (158, 15086), (160, 15179), (162, 15203), (165, 15359), (167, 15377),

Gene: Hiro\_21 Start: 12068, Stop: 15727, Start Num: 1

Candidate Starts for Hiro\_21:

(Start: 1 @12068 has 35 MA's), (3, 12116), (5, 12230), (6, 12251), (10, 12353), (16, 12455), (21, 12569), (25, 12617), (26, 12623), (28, 12647), (31, 12719), (33, 12752), (42, 13043), (43, 13076), (44, 13124), (45, 13130), (47, 13211), (48, 13217), (49, 13226), (52, 13277), (53, 13289), (54, 13328), (56, 13385), (57, 13496), (59, 13517), (60, 13526), (62, 13568), (65, 13619), (66, 13631), (67, 13703), (68, 13706), (70, 13778), (71, 13787), (73, 13808), (76, 13829), (77, 13835), (80, 13853), (81, 13862), (82, 13874), (84, 13916), (86, 13946), (89, 13991), (90, 14015), (92, 14060), (94, 14111), (95, 14123), (96, 14126), (97, 14144), (98, 14159), (100, 14210), (102, 14306), (105, 14363), (106, 14387), (107, 14405), (108, 14414), (112, 14501), (115, 14579), (117, 14615), (119, 14642), (120, 14654), (124, 14717), (125, 14741), (127, 14762), (129, 14777), (130, 14783), (131, 14786), (132, 14795), (138, 14918), (140, 14951), (146, 15038), (148, 15080), (149, 15083), (150, 15155), (151, 15179), (152, 15200), (153, 15224), (154, 15242), (156, 15317), (157, 15350), (158, 15392), (161, 15488), (162, 15509), (164, 15560), (165, 15665), (167, 15683),

Gene: Jester\_21 Start: 12068, Stop: 15415, Start Num: 1

Candidate Starts for Jester\_21:

(Start: 1 @12068 has 35 MA's), (2, 12086), (4, 12209), (5, 12230), (6, 12251), (8, 12281), (15, 12395), (22, 12491), (23, 12500), (Start: 29 @12575 has 1 MA's), (32, 12596), (34, 12617), (35, 12623), (36, 12671), (38, 12743), (39, 12770), (40, 12782), (41, 12791), (46, 12845), (48, 12905), (51, 12944), (53, 12977), (54, 13016), (55, 13031), (56, 13073), (57, 13184), (59, 13205), (60, 13214), (62, 13256), (65, 13307), (66, 13319), (67, 13391), (68, 13394), (70, 13466), (71, 13475), (77, 13523), (80, 13541), (81, 13550), (82, 13562), (84, 13604), (86, 13634), (89, 13679), (90, 13703), (92, 13748), (94, 13799), (95, 13811), (96, 13814), (97, 13832), (98, 13847), (100, 13898), (101, 13952), (102, 13994), (105, 14051), (108, 14102), (112, 14189), (115, 14267), (117, 14303), (120, 14342), (122, 14384), (123, 14393), (125, 14429), (127, 14450), (128, 14459), (129, 14465), (134, 14492), (138, 14606), (140, 14639), (144, 14681), (146, 14726), (148, 14768), (149, 14771), (150, 14843), (151, 14867), (152, 14888), (153, 14912), (154, 14930), (156, 15005), (157, 15038), (158, 15080), (161, 15176), (162, 15197), (164, 15248), (165, 15353), (167, 15371),

Gene: Krishelle\_21 Start: 12083, Stop: 15742, Start Num: 1

Candidate Starts for Krishelle\_21:

(Start: 1 @12083 has 35 MA's), (5, 12245), (6, 12266), (10, 12368), (16, 12470), (21, 12584), (25, 12632), (26, 12638), (28, 12662), (31, 12734), (33, 12767), (42, 13058), (43, 13091), (44, 13139), (45, 13145), (47, 13226), (48, 13232), (49, 13241), (51, 13271), (52, 13292), (53, 13304), (54, 13343), (56, 13400), (57, 13511), (59, 13532), (60, 13541), (62, 13583), (65, 13634), (66, 13646), (67, 13718), (68, 13721), (70, 13793), (71, 13802), (73, 13823), (76, 13844), (77, 13850), (80, 13868), (81, 13877), (82, 13889), (84, 13931), (86, 13961), (89, 14006), (90, 14030), (92, 14075), (94, 14126), (95, 14138), (96, 14141), (97, 14159), (98, 14174), (100, 14225), (102, 14321), (105, 14378), (106, 14402), (107, 14420), (108, 14429), (112, 14516), (115, 14594), (117, 14630), (119, 14657), (120, 14669), (124, 14732), (125, 14756), (127, 14777), (129, 14792), (130, 14798), (131, 14801), (132, 14810), (138, 14933), (140, 14966), (146, 15053), (148, 15095), (149, 15098), (150, 15170), (151, 15194), (152, 15215), (153, 15239), (154, 15257), (156, 15332), (157, 15365), (158, 15407), (161, 15503), (162, 15524), (164, 15575), (165, 15680), (167, 15698),

Gene: Lillie\_21 Start: 12124, Stop: 15471, Start Num: 1

Candidate Starts for Lillie\_21:

(Start: 1 @12124 has 35 MA's), (2, 12142), (4, 12265), (5, 12286), (6, 12307), (8, 12337), (15, 12451), (18, 12499), (22, 12547), (23, 12556), (Start: 29 @12631 has 1 MA's), (32, 12652), (34, 12673), (35, 12679), (36, 12727), (38, 12799), (40, 12838), (41, 12847), (46, 12901), (47, 12955), (48, 12961), (51, 13000), (53, 13033), (54, 13072), (56, 13129), (57, 13240), (59, 13261), (60, 13270), (62, 13312), (65, 13363), (66, 13375), (67, 13447), (68, 13450), (70, 13522), (71, 13531), (74, 13555), (77, 13579), (78, 13588), (79, 13594), (80, 13597), (81, 13606), (82, 13618), (84, 13660), (86, 13690), (88, 13714), (89, 13735), (90, 13759), (92, 13804), (94, 13855), (95, 13867), (96, 13870), (97, 13888), (98, 13903), (100, 13954), (101, 14008), (106, 14131), (108, 14158), (109, 14182), (110, 14209), (112, 14245),



(113, 14275), (117, 14359), (122, 14440), (125, 14485), (126, 14497), (127, 14506), (128, 14515), (129, 14521), (130, 14527), (134, 14548), (138, 14662), (139, 14683), (143, 14728), (146, 14782), (149, 14827), (150, 14899), (151, 14923), (153, 14968), (154, 14986), (156, 15061), (157, 15094), (158, 15136), (159, 15214), (160, 15229), (162, 15253), (165, 15409), (166, 15421), (167, 15427),

Gene: Naiad\_21 Start: 12124, Stop: 15471, Start Num: 1

Candidate Starts for Naiad\_21:

(Start: 1 @12124 has 35 MA's), (2, 12142), (4, 12265), (5, 12286), (6, 12307), (8, 12337), (15, 12451), (18, 12499), (22, 12547), (23, 12556), (Start: 29 @12631 has 1 MA's), (32, 12652), (34, 12673), (35, 12679), (36, 12727), (38, 12799), (40, 12838), (41, 12847), (46, 12901), (47, 12955), (48, 12961), (51, 13000), (53, 13033), (54, 13072), (56, 13129), (57, 13240), (59, 13261), (60, 13270), (62, 13312), (65, 13363), (66, 13375), (67, 13447), (68, 13450), (70, 13522), (71, 13531), (74, 13555), (77, 13579), (78, 13588), (79, 13594), (80, 13597), (81, 13606), (82, 13618), (84, 13660), (86, 13690), (88, 13714), (89, 13735), (90, 13759), (92, 13804), (94, 13855), (95, 13867), (96, 13870), (97, 13888), (98, 13903), (100, 13954), (101, 14008), (106, 14131), (108, 14158), (109, 14182), (110, 14209), (112, 14245), (113, 14275), (117, 14359), (122, 14440), (125, 14485), (126, 14497), (127, 14506), (128, 14515), (129, 14521), (130, 14527), (134, 14548), (138, 14662), (139, 14683), (143, 14728), (146, 14782), (149, 14827), (150, 14899), (151, 14923), (153, 14968), (154, 14986), (156, 15061), (157, 15094), (158, 15136), (159, 15214), (160, 15229), (162, 15253), (165, 15409), (166, 15421), (167, 15427),

Gene: Nancinator\_21 Start: 12124, Stop: 15471, Start Num: 1

Candidate Starts for Nancinator\_21:

(Start: 1 @12124 has 35 MA's), (2, 12142), (4, 12265), (5, 12286), (6, 12307), (8, 12337), (15, 12451), (18, 12499), (22, 12547), (23, 12556), (Start: 29 @12631 has 1 MA's), (32, 12652), (34, 12673), (35, 12679), (36, 12727), (38, 12799), (40, 12838), (41, 12847), (46, 12901), (47, 12955), (48, 12961), (51, 13000), (53, 13033), (54, 13072), (56, 13129), (57, 13240), (59, 13261), (60, 13270), (62, 13312), (65, 13363), (66, 13375), (67, 13447), (68, 13450), (70, 13522), (71, 13531), (74, 13555), (77, 13579), (78, 13588), (79, 13594), (80, 13597), (81, 13606), (82, 13618), (84, 13660), (86, 13690), (88, 13714), (89, 13735), (90, 13759), (92, 13804), (94, 13855), (95, 13867), (96, 13870), (97, 13888), (98, 13903), (100, 13954), (101, 14008), (106, 14131), (108, 14158), (109, 14182), (110, 14209), (112, 14245), (113, 14275), (117, 14359), (122, 14440), (125, 14485), (126, 14497), (127, 14506), (128, 14515), (129, 14521), (130, 14527), (134, 14548), (138, 14662), (139, 14683), (143, 14728), (146, 14782), (149, 14827), (150, 14899), (151, 14923), (153, 14968), (154, 14986), (156, 15061), (157, 15094), (158, 15136), (159, 15214), (160, 15229), (162, 15253), (165, 15409), (166, 15421), (167, 15427),

Gene: Natosaleda\_21 Start: 12124, Stop: 15471, Start Num: 1

Candidate Starts for Natosaleda\_21:

(Start: 1 @12124 has 35 MA's), (2, 12142), (4, 12265), (5, 12286), (6, 12307), (8, 12337), (15, 12451), (18, 12499), (22, 12547), (23, 12556), (Start: 29 @12631 has 1 MA's), (32, 12652), (34, 12673), (35, 12679), (36, 12727), (38, 12799), (40, 12838), (41, 12847), (46, 12901), (47, 12955), (48, 12961), (51, 13000), (53, 13033), (54, 13072), (56, 13129), (57, 13240), (59, 13261), (60, 13270), (62, 13312), (65, 13363), (66, 13375), (67, 13447), (68, 13450), (70, 13522), (71, 13531), (74, 13555), (77, 13579), (78, 13588), (79, 13594), (80, 13597), (81, 13606), (82, 13618), (84, 13660), (86, 13690), (88, 13714), (89, 13735), (90, 13759), (92, 13804), (94, 13855), (95, 13867), (96, 13870), (97, 13888), (98, 13903), (100, 13954), (101, 14008), (106, 14131), (108, 14158), (109, 14182), (110, 14209), (112, 14245), (113, 14275), (117, 14359), (122, 14440), (125, 14485), (126, 14497), (127, 14506), (128, 14515), (129, 14521), (130, 14527), (134, 14548), (138, 14662), (139, 14683), (143, 14728), (146, 14782), (149, 14827), (150, 14899), (151, 14923), (153, 14968), (154, 14986), (156, 15061), (157, 15094), (158, 15136), (159, 15214), (160, 15229), (162, 15253), (165, 15409), (166, 15421), (167, 15427),

Gene: Partridge\_21 Start: 12664, Stop: 15504, Start Num: 29

Candidate Starts for Partridge\_21:

(Start: 1 @12157 has 35 MA's), (2, 12175), (4, 12298), (5, 12319), (6, 12340), (8, 12370), (10, 12409), (15, 12484), (22, 12580), (23, 12589), (Start: 29 @12664 has 1 MA's), (32, 12685), (34, 12706), (35, 12712), (36, 12760), (38, 12832), (40, 12871), (41, 12880), (46, 12934), (48, 12994), (51, 13033), (53, 13066), (54, 13105), (56, 13162), (57, 13273), (59, 13294), (60, 13303), (62, 13345), (65, 13396), (66, 13408), (67, 13480), (68, 13483), (70, 13555), (71, 13564), (77, 13612), (80, 13630), (81, 13639), (82, 13651), (84, 13693), (86, 13723), (89, 13768), (90, 13792), (92, 13837), (94, 13888), (95, 13900), (96, 13903), (97, 13921), (98, 13936), (100, 13987), (101, 14041), (102, 14083), (104, 14137), (105, 14140), (107, 14182), (112, 14278), (113, 14308), (117, 14392), (119, 14419), (124, 14494), (127, 14539), (128, 14548), (138, 14695), (143, 14761), (146, 14815), (147, 14824), (149, 14860), (150, 14932), (151, 14956), (153, 15001), (154, 15019), (156, 15094), (157, 15127), (158, 15169), (160, 15262), (162, 15286), (165, 15442), (167, 15460),

Gene: PhailMary\_20 Start: 12134, Stop: 15793, Start Num: 1

Candidate Starts for PhailMary\_20:

(Start: 1 @12134 has 35 MA's), (3, 12182), (5, 12296), (6, 12317), (10, 12419), (16, 12521), (21, 12635), (25, 12683), (26, 12689), (28, 12713), (31, 12785), (33, 12818), (42, 13109), (43, 13142), (44, 13190), (45, 13196), (47, 13277), (48, 13283), (49, 13292), (51, 13322), (52, 13343), (53, 13355), (54, 13394), (56, 13451), (57, 13562), (59, 13583), (60, 13592), (62, 13634), (65, 13685), (66, 13697), (67, 13769), (68, 13772), (70, 13844), (71, 13853), (73, 13874), (76, 13895), (77, 13901), (80, 13919), (81, 13928), (82, 13940), (84, 13982), (86, 14012), (89, 14057), (90, 14081), (92, 14126), (94, 14177), (95, 14189), (96, 14192), (97, 14210), (98, 14225), (100, 14276), (102, 14372), (104, 14426), (105, 14429), (107, 14471), (112, 14567), (115, 14645), (117, 14681), (119, 14708), (120, 14720), (124, 14783), (125, 14807), (127, 14828), (129, 14843), (130, 14849), (131, 14852), (132, 14861), (138, 14984), (140, 15017), (146, 15104), (148, 15146), (149, 15149), (150, 15221), (151, 15245), (152, 15266), (153, 15290), (154, 15308), (156, 15383), (157, 15416), (158, 15458), (161, 15554), (162, 15575), (164, 15626), (165, 15731), (167, 15749),

Gene: Phrankenstein\_21 Start: 12124, Stop: 15471, Start Num: 1

Candidate Starts for Phrankenstein\_21:

(Start: 1 @12124 has 35 MA's), (2, 12142), (4, 12265), (5, 12286), (6, 12307), (8, 12337), (15, 12451), (18, 12499), (22, 12547), (23, 12556), (Start: 29 @12631 has 1 MA's), (32, 12652), (34, 12673), (35, 12679), (36, 12727), (38, 12799), (40, 12838), (41, 12847), (46, 12901), (47, 12955), (48, 12961), (51, 13000), (53, 13033), (54, 13072), (56, 13129), (57, 13240), (59, 13261), (60, 13270), (62, 13312), (65, 13363), (66, 13375), (67, 13447), (68, 13450), (70, 13522), (71, 13531), (74, 13555), (77, 13579), (78, 13588), (79, 13594), (80, 13597), (81, 13606), (82, 13618), (84, 13660), (86, 13690), (88, 13714), (89, 13735), (90, 13759), (92, 13804), (94, 13855), (95, 13867), (96, 13870), (97, 13888), (98, 13903), (100, 13954), (101, 14008), (106, 14131), (108, 14158), (109, 14182), (110, 14209), (112, 14245), (113, 14275), (117, 14359), (122, 14440), (125, 14485), (126, 14497), (127, 14506), (128, 14515), (129, 14521), (130, 14527), (134, 14548), (138, 14662), (139, 14683), (143, 14728), (146, 14782), (149, 14827), (150, 14899), (151, 14923), (153, 14968), (154, 14986), (156, 15061), (157, 15094), (158, 15136), (159, 15214), (160, 15229), (162, 15253), (165, 15409), (166, 15421), (167, 15427),

Gene: RER2\_14 Start: 8996, Stop: 12343, Start Num: 1

Candidate Starts for RER2\_14:

(Start: 1 @8996 has 35 MA's), (2, 9014), (4, 9137), (5, 9158), (6, 9179), (8, 9209), (15, 9323), (18, 9371), (22, 9419), (23, 9428), (Start: 29 @9503 has 1 MA's), (32, 9524), (34, 9545), (35, 9551), (36, 9599), (38, 9671), (40, 9710), (41, 9719), (46, 9773), (47, 9827), (48, 9833), (51, 9872), (53, 9905), (54, 9944), (56, 10001), (57, 10112), (59, 10133), (60, 10142), (62, 10184), (65, 10235), (66, 10247), (67, 10319), (68, 10322), (70, 10394), (71, 10403), (74, 10427), (77, 10451), (78, 10460), (79, 10466), (80, 10469), (81, 10478), (82, 10490), (84, 10532), (86, 10562), (88, 10586), (89, 10607), (90, 10631), (92, 10676), (94, 10727), (95, 10739), (96, 10742), (97, 10760), (98, 10775), (100, 10826), (101, 10880), (106, 11003), (108, 11030), (109, 11054), (110, 11081), (112, 11117), (113, 11147), (117, 11231), (122, 11312), (125, 11357), (126, 11369), (127, 11378), (128, 11387), (129, 11393), (130,

11399), (134, 11420), (138, 11534), (139, 11555), (143, 11600), (146, 11654), (149, 11699), (150, 11771), (151, 11795), (153, 11840), (154, 11858), (156, 11933), (157, 11966), (158, 12008), (159, 12086), (160, 12101), (162, 12125), (165, 12281), (166, 12293), (167, 12299),

Gene: RGL3\_14 Start: 8969, Stop: 12505, Start Num: 1

Candidate Starts for RGL3\_14:

(Start: 1 @8969 has 35 MA's), (2, 8987), (4, 9110), (5, 9131), (6, 9152), (7, 9170), (8, 9182), (9, 9221), (10, 9242), (11, 9272), (12, 9305), (13, 9311), (14, 9314), (17, 9374), (19, 9419), (20, 9440), (24, 9503), (27, 9533), (30, 9611), (36, 9707), (37, 9728), (40, 9833), (41, 9842), (46, 9896), (49, 9965), (50, 9977), (56, 10124), (57, 10235), (58, 10244), (60, 10265), (61, 10277), (62, 10307), (63, 10316), (64, 10346), (66, 10370), (67, 10442), (68, 10445), (69, 10478), (70, 10517), (71, 10526), (72, 10532), (75, 10559), (80, 10592), (81, 10601), (82, 10613), (84, 10655), (85, 10658), (86, 10685), (88, 10709), (89, 10730), (90, 10754), (91, 10763), (92, 10799), (94, 10883), (99, 10937), (101, 11036), (103, 11123), (105, 11135), (106, 11159), (108, 11186), (111, 11258), (113, 11303), (114, 11333), (115, 11351), (116, 11375), (117, 11387), (118, 11399), (121, 11429), (124, 11489), (127, 11534), (129, 11549), (131, 11558), (132, 11567), (134, 11576), (135, 11612), (136, 11624), (137, 11669), (138, 11690), (142, 11753), (145, 11783), (146, 11810), (148, 11852), (150, 11927), (151, 11951), (152, 11972), (154, 12014), (155, 12038), (156, 12089), (161, 12260), (162, 12281), (163, 12311), (167, 12461),

Gene: Rasputin\_21 Start: 12092, Stop: 15439, Start Num: 1

Candidate Starts for Rasputin\_21:

(Start: 1 @12092 has 35 MA's), (2, 12110), (4, 12233), (5, 12254), (6, 12275), (7, 12293), (8, 12305), (10, 12344), (15, 12419), (22, 12515), (23, 12524), (Start: 29 @12599 has 1 MA's), (32, 12620), (34, 12641), (35, 12647), (36, 12695), (38, 12767), (40, 12806), (41, 12815), (46, 12869), (48, 12929), (51, 12968), (53, 13001), (54, 13040), (56, 13097), (57, 13208), (59, 13229), (60, 13238), (62, 13280), (65, 13331), (66, 13343), (67, 13415), (68, 13418), (70, 13490), (71, 13499), (77, 13547), (80, 13565), (81, 13574), (82, 13586), (84, 13628), (86, 13658), (89, 13703), (90, 13727), (92, 13772), (94, 13823), (95, 13835), (96, 13838), (97, 13856), (98, 13871), (100, 13922), (101, 13976), (102, 14018), (104, 14072), (105, 14075), (107, 14117), (112, 14213), (113, 14243), (117, 14327), (123, 14417), (125, 14453), (126, 14465), (127, 14474), (128, 14483), (129, 14489), (132, 14507), (134, 14516), (138, 14630), (139, 14651), (141, 14672), (143, 14696), (146, 14750), (149, 14795), (150, 14867), (151, 14891), (153, 14936), (154, 14954), (156, 15029), (157, 15062), (158, 15104), (160, 15197), (162, 15221), (165, 15377), (167, 15395),

Gene: RexFury\_21 Start: 12155, Stop: 15502, Start Num: 1

Candidate Starts for RexFury\_21:

(Start: 1 @12155 has 35 MA's), (2, 12173), (4, 12296), (5, 12317), (6, 12338), (8, 12368), (15, 12482), (22, 12578), (23, 12587), (Start: 29 @12662 has 1 MA's), (32, 12683), (34, 12704), (35, 12710), (36, 12758), (38, 12830), (40, 12869), (41, 12878), (46, 12932), (47, 12986), (48, 12992), (51, 13031), (53, 13064), (54, 13103), (56, 13160), (57, 13271), (59, 13292), (60, 13301), (62, 13343), (65, 13394), (66, 13406), (67, 13478), (68, 13481), (70, 13553), (71, 13562), (74, 13586), (77, 13610), (78, 13619), (79, 13625), (80, 13628), (81, 13637), (82, 13649), (84, 13691), (86, 13721), (88, 13745), (89, 13766), (90, 13790), (92, 13835), (94, 13886), (95, 13898), (96, 13901), (97, 13919), (98, 13934), (100, 13985), (101, 14039), (106, 14162), (108, 14189), (109, 14213), (110, 14240), (112, 14276), (113, 14306), (117, 14390), (122, 14471), (125, 14516), (126, 14528), (127, 14537), (128, 14546), (129, 14552), (130, 14558), (134, 14579), (138, 14693), (139, 14714), (143, 14759), (146, 14813), (149, 14858), (150, 14930), (151, 14954), (153, 14999), (154, 15017), (156, 15092), (157, 15125), (158, 15167), (159, 15245), (160, 15260), (162, 15284), (165, 15440), (166, 15452), (167, 15458),

Gene: Rhodalysa\_21 Start: 12124, Stop: 15471, Start Num: 1

Candidate Starts for Rhodalysa\_21:

(Start: 1 @12124 has 35 MA's), (2, 12142), (4, 12265), (5, 12286), (6, 12307), (8, 12337), (15, 12451), (18, 12499), (22, 12547), (23, 12556), (Start: 29 @12631 has 1 MA's), (32, 12652), (34, 12673), (35, 12679), (36, 12727), (38, 12799), (40, 12838), (41, 12847), (46, 12901), (47, 12955), (48, 12961), (51, 13000), (53, 13033), (54, 13072), (56, 13129), (57, 13240), (59, 13261), (60, 13270), (62, 13312), (65, 13363), (66, 13375), (67, 13447), (68, 13450), (70, 13522), (71, 13531), (74, 13555), (77, 13579), (78, 13588), (79, 13594), (80, 13597), (81, 13606), (82, 13618), (84, 13660), (86, 13690), (88, 13714), (89, 13735), (90, 13759), (92, 13804), (94, 13855), (95, 13867), (96, 13870), (97, 13888), (98, 13903), (100, 13954), (101, 14008), (106, 14131), (108, 14158), (109, 14182), (110, 14209), (112, 14245), (113, 14275), (117, 14359), (122, 14440), (125, 14485), (126, 14497), (127, 14506), (128, 14515), (129, 14521), (130, 14527), (134, 14548), (138, 14662), (139, 14683), (143, 14728), (146, 14782), (149, 14827), (150, 14899), (151, 14923), (153, 14968), (154, 14986), (156, 15061), (157, 15094), (158, 15136), (159, 15214), (160, 15229), (162, 15253), (165, 15409), (166, 15421), (167, 15427),

Gene: Shuman\_21 Start: 12124, Stop: 15471, Start Num: 1

Candidate Starts for Shuman\_21:

(Start: 1 @12124 has 35 MA's), (2, 12142), (4, 12265), (5, 12286), (6, 12307), (8, 12337), (10, 12376), (15, 12451), (18, 12499), (22, 12547), (23, 12556), (Start: 29 @12631 has 1 MA's), (32, 12652), (34, 12673), (35, 12679), (36, 12727), (38, 12799), (40, 12838), (41, 12847), (46, 12901), (47, 12955), (48, 12961), (51, 13000), (53, 13033), (54, 13072), (56, 13129), (57, 13240), (59, 13261), (60, 13270), (62, 13312), (65, 13363), (66, 13375), (67, 13447), (68, 13450), (70, 13522), (71, 13531), (74, 13555), (77, 13579), (78, 13588), (79, 13594), (80, 13597), (81, 13606), (82, 13618), (84, 13660), (86, 13690), (88, 13714), (89, 13735), (90, 13759), (92, 13804), (94, 13855), (95, 13867), (96, 13870), (97, 13888), (98, 13903), (100, 13954), (101, 14008), (106, 14131), (108, 14158), (109, 14182), (110, 14209), (112, 14245), (113, 14275), (117, 14359), (122, 14440), (125, 14485), (126, 14497), (127, 14506), (128, 14515), (129, 14521), (130, 14527), (134, 14548), (138, 14662), (139, 14683), (143, 14728), (146, 14782), (149, 14827), (150, 14899), (151, 14923), (153, 14968), (154, 14986), (156, 15061), (157, 15094), (158, 15136), (159, 15214), (160, 15229), (162, 15253), (165, 15409), (166, 15421), (167, 15427),

Gene: StCroix\_21 Start: 12124, Stop: 15471, Start Num: 1

Candidate Starts for StCroix\_21:

(Start: 1 @12124 has 35 MA's), (2, 12142), (4, 12265), (5, 12286), (6, 12307), (8, 12337), (15, 12451), (18, 12499), (22, 12547), (23, 12556), (Start: 29 @12631 has 1 MA's), (32, 12652), (34, 12673), (35, 12679), (36, 12727), (38, 12799), (40, 12838), (41, 12847), (46, 12901), (47, 12955), (48, 12961), (51, 13000), (53, 13033), (54, 13072), (56, 13129), (57, 13240), (59, 13261), (60, 13270), (62, 13312), (65, 13363), (66, 13375), (67, 13447), (68, 13450), (70, 13522), (71, 13531), (74, 13555), (77, 13579), (78, 13588), (79, 13594), (80, 13597), (81, 13606), (82, 13618), (84, 13660), (86, 13690), (88, 13714), (89, 13735), (90, 13759), (92, 13804), (94, 13855), (95, 13867), (96, 13870), (97, 13888), (98, 13903), (100, 13954), (101, 14008), (106, 14131), (108, 14158), (109, 14182), (110, 14209), (112, 14245), (113, 14275), (117, 14359), (122, 14440), (125, 14485), (126, 14497), (127, 14506), (128, 14515), (129, 14521), (130, 14527), (134, 14548), (138, 14662), (139, 14683), (143, 14728), (146, 14782), (149, 14827), (150, 14899), (151, 14923), (153, 14968), (154, 14986), (156, 15061), (157, 15094), (158, 15136), (159, 15214), (160, 15229), (162, 15253), (165, 15409), (166, 15421), (167, 15427),

Gene: Swann\_21 Start: 12124, Stop: 15471, Start Num: 1

Candidate Starts for Swann\_21:

(Start: 1 @12124 has 35 MA's), (2, 12142), (4, 12265), (5, 12286), (6, 12307), (8, 12337), (15, 12451), (18, 12499), (22, 12547), (23, 12556), (Start: 29 @12631 has 1 MA's), (32, 12652), (34, 12673), (35, 12679), (36, 12727), (38, 12799), (40, 12838), (41, 12847), (46, 12901), (47, 12955), (48, 12961), (51, 13000), (53, 13033), (54, 13072), (56, 13129), (57, 13240), (59, 13261), (60, 13270), (62, 13312), (65, 13363), (66, 13375), (67, 13447), (68, 13450), (70, 13522), (71, 13531), (74, 13555), (77, 13579), (78, 13588), (79, 13594), (80, 13597), (81, 13606), (82, 13618), (84, 13660), (86, 13690), (88, 13714), (89, 13735), (90, 13759), (92, 13804), (94, 13855), (95, 13867), (96, 13870), (97, 13888), (98, 13903),

(100, 13954), (101, 14008), (106, 14131), (108, 14158), (109, 14182), (110, 14209), (112, 14245), (113, 14275), (117, 14359), (122, 14440), (125, 14485), (126, 14497), (127, 14506), (128, 14515), (129, 14521), (130, 14527), (134, 14548), (138, 14662), (139, 14683), (143, 14728), (146, 14782), (149, 14827), (150, 14899), (151, 14923), (153, 14968), (154, 14986), (156, 15061), (157, 15094), (158, 15136), (159, 15214), (160, 15229), (162, 15253), (165, 15409), (166, 15421), (167, 15427),

Gene: TWAMP\_21 Start: 12124, Stop: 15471, Start Num: 1

Candidate Starts for TWAMP\_21:

(Start: 1 @12124 has 35 MA's), (2, 12142), (4, 12265), (5, 12286), (6, 12307), (8, 12337), (15, 12451), (18, 12499), (22, 12547), (23, 12556), (Start: 29 @12631 has 1 MA's), (32, 12652), (34, 12673), (35, 12679), (36, 12727), (38, 12799), (40, 12838), (41, 12847), (46, 12901), (47, 12955), (48, 12961), (51, 13000), (53, 13033), (54, 13072), (56, 13129), (57, 13240), (59, 13261), (60, 13270), (62, 13312), (65, 13363), (66, 13375), (67, 13447), (68, 13450), (70, 13522), (71, 13531), (74, 13555), (77, 13579), (78, 13588), (79, 13594), (80, 13597), (81, 13606), (82, 13618), (84, 13660), (86, 13690), (88, 13714), (89, 13735), (90, 13759), (92, 13804), (94, 13855), (95, 13867), (96, 13870), (97, 13888), (98, 13903), (100, 13954), (101, 14008), (106, 14131), (108, 14158), (109, 14182), (110, 14209), (112, 14245), (113, 14275), (117, 14359), (122, 14440), (125, 14485), (126, 14497), (127, 14506), (128, 14515), (129, 14521), (130, 14527), (134, 14548), (138, 14662), (139, 14683), (143, 14728), (146, 14782), (149, 14827), (150, 14899), (151, 14923), (153, 14968), (154, 14986), (156, 15061), (157, 15094), (158, 15136), (159, 15214), (160, 15229), (162, 15253), (165, 15409), (166, 15421), (167, 15427),

Gene: Takoda\_21 Start: 12084, Stop: 15431, Start Num: 1

Candidate Starts for Takoda\_21:

(Start: 1 @12084 has 35 MA's), (2, 12102), (4, 12225), (5, 12246), (6, 12267), (8, 12297), (10, 12336), (15, 12411), (22, 12507), (23, 12516), (Start: 29 @12591 has 1 MA's), (32, 12612), (34, 12633), (35, 12639), (36, 12687), (38, 12759), (40, 12798), (41, 12807), (46, 12861), (48, 12921), (51, 12960), (53, 12993), (54, 13032), (56, 13089), (57, 13200), (59, 13221), (60, 13230), (62, 13272), (65, 13323), (66, 13335), (67, 13407), (68, 13410), (70, 13482), (71, 13491), (74, 13515), (80, 13557), (81, 13566), (82, 13578), (84, 13620), (86, 13650), (89, 13695), (90, 13719), (92, 13764), (93, 13794), (94, 13815), (95, 13827), (96, 13830), (97, 13848), (98, 13863), (100, 13914), (102, 14010), (103, 14055), (104, 14064), (105, 14067), (107, 14109), (112, 14205), (113, 14235), (117, 14319), (119, 14346), (124, 14421), (127, 14466), (128, 14475), (138, 14622), (144, 14697), (146, 14742), (149, 14787), (150, 14859), (151, 14883), (153, 14928), (154, 14946), (156, 15021), (157, 15054), (158, 15096), (160, 15189), (162, 15213), (165, 15369), (167, 15387),

Gene: UhSalsa\_21 Start: 12124, Stop: 15471, Start Num: 1

Candidate Starts for UhSalsa\_21:

(Start: 1 @12124 has 35 MA's), (2, 12142), (4, 12265), (5, 12286), (6, 12307), (8, 12337), (15, 12451), (18, 12499), (22, 12547), (23, 12556), (Start: 29 @12631 has 1 MA's), (32, 12652), (34, 12673), (35, 12679), (36, 12727), (38, 12799), (40, 12838), (41, 12847), (46, 12901), (47, 12955), (48, 12961), (51, 13000), (53, 13033), (54, 13072), (56, 13129), (57, 13240), (59, 13261), (60, 13270), (62, 13312), (65, 13363), (66, 13375), (67, 13447), (68, 13450), (70, 13522), (71, 13531), (74, 13555), (77, 13579), (78, 13588), (79, 13594), (80, 13597), (81, 13606), (82, 13618), (84, 13660), (86, 13690), (88, 13714), (89, 13735), (90, 13759), (92, 13804), (94, 13855), (95, 13867), (96, 13870), (97, 13888), (98, 13903), (100, 13954), (101, 14008), (106, 14131), (108, 14158), (109, 14182), (110, 14209), (112, 14245), (113, 14275), (117, 14359), (122, 14440), (125, 14485), (126, 14497), (127, 14506), (128, 14515), (129, 14521), (130, 14527), (134, 14548), (138, 14662), (139, 14683), (143, 14728), (146, 14782), (149, 14827), (150, 14899), (151, 14923), (153, 14968), (154, 14986), (156, 15061), (157, 15094), (158, 15136), (159, 15214), (160, 15229), (162, 15253), (165, 15409), (166, 15421), (167, 15427),

Gene: Yogi\_21 Start: 12098, Stop: 15445, Start Num: 1

Candidate Starts for Yogi\_21:

(Start: 1 @12098 has 35 MA's), (2, 12116), (4, 12239), (5, 12260), (6, 12281), (7, 12299), (8, 12311), (10, 12350), (15, 12425), (22, 12521), (23, 12530), (Start: 29 @12605 has 1 MA's), (32, 12626), (34, 12647), (35, 12653), (36, 12701), (38, 12773), (40, 12812), (41, 12821), (46, 12875), (48, 12935), (51, 12974), (53, 13007), (54, 13046), (56, 13103), (57, 13214), (59, 13235), (60, 13244), (62, 13286), (65, 13337), (66, 13349), (67, 13421), (68, 13424), (70, 13496), (71, 13505), (76, 13547), (77, 13553), (80, 13571), (81, 13580), (82, 13592), (84, 13634), (86, 13664), (87, 13667), (89, 13709), (90, 13733), (92, 13778), (94, 13829), (95, 13841), (96, 13844), (97, 13862), (98, 13877), (100, 13928), (101, 13982), (102, 14024), (104, 14078), (105, 14081), (107, 14123), (112, 14219), (113, 14249), (117, 14333), (123, 14423), (125, 14459), (126, 14471), (127, 14480), (128, 14489), (129, 14495), (132, 14513), (134, 14522), (138, 14636), (139, 14657), (141, 14678), (143, 14702), (146, 14756), (149, 14801), (150, 14873), (151, 14897), (153, 14942), (154, 14960), (156, 15035), (157, 15068), (158, 15110), (160, 15203), (162, 15227), (165, 15383), (167, 15401),

Gene: Yoncess\_21 Start: 12098, Stop: 15445, Start Num: 1

Candidate Starts for Yoncess\_21:

(Start: 1 @12098 has 35 MA's), (2, 12116), (4, 12239), (5, 12260), (6, 12281), (8, 12311), (10, 12350), (15, 12425), (22, 12521), (23, 12530), (Start: 29 @12605 has 1 MA's), (32, 12626), (34, 12647), (35, 12653), (36, 12701), (38, 12773), (40, 12812), (41, 12821), (46, 12875), (48, 12935), (51, 12974), (53, 13007), (54, 13046), (56, 13103), (57, 13214), (59, 13235), (60, 13244), (62, 13286), (65, 13337), (66, 13349), (67, 13421), (68, 13424), (70, 13496), (71, 13505), (77, 13553), (80, 13571), (81, 13580), (82, 13592), (84, 13634), (86, 13664), (89, 13709), (90, 13733), (92, 13778), (94, 13829), (95, 13841), (96, 13844), (97, 13862), (98, 13877), (100, 13928), (101, 13982), (102, 14024), (104, 14078), (105, 14081), (112, 14219), (113, 14249), (117, 14333), (123, 14423), (125, 14459), (126, 14471), (127, 14480), (128, 14489), (129, 14495), (132, 14513), (134, 14522), (138, 14636), (141, 14678), (143, 14702), (146, 14756), (149, 14801), (150, 14873), (151, 14897), (153, 14942), (154, 14960), (156, 15035), (157, 15068), (158, 15110), (160, 15203), (162, 15227), (165, 15383), (167, 15401),