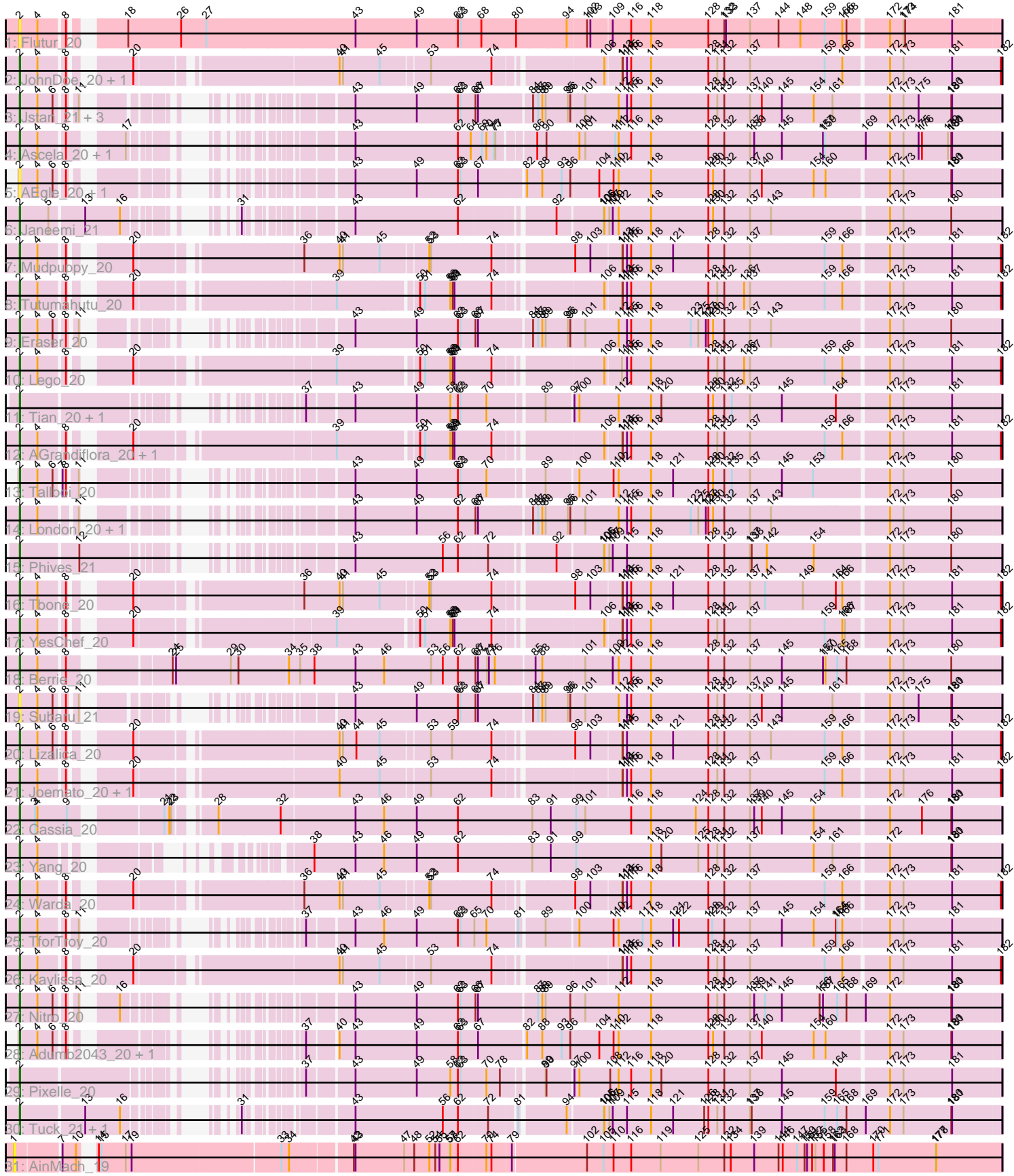


Pham 296707



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 296707 Report

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

Pham number 296707 has 43 members, 12 are drafts.

Phages represented in each track:

- Track 1 : Flutur\_20
- Track 2 : JohnDoe\_20, Cyan\_20
- Track 3 : Jstan\_21, Skelbel\_21, Asa16\_20, Niobe\_20
- Track 4 : Ascela\_20, Iter\_20
- Track 5 : AEgle\_20, Amploria\_20
- Track 6 : Janeemi\_21
- Track 7 : Mudpuppy\_20
- Track 8 : Tutumahutu\_20
- Track 9 : Eraser\_20
- Track 10 : Lego\_20
- Track 11 : Tian\_20, Amyev\_20
- Track 12 : AGrandiflora\_20, Powerpuff\_20
- Track 13 : Tallboi\_20
- Track 14 : London\_20, Elezi\_20
- Track 15 : Phives\_21
- Track 16 : Tbone\_20
- Track 17 : YesChef\_20
- Track 18 : Berrie\_20
- Track 19 : Subaru\_21
- Track 20 : Lizalica\_20
- Track 21 : Joemato\_20, Simpson\_22
- Track 22 : Cassia\_20
- Track 23 : Yang\_20
- Track 24 : Warda\_20
- Track 25 : TforTroy\_20
- Track 26 : Kaylissa\_20
- Track 27 : Nitro\_20
- Track 28 : Adumb2043\_20, Turab\_20
- Track 29 : Pixelle\_20
- Track 30 : Tuck\_21, Community\_20
- Track 31 : AinMach\_19

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

The start number called the most often in the published annotations is 2, it was called in 31 of the 31 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- AEgle\_20, AGrandiflora\_20, Adumb2043\_20, Amploria\_20, Amyev\_20, Asa16\_20, Ascela\_20, Berrie\_20, Cassia\_20, Community\_20, Cyan\_20, Elezi\_20, Eraser\_20, Flutur\_20, Iter\_20, Janeemi\_21, Joemato\_20, JohnDoe\_20, Jstan\_21, Kaylissa\_20, Lego\_20, Lizalica\_20, London\_20, Mudpuppy\_20, Niobe\_20, Nitro\_20, Phives\_21, Pixelle\_20, Powerpuff\_20, Simpson\_22, Skelbel\_21, Subaru\_21, Tallboi\_20, Tbone\_20, TforTroy\_20, Tian\_20, Tuck\_21, Turab\_20, Tutumahutu\_20, Warda\_20, Yang\_20, YesChef\_20,

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

- 

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

- AinMach\_19,

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

Start 1:

- Found in 1 of 43 ( 2.3% ) of genes in pham
- No Manual Annotations of this start.
- Called 100.0% of time when present
- Phage (with cluster) where this start called: AinMach\_19 (AZ7),

Start 2:

- Found in 42 of 43 ( 97.7% ) of genes in pham
- Manual Annotations of this start: 31 of 31
- Called 100.0% of time when present
- Phage (with cluster) where this start called: AEgle\_20 (AZ1), AGrandiflora\_20 (AZ1), Adumb2043\_20 (AZ1), Amploria\_20 (AZ1), Amyev\_20 (AZ1), Asa16\_20 (AZ1), Ascela\_20 (AZ1), Berrie\_20 (AZ1), Cassia\_20 (AZ1), Community\_20 (AZ1), Cyan\_20 (AZ1), Elezi\_20 (AZ1), Eraser\_20 (AZ1), Flutur\_20 (AZ), Iter\_20 (AZ1), Janeemi\_21 (AZ1), Joemato\_20 (AZ1), JohnDoe\_20 (AZ1), Jstan\_21 (AZ1), Kaylissa\_20 (AZ1), Lego\_20 (AZ1), Lizalica\_20 (AZ1), London\_20 (AZ1), Mudpuppy\_20 (AZ1), Niobe\_20 (AZ1), Nitro\_20 (AZ1), Phives\_21 (AZ1), Pixelle\_20 (AZ1), Powerpuff\_20 (AZ1), Simpson\_22 (AZ1), Skelbel\_21 (AZ1), Subaru\_21 (AZ1), Tallboi\_20 (AZ1), Tbone\_20 (AZ1), TforTroy\_20 (AZ1), Tian\_20 (AZ1), Tuck\_21 (AZ1), Turab\_20 (AZ1), Tutumahutu\_20 (AZ1), Warda\_20 (AZ1), Yang\_20 (AZ1), YesChef\_20 (AZ1),

### **Summary by clusters:**

There are 3 clusters represented in this pham: AZ1, AZ, AZ7,

Info for manual annotations of cluster AZ1:

- Start number 2 was manually annotated 31 times for cluster AZ1.

### **Gene Information:**

Gene: AEgle\_20 Start: 16059, Stop: 18917, Start Num: 2

Candidate Starts for AEgle\_20:

(Start: 2 @16059 has 31 MA's), (4, 16122), (6, 16176), (8, 16206), (43, 16749), (49, 16968), (62, 17115), (63, 17124), (67, 17184), (82, 17334), (88, 17388), (93, 17457), (96, 17487), (104, 17577), (110, 17619), (112, 17637), (118, 17742), (128, 17943), (130, 17958), (132, 17994), (137, 18078), (140, 18120), (154, 18294), (160, 18333), (172, 18528), (173, 18573), (180, 18741), (181, 18744),

Gene: AGrandiflora\_20 Start: 16043, Stop: 19015, Start Num: 2

Candidate Starts for AGrandiflora\_20:

(Start: 2 @16043 has 31 MA's), (4, 16106), (8, 16190), (20, 16334), (39, 16928), (50, 17159), (51, 17177), (58, 17255), (59, 17261), (60, 17264), (61, 17270), (74, 17381), (106, 17693), (113, 17747), (114, 17750), (115, 17765), (116, 17780), (118, 17840), (128, 18041), (131, 18071), (132, 18092), (137, 18173), (159, 18425), (166, 18485), (172, 18626), (173, 18671), (181, 18842), (182, 19010),

Gene: Adumb2043\_20 Start: 16058, Stop: 18916, Start Num: 2

Candidate Starts for Adumb2043\_20:

(Start: 2 @16058 has 31 MA's), (4, 16121), (6, 16175), (8, 16205), (37, 16610), (40, 16691), (43, 16748), (49, 16967), (62, 17114), (63, 17123), (67, 17183), (82, 17333), (88, 17387), (93, 17456), (96, 17486), (104, 17576), (110, 17618), (112, 17636), (118, 17741), (128, 17942), (130, 17957), (132, 17993), (137, 18077), (140, 18119), (154, 18293), (160, 18332), (172, 18527), (173, 18572), (180, 18740), (181, 18743),

Gene: AinMach\_19 Start: 15227, Stop: 18562, Start Num: 1

Candidate Starts for AinMach\_19:

(1, 15227), (7, 15374), (10, 15416), (14, 15437), (15, 15446), (17, 15533), (19, 15554), (33, 16064), (34, 16091), (42, 16292), (43, 16298), (47, 16472), (48, 16508), (52, 16562), (54, 16583), (55, 16598), (57, 16634), (58, 16637), (62, 16664), (70, 16757), (74, 16775), (79, 16841), (102, 17096), (105, 17153), (110, 17183), (116, 17243), (119, 17348), (125, 17480), (132, 17573), (134, 17594), (139, 17678), (144, 17765), (146, 17780), (147, 17831), (150, 17858), (151, 17867), (152, 17885), (155, 17897), (158, 17927), (162, 17960), (163, 17966), (168, 18008), (170, 18104), (171, 18122), (177, 18326), (178, 18329),

Gene: Amploria\_20 Start: 16058, Stop: 18916, Start Num: 2

Candidate Starts for Amploria\_20:

(Start: 2 @16058 has 31 MA's), (4, 16121), (6, 16175), (8, 16205), (43, 16748), (49, 16967), (62, 17114), (63, 17123), (67, 17183), (82, 17333), (88, 17387), (93, 17456), (96, 17486), (104, 17576), (110, 17618), (112, 17636), (118, 17741), (128, 17942), (130, 17957), (132, 17993), (137, 18077), (140, 18119), (154, 18293), (160, 18332), (172, 18527), (173, 18572), (180, 18740), (181, 18743),

Gene: Amyev\_20 Start: 16398, Stop: 19307, Start Num: 2

Candidate Starts for Amyev\_20:

(Start: 2 @16398 has 31 MA's), (37, 17013), (43, 17151), (49, 17370), (58, 17490), (62, 17517), (63, 17526), (70, 17607), (89, 17787), (97, 17877), (100, 17895), (112, 18027), (118, 18132), (120, 18168), (128, 18333), (130, 18348), (132, 18384), (135, 18408), (137, 18468), (145, 18579), (164, 18759), (172, 18918), (173, 18963), (181, 19134),

Gene: Asa16\_20 Start: 16027, Stop: 18864, Start Num: 2

Candidate Starts for Asa16\_20:

(Start: 2 @16027 has 31 MA's), (4, 16090), (6, 16144), (8, 16174), (11, 16198), (43, 16696), (49, 16915), (62, 17062), (63, 17071), (66, 17122), (67, 17131), (84, 17302), (87, 17320), (88, 17335), (89, 17347), (95, 17425), (96, 17434), (101, 17476), (112, 17584), (115, 17614), (116, 17629), (118, 17689), (128, 17890), (131, 17920), (132, 17941), (137, 18022), (140, 18064), (145, 18133), (154, 18238), (161, 18301), (172, 18475), (173, 18520), (175, 18574), (180, 18688), (181, 18691),

Gene: Ascela\_20 Start: 16055, Stop: 18919, Start Num: 2

Candidate Starts for Ascela\_20:

(Start: 2 @16055 has 31 MA's), (4, 16118), (8, 16202), (17, 16346), (43, 16748), (62, 17114), (64, 17159), (69, 17198), (70, 17213), (75, 17237), (77, 17243), (86, 17354), (90, 17387), (100, 17480), (101, 17501), (111, 17600), (112, 17612), (116, 17657), (118, 17717), (128, 17918), (132, 17969), (137, 18053), (139, 18068), (145, 18164), (157, 18299), (159, 18305), (169, 18443), (172, 18527), (173, 18572), (175, 18626), (176, 18638), (179, 18731), (180, 18743), (181, 18746),

Gene: Berrie\_20 Start: 16192, Stop: 19419, Start Num: 2

Candidate Starts for Berrie\_20:

(Start: 2 @16192 has 31 MA's), (4, 16255), (8, 16339), (24, 16615), (25, 16627), (29, 16810), (30, 16831), (34, 16996), (35, 17029), (38, 17080), (43, 17227), (46, 17329), (53, 17497), (56, 17539), (62, 17593), (66, 17653), (67, 17662), (71, 17695), (73, 17701), (76, 17722), (85, 17842), (88, 17866), (101, 18007), (109, 18094), (112, 18115), (116, 18160), (118, 18220), (128, 18421), (132, 18472), (137, 18556), (145, 18667), (157, 18802), (160, 18811), (165, 18850), (168, 18883), (172, 19030), (173, 19075), (180, 19243),

Gene: Cassia\_20 Start: 16153, Stop: 19350, Start Num: 2

Candidate Starts for Cassia\_20:

(Start: 2 @16153 has 31 MA's), (3, 16207), (4, 16216), (9, 16321), (21, 16573), (22, 16585), (23, 16591), (28, 16690), (32, 16894), (43, 17137), (46, 17239), (49, 17356), (62, 17503), (83, 17767), (91, 17830), (99, 17920), (101, 17953), (116, 18115), (118, 18175), (124, 18331), (128, 18376), (132, 18427), (137, 18508), (139, 18523), (140, 18550), (145, 18619), (154, 18724), (172, 18961), (176, 19072), (180, 19174), (181, 19177),

Gene: Community\_20 Start: 17595, Stop: 20501, Start Num: 2

Candidate Starts for Community\_20:

(Start: 2 @17595 has 31 MA's), (13, 17808), (16, 17931), (31, 18093), (43, 18348), (56, 18660), (62, 18714), (72, 18810), (81, 18891), (94, 19035), (105, 19149), (106, 19152), (107, 19164), (109, 19176), (115, 19227), (118, 19302), (121, 19380), (126, 19488), (128, 19503), (131, 19533), (132, 19554), (137, 19638), (138, 19644), (145, 19749), (159, 19890), (165, 19932), (168, 19965), (169, 20028), (172, 20112), (173, 20157), (180, 20325), (181, 20328),

Gene: Cyan\_20 Start: 16046, Stop: 19063, Start Num: 2

Candidate Starts for Cyan\_20:

(Start: 2 @16046 has 31 MA's), (4, 16109), (8, 16193), (20, 16337), (40, 16955), (41, 16967), (45, 17087), (53, 17237), (74, 17429), (106, 17741), (113, 17795), (114, 17798), (115, 17813), (116, 17828), (118, 17888), (128, 18089), (131, 18119), (132, 18140), (137, 18221), (159, 18473), (166, 18533), (172, 18674), (173, 18719), (181, 18890), (182, 19058),

Gene: Elezi\_20 Start: 16028, Stop: 18865, Start Num: 2

Candidate Starts for Elezi\_20:

(Start: 2 @16028 has 31 MA's), (4, 16091), (11, 16199), (43, 16697), (49, 16916), (62, 17063), (66, 17123), (67, 17132), (84, 17303), (87, 17321), (88, 17336), (89, 17348), (95, 17426), (96, 17435), (101, 17477), (112, 17585), (115, 17615), (116, 17630), (118, 17690), (123, 17831), (125, 17855), (127, 17882), (128, 17891), (130, 17906), (132, 17942), (137, 18026), (143, 18098), (172, 18476), (173, 18521), (180, 18689),

Gene: Eraser\_20 Start: 16028, Stop: 18865, Start Num: 2

Candidate Starts for Eraser\_20:

(Start: 2 @16028 has 31 MA's), (4, 16091), (6, 16145), (8, 16175), (11, 16199), (43, 16697), (49, 16916), (62, 17063), (63, 17072), (66, 17123), (67, 17132), (84, 17303), (87, 17321), (88, 17336), (89,

17348), (95, 17426), (96, 17435), (101, 17477), (112, 17585), (115, 17615), (116, 17630), (118, 17690), (123, 17831), (125, 17855), (127, 17882), (128, 17891), (130, 17906), (132, 17942), (137, 18026), (143, 18098), (172, 18476), (173, 18521), (180, 18689),

Gene: Flutur\_20 Start: 16046, Stop: 19297, Start Num: 2

Candidate Starts for Flutur\_20:

(Start: 2 @16046 has 31 MA's), (4, 16109), (8, 16193), (18, 16325), (26, 16508), (27, 16598), (43, 17117), (49, 17336), (62, 17483), (63, 17492), (68, 17567), (80, 17678), (94, 17852), (102, 17918), (103, 17930), (109, 17996), (116, 18062), (118, 18122), (128, 18323), (132, 18374), (133, 18380), (137, 18458), (144, 18557), (148, 18626), (159, 18710), (166, 18770), (168, 18785), (172, 18908), (173, 18953), (174, 18959), (181, 19124),

Gene: Iter\_20 Start: 16055, Stop: 18919, Start Num: 2

Candidate Starts for Iter\_20:

(Start: 2 @16055 has 31 MA's), (4, 16118), (8, 16202), (17, 16346), (43, 16748), (62, 17114), (64, 17159), (69, 17198), (70, 17213), (75, 17237), (77, 17243), (86, 17354), (90, 17387), (100, 17480), (101, 17501), (111, 17600), (112, 17612), (116, 17657), (118, 17717), (128, 17918), (132, 17969), (137, 18053), (139, 18068), (145, 18164), (157, 18299), (159, 18305), (169, 18443), (172, 18527), (173, 18572), (175, 18626), (176, 18638), (179, 18731), (180, 18743), (181, 18746),

Gene: Janeemi\_21 Start: 17623, Stop: 20508, Start Num: 2

Candidate Starts for Janeemi\_21:

(Start: 2 @17623 has 31 MA's), (5, 17725), (13, 17836), (16, 17959), (31, 18121), (43, 18376), (62, 18742), (92, 19030), (105, 19180), (106, 19183), (107, 19195), (109, 19207), (112, 19228), (118, 19333), (128, 19534), (130, 19549), (132, 19585), (137, 19669), (143, 19741), (172, 20119), (173, 20164), (180, 20332),

Gene: Joemato\_20 Start: 16046, Stop: 19063, Start Num: 2

Candidate Starts for Joemato\_20:

(Start: 2 @16046 has 31 MA's), (4, 16109), (8, 16193), (20, 16337), (40, 16955), (45, 17087), (53, 17237), (74, 17429), (113, 17795), (114, 17798), (115, 17813), (116, 17828), (118, 17888), (128, 18089), (131, 18119), (132, 18140), (137, 18221), (159, 18473), (166, 18533), (172, 18674), (173, 18719), (181, 18890), (182, 19058),

Gene: JohnDoe\_20 Start: 16041, Stop: 19058, Start Num: 2

Candidate Starts for JohnDoe\_20:

(Start: 2 @16041 has 31 MA's), (4, 16104), (8, 16188), (20, 16332), (40, 16950), (41, 16962), (45, 17082), (53, 17232), (74, 17424), (106, 17736), (113, 17790), (114, 17793), (115, 17808), (116, 17823), (118, 17883), (128, 18084), (131, 18114), (132, 18135), (137, 18216), (159, 18468), (166, 18528), (172, 18669), (173, 18714), (181, 18885), (182, 19053),

Gene: Jstan\_21 Start: 16028, Stop: 18865, Start Num: 2

Candidate Starts for Jstan\_21:

(Start: 2 @16028 has 31 MA's), (4, 16091), (6, 16145), (8, 16175), (11, 16199), (43, 16697), (49, 16916), (62, 17063), (63, 17072), (66, 17123), (67, 17132), (84, 17303), (87, 17321), (88, 17336), (89, 17348), (95, 17426), (96, 17435), (101, 17477), (112, 17585), (115, 17615), (116, 17630), (118, 17690), (128, 17891), (131, 17921), (132, 17942), (137, 18023), (140, 18065), (145, 18134), (154, 18239), (161, 18302), (172, 18476), (173, 18521), (175, 18575), (180, 18689), (181, 18692),

Gene: Kaylissa\_20 Start: 16047, Stop: 19064, Start Num: 2

Candidate Starts for Kaylissa\_20:

(Start: 2 @16047 has 31 MA's), (4, 16110), (8, 16194), (20, 16338), (40, 16956), (41, 16968), (45, 17088), (53, 17238), (74, 17430), (113, 17796), (114, 17799), (115, 17814), (116, 17829), (118,

17889), (128, 18090), (131, 18120), (132, 18141), (137, 18222), (159, 18474), (166, 18534), (172, 18675), (173, 18720), (181, 18891), (182, 19059),

Gene: Lego\_20 Start: 16046, Stop: 19018, Start Num: 2

Candidate Starts for Lego\_20:

(Start: 2 @16046 has 31 MA's), (4, 16109), (8, 16193), (20, 16337), (39, 16931), (50, 17162), (51, 17180), (58, 17258), (59, 17264), (60, 17267), (61, 17273), (74, 17384), (106, 17696), (113, 17750), (115, 17768), (116, 17783), (118, 17843), (128, 18044), (131, 18074), (132, 18095), (136, 18158), (137, 18176), (159, 18428), (166, 18488), (172, 18629), (173, 18674), (181, 18845), (182, 19013),

Gene: Lizalica\_20 Start: 16031, Stop: 19048, Start Num: 2

Candidate Starts for Lizalica\_20:

(Start: 2 @16031 has 31 MA's), (4, 16094), (6, 16148), (8, 16178), (20, 16322), (40, 16940), (41, 16952), (44, 16997), (45, 17072), (53, 17222), (59, 17294), (74, 17414), (98, 17633), (103, 17684), (113, 17780), (114, 17783), (115, 17798), (118, 17873), (121, 17951), (128, 18074), (131, 18104), (132, 18125), (137, 18206), (143, 18278), (159, 18458), (166, 18518), (172, 18659), (173, 18704), (181, 18875), (182, 19043),

Gene: London\_20 Start: 16028, Stop: 18865, Start Num: 2

Candidate Starts for London\_20:

(Start: 2 @16028 has 31 MA's), (4, 16091), (11, 16199), (43, 16697), (49, 16916), (62, 17063), (66, 17123), (67, 17132), (84, 17303), (87, 17321), (88, 17336), (89, 17348), (95, 17426), (96, 17435), (101, 17477), (112, 17585), (115, 17615), (116, 17630), (118, 17690), (123, 17831), (125, 17855), (127, 17882), (128, 17891), (130, 17906), (132, 17942), (137, 18026), (143, 18098), (172, 18476), (173, 18521), (180, 18689),

Gene: Mudpuppy\_20 Start: 16045, Stop: 19062, Start Num: 2

Candidate Starts for Mudpuppy\_20:

(Start: 2 @16045 has 31 MA's), (4, 16108), (8, 16192), (20, 16336), (36, 16837), (40, 16954), (41, 16966), (45, 17086), (52, 17230), (53, 17236), (74, 17428), (98, 17647), (103, 17698), (113, 17794), (114, 17797), (115, 17812), (116, 17827), (118, 17887), (121, 17965), (128, 18088), (132, 18139), (137, 18220), (159, 18472), (166, 18532), (172, 18673), (173, 18718), (181, 18889), (182, 19057),

Gene: Niobe\_20 Start: 16028, Stop: 18865, Start Num: 2

Candidate Starts for Niobe\_20:

(Start: 2 @16028 has 31 MA's), (4, 16091), (6, 16145), (8, 16175), (11, 16199), (43, 16697), (49, 16916), (62, 17063), (63, 17072), (66, 17123), (67, 17132), (84, 17303), (87, 17321), (88, 17336), (89, 17348), (95, 17426), (96, 17435), (101, 17477), (112, 17585), (115, 17615), (116, 17630), (118, 17690), (128, 17891), (131, 17921), (132, 17942), (137, 18023), (140, 18065), (145, 18134), (154, 18239), (161, 18302), (172, 18476), (173, 18521), (175, 18575), (180, 18689), (181, 18692),

Gene: Nitro\_20 Start: 16056, Stop: 18917, Start Num: 2

Candidate Starts for Nitro\_20:

(Start: 2 @16056 has 31 MA's), (4, 16119), (6, 16173), (8, 16203), (11, 16227), (16, 16308), (43, 16725), (49, 16944), (62, 17091), (63, 17100), (66, 17151), (67, 17160), (87, 17349), (88, 17364), (89, 17376), (96, 17463), (101, 17505), (112, 17613), (118, 17718), (128, 17919), (131, 17949), (132, 17970), (137, 18054), (139, 18069), (141, 18108), (145, 18165), (156, 18288), (157, 18300), (165, 18348), (168, 18381), (169, 18444), (172, 18528), (180, 18741), (181, 18744),

Gene: Phives\_21 Start: 17458, Stop: 20337, Start Num: 2

Candidate Starts for Phives\_21:

(Start: 2 @17458 has 31 MA's), (12, 17650), (43, 18211), (56, 18523), (62, 18577), (72, 18673), (92, 18862), (105, 19012), (106, 19015), (107, 19027), (109, 19039), (115, 19090), (118, 19165), (128,

19366), (132, 19417), (137, 19498), (138, 19504), (142, 19558), (154, 19714), (172, 19948), (173, 19993), (180, 20161),

Gene: Pixelle\_20 Start: 16401, Stop: 19310, Start Num: 2

Candidate Starts for Pixelle\_20:

(Start: 2 @16401 has 31 MA's), (37, 17016), (43, 17154), (49, 17373), (58, 17493), (62, 17520), (63, 17529), (70, 17610), (78, 17658), (89, 17790), (90, 17793), (97, 17880), (100, 17898), (108, 18000), (112, 18030), (116, 18075), (118, 18135), (120, 18171), (128, 18336), (132, 18387), (137, 18471), (145, 18582), (164, 18762), (172, 18921), (173, 18966), (181, 19137),

Gene: Powerpuff\_20 Start: 16097, Stop: 19069, Start Num: 2

Candidate Starts for Powerpuff\_20:

(Start: 2 @16097 has 31 MA's), (4, 16160), (8, 16244), (20, 16388), (39, 16982), (50, 17213), (51, 17231), (58, 17309), (59, 17315), (60, 17318), (61, 17324), (74, 17435), (106, 17747), (113, 17801), (114, 17804), (115, 17819), (116, 17834), (118, 17894), (128, 18095), (131, 18125), (132, 18146), (137, 18227), (159, 18479), (166, 18539), (172, 18680), (173, 18725), (181, 18896), (182, 19064),

Gene: Simpson\_22 Start: 16046, Stop: 19063, Start Num: 2

Candidate Starts for Simpson\_22:

(Start: 2 @16046 has 31 MA's), (4, 16109), (8, 16193), (20, 16337), (40, 16955), (45, 17087), (53, 17237), (74, 17429), (113, 17795), (114, 17798), (115, 17813), (116, 17828), (118, 17888), (128, 18089), (131, 18119), (132, 18140), (137, 18221), (159, 18473), (166, 18533), (172, 18674), (173, 18719), (181, 18890), (182, 19058),

Gene: Skelbel\_21 Start: 16028, Stop: 18865, Start Num: 2

Candidate Starts for Skelbel\_21:

(Start: 2 @16028 has 31 MA's), (4, 16091), (6, 16145), (8, 16175), (11, 16199), (43, 16697), (49, 16916), (62, 17063), (63, 17072), (66, 17123), (67, 17132), (84, 17303), (87, 17321), (88, 17336), (89, 17348), (95, 17426), (96, 17435), (101, 17477), (112, 17585), (115, 17615), (116, 17630), (118, 17690), (128, 17891), (131, 17921), (132, 17942), (137, 18023), (140, 18065), (145, 18134), (154, 18239), (161, 18302), (172, 18476), (173, 18521), (175, 18575), (180, 18689), (181, 18692),

Gene: Subaru\_21 Start: 16028, Stop: 18865, Start Num: 2

Candidate Starts for Subaru\_21:

(Start: 2 @16028 has 31 MA's), (4, 16091), (6, 16145), (8, 16175), (11, 16199), (43, 16697), (49, 16916), (62, 17063), (63, 17072), (66, 17123), (67, 17132), (84, 17303), (87, 17321), (88, 17336), (89, 17348), (95, 17426), (96, 17435), (101, 17477), (112, 17585), (115, 17615), (116, 17630), (118, 17690), (128, 17891), (131, 17921), (132, 17942), (137, 18023), (140, 18065), (145, 18134), (161, 18302), (172, 18476), (173, 18521), (175, 18575), (180, 18689), (181, 18692),

Gene: Tallboi\_20 Start: 16061, Stop: 18886, Start Num: 2

Candidate Starts for Tallboi\_20:

(Start: 2 @16061 has 31 MA's), (4, 16124), (6, 16178), (7, 16196), (8, 16208), (11, 16232), (43, 16730), (49, 16949), (62, 17096), (63, 17105), (70, 17186), (89, 17366), (100, 17474), (110, 17588), (112, 17606), (118, 17711), (121, 17789), (128, 17912), (130, 17927), (132, 17963), (135, 17987), (137, 18047), (145, 18158), (153, 18260), (172, 18497), (173, 18542), (180, 18710),

Gene: Tbone\_20 Start: 16050, Stop: 19067, Start Num: 2

Candidate Starts for Tbone\_20:

(Start: 2 @16050 has 31 MA's), (4, 16113), (8, 16197), (20, 16341), (36, 16842), (40, 16959), (41, 16971), (45, 17091), (52, 17235), (53, 17241), (74, 17433), (98, 17652), (103, 17703), (113, 17799), (114, 17802), (115, 17817), (116, 17832), (118, 17892), (121, 17970), (128, 18093), (132, 18144), (137, 18225), (141, 18279), (149, 18402), (164, 18516), (166, 18537), (172, 18678), (173, 18723),

(181, 18894), (182, 19062),

Gene: TforTroy\_20 Start: 16181, Stop: 19015, Start Num: 2

Candidate Starts for TforTroy\_20:

(Start: 2 @16181 has 31 MA's), (4, 16244), (8, 16328), (11, 16352), (37, 16712), (43, 16850), (46, 16952), (49, 17069), (62, 17216), (63, 17225), (65, 17270), (70, 17306), (81, 17408), (89, 17486), (100, 17594), (110, 17708), (112, 17726), (117, 17807), (118, 17831), (121, 17909), (122, 17930), (128, 18032), (129, 18044), (132, 18083), (137, 18164), (145, 18275), (154, 18377), (164, 18449), (165, 18452), (166, 18470), (172, 18626), (173, 18671), (181, 18842),

Gene: Tian\_20 Start: 16398, Stop: 19307, Start Num: 2

Candidate Starts for Tian\_20:

(Start: 2 @16398 has 31 MA's), (37, 17013), (43, 17151), (49, 17370), (58, 17490), (62, 17517), (63, 17526), (70, 17607), (89, 17787), (97, 17877), (100, 17895), (112, 18027), (118, 18132), (120, 18168), (128, 18333), (130, 18348), (132, 18384), (135, 18408), (137, 18468), (145, 18579), (164, 18759), (172, 18918), (173, 18963), (181, 19134),

Gene: Tuck\_21 Start: 17575, Stop: 20481, Start Num: 2

Candidate Starts for Tuck\_21:

(Start: 2 @17575 has 31 MA's), (13, 17788), (16, 17911), (31, 18073), (43, 18328), (56, 18640), (62, 18694), (72, 18790), (81, 18871), (94, 19015), (105, 19129), (106, 19132), (107, 19144), (109, 19156), (115, 19207), (118, 19282), (121, 19360), (126, 19468), (128, 19483), (131, 19513), (132, 19534), (137, 19618), (138, 19624), (145, 19729), (159, 19870), (165, 19912), (168, 19945), (169, 20008), (172, 20092), (173, 20137), (180, 20305), (181, 20308),

Gene: Turab\_20 Start: 16058, Stop: 18916, Start Num: 2

Candidate Starts for Turab\_20:

(Start: 2 @16058 has 31 MA's), (4, 16121), (6, 16175), (8, 16205), (37, 16610), (40, 16691), (43, 16748), (49, 16967), (62, 17114), (63, 17123), (67, 17183), (82, 17333), (88, 17387), (93, 17456), (96, 17486), (104, 17576), (110, 17618), (112, 17636), (118, 17741), (128, 17942), (130, 17957), (132, 17993), (137, 18077), (140, 18119), (154, 18293), (160, 18332), (172, 18527), (173, 18572), (180, 18740), (181, 18743),

Gene: Tutumahutu\_20 Start: 16097, Stop: 19069, Start Num: 2

Candidate Starts for Tutumahutu\_20:

(Start: 2 @16097 has 31 MA's), (4, 16160), (8, 16244), (20, 16388), (39, 16982), (50, 17213), (51, 17231), (58, 17309), (59, 17315), (60, 17318), (61, 17324), (74, 17435), (106, 17747), (113, 17801), (114, 17804), (115, 17819), (116, 17834), (118, 17894), (128, 18095), (131, 18125), (132, 18146), (136, 18209), (137, 18227), (159, 18479), (166, 18539), (172, 18680), (173, 18725), (181, 18896), (182, 19064),

Gene: Warda\_20 Start: 16042, Stop: 19059, Start Num: 2

Candidate Starts for Warda\_20:

(Start: 2 @16042 has 31 MA's), (4, 16105), (8, 16189), (20, 16333), (36, 16834), (40, 16951), (41, 16963), (45, 17083), (52, 17227), (53, 17233), (74, 17425), (98, 17644), (103, 17695), (113, 17791), (114, 17794), (115, 17809), (116, 17824), (118, 17884), (128, 18085), (132, 18136), (137, 18217), (159, 18469), (166, 18529), (172, 18670), (173, 18715), (181, 18886), (182, 19054),

Gene: Yang\_20 Start: 16153, Stop: 19056, Start Num: 2

Candidate Starts for Yang\_20:

(Start: 2 @16153 has 31 MA's), (4, 16216), (38, 16705), (43, 16843), (46, 16945), (49, 17062), (62, 17209), (83, 17473), (91, 17536), (99, 17626), (118, 17881), (120, 17917), (125, 18046), (128, 18082), (131, 18112), (132, 18133), (137, 18214), (154, 18430), (161, 18493), (172, 18667), (180, 18880),

(181, 18883),

Gene: YesChef\_20 Start: 16097, Stop: 19069, Start Num: 2

Candidate Starts for YesChef\_20:

(Start: 2 @16097 has 31 MA's), (4, 16160), (8, 16244), (20, 16388), (39, 16982), (50, 17213), (51, 17231), (58, 17309), (59, 17315), (60, 17318), (61, 17324), (74, 17435), (106, 17747), (113, 17801), (114, 17804), (115, 17819), (116, 17834), (118, 17894), (128, 18095), (131, 18125), (132, 18146), (137, 18227), (159, 18479), (166, 18539), (167, 18548), (172, 18680), (173, 18725), (181, 18896), (182, 19064),