



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 156449 Report

This analysis was run 04/12/24 on database version 558.

Pham number 156449 has 47 members, 3 are drafts.

Phages represented in each track:

- Track 1 : Dori\_27
- Track 2 : Leopard\_40, Onyinye\_41, Aikoy\_40
- Track 3 : Farewell\_19
- Track 4 : Sparky\_19
- Track 5 : Brocalys\_18
- Track 6 : Sbash\_19
- Track 7 : Che9c\_19
- Track 8 : Ruthiejr\_27
- Track 9 : Juliette\_28
- Track 10 : Reindeer\_28
- Track 11 : Rubeelu\_20, Butters\_20
- Track 12 : Kevin1\_20
- Track 13 : MichelleMyBell\_20
- Track 14 : Tortellini\_20
- Track 15 : BigNuz\_20, Nazo\_20
- Track 16 : ThulaThula\_20, Phayonce\_20
- Track 17 : Purky\_20
- Track 18 : Giles\_25, HH92\_25, Forge\_25, OBUpride\_25, Dewey\_25, Wishmaker\_25, LilHazelNut\_25, Luna22\_25, Ubuntu\_25, Hail\_25, Luke\_25, Kinbote\_25, Evanesce\_25, Hadrien\_25, Webster2\_25, DeepSoil15\_25, Amymech\_25, Ein37\_25
- Track 19 : Amochick\_25, Daegal\_26
- Track 20 : Gravallia\_25
- Track 21 : Gancho\_24
- Track 22 : Rem711\_28
- Track 23 : 32HC\_29
- Track 24 : IdentityCrisis\_19

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

The start number called the most often in the published annotations is 33, it was called in 21 of the 44 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Amochick\_25, Amymech\_25, Daegal\_26, DeepSoil15\_25, Dewey\_25, Ein37\_25, Evanesce\_25, Forge\_25, Gancho\_24, Giles\_25, Gravaillia\_25, HH92\_25, Hadrien\_25, Hail\_25, Kinbote\_25, LilHazelNut\_25, Luke\_25, Luna22\_25, OBUpride\_25, Ubuntu\_25, Webster2\_25, Wishmaker\_25,

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

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

- 32HC\_29, Aikoy\_40, BigNuz\_20, Brocalys\_18, Butters\_20, Che9c\_19, Dori\_27, Farewell\_19, IdentityCrisis\_19, Juliette\_28, Kevin1\_20, Leopard\_40, MichelleMyBell\_20, Nazo\_20, Onyinye\_41, Phayonce\_20, Purky\_20, Reindeer\_28, Rem711\_28, Rubeelu\_20, Ruthiejr\_27, Sbash\_19, Sparky\_19, ThulaThula\_20, Tortellini\_20,

### Summary by start number:

Start 2:

- Found in 1 of 47 ( 2.1% ) of genes in pham
- Manual Annotations of this start: 1 of 44
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Dori\_27 (AD),

Start 9:

- Found in 3 of 47 ( 6.4% ) of genes in pham
- Manual Annotations of this start: 3 of 44
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Aikoy\_40 (AE), Leopard\_40 (AE), Onyinye\_41 (AE),

Start 10:

- Found in 2 of 47 ( 4.3% ) of genes in pham
- Manual Annotations of this start: 1 of 44
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Farewell\_19 (AF), Sparky\_19 (AF),

Start 12:

- Found in 1 of 47 ( 2.1% ) of genes in pham
- Manual Annotations of this start: 1 of 44
- Called 100.0% of time when present
- Phage (with cluster) where this start called: IdentityCrisis\_19 (singleton),

Start 13:

- Found in 1 of 47 ( 2.1% ) of genes in pham
- Manual Annotations of this start: 1 of 44
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Sbash\_19 (I2),

Start 15:

- Found in 3 of 47 ( 6.4% ) of genes in pham
- Manual Annotations of this start: 2 of 44
- Called 66.7% of time when present
- Phage (with cluster) where this start called: Che9c\_19 (I2), Reindeer\_28 (M1),

Start 16:

- Found in 3 of 47 ( 6.4% ) of genes in pham
- Manual Annotations of this start: 2 of 44
- Called 100.0% of time when present
- Phage (with cluster) where this start called: 32HC\_29 (Z), Brocalys\_18 (F1), Rem711\_28 (Z),

Start 17:

- Found in 5 of 47 ( 10.6% ) of genes in pham
- Manual Annotations of this start: 4 of 44
- Called 80.0% of time when present
- Phage (with cluster) where this start called: BigNuz\_20 (P4), Nazo\_20 (P4), Phayonce\_20 (P5), ThulaThula\_20 (P5),

Start 18:

- Found in 6 of 47 ( 12.8% ) of genes in pham
- Manual Annotations of this start: 2 of 44
- Called 33.3% of time when present
- Phage (with cluster) where this start called: Purky\_20 (P6), Tortellini\_20 (P2),

Start 19:

- Found in 5 of 47 ( 10.6% ) of genes in pham
- Manual Annotations of this start: 4 of 44
- Called 80.0% of time when present
- Phage (with cluster) where this start called: Butters\_20 (N), Kevin1\_20 (N), MichelleMyBell\_20 (N), Rubeelu\_20 (N),

Start 33:

- Found in 22 of 47 ( 46.8% ) of genes in pham
- Manual Annotations of this start: 21 of 44
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Amochick\_25 (Q), Amymech\_25 (Q), Daegal\_26 (Q), DeepSoil15\_25 (Q), Dewey\_25 (Q), Ein37\_25 (Q), Evanesce\_25 (Q), Forge\_25 (Q), Gancho\_24 (Q), Giles\_25 (Q), Gravaillia\_25 (Q), HH92\_25 (Q), Hadrien\_25 (Q), Hail\_25 (Q), Kinbote\_25 (Q), LilHazelnut\_25 (Q), Luke\_25 (Q), Luna22\_25 (Q), OBUpride\_25 (Q), Ubuntu\_25 (Q), Webster2\_25 (Q), Wishmaker\_25 (Q),

Start 34:

- Found in 2 of 47 ( 4.3% ) of genes in pham
- Manual Annotations of this start: 1 of 44
- Called 50.0% of time when present
- Phage (with cluster) where this start called: Juliette\_28 (K4),

Start 74:

- Found in 4 of 47 ( 8.5% ) of genes in pham
- Manual Annotations of this start: 1 of 44
- Called 25.0% of time when present
- Phage (with cluster) where this start called: Ruthiejr\_27 (K4),

**Summary by clusters:**

There are 15 clusters represented in this pham: P2, F1, singleton, I2, AE, AD, P4, AF, P5, N, Q, M1, K4, P6, Z,

Info for manual annotations of cluster AD:

- Start number 2 was manually annotated 1 time for cluster AD.

Info for manual annotations of cluster AE:

- Start number 9 was manually annotated 3 times for cluster AE.

Info for manual annotations of cluster AF:

- Start number 10 was manually annotated 1 time for cluster AF.

Info for manual annotations of cluster F1:

- Start number 16 was manually annotated 1 time for cluster F1.

Info for manual annotations of cluster I2:

- Start number 13 was manually annotated 1 time for cluster I2.
- Start number 15 was manually annotated 1 time for cluster I2.

Info for manual annotations of cluster K4:

- Start number 34 was manually annotated 1 time for cluster K4.
- Start number 74 was manually annotated 1 time for cluster K4.

Info for manual annotations of cluster M1:

- Start number 15 was manually annotated 1 time for cluster M1.

Info for manual annotations of cluster N:

- Start number 19 was manually annotated 4 times for cluster N.

Info for manual annotations of cluster P2:

- Start number 18 was manually annotated 1 time for cluster P2.

Info for manual annotations of cluster P4:

- Start number 17 was manually annotated 2 times for cluster P4.

Info for manual annotations of cluster P5:

- Start number 17 was manually annotated 2 times for cluster P5.

Info for manual annotations of cluster P6:

- Start number 18 was manually annotated 1 time for cluster P6.

Info for manual annotations of cluster Q:

- Start number 33 was manually annotated 21 times for cluster Q.

Info for manual annotations of cluster Z:

- Start number 16 was manually annotated 1 time for cluster Z.

### ***Gene Information:***

Gene: 32HC\_29 Start: 22389, Stop: 24797, Start Num: 16

Candidate Starts for 32HC\_29:

(Start: 16 @22389 has 2 MA's), (46, 22560), (80, 22695), (130, 23058), (138, 23094), (157, 23226), (161, 23244), (169, 23310), (181, 23382), (189, 23460), (190, 23463), (196, 23562), (252, 23823), (255, 23841), (259, 23856), (269, 23940), (273, 24009), (274, 24030), (275, 24033), (276, 24048), (277, 24105), (289, 24186), (293, 24219), (302, 24315), (309, 24417), (314, 24576),

Gene: Aikoy\_40 Start: 29919, Stop: 32537, Start Num: 9

Candidate Starts for Aikoy\_40:

(Start: 9 @29919 has 3 MA's), (27, 30078), (37, 30132), (39, 30147), (40, 30153), (47, 30174), (71, 30267), (77, 30291), (79, 30306), (85, 30372), (91, 30408), (93, 30423), (98, 30459), (110, 30567), (121, 30630), (123, 30642), (124, 30654), (125, 30684), (131, 30696), (133, 30711), (139, 30735), (149, 30807), (156, 30876), (175, 31017), (189, 31125), (198, 31257), (210, 31368), (238, 31479), (261, 31608), (264, 31626), (277, 31851), (287, 31914), (289, 31932), (291, 31959), (302, 32058), (309, 32160), (317, 32469), (320, 32523),

Gene: Amochick\_25 Start: 20859, Stop: 23123, Start Num: 33

Candidate Starts for Amochick\_25:

(Start: 33 @20859 has 21 MA's), (49, 20919), (54, 20931), (61, 20955), (69, 21003), (70, 21006), (81, 21060), (84, 21087), (88, 21111), (92, 21138), (93, 21150), (103, 21216), (106, 21237), (107, 21246), (114, 21291), (120, 21333), (126, 21390), (132, 21402), (136, 21420), (137, 21423), (144, 21480), (146, 21489), (148, 21492), (153, 21531), (162, 21582), (164, 21600), (187, 21765), (193, 21819), (196, 21876), (199, 21909), (202, 21942), (205, 21978), (228, 22038), (237, 22080), (243, 22101), (245, 22113), (248, 22122), (251, 22155), (254, 22173), (256, 22179), (258, 22188), (261, 22209), (265, 22242), (272, 22308), (282, 22446), (285, 22488), (290, 22533), (297, 22587), (299, 22593), (303, 22656), (304, 22668), (308, 22707), (310, 22758), (312, 22821),

Gene: Amymech\_25 Start: 20853, Stop: 23117, Start Num: 33

Candidate Starts for Amymech\_25:

(Start: 33 @20853 has 21 MA's), (38, 20871), (49, 20913), (54, 20925), (61, 20949), (64, 20964), (69, 20997), (70, 21000), (81, 21054), (84, 21081), (88, 21105), (92, 21132), (93, 21144), (103, 21210), (106, 21231), (107, 21240), (114, 21285), (120, 21327), (126, 21384), (132, 21396), (136, 21414), (137, 21417), (144, 21474), (146, 21483), (148, 21486), (153, 21525), (162, 21576), (164, 21594), (187, 21759), (193, 21813), (196, 21870), (199, 21903), (202, 21936), (205, 21972), (237, 22074), (243, 22095), (245, 22107), (248, 22116), (251, 22149), (254, 22167), (256, 22173), (258, 22182), (261, 22203), (265, 22236), (272, 22302), (282, 22440), (285, 22482), (290, 22527), (297, 22581), (299, 22587), (303, 22650), (304, 22662), (308, 22701), (310, 22752), (312, 22815),

Gene: BigNuz\_20 Start: 18782, Stop: 21163, Start Num: 17

Candidate Starts for BigNuz\_20:

(Start: 17 @18782 has 4 MA's), (44, 18935), (Start: 74 @19028 has 1 MA's), (96, 19187), (99, 19208), (102, 19220), (109, 19286), (117, 19340), (125, 19412), (139, 19457), (141, 19478), (153, 19556), (157, 19589), (160, 19595), (173, 19694), (174, 19703), (192, 19841), (223, 20024), (227, 20051), (230, 20060), (237, 20111), (239, 20123), (241, 20129), (244, 20138), (246, 20150), (289, 20552), (293, 20585), (305, 20729), (307, 20738), (309, 20783), (314, 20942),

Gene: Brocalys\_18 Start: 17383, Stop: 19617, Start Num: 16

Candidate Starts for Brocalys\_18:

(14, 17371), (Start: 16 @17383 has 2 MA's), (20, 17404), (24, 17425), (28, 17464), (41, 17533), (43, 17542), (44, 17545), (65, 17596), (81, 17686), (87, 17731), (100, 17821), (101, 17830), (102, 17833), (103, 17854), (104, 17866), (109, 17899), (129, 18034), (140, 18082), (141, 18097), (143, 18118), (151, 18160), (153, 18175), (154, 18184), (158, 18211), (160, 18217), (168, 18286), (171, 18307), (173, 18313), (174, 18322), (176, 18349), (192, 18460), (194, 18481), (195, 18505), (200, 18571), (224, 18592), (232, 18610), (249, 18661), (250, 18667), (272, 18790), (274, 18832), (276, 18850), (282, 18928), (285, 18970), (292, 19036), (297, 19069), (304, 19150), (310, 19240), (313, 19369),

(318, 19537),

Gene: Butters\_20 Start: 17523, Stop: 19739, Start Num: 19

Candidate Starts for Butters\_20:

(Start: 18 @17511 has 2 MA's), (Start: 19 @17523 has 4 MA's), (22, 17535), (31, 17601), (43, 17670), (44, 17673), (48, 17682), (65, 17730), (100, 17955), (102, 17967), (103, 17988), (111, 18051), (117, 18087), (127, 18165), (129, 18168), (140, 18216), (141, 18231), (145, 18267), (158, 18342), (160, 18348), (165, 18393), (168, 18417), (172, 18444), (173, 18447), (186, 18549), (224, 18726), (257, 18834), (263, 18858), (272, 18924), (276, 18984), (283, 19086), (286, 19119), (292, 19170), (304, 19284), (306, 19314), (310, 19374), (318, 19671),

Gene: Che9c\_19 Start: 18477, Stop: 20729, Start Num: 15

Candidate Starts for Che9c\_19:

(Start: 15 @18477 has 2 MA's), (Start: 19 @18501 has 4 MA's), (37, 18615), (44, 18651), (50, 18663), (55, 18675), (82, 18807), (100, 18933), (102, 18945), (103, 18966), (112, 19035), (129, 19146), (135, 19170), (140, 19194), (143, 19230), (147, 19248), (151, 19272), (153, 19287), (157, 19320), (158, 19323), (160, 19329), (167, 19395), (168, 19398), (176, 19461), (182, 19479), (192, 19572), (194, 19593), (195, 19617), (243, 19737), (249, 19773), (250, 19779), (272, 19902), (274, 19944), (276, 19962), (282, 20040), (285, 20082), (292, 20148), (297, 20181), (304, 20262), (310, 20352), (313, 20481), (318, 20649),

Gene: Daegal\_26 Start: 21147, Stop: 23411, Start Num: 33

Candidate Starts for Daegal\_26:

(Start: 33 @21147 has 21 MA's), (49, 21207), (54, 21219), (61, 21243), (69, 21291), (70, 21294), (81, 21348), (84, 21375), (88, 21399), (92, 21426), (93, 21438), (103, 21504), (106, 21525), (107, 21534), (114, 21579), (120, 21621), (126, 21678), (132, 21690), (136, 21708), (137, 21711), (144, 21768), (146, 21777), (148, 21780), (153, 21819), (162, 21870), (164, 21888), (187, 22053), (193, 22107), (196, 22164), (199, 22197), (202, 22230), (205, 22266), (228, 22326), (237, 22368), (243, 22389), (245, 22401), (248, 22410), (251, 22443), (254, 22461), (256, 22467), (258, 22476), (261, 22497), (265, 22530), (272, 22596), (282, 22734), (285, 22776), (290, 22821), (297, 22875), (299, 22881), (303, 22944), (304, 22956), (308, 22995), (310, 23046), (312, 23109),

Gene: DeepSoil15\_25 Start: 20853, Stop: 23117, Start Num: 33

Candidate Starts for DeepSoil15\_25:

(Start: 33 @20853 has 21 MA's), (38, 20871), (49, 20913), (54, 20925), (61, 20949), (64, 20964), (69, 20997), (70, 21000), (81, 21054), (84, 21081), (88, 21105), (92, 21132), (93, 21144), (103, 21210), (106, 21231), (107, 21240), (114, 21285), (120, 21327), (126, 21384), (132, 21396), (136, 21414), (137, 21417), (144, 21474), (146, 21483), (148, 21486), (153, 21525), (162, 21576), (164, 21594), (187, 21759), (193, 21813), (196, 21870), (199, 21903), (202, 21936), (205, 21972), (237, 22074), (243, 22095), (245, 22107), (248, 22116), (251, 22149), (254, 22167), (256, 22173), (258, 22182), (261, 22203), (265, 22236), (272, 22302), (282, 22440), (285, 22482), (290, 22527), (297, 22581), (299, 22587), (303, 22650), (304, 22662), (308, 22701), (310, 22752), (312, 22815),

Gene: Dewey\_25 Start: 20853, Stop: 23117, Start Num: 33

Candidate Starts for Dewey\_25:

(Start: 33 @20853 has 21 MA's), (38, 20871), (49, 20913), (54, 20925), (61, 20949), (64, 20964), (69, 20997), (70, 21000), (81, 21054), (84, 21081), (88, 21105), (92, 21132), (93, 21144), (103, 21210), (106, 21231), (107, 21240), (114, 21285), (120, 21327), (126, 21384), (132, 21396), (136, 21414), (137, 21417), (144, 21474), (146, 21483), (148, 21486), (153, 21525), (162, 21576), (164, 21594), (187, 21759), (193, 21813), (196, 21870), (199, 21903), (202, 21936), (205, 21972), (237, 22074), (243, 22095), (245, 22107), (248, 22116), (251, 22149), (254, 22167), (256, 22173), (258, 22182), (261, 22203), (265, 22236), (272, 22302), (282, 22440), (285, 22482), (290, 22527), (297, 22581), (299, 22587), (303, 22650), (304, 22662), (308, 22701), (310, 22752), (312, 22815),

Gene: Dori\_27 Start: 25587, Stop: 28415, Start Num: 2

Candidate Starts for Dori\_27:

(1, 25494), (Start: 2 @25587 has 1 MA's), (3, 25665), (4, 25701), (5, 25728), (6, 25752), (7, 25821), (8, 25890), (11, 25926), (51, 26160), (56, 26172), (60, 26187), (67, 26223), (76, 26265), (83, 26319), (90, 26367), (94, 26397), (95, 26400), (108, 26508), (115, 26562), (116, 26577), (119, 26592), (128, 26661), (134, 26682), (139, 26703), (141, 26721), (143, 26742), (149, 26766), (150, 26778), (152, 26790), (166, 26892), (170, 26916), (175, 26955), (179, 26979), (180, 26985), (182, 26991), (183, 27027), (185, 27033), (189, 27063), (192, 27090), (197, 27174), (200, 27207), (201, 27216), (203, 27225), (204, 27249), (207, 27258), (208, 27270), (223, 27291), (226, 27315), (230, 27327), (231, 27339), (239, 27378), (257, 27474), (266, 27546), (274, 27651), (276, 27669), (277, 27726), (289, 27807), (293, 27840), (296, 27861), (300, 27900), (302, 27933), (309, 28035), (314, 28194),

Gene: Ein37\_25 Start: 20853, Stop: 23117, Start Num: 33

Candidate Starts for Ein37\_25:

(Start: 33 @20853 has 21 MA's), (38, 20871), (49, 20913), (54, 20925), (61, 20949), (64, 20964), (69, 20997), (70, 21000), (81, 21054), (84, 21081), (88, 21105), (92, 21132), (93, 21144), (103, 21210), (106, 21231), (107, 21240), (114, 21285), (120, 21327), (126, 21384), (132, 21396), (136, 21414), (137, 21417), (144, 21474), (146, 21483), (148, 21486), (153, 21525), (162, 21576), (164, 21594), (187, 21759), (193, 21813), (196, 21870), (199, 21903), (202, 21936), (205, 21972), (237, 22074), (243, 22095), (245, 22107), (248, 22116), (251, 22149), (254, 22167), (256, 22173), (258, 22182), (261, 22203), (265, 22236), (272, 22302), (282, 22440), (285, 22482), (290, 22527), (297, 22581), (299, 22587), (303, 22650), (304, 22662), (308, 22701), (310, 22752), (312, 22815),

Gene: Evanesce\_25 Start: 20853, Stop: 23117, Start Num: 33

Candidate Starts for Evanesce\_25:

(Start: 33 @20853 has 21 MA's), (38, 20871), (49, 20913), (54, 20925), (61, 20949), (64, 20964), (69, 20997), (70, 21000), (81, 21054), (84, 21081), (88, 21105), (92, 21132), (93, 21144), (103, 21210), (106, 21231), (107, 21240), (114, 21285), (120, 21327), (126, 21384), (132, 21396), (136, 21414), (137, 21417), (144, 21474), (146, 21483), (148, 21486), (153, 21525), (162, 21576), (164, 21594), (187, 21759), (193, 21813), (196, 21870), (199, 21903), (202, 21936), (205, 21972), (237, 22074), (243, 22095), (245, 22107), (248, 22116), (251, 22149), (254, 22167), (256, 22173), (258, 22182), (261, 22203), (265, 22236), (272, 22302), (282, 22440), (285, 22482), (290, 22527), (297, 22581), (299, 22587), (303, 22650), (304, 22662), (308, 22701), (310, 22752), (312, 22815),

Gene: Farewell\_19 Start: 19297, Stop: 21606, Start Num: 10

Candidate Starts for Farewell\_19:

(Start: 10 @19297 has 1 MA's), (23, 19396), (42, 19525), (45, 19531), (68, 19609), (90, 19738), (97, 19795), (101, 19819), (107, 19876), (112, 19912), (129, 20023), (135, 20047), (140, 20071), (143, 20107), (145, 20122), (147, 20125), (151, 20149), (153, 20164), (157, 20197), (158, 20200), (160, 20206), (167, 20272), (168, 20275), (176, 20338), (192, 20449), (194, 20470), (195, 20494), (243, 20614), (249, 20650), (250, 20656), (272, 20779), (274, 20821), (276, 20839), (282, 20917), (285, 20959), (292, 21025), (297, 21058), (304, 21139), (310, 21229), (313, 21358), (318, 21526),

Gene: Forge\_25 Start: 20853, Stop: 23117, Start Num: 33

Candidate Starts for Forge\_25:

(Start: 33 @20853 has 21 MA's), (38, 20871), (49, 20913), (54, 20925), (61, 20949), (64, 20964), (69, 20997), (70, 21000), (81, 21054), (84, 21081), (88, 21105), (92, 21132), (93, 21144), (103, 21210), (106, 21231), (107, 21240), (114, 21285), (120, 21327), (126, 21384), (132, 21396), (136, 21414), (137, 21417), (144, 21474), (146, 21483), (148, 21486), (153, 21525), (162, 21576), (164, 21594), (187, 21759), (193, 21813), (196, 21870), (199, 21903), (202, 21936), (205, 21972), (237, 22074), (243, 22095), (245, 22107), (248, 22116), (251, 22149), (254, 22167), (256, 22173), (258, 22182), (261, 22203), (265, 22236), (272, 22302), (282, 22440), (285, 22482), (290, 22527), (297, 22581),



(299, 22587), (303, 22650), (304, 22662), (308, 22701), (310, 22752), (312, 22815),

Gene: Gancho\_24 Start: 20577, Stop: 22841, Start Num: 33

Candidate Starts for Gancho\_24:

(Start: 33 @20577 has 21 MA's), (49, 20637), (54, 20649), (61, 20673), (69, 20721), (70, 20724), (81, 20778), (84, 20805), (88, 20829), (92, 20856), (93, 20868), (103, 20934), (106, 20955), (107, 20964), (114, 21009), (126, 21108), (132, 21120), (136, 21138), (137, 21141), (144, 21198), (146, 21207), (148, 21210), (153, 21249), (164, 21318), (187, 21483), (193, 21537), (196, 21594), (199, 21627), (202, 21660), (205, 21696), (235, 21786), (243, 21819), (254, 21891), (256, 21897), (262, 21936), (265, 21960), (272, 22026), (282, 22164), (285, 22206), (290, 22251), (297, 22305), (299, 22311), (303, 22374), (304, 22386), (308, 22425), (310, 22476), (312, 22539),

Gene: Giles\_25 Start: 20853, Stop: 23117, Start Num: 33

Candidate Starts for Giles\_25:

(Start: 33 @20853 has 21 MA's), (38, 20871), (49, 20913), (54, 20925), (61, 20949), (64, 20964), (69, 20997), (70, 21000), (81, 21054), (84, 21081), (88, 21105), (92, 21132), (93, 21144), (103, 21210), (106, 21231), (107, 21240), (114, 21285), (120, 21327), (126, 21384), (132, 21396), (136, 21414), (137, 21417), (144, 21474), (146, 21483), (148, 21486), (153, 21525), (162, 21576), (164, 21594), (187, 21759), (193, 21813), (196, 21870), (199, 21903), (202, 21936), (205, 21972), (237, 22074), (243, 22095), (245, 22107), (248, 22116), (251, 22149), (254, 22167), (256, 22173), (258, 22182), (261, 22203), (265, 22236), (272, 22302), (282, 22440), (285, 22482), (290, 22527), (297, 22581), (299, 22587), (303, 22650), (304, 22662), (308, 22701), (310, 22752), (312, 22815),

Gene: Gravaillia\_25 Start: 20583, Stop: 22847, Start Num: 33

Candidate Starts for Gravaillia\_25:

(Start: 33 @20583 has 21 MA's), (49, 20643), (54, 20655), (61, 20679), (69, 20727), (70, 20730), (81, 20784), (84, 20811), (88, 20835), (92, 20862), (103, 20940), (106, 20961), (107, 20970), (114, 21015), (120, 21057), (126, 21114), (132, 21126), (136, 21144), (137, 21147), (144, 21204), (146, 21213), (148, 21216), (153, 21255), (164, 21324), (187, 21489), (193, 21543), (196, 21600), (199, 21633), (202, 21666), (203, 21672), (205, 21702), (243, 21825), (254, 21897), (256, 21903), (262, 21942), (265, 21966), (272, 22032), (282, 22170), (285, 22212), (290, 22257), (297, 22311), (299, 22317), (303, 22380), (304, 22392), (308, 22431), (310, 22482), (312, 22545),

Gene: HH92\_25 Start: 20853, Stop: 23117, Start Num: 33

Candidate Starts for HH92\_25:

(Start: 33 @20853 has 21 MA's), (38, 20871), (49, 20913), (54, 20925), (61, 20949), (64, 20964), (69, 20997), (70, 21000), (81, 21054), (84, 21081), (88, 21105), (92, 21132), (93, 21144), (103, 21210), (106, 21231), (107, 21240), (114, 21285), (120, 21327), (126, 21384), (132, 21396), (136, 21414), (137, 21417), (144, 21474), (146, 21483), (148, 21486), (153, 21525), (162, 21576), (164, 21594), (187, 21759), (193, 21813), (196, 21870), (199, 21903), (202, 21936), (205, 21972), (237, 22074), (243, 22095), (245, 22107), (248, 22116), (251, 22149), (254, 22167), (256, 22173), (258, 22182), (261, 22203), (265, 22236), (272, 22302), (282, 22440), (285, 22482), (290, 22527), (297, 22581), (299, 22587), (303, 22650), (304, 22662), (308, 22701), (310, 22752), (312, 22815),

Gene: Hadrien\_25 Start: 20853, Stop: 23117, Start Num: 33

Candidate Starts for Hadrien\_25:

(Start: 33 @20853 has 21 MA's), (38, 20871), (49, 20913), (54, 20925), (61, 20949), (64, 20964), (69, 20997), (70, 21000), (81, 21054), (84, 21081), (88, 21105), (92, 21132), (93, 21144), (103, 21210), (106, 21231), (107, 21240), (114, 21285), (120, 21327), (126, 21384), (132, 21396), (136, 21414), (137, 21417), (144, 21474), (146, 21483), (148, 21486), (153, 21525), (162, 21576), (164, 21594), (187, 21759), (193, 21813), (196, 21870), (199, 21903), (202, 21936), (205, 21972), (237, 22074), (243, 22095), (245, 22107), (248, 22116), (251, 22149), (254, 22167), (256, 22173), (258, 22182), (261, 22203), (265, 22236), (272, 22302), (282, 22440), (285, 22482), (290, 22527), (297, 22581),

(299, 22587), (303, 22650), (304, 22662), (308, 22701), (310, 22752), (312, 22815),

Gene: Hail\_25 Start: 20853, Stop: 23117, Start Num: 33

Candidate Starts for Hail\_25:

(Start: 33 @20853 has 21 MA's), (38, 20871), (49, 20913), (54, 20925), (61, 20949), (64, 20964), (69, 20997), (70, 21000), (81, 21054), (84, 21081), (88, 21105), (92, 21132), (93, 21144), (103, 21210), (106, 21231), (107, 21240), (114, 21285), (120, 21327), (126, 21384), (132, 21396), (136, 21414), (137, 21417), (144, 21474), (146, 21483), (148, 21486), (153, 21525), (162, 21576), (164, 21594), (187, 21759), (193, 21813), (196, 21870), (199, 21903), (202, 21936), (205, 21972), (237, 22074), (243, 22095), (245, 22107), (248, 22116), (251, 22149), (254, 22167), (256, 22173), (258, 22182), (261, 22203), (265, 22236), (272, 22302), (282, 22440), (285, 22482), (290, 22527), (297, 22581), (299, 22587), (303, 22650), (304, 22662), (308, 22701), (310, 22752), (312, 22815),

Gene: IdentityCrisis\_19 Start: 16453, Stop: 18753, Start Num: 12

Candidate Starts for IdentityCrisis\_19:

(Start: 12 @16453 has 1 MA's), (Start: 15 @16495 has 2 MA's), (25, 16564), (26, 16573), (29, 16588), (32, 16612), (78, 16804), (97, 16942), (107, 17023), (118, 17098), (129, 17170), (135, 17194), (140, 17218), (143, 17254), (147, 17272), (151, 17296), (153, 17311), (157, 17344), (158, 17347), (160, 17353), (167, 17419), (168, 17422), (176, 17485), (182, 17503), (192, 17596), (194, 17617), (243, 17761), (249, 17797), (250, 17803), (272, 17926), (274, 17968), (276, 17986), (282, 18064), (285, 18106), (292, 18172), (297, 18205), (304, 18286), (310, 18376), (313, 18505), (318, 18673),

Gene: Juliette\_28 Start: 22173, Stop: 24272, Start Num: 34

Candidate Starts for Juliette\_28:

(Start: 34 @22173 has 1 MA's), (Start: 74 @22308 has 1 MA's), (100, 22488), (102, 22500), (103, 22521), (104, 22533), (111, 22584), (117, 22620), (127, 22698), (140, 22749), (141, 22764), (145, 22800), (158, 22875), (159, 22878), (160, 22881), (165, 22926), (168, 22950), (172, 22977), (173, 22980), (186, 23082), (194, 23148), (257, 23367), (263, 23391), (272, 23457), (276, 23517), (283, 23619), (286, 23652), (292, 23703), (294, 23709), (301, 23787), (303, 23805), (304, 23817), (306, 23847), (310, 23907), (318, 24204),

Gene: Kevin1\_20 Start: 17524, Stop: 19740, Start Num: 19

Candidate Starts for Kevin1\_20:

(Start: 18 @17512 has 2 MA's), (Start: 19 @17524 has 4 MA's), (21, 17530), (22, 17536), (30, 17599), (31, 17602), (43, 17671), (44, 17674), (48, 17683), (65, 17731), (87, 17866), (100, 17956), (101, 17965), (102, 17968), (104, 18001), (105, 18010), (111, 18052), (117, 18088), (127, 18166), (129, 18169), (140, 18217), (141, 18232), (145, 18268), (158, 18343), (160, 18349), (165, 18394), (168, 18418), (172, 18445), (173, 18448), (186, 18550), (224, 18727), (257, 18835), (263, 18859), (272, 18925), (276, 18985), (283, 19087), (286, 19120), (292, 19171), (304, 19285), (306, 19315), (310, 19375), (318, 19672),

Gene: Kinbote\_25 Start: 20853, Stop: 23117, Start Num: 33

Candidate Starts for Kinbote\_25:

(Start: 33 @20853 has 21 MA's), (38, 20871), (49, 20913), (54, 20925), (61, 20949), (64, 20964), (69, 20997), (70, 21000), (81, 21054), (84, 21081), (88, 21105), (92, 21132), (93, 21144), (103, 21210), (106, 21231), (107, 21240), (114, 21285), (120, 21327), (126, 21384), (132, 21396), (136, 21414), (137, 21417), (144, 21474), (146, 21483), (148, 21486), (153, 21525), (162, 21576), (164, 21594), (187, 21759), (193, 21813), (196, 21870), (199, 21903), (202, 21936), (205, 21972), (237, 22074), (243, 22095), (245, 22107), (248, 22116), (251, 22149), (254, 22167), (256, 22173), (258, 22182), (261, 22203), (265, 22236), (272, 22302), (282, 22440), (285, 22482), (290, 22527), (297, 22581), (299, 22587), (303, 22650), (304, 22662), (308, 22701), (310, 22752), (312, 22815),

Gene: Leopard\_40 Start: 30207, Stop: 32825, Start Num: 9

Candidate Starts for Leopard\_40:

(Start: 9 @30207 has 3 MA's), (27, 30366), (37, 30420), (39, 30435), (40, 30441), (47, 30462), (71, 30555), (77, 30579), (79, 30594), (85, 30660), (91, 30696), (93, 30711), (98, 30747), (110, 30855), (121, 30918), (123, 30930), (124, 30942), (125, 30972), (131, 30984), (133, 30999), (139, 31023), (149, 31095), (156, 31164), (175, 31305), (189, 31413), (198, 31545), (210, 31656), (238, 31767), (261, 31896), (264, 31914), (277, 32139), (287, 32202), (289, 32220), (291, 32247), (302, 32346), (309, 32448), (317, 32757), (320, 32811),

Gene: LilHazelNut\_25 Start: 20853, Stop: 23117, Start Num: 33

Candidate Starts for LilHazelNut\_25:

(Start: 33 @20853 has 21 MA's), (38, 20871), (49, 20913), (54, 20925), (61, 20949), (64, 20964), (69, 20997), (70, 21000), (81, 21054), (84, 21081), (88, 21105), (92, 21132), (93, 21144), (103, 21210), (106, 21231), (107, 21240), (114, 21285), (120, 21327), (126, 21384), (132, 21396), (136, 21414), (137, 21417), (144, 21474), (146, 21483), (148, 21486), (153, 21525), (162, 21576), (164, 21594), (187, 21759), (193, 21813), (196, 21870), (199, 21903), (202, 21936), (205, 21972), (237, 22074), (243, 22095), (245, 22107), (248, 22116), (251, 22149), (254, 22167), (256, 22173), (258, 22182), (261, 22203), (265, 22236), (272, 22302), (282, 22440), (285, 22482), (290, 22527), (297, 22581), (299, 22587), (303, 22650), (304, 22662), (308, 22701), (310, 22752), (312, 22815),

Gene: Luke\_25 Start: 20853, Stop: 23117, Start Num: 33

Candidate Starts for Luke\_25:

(Start: 33 @20853 has 21 MA's), (38, 20871), (49, 20913), (54, 20925), (61, 20949), (64, 20964), (69, 20997), (70, 21000), (81, 21054), (84, 21081), (88, 21105), (92, 21132), (93, 21144), (103, 21210), (106, 21231), (107, 21240), (114, 21285), (120, 21327), (126, 21384), (132, 21396), (136, 21414), (137, 21417), (144, 21474), (146, 21483), (148, 21486), (153, 21525), (162, 21576), (164, 21594), (187, 21759), (193, 21813), (196, 21870), (199, 21903), (202, 21936), (205, 21972), (237, 22074), (243, 22095), (245, 22107), (248, 22116), (251, 22149), (254, 22167), (256, 22173), (258, 22182), (261, 22203), (265, 22236), (272, 22302), (282, 22440), (285, 22482), (290, 22527), (297, 22581), (299, 22587), (303, 22650), (304, 22662), (308, 22701), (310, 22752), (312, 22815),

Gene: Luna22\_25 Start: 20853, Stop: 23117, Start Num: 33

Candidate Starts for Luna22\_25:

(Start: 33 @20853 has 21 MA's), (38, 20871), (49, 20913), (54, 20925), (61, 20949), (64, 20964), (69, 20997), (70, 21000), (81, 21054), (84, 21081), (88, 21105), (92, 21132), (93, 21144), (103, 21210), (106, 21231), (107, 21240), (114, 21285), (120, 21327), (126, 21384), (132, 21396), (136, 21414), (137, 21417), (144, 21474), (146, 21483), (148, 21486), (153, 21525), (162, 21576), (164, 21594), (187, 21759), (193, 21813), (196, 21870), (199, 21903), (202, 21936), (205, 21972), (237, 22074), (243, 22095), (245, 22107), (248, 22116), (251, 22149), (254, 22167), (256, 22173), (258, 22182), (261, 22203), (265, 22236), (272, 22302), (282, 22440), (285, 22482), (290, 22527), (297, 22581), (299, 22587), (303, 22650), (304, 22662), (308, 22701), (310, 22752), (312, 22815),

Gene: MichelleMyBell\_20 Start: 17554, Stop: 19770, Start Num: 19

Candidate Starts for MichelleMyBell\_20:

(Start: 18 @17542 has 2 MA's), (Start: 19 @17554 has 4 MA's), (21, 17560), (22, 17566), (31, 17632), (43, 17701), (44, 17704), (48, 17713), (81, 17851), (86, 17893), (87, 17896), (100, 17986), (101, 17995), (102, 17998), (103, 18019), (104, 18031), (111, 18082), (117, 18118), (127, 18196), (140, 18247), (141, 18262), (145, 18298), (158, 18373), (160, 18379), (165, 18424), (168, 18448), (172, 18475), (173, 18478), (186, 18580), (224, 18757), (257, 18865), (263, 18889), (272, 18955), (276, 19015), (283, 19117), (286, 19150), (292, 19201), (304, 19315), (306, 19345), (310, 19405), (318, 19702),

Gene: Nazo\_20 Start: 18782, Stop: 21163, Start Num: 17

Candidate Starts for Nazo\_20:

(Start: 17 @18782 has 4 MA's), (44, 18935), (Start: 74 @19028 has 1 MA's), (96, 19187), (99, 19208), (102, 19220), (109, 19286), (117, 19340), (125, 19412), (139, 19457), (141, 19478), (153, 19556), (157, 19589), (160, 19595), (173, 19694), (174, 19703), (192, 19841), (223, 20024), (227, 20051), (230, 20060), (237, 20111), (239, 20123), (241, 20129), (244, 20138), (246, 20150), (289, 20552), (293, 20585), (305, 20729), (307, 20738), (309, 20783), (314, 20942),

Gene: OBUpride\_25 Start: 20847, Stop: 23111, Start Num: 33

Candidate Starts for OBUpride\_25:

(Start: 33 @20847 has 21 MA's), (38, 20865), (49, 20907), (54, 20919), (61, 20943), (64, 20958), (69, 20991), (70, 20994), (81, 21048), (84, 21075), (88, 21099), (92, 21126), (93, 21138), (103, 21204), (106, 21225), (107, 21234), (114, 21279), (120, 21321), (126, 21378), (132, 21390), (136, 21408), (137, 21411), (144, 21468), (146, 21477), (148, 21480), (153, 21519), (162, 21570), (164, 21588), (187, 21753), (193, 21807), (196, 21864), (199, 21897), (202, 21930), (205, 21966), (237, 22068), (243, 22089), (245, 22101), (248, 22110), (251, 22143), (254, 22161), (256, 22167), (258, 22176), (261, 22197), (265, 22230), (272, 22296), (282, 22434), (285, 22476), (290, 22521), (297, 22575), (299, 22581), (303, 22644), (304, 22656), (308, 22695), (310, 22746), (312, 22809),

Gene: Onyinye\_41 Start: 30086, Stop: 32719, Start Num: 9

Candidate Starts for Onyinye\_41:

(Start: 9 @30086 has 3 MA's), (27, 30245), (37, 30299), (39, 30314), (40, 30320), (47, 30341), (71, 30434), (77, 30458), (79, 30473), (85, 30539), (91, 30575), (93, 30590), (98, 30626), (110, 30734), (121, 30797), (123, 30809), (124, 30821), (125, 30851), (131, 30863), (133, 30878), (139, 30902), (149, 30974), (156, 31043), (175, 31184), (189, 31292), (198, 31424), (210, 31535), (238, 31646), (261, 31775), (264, 31793), (277, 32018), (287, 32081), (289, 32099), (291, 32126), (302, 32225), (309, 32327), (317, 32636), (320, 32690),

Gene: Phayonce\_20 Start: 18734, Stop: 21115, Start Num: 17

Candidate Starts for Phayonce\_20:

(Start: 17 @18734 has 4 MA's), (43, 18884), (44, 18887), (99, 19160), (102, 19172), (104, 19205), (109, 19238), (117, 19292), (125, 19364), (139, 19409), (140, 19415), (141, 19430), (143, 19451), (153, 19508), (157, 19541), (160, 19547), (173, 19646), (174, 19655), (192, 19793), (207, 19943), (208, 19955), (223, 19976), (227, 20003), (237, 20063), (239, 20075), (241, 20081), (244, 20090), (246, 20102), (265, 20213), (266, 20243), (267, 20246), (276, 20366), (277, 20423), (280, 20432), (293, 20537), (302, 20633), (309, 20735), (319, 21095),

Gene: Purky\_20 Start: 18624, Stop: 20846, Start Num: 18

Candidate Starts for Purky\_20:

(Start: 18 @18624 has 2 MA's), (44, 18777), (53, 18795), (100, 19050), (102, 19062), (103, 19083), (112, 19152), (129, 19263), (135, 19287), (140, 19311), (143, 19347), (147, 19365), (151, 19389), (153, 19404), (155, 19419), (157, 19437), (158, 19440), (160, 19446), (167, 19512), (168, 19515), (176, 19578), (182, 19596), (192, 19689), (193, 19701), (194, 19710), (195, 19734), (240, 19851), (243, 19854), (249, 19890), (250, 19896), (272, 20019), (274, 20061), (276, 20079), (282, 20157), (285, 20199), (292, 20265), (297, 20298), (304, 20379), (310, 20469), (313, 20598), (318, 20766),

Gene: Reindeer\_28 Start: 24446, Stop: 26686, Start Num: 15

Candidate Starts for Reindeer\_28:

(Start: 15 @24446 has 2 MA's), (32, 24566), (35, 24581), (58, 24653), (59, 24656), (62, 24674), (63, 24677), (66, 24686), (69, 24713), (73, 24722), (75, 24734), (77, 24740), (89, 24830), (100, 24908), (109, 24986), (113, 25013), (117, 25040), (140, 25163), (142, 25181), (158, 25289), (160, 25295), (163, 25325), (171, 25388), (174, 25403), (177, 25433), (191, 25538), (195, 25586), (238, 25694), (243, 25706), (247, 25724), (250, 25748), (253, 25772), (272, 25871), (274, 25913), (276, 25931), (284, 26042), (286, 26066), (288, 26075), (292, 26117), (297, 26150), (304, 26231), (310, 26321), (312, 26384), (313, 26450), (318, 26618),

Gene: Rem711\_28 Start: 22439, Stop: 24847, Start Num: 16

Candidate Starts for Rem711\_28:

(Start: 16 @22439 has 2 MA's), (46, 22610), (80, 22745), (130, 23108), (138, 23144), (157, 23276), (161, 23294), (178, 23420), (181, 23432), (184, 23474), (189, 23510), (190, 23513), (225, 23738), (236, 23783), (252, 23873), (273, 24059), (274, 24080), (277, 24155), (302, 24365), (309, 24467), (314, 24626),

Gene: Rubeelu\_20 Start: 17523, Stop: 19739, Start Num: 19

Candidate Starts for Rubeelu\_20:

(Start: 18 @17511 has 2 MA's), (Start: 19 @17523 has 4 MA's), (22, 17535), (31, 17601), (43, 17670), (44, 17673), (48, 17682), (65, 17730), (100, 17955), (102, 17967), (103, 17988), (111, 18051), (117, 18087), (127, 18165), (129, 18168), (140, 18216), (141, 18231), (145, 18267), (158, 18342), (160, 18348), (165, 18393), (168, 18417), (172, 18444), (173, 18447), (186, 18549), (224, 18726), (257, 18834), (263, 18858), (272, 18924), (276, 18984), (283, 19086), (286, 19119), (292, 19170), (304, 19284), (306, 19314), (310, 19374), (318, 19671),

Gene: Ruthiejr\_27 Start: 22039, Stop: 24003, Start Num: 74

Candidate Starts for Ruthiejr\_27:

(Start: 34 @21904 has 1 MA's), (Start: 74 @22039 has 1 MA's), (100, 22219), (102, 22231), (103, 22252), (104, 22264), (111, 22315), (117, 22351), (127, 22429), (140, 22480), (141, 22495), (145, 22531), (158, 22606), (159, 22609), (160, 22612), (165, 22657), (168, 22681), (172, 22708), (173, 22711), (186, 22813), (194, 22879), (257, 23098), (263, 23122), (272, 23188), (276, 23248), (283, 23350), (286, 23383), (292, 23434), (294, 23440), (301, 23518), (303, 23536), (304, 23548), (306, 23578), (310, 23638), (318, 23935),

Gene: Sbash\_19 Start: 18307, Stop: 20691, Start Num: 13

Candidate Starts for Sbash\_19:

(Start: 13 @18307 has 1 MA's), (Start: 17 @18331 has 4 MA's), (36, 18445), (44, 18481), (52, 18493), (57, 18505), (72, 18574), (99, 18763), (104, 18808), (105, 18817), (109, 18841), (117, 18895), (122, 18922), (125, 18967), (139, 19012), (140, 19018), (141, 19033), (143, 19054), (145, 19069), (153, 19111), (157, 19144), (160, 19150), (173, 19249), (174, 19258), (192, 19396), (194, 19417), (223, 19579), (227, 19606), (237, 19666), (239, 19678), (241, 19684), (244, 19693), (246, 19705), (265, 19816), (266, 19846), (267, 19849), (274, 19951), (276, 19969), (278, 20029), (279, 20032), (281, 20038), (295, 20140), (298, 20164), (300, 20191), (302, 20224), (315, 20482),

Gene: Sparky\_19 Start: 19298, Stop: 21607, Start Num: 10

Candidate Starts for Sparky\_19:

(Start: 10 @19298 has 1 MA's), (23, 19397), (42, 19526), (45, 19532), (68, 19610), (90, 19739), (97, 19796), (107, 19877), (112, 19913), (129, 20024), (135, 20048), (140, 20072), (143, 20108), (147, 20126), (151, 20150), (153, 20165), (157, 20198), (158, 20201), (160, 20207), (167, 20273), (168, 20276), (176, 20339), (192, 20450), (194, 20471), (243, 20615), (249, 20651), (250, 20657), (272, 20780), (274, 20822), (276, 20840), (282, 20918), (285, 20960), (292, 21026), (297, 21059), (304, 21140), (310, 21230), (313, 21359), (318, 21527),

Gene: ThulaThula\_20 Start: 18740, Stop: 21121, Start Num: 17

Candidate Starts for ThulaThula\_20:

(Start: 17 @18740 has 4 MA's), (43, 18890), (44, 18893), (99, 19166), (102, 19178), (104, 19211), (109, 19244), (117, 19298), (125, 19370), (139, 19415), (140, 19421), (141, 19436), (143, 19457), (153, 19514), (157, 19547), (160, 19553), (173, 19652), (174, 19661), (192, 19799), (207, 19949), (208, 19961), (223, 19982), (227, 20009), (237, 20069), (239, 20081), (241, 20087), (244, 20096), (246, 20108), (265, 20219), (266, 20249), (267, 20252), (276, 20372), (277, 20429), (280, 20438), (293, 20543), (302, 20639), (309, 20741), (319, 21101),

Gene: Tortellini\_20 Start: 18641, Stop: 21592, Start Num: 18

Candidate Starts for Tortellini\_20:

(Start: 18 @18641 has 2 MA's), (43, 18791), (81, 18932), (100, 19067), (102, 19079), (103, 19100), (104, 19112), (107, 19133), (129, 19280), (140, 19328), (141, 19343), (143, 19364), (147, 19382), (151, 19406), (153, 19421), (154, 19430), (158, 19457), (160, 19463), (165, 19508), (168, 19532), (170, 19544), (171, 19553), (173, 19559), (176, 19595), (182, 19613), (188, 19673), (192, 19706), (202, 19838), (206, 19877), (209, 19898), (211, 19922), (212, 19934), (213, 19946), (214, 20048), (215, 20072), (216, 20111), (217, 20135), (218, 20147), (219, 20183), (220, 20189), (221, 20219), (222, 20246), (229, 20330), (233, 20372), (234, 20381), (238, 20405), (242, 20426), (243, 20429), (247, 20447), (251, 20483), (253, 20495), (255, 20504), (260, 20534), (268, 20630), (270, 20672), (271, 20702), (274, 20807), (276, 20825), (282, 20903), (292, 21011), (297, 21044), (304, 21125), (310, 21215), (311, 21224), (313, 21344), (316, 21485), (318, 21512),

Gene: Ubuntu\_25 Start: 20853, Stop: 23117, Start Num: 33

Candidate Starts for Ubuntu\_25:

(Start: 33 @20853 has 21 MA's), (38, 20871), (49, 20913), (54, 20925), (61, 20949), (64, 20964), (69, 20997), (70, 21000), (81, 21054), (84, 21081), (88, 21105), (92, 21132), (93, 21144), (103, 21210), (106, 21231), (107, 21240), (114, 21285), (120, 21327), (126, 21384), (132, 21396), (136, 21414), (137, 21417), (144, 21474), (146, 21483), (148, 21486), (153, 21525), (162, 21576), (164, 21594), (187, 21759), (193, 21813), (196, 21870), (199, 21903), (202, 21936), (205, 21972), (237, 22074), (243, 22095), (245, 22107), (248, 22116), (251, 22149), (254, 22167), (256, 22173), (258, 22182), (261, 22203), (265, 22236), (272, 22302), (282, 22440), (285, 22482), (290, 22527), (297, 22581), (299, 22587), (303, 22650), (304, 22662), (308, 22701), (310, 22752), (312, 22815),

Gene: Webster2\_25 Start: 20853, Stop: 23117, Start Num: 33

Candidate Starts for Webster2\_25:

(Start: 33 @20853 has 21 MA's), (38, 20871), (49, 20913), (54, 20925), (61, 20949), (64, 20964), (69, 20997), (70, 21000), (81, 21054), (84, 21081), (88, 21105), (92, 21132), (93, 21144), (103, 21210), (106, 21231), (107, 21240), (114, 21285), (120, 21327), (126, 21384), (132, 21396), (136, 21414), (137, 21417), (144, 21474), (146, 21483), (148, 21486), (153, 21525), (162, 21576), (164, 21594), (187, 21759), (193, 21813), (196, 21870), (199, 21903), (202, 21936), (205, 21972), (237, 22074), (243, 22095), (245, 22107), (248, 22116), (251, 22149), (254, 22167), (256, 22173), (258, 22182), (261, 22203), (265, 22236), (272, 22302), (282, 22440), (285, 22482), (290, 22527), (297, 22581), (299, 22587), (303, 22650), (304, 22662), (308, 22701), (310, 22752), (312, 22815),

Gene: Wishmaker\_25 Start: 20853, Stop: 23117, Start Num: 33

Candidate Starts for Wishmaker\_25:

(Start: 33 @20853 has 21 MA's), (38, 20871), (49, 20913), (54, 20925), (61, 20949), (64, 20964), (69, 20997), (70, 21000), (81, 21054), (84, 21081), (88, 21105), (92, 21132), (93, 21144), (103, 21210), (106, 21231), (107, 21240), (114, 21285), (120, 21327), (126, 21384), (132, 21396), (136, 21414), (137, 21417), (144, 21474), (146, 21483), (148, 21486), (153, 21525), (162, 21576), (164, 21594), (187, 21759), (193, 21813), (196, 21870), (199, 21903), (202, 21936), (205, 21972), (237, 22074), (243, 22095), (245, 22107), (248, 22116), (251, 22149), (254, 22167), (256, 22173), (258, 22182), (261, 22203), (265, 22236), (272, 22302), (282, 22440), (285, 22482), (290, 22527), (297, 22581), (299, 22587), (303, 22650), (304, 22662), (308, 22701), (310, 22752), (312, 22815),