



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 188122 Report

This analysis was run 11/02/24 on database version 579.

Pham number 188122 has 72 members, 16 are drafts.

Phages represented in each track:

- Track 1 : GMA7\_3
- Track 2 : GTE7\_3
- Track 3 : Austin\_12, HayZem\_12, Amore2\_12
- Track 4 : Adgers\_12
- Track 5 : Chelms\_11
- Track 6 : CathyBurgh\_11, Exiguo\_11, Sam12\_11, Ekhein\_11, Lizzo\_11, Squibbles\_11, Beaver\_11
- Track 7 : BigShaq\_11
- Track 8 : SteveFrench\_10
- Track 9 : Eggsie\_11
- Track 10 : Flakey\_11, Barbochs\_11, Breezic\_11, Gorko\_11
- Track 11 : Boneham\_11, Butterball\_11, CinnamonToast\_12, BirksAndSocks\_11
- Track 12 : Jellybones\_11, John316\_11
- Track 13 : Diabla\_10
- Track 14 : FelixAlejandro\_12
- Track 15 : Hotorobo\_11, Monty\_10
- Track 16 : PierreThree\_11, BenoitCattle\_11, Linetti\_12, Dakiti\_11
- Track 17 : Poland\_12, Msay19\_12
- Track 18 : Sombrero\_11
- Track 19 : RoyalG\_12
- Track 20 : RemRem\_12
- Track 21 : GourdThymes\_11
- Track 22 : PokyPuppy\_10
- Track 23 : MrWormie\_8
- Track 24 : Jams\_8
- Track 25 : Damp\_8
- Track 26 : Kaseim\_8, Shelley\_8
- Track 27 : Teatealatte\_11, Tredge\_11
- Track 28 : Kvothe\_11, Benczkowski14\_11, Katyusha\_11
- Track 29 : ASerpRocky\_11
- Track 30 : Niagara\_11
- Track 31 : Teech\_11
- Track 32 : Hollow\_11
- Track 33 : Demosthenes\_11
- Track 34 : Orchid\_11, Kampe\_11, Gibbles\_10, PatrickStar\_11
- Track 35 : RobinSparkles\_15
- Track 36 : Camerico\_11

- Track 37 : Gmala1\_3
- Track 38 : GordTnk2\_3
- Track 39 : GordDuk1\_3
- Track 40 : GMA3\_3
- Track 41 : Jumbo\_8
- Track 42 : DocB7\_004
- Track 43 : Mbo2\_8
- Track 44 : Reynauld\_16
- Track 45 : Trogglehumper\_30

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

The start number called the most often in the published annotations is 11, it was called in 46 of the 56 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Adgers\_12, Amore2\_12, Austin\_12, Barbochs\_11, Beaver\_11, BenoitCattle\_11, BigShaq\_11, BirksAndSocks\_11, Boneham\_11, Breezic\_11, Butterball\_11, Camerico\_11, CathyBurgh\_11, Chelms\_11, CinnamonToast\_12, Dakiti\_11, Damp\_8, Diabla\_10, DocB7\_004, Eggsie\_11, Ekhein\_11, Exiguo\_11, FelixAlejandro\_12, Flakey\_11, GMA3\_3, GMA7\_3, Gibbles\_10, Gmala1\_3, GordDuk1\_3, GordTnk2\_3, Gorko\_11, GourdThymes\_11, HayZem\_12, Hotorobo\_11, Jams\_8, Jellybones\_11, John316\_11, Jumbo\_8, Kampe\_11, Kaseim\_8, Linetti\_12, Lizzo\_11, Mbo2\_8, Monty\_10, MrWormie\_8, Msay19\_12, Orchid\_11, PatrickStar\_11, PierreThree\_11, PokyPuppy\_10, Poland\_12, RemRem\_12, Reynauld\_16, RobinSparkles\_15, RoyalG\_12, Sam12\_11, Shelley\_8, Sombrero\_11, Squibbles\_11, SteveFrench\_10,

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

- GTE7\_3,

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

- ASerpRocky\_11, Benczkowski14\_11, Demosthenes\_11, Hollow\_11, Katyusha\_11, Kvothe\_11, Niagara\_11, Teatealatte\_11, Teech\_11, Tredge\_11, Trogglehumper\_30,

**Summary by start number:**

Start 1:

- Found in 1 of 72 ( 1.4% ) of genes in pham
- Manual Annotations of this start: 1 of 56
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Trogglehumper\_30 (singleton),

Start 10:

- Found in 6 of 72 ( 8.3% ) of genes in pham
- No Manual Annotations of this start.
- Called 16.7% of time when present
- Phage (with cluster) where this start called: GTE7\_3 (CS1),

Start 11:

- Found in 61 of 72 ( 84.7% ) of genes in pham

- Manual Annotations of this start: 46 of 56
- Called 98.4% of time when present
- Phage (with cluster) where this start called: Adgers\_12 (CS2), Amore2\_12 (CS1), Austin\_12 (CS1), Barbochs\_11 (CS2), Beaver\_11 (CS2), BenoitCattle\_11 (CS2), BigShaq\_11 (CS2), BirksAndSocks\_11 (CS2), Boneham\_11 (CS2), Breezic\_11 (CS2), Butterball\_11 (CS2), Camerico\_11 (DF), CathyBurgh\_11 (CS2), Chelms\_11 (CS2), CinnamonToast\_12 (CS2), Dakiti\_11 (CS2), Damp\_8 (CS3), Diabla\_10 (CS2), DocB7\_004 (singleton), Eggsie\_11 (CS2), Ekhein\_11 (CS2), Exiguo\_11 (CS2), FelixAlejandro\_12 (CS2), Flakey\_11 (CS2), GMA3\_3 (DF2), GMA7\_3 (CS1), Gibbles\_10 (CX), Gmala1\_3 (DF1), GordDuk1\_3 (DF1), GordTnk2\_3 (DF1), Gorko\_11 (CS2), GourdThymes\_11 (CS2), HayZem\_12 (CS1), Hotorobo\_11 (CS2), Jams\_8 (CS3), Jellybones\_11 (CS2), John316\_11 (CS2), Jumbo\_8 (DF3), Kampe\_11 (CX), Kaseim\_8 (CS3), Linetti\_12 (CS2), Lizzo\_11 (CS2), Mbo2\_8 (singleton), Monty\_10 (CS2), MrWormie\_8 (CS3), Msay19\_12 (CS2), Orchid\_11 (CX), PatrickStar\_11 (CX), PierreThree\_11 (CS2), PokyPuppy\_10 (CS2), Poland\_12 (CS2), RemRem\_12 (CS2), Reynauld\_16 (singleton), RobinSparkles\_15 (CX), RoyalG\_12 (CS2), Sam12\_11 (CS2), Shelley\_8 (CS3), Sombrero\_11 (CS2), Squibbles\_11 (CS2), SteveFrench\_10 (CS2),

Start 12:

- Found in 10 of 72 ( 13.9% ) of genes in pham
- Manual Annotations of this start: 9 of 56
- Called 100.0% of time when present
- Phage (with cluster) where this start called: ASerpRocky\_11 (CS4), Benczkowski14\_11 (CS4), Demosthenes\_11 (CS4), Hollow\_11 (CS4), Katyusha\_11 (CS4), Kvothe\_11 (CS4), Niagara\_11 (CS4), Teatealatte\_11 (CS4), Teech\_11 (CS4), Tredge\_11 (CS4),

### Summary by clusters:

There are 10 clusters represented in this pham: singleton, DF, DF1, DF3, DF2, CX, CS4, CS1, CS3, CS2,

Info for manual annotations of cluster CS1:

- Start number 11 was manually annotated 3 times for cluster CS1.

Info for manual annotations of cluster CS2:

- Start number 11 was manually annotated 31 times for cluster CS2.

Info for manual annotations of cluster CS3:

- Start number 11 was manually annotated 4 times for cluster CS3.

Info for manual annotations of cluster CS4:

- Start number 12 was manually annotated 9 times for cluster CS4.

Info for manual annotations of cluster CX:

- Start number 11 was manually annotated 5 times for cluster CX.

Info for manual annotations of cluster DF:

- Start number 11 was manually annotated 1 time for cluster DF.

Info for manual annotations of cluster DF3:

•Start number 11 was manually annotated 1 time for cluster DF3.

### **Gene Information:**

Gene: ASerpRocky\_11 Start: 10816, Stop: 12555, Start Num: 12

Candidate Starts for ASerpRocky\_11:

(9, 10810), (Start: 12 @10816 has 9 MA's), (16, 10849), (26, 10939), (31, 11005), (33, 11023), (35, 11059), (38, 11071), (39, 11074), (46, 11149), (48, 11164), (50, 11212), (53, 11251), (57, 11290), (63, 11353), (66, 11404), (70, 11434), (78, 11551), (85, 11623), (91, 11662), (92, 11665), (95, 11695), (97, 11725), (99, 11746), (104, 11794), (113, 11878), (115, 11890), (122, 11950), (132, 12070), (133, 12073), (143, 12136), (153, 12304), (169, 12442), (175, 12493), (183, 12538),

Gene: Adgers\_12 Start: 9331, Stop: 11055, Start Num: 11

Candidate Starts for Adgers\_12:

(Start: 11 @9331 has 46 MA's), (28, 9463), (29, 9484), (33, 9532), (38, 9580), (45, 9655), (49, 9682), (68, 9934), (70, 9940), (85, 10129), (91, 10168), (95, 10201), (99, 10252), (104, 10300), (109, 10333), (113, 10384), (115, 10396), (117, 10408), (119, 10420), (122, 10456), (134, 10588), (156, 10831), (160, 10870), (163, 10891), (164, 10900), (165, 10924), (167, 10939),

Gene: Amore2\_12 Start: 9385, Stop: 11100, Start Num: 11

Candidate Starts for Amore2\_12:

(10, 9382), (Start: 11 @9385 has 46 MA's), (16, 9418), (28, 9514), (30, 9559), (33, 9583), (38, 9631), (49, 9733), (53, 9811), (70, 9997), (85, 10186), (92, 10228), (95, 10258), (99, 10309), (104, 10357), (113, 10441), (115, 10453), (119, 10477), (122, 10513), (130, 10615), (157, 10885), (162, 10924), (166, 10978), (167, 10981),

Gene: Austin\_12 Start: 9385, Stop: 11100, Start Num: 11

Candidate Starts for Austin\_12:

(10, 9382), (Start: 11 @9385 has 46 MA's), (16, 9418), (28, 9514), (30, 9559), (33, 9583), (38, 9631), (49, 9733), (53, 9811), (70, 9997), (85, 10186), (92, 10228), (95, 10258), (99, 10309), (104, 10357), (113, 10441), (115, 10453), (119, 10477), (122, 10513), (130, 10615), (157, 10885), (162, 10924), (166, 10978), (167, 10981),

Gene: Barbochs\_11 Start: 9166, Stop: 10893, Start Num: 11

Candidate Starts for Barbochs\_11:

(Start: 11 @9166 has 46 MA's), (26, 9283), (28, 9298), (29, 9319), (33, 9367), (38, 9415), (40, 9427), (45, 9490), (47, 9505), (49, 9517), (50, 9556), (70, 9775), (85, 9964), (95, 10036), (99, 10087), (104, 10135), (113, 10219), (115, 10231), (117, 10243), (119, 10255), (122, 10291), (128, 10384), (134, 10423), (156, 10669), (160, 10708), (163, 10729), (164, 10738), (165, 10762), (167, 10777),

Gene: Beaver\_11 Start: 9177, Stop: 10901, Start Num: 11

Candidate Starts for Beaver\_11:

(Start: 11 @9177 has 46 MA's), (26, 9294), (28, 9309), (29, 9330), (33, 9378), (38, 9426), (45, 9501), (47, 9516), (49, 9528), (70, 9786), (85, 9975), (95, 10047), (99, 10098), (104, 10146), (113, 10230), (115, 10242), (117, 10254), (119, 10266), (122, 10302), (128, 10395), (134, 10434), (156, 10677), (160, 10716), (163, 10737), (164, 10746), (165, 10770), (167, 10785),

Gene: Benczkowski14\_11 Start: 10878, Stop: 12617, Start Num: 12

Candidate Starts for Benczkowski14\_11:

(9, 10872), (Start: 12 @10878 has 9 MA's), (16, 10911), (26, 11001), (31, 11067), (33, 11085), (35, 11121), (38, 11133), (39, 11136), (46, 11211), (48, 11226), (50, 11274), (53, 11313), (57, 11352), (63, 11415), (65, 11460), (66, 11466), (67, 11478), (70, 11496), (80, 11646), (85, 11685), (91, 11724), (92, 11727), (95, 11757), (99, 11808), (104, 11856), (113, 11940), (115, 11952), (121, 12003), (122, 12012), (132, 12132), (133, 12135), (143, 12198), (153, 12366), (169, 12504), (175, 12555), (183, 12600),

Gene: BenoitCattle\_11 Start: 9161, Stop: 10888, Start Num: 11

Candidate Starts for BenoitCattle\_11:

(Start: 11 @9161 has 46 MA's), (28, 9293), (29, 9314), (33, 9362), (38, 9410), (42, 9455), (45, 9485), (49, 9512), (50, 9551), (58, 9644), (70, 9770), (85, 9959), (95, 10031), (99, 10082), (104, 10130), (108, 10160), (113, 10214), (115, 10226), (117, 10238), (119, 10250), (122, 10286), (126, 10367), (128, 10379), (130, 10388), (156, 10664), (160, 10703), (163, 10724), (164, 10733), (165, 10757), (167, 10772),

Gene: BigShaq\_11 Start: 9163, Stop: 10890, Start Num: 11

Candidate Starts for BigShaq\_11:

(Start: 11 @9163 has 46 MA's), (26, 9280), (28, 9295), (29, 9316), (33, 9364), (38, 9412), (42, 9457), (45, 9487), (49, 9514), (50, 9553), (58, 9646), (70, 9772), (85, 9961), (95, 10033), (99, 10084), (104, 10132), (108, 10162), (113, 10216), (115, 10228), (117, 10240), (119, 10252), (122, 10288), (126, 10369), (128, 10381), (130, 10390), (156, 10666), (160, 10705), (163, 10726), (164, 10735), (165, 10759), (167, 10774),

Gene: BirksAndSocks\_11 Start: 9166, Stop: 10890, Start Num: 11

Candidate Starts for BirksAndSocks\_11:

(Start: 11 @9166 has 46 MA's), (28, 9298), (29, 9319), (33, 9367), (38, 9415), (45, 9490), (49, 9517), (50, 9556), (68, 9769), (70, 9775), (85, 9964), (91, 10003), (95, 10036), (99, 10087), (104, 10135), (109, 10168), (113, 10219), (115, 10231), (117, 10243), (119, 10255), (122, 10291), (134, 10423), (156, 10666), (160, 10705), (163, 10726), (164, 10735), (165, 10759), (167, 10774),

Gene: Boneham\_11 Start: 9165, Stop: 10889, Start Num: 11

Candidate Starts for Boneham\_11:

(Start: 11 @9165 has 46 MA's), (28, 9297), (29, 9318), (33, 9366), (38, 9414), (45, 9489), (49, 9516), (50, 9555), (68, 9768), (70, 9774), (85, 9963), (91, 10002), (95, 10035), (99, 10086), (104, 10134), (109, 10167), (113, 10218), (115, 10230), (117, 10242), (119, 10254), (122, 10290), (134, 10422), (156, 10665), (160, 10704), (163, 10725), (164, 10734), (165, 10758), (167, 10773),

Gene: Breezic\_11 Start: 9177, Stop: 10904, Start Num: 11

Candidate Starts for Breezic\_11:

(Start: 11 @9177 has 46 MA's), (26, 9294), (28, 9309), (29, 9330), (33, 9378), (38, 9426), (40, 9438), (45, 9501), (47, 9516), (49, 9528), (50, 9567), (70, 9786), (85, 9975), (95, 10047), (99, 10098), (104, 10146), (113, 10230), (115, 10242), (117, 10254), (119, 10266), (122, 10302), (128, 10395), (134, 10434), (156, 10680), (160, 10719), (163, 10740), (164, 10749), (165, 10773), (167, 10788),

Gene: Butterball\_11 Start: 9165, Stop: 10889, Start Num: 11

Candidate Starts for Butterball\_11:

(Start: 11 @9165 has 46 MA's), (28, 9297), (29, 9318), (33, 9366), (38, 9414), (45, 9489), (49, 9516), (50, 9555), (68, 9768), (70, 9774), (85, 9963), (91, 10002), (95, 10035), (99, 10086), (104, 10134), (109, 10167), (113, 10218), (115, 10230), (117, 10242), (119, 10254), (122, 10290), (134, 10422), (156, 10665), (160, 10704), (163, 10725), (164, 10734), (165, 10758), (167, 10773),

Gene: Camerico\_11 Start: 10289, Stop: 12118, Start Num: 11

Candidate Starts for Camerico\_11:

(10, 10286), (Start: 11 @10289 has 46 MA's), (14, 10301), (33, 10493), (35, 10529), (36, 10532), (37, 10535), (38, 10541), (49, 10646), (52, 10721), (58, 10778), (59, 10823), (67, 10961), (70, 10979), (72, 11009), (76, 11057), (83, 11150), (85, 11168), (91, 11207), (94, 11231), (96, 11255), (98, 11279), (101, 11318), (109, 11372), (112, 11417), (113, 11423), (118, 11450), (119, 11459), (122, 11495), (127, 11585), (128, 11588), (130, 11597), (131, 11600), (136, 11636), (151, 11849), (170, 12002), (177, 12053),

Gene: CathyBurgh\_11 Start: 9165, Stop: 10892, Start Num: 11

Candidate Starts for CathyBurgh\_11:

(Start: 11 @9165 has 46 MA's), (26, 9282), (28, 9297), (29, 9318), (33, 9366), (38, 9414), (45, 9489), (47, 9504), (49, 9516), (70, 9774), (85, 9963), (95, 10035), (99, 10086), (104, 10134), (113, 10218), (115, 10230), (117, 10242), (119, 10254), (122, 10290), (128, 10383), (134, 10422), (156, 10668), (160, 10707), (163, 10728), (164, 10737), (165, 10761), (167, 10776),

Gene: Chelms\_11 Start: 9163, Stop: 10890, Start Num: 11

Candidate Starts for Chelms\_11:

(Start: 11 @9163 has 46 MA's), (26, 9280), (28, 9295), (29, 9316), (33, 9364), (38, 9412), (42, 9457), (45, 9487), (49, 9514), (50, 9553), (58, 9646), (70, 9772), (85, 9961), (95, 10033), (99, 10084), (104, 10132), (108, 10162), (113, 10216), (115, 10228), (117, 10240), (119, 10252), (122, 10288), (126, 10369), (130, 10390), (156, 10666), (160, 10705), (163, 10726), (164, 10735), (165, 10759), (167, 10774),

Gene: CinnamonToast\_12 Start: 9201, Stop: 10925, Start Num: 11

Candidate Starts for CinnamonToast\_12:

(Start: 11 @9201 has 46 MA's), (28, 9333), (29, 9354), (33, 9402), (38, 9450), (45, 9525), (49, 9552), (50, 9591), (68, 9804), (70, 9810), (85, 9999), (91, 10038), (95, 10071), (99, 10122), (104, 10170), (109, 10203), (113, 10254), (115, 10266), (117, 10278), (119, 10290), (122, 10326), (134, 10458), (156, 10701), (160, 10740), (163, 10761), (164, 10770), (165, 10794), (167, 10809),

Gene: Dakiti\_11 Start: 9163, Stop: 10890, Start Num: 11

Candidate Starts for Dakiti\_11:

(Start: 11 @9163 has 46 MA's), (28, 9295), (29, 9316), (33, 9364), (38, 9412), (42, 9457), (45, 9487), (49, 9514), (50, 9553), (58, 9646), (70, 9772), (85, 9961), (95, 10033), (99, 10084), (104, 10132), (108, 10162), (113, 10216), (115, 10228), (117, 10240), (119, 10252), (122, 10288), (126, 10369), (128, 10381), (130, 10390), (156, 10666), (160, 10705), (163, 10726), (164, 10735), (165, 10759), (167, 10774),

Gene: Damp\_8 Start: 8384, Stop: 10111, Start Num: 11

Candidate Starts for Damp\_8:

(Start: 11 @8384 has 46 MA's), (16, 8420), (26, 8501), (29, 8537), (33, 8585), (38, 8633), (45, 8708), (47, 8723), (49, 8735), (58, 8867), (61, 8897), (67, 8975), (70, 8993), (78, 9110), (85, 9182), (95, 9254), (97, 9284), (98, 9293), (99, 9305), (104, 9353), (115, 9449), (117, 9461), (119, 9473), (122, 9509), (130, 9611), (148, 9791), (156, 9887), (160, 9926), (163, 9947), (164, 9956), (165, 9980), (167, 9995), (168, 10004), (173, 10025),

Gene: Demosthenes\_11 Start: 10786, Stop: 12525, Start Num: 12

Candidate Starts for Demosthenes\_11:

(9, 10780), (Start: 12 @10786 has 9 MA's), (16, 10819), (26, 10909), (31, 10975), (33, 10993), (35, 11029), (38, 11041), (39, 11044), (45, 11116), (46, 11119), (48, 11134), (50, 11182), (53, 11221), (57, 11260), (65, 11368), (70, 11404), (78, 11521), (80, 11554), (81, 11560), (83, 11575), (85, 11593), (91, 11632), (92, 11635), (95, 11665), (99, 11716), (104, 11764), (113, 11848), (115, 11860), (122, 11920), (132, 12040), (133, 12043), (143, 12106), (153, 12274), (169, 12412), (175, 12463),

Gene: Diabla\_10 Start: 8971, Stop: 10701, Start Num: 11

Candidate Starts for Diabla\_10:

(Start: 11 @8971 has 46 MA's), (13, 8983), (17, 9019), (28, 9103), (29, 9124), (33, 9172), (38, 9220), (41, 9244), (45, 9295), (46, 9298), (49, 9322), (58, 9454), (70, 9580), (78, 9697), (85, 9769), (95, 9841), (99, 9892), (104, 9940), (113, 10024), (115, 10036), (117, 10048), (119, 10060), (122, 10096), (128, 10189), (134, 10228), (148, 10381), (156, 10477), (160, 10516), (163, 10537), (164, 10546), (165, 10570), (167, 10585),

Gene: DocB7\_004 Start: 3689, Stop: 5428, Start Num: 11

Candidate Starts for DocB7\_004:

(3, 3650), (Start: 11 @3689 has 46 MA's), (24, 3785), (33, 3890), (36, 3929), (38, 3938), (39, 3941), (44, 4007), (45, 4013), (49, 4040), (53, 4118), (64, 4250), (66, 4277), (70, 4307), (82, 4487), (85, 4508), (88, 4520), (99, 4631), (100, 4655), (104, 4679), (109, 4712), (113, 4763), (115, 4775), (116, 4778), (122, 4835), (130, 4937), (139, 4994), (150, 5141), (151, 5165), (158, 5228), (176, 5375), (181, 5402),

Gene: Eggsie\_11 Start: 9171, Stop: 10901, Start Num: 11

Candidate Starts for Eggsie\_11:

(Start: 11 @9171 has 46 MA's), (28, 9303), (29, 9324), (33, 9372), (38, 9420), (41, 9444), (45, 9495), (46, 9498), (49, 9522), (56, 9621), (58, 9654), (70, 9780), (85, 9969), (95, 10041), (99, 10092), (104, 10140), (113, 10224), (115, 10236), (117, 10248), (119, 10260), (122, 10296), (126, 10377), (128, 10389), (134, 10428), (148, 10581), (156, 10677), (160, 10716), (163, 10737), (164, 10746), (165, 10770), (167, 10785),

Gene: Ekhein\_11 Start: 9165, Stop: 10889, Start Num: 11

Candidate Starts for Ekhein\_11:

(Start: 11 @9165 has 46 MA's), (26, 9282), (28, 9297), (29, 9318), (33, 9366), (38, 9414), (45, 9489), (47, 9504), (49, 9516), (70, 9774), (85, 9963), (95, 10035), (99, 10086), (104, 10134), (113, 10218), (115, 10230), (117, 10242), (119, 10254), (122, 10290), (128, 10383), (134, 10422), (156, 10665), (160, 10704), (163, 10725), (164, 10734), (165, 10758), (167, 10773),

Gene: Exiguo\_11 Start: 9177, Stop: 10901, Start Num: 11

Candidate Starts for Exiguo\_11:

(Start: 11 @9177 has 46 MA's), (26, 9294), (28, 9309), (29, 9330), (33, 9378), (38, 9426), (45, 9501), (47, 9516), (49, 9528), (70, 9786), (85, 9975), (95, 10047), (99, 10098), (104, 10146), (113, 10230), (115, 10242), (117, 10254), (119, 10266), (122, 10302), (128, 10395), (134, 10434), (156, 10677), (160, 10716), (163, 10737), (164, 10746), (165, 10770), (167, 10785),

Gene: FelixAlejandro\_12 Start: 9363, Stop: 11087, Start Num: 11

Candidate Starts for FelixAlejandro\_12:

(Start: 11 @9363 has 46 MA's), (26, 9480), (28, 9495), (29, 9516), (33, 9564), (38, 9612), (45, 9687), (49, 9714), (50, 9753), (68, 9966), (70, 9972), (85, 10161), (91, 10200), (95, 10233), (99, 10284), (104, 10332), (113, 10416), (115, 10428), (117, 10440), (119, 10452), (122, 10488), (134, 10620), (156, 10863), (160, 10902), (163, 10923), (164, 10932), (167, 10971),

Gene: Flakey\_11 Start: 9166, Stop: 10893, Start Num: 11

Candidate Starts for Flakey\_11:

(Start: 11 @9166 has 46 MA's), (26, 9283), (28, 9298), (29, 9319), (33, 9367), (38, 9415), (40, 9427), (45, 9490), (47, 9505), (49, 9517), (50, 9556), (70, 9775), (85, 9964), (95, 10036), (99, 10087), (104, 10135), (113, 10219), (115, 10231), (117, 10243), (119, 10255), (122, 10291), (128, 10384), (134, 10423), (156, 10669), (160, 10708), (163, 10729), (164, 10738), (165, 10762), (167, 10777),

Gene: GMA3\_3 Start: 4995, Stop: 6896, Start Num: 11



Candidate Starts for GMA3\_3:

(Start: 11 @4995 has 46 MA's), (20, 5061), (31, 5190), (32, 5205), (33, 5208), (38, 5256), (40, 5268), (46, 5334), (49, 5358), (53, 5430), (55, 5448), (59, 5526), (70, 5676), (73, 5742), (76, 5754), (84, 5862), (85, 5865), (94, 5928), (96, 5952), (99, 5988), (105, 6042), (112, 6114), (119, 6156), (122, 6192), (123, 6201), (124, 6234), (129, 6288), (139, 6351), (146, 6462), (147, 6465), (161, 6678), (166, 6735), (179, 6822), (180, 6825),

Gene: GMA7\_3 Start: 3574, Stop: 5289, Start Num: 11

Candidate Starts for GMA7\_3:

(10, 3571), (Start: 11 @3574 has 46 MA's), (16, 3607), (28, 3703), (30, 3748), (33, 3772), (38, 3820), (49, 3922), (53, 4000), (66, 4156), (70, 4186), (85, 4375), (92, 4417), (95, 4447), (99, 4498), (104, 4546), (113, 4630), (115, 4642), (119, 4666), (122, 4702), (130, 4804), (157, 5074), (162, 5113), (166, 5167), (167, 5170),

Gene: GTE7\_3 Start: 3556, Stop: 5274, Start Num: 10

Candidate Starts for GTE7\_3:

(10, 3556), (Start: 11 @3559 has 46 MA's), (16, 3592), (28, 3688), (30, 3733), (33, 3757), (38, 3805), (49, 3907), (53, 3985), (70, 4171), (85, 4360), (92, 4402), (95, 4432), (99, 4483), (104, 4531), (113, 4615), (115, 4627), (119, 4651), (122, 4687), (130, 4789), (157, 5059), (162, 5098), (166, 5152), (167, 5155),

Gene: Gibbles\_10 Start: 8889, Stop: 10658, Start Num: 11

Candidate Starts for Gibbles\_10:

(7, 8877), (Start: 11 @8889 has 46 MA's), (27, 9009), (32, 9084), (33, 9087), (35, 9123), (38, 9135), (42, 9180), (49, 9237), (50, 9276), (51, 9309), (52, 9312), (55, 9333), (69, 9528), (71, 9546), (72, 9561), (75, 9603), (76, 9609), (85, 9720), (90, 9741), (93, 9765), (95, 9792), (99, 9843), (101, 9870), (108, 9921), (113, 9975), (117, 9999), (118, 10002), (119, 10011), (122, 10047), (136, 10188), (182, 10626), (183, 10635),

Gene: Gmala1\_3 Start: 5276, Stop: 7147, Start Num: 11

Candidate Starts for Gmala1\_3:

(Start: 11 @5276 has 46 MA's), (21, 5348), (31, 5462), (33, 5480), (38, 5528), (40, 5540), (43, 5585), (44, 5597), (49, 5630), (55, 5726), (59, 5819), (60, 5849), (62, 5870), (68, 5963), (70, 5969), (76, 6047), (85, 6158), (92, 6200), (94, 6221), (96, 6245), (99, 6281), (101, 6308), (103, 6317), (107, 6356), (110, 6398), (112, 6407), (113, 6413), (118, 6440), (120, 6452), (122, 6485), (124, 6527), (128, 6578), (131, 6590), (138, 6638), (141, 6668), (151, 6851), (161, 6935), (170, 7013), (178, 7079),

Gene: GordDuk1\_3 Start: 5216, Stop: 7087, Start Num: 11

Candidate Starts for GordDuk1\_3:

(Start: 11 @5216 has 46 MA's), (21, 5288), (31, 5402), (33, 5420), (38, 5468), (40, 5480), (43, 5525), (44, 5537), (55, 5666), (59, 5759), (60, 5789), (62, 5810), (68, 5903), (70, 5909), (76, 5987), (85, 6098), (92, 6140), (94, 6161), (96, 6185), (99, 6221), (101, 6248), (103, 6257), (107, 6296), (110, 6338), (112, 6347), (113, 6353), (118, 6380), (120, 6392), (122, 6425), (124, 6467), (128, 6518), (131, 6530), (138, 6578), (151, 6791), (161, 6875), (170, 6953), (178, 7019),

Gene: GordTnk2\_3 Start: 5183, Stop: 7054, Start Num: 11

Candidate Starts for GordTnk2\_3:

(Start: 11 @5183 has 46 MA's), (21, 5255), (31, 5369), (33, 5387), (38, 5435), (40, 5447), (43, 5492), (44, 5504), (55, 5633), (59, 5726), (60, 5756), (62, 5777), (68, 5870), (70, 5876), (76, 5954), (85, 6065), (92, 6107), (94, 6128), (96, 6152), (99, 6188), (101, 6215), (103, 6224), (107, 6263), (110, 6305), (112, 6314), (113, 6320), (118, 6347), (120, 6359), (122, 6392), (124, 6434), (128, 6485), (131, 6497), (138, 6545), (141, 6575), (151, 6758), (161, 6842), (170, 6920), (178, 6986),

Gene: Gorko\_11 Start: 9166, Stop: 10893, Start Num: 11

Candidate Starts for Gorko\_11:

(Start: 11 @9166 has 46 MA's), (26, 9283), (28, 9298), (29, 9319), (33, 9367), (38, 9415), (40, 9427), (45, 9490), (47, 9505), (49, 9517), (50, 9556), (70, 9775), (85, 9964), (95, 10036), (99, 10087), (104, 10135), (113, 10219), (115, 10231), (117, 10243), (119, 10255), (122, 10291), (128, 10384), (134, 10423), (156, 10669), (160, 10708), (163, 10729), (164, 10738), (165, 10762), (167, 10777),

Gene: GourdThymes\_11 Start: 9165, Stop: 10892, Start Num: 11

Candidate Starts for GourdThymes\_11:

(Start: 11 @9165 has 46 MA's), (26, 9282), (28, 9297), (29, 9318), (33, 9366), (38, 9414), (45, 9489), (49, 9516), (50, 9555), (70, 9774), (85, 9963), (91, 10002), (95, 10035), (99, 10086), (104, 10134), (113, 10218), (115, 10230), (117, 10242), (119, 10254), (122, 10290), (128, 10383), (134, 10422), (156, 10668), (160, 10707), (163, 10728), (164, 10737), (165, 10761), (167, 10776),

Gene: HayZem\_12 Start: 9385, Stop: 11100, Start Num: 11

Candidate Starts for HayZem\_12:

(10, 9382), (Start: 11 @9385 has 46 MA's), (16, 9418), (28, 9514), (30, 9559), (33, 9583), (38, 9631), (49, 9733), (53, 9811), (70, 9997), (85, 10186), (92, 10228), (95, 10258), (99, 10309), (104, 10357), (113, 10441), (115, 10453), (119, 10477), (122, 10513), (130, 10615), (157, 10885), (162, 10924), (166, 10978), (167, 10981),

Gene: Hollow\_11 Start: 10813, Stop: 12552, Start Num: 12

Candidate Starts for Hollow\_11:

(9, 10807), (Start: 12 @10813 has 9 MA's), (16, 10846), (26, 10936), (31, 11002), (33, 11020), (35, 11056), (36, 11059), (38, 11068), (39, 11071), (46, 11146), (48, 11161), (50, 11209), (53, 11248), (57, 11287), (66, 11401), (67, 11413), (70, 11431), (78, 11548), (85, 11620), (91, 11659), (92, 11662), (95, 11692), (99, 11743), (104, 11791), (113, 11875), (115, 11887), (122, 11947), (132, 12067), (133, 12070), (140, 12112), (143, 12133), (153, 12301), (169, 12439), (175, 12490), (183, 12535),

Gene: Hotorobo\_11 Start: 9176, Stop: 10903, Start Num: 11

Candidate Starts for Hotorobo\_11:

(Start: 11 @9176 has 46 MA's), (26, 9293), (28, 9308), (29, 9329), (33, 9377), (38, 9425), (45, 9500), (49, 9527), (70, 9785), (85, 9974), (95, 10046), (99, 10097), (104, 10145), (113, 10229), (115, 10241), (117, 10253), (119, 10265), (122, 10301), (128, 10394), (134, 10433), (156, 10679), (160, 10718), (163, 10739), (164, 10748), (165, 10772), (167, 10787),

Gene: Jams\_8 Start: 8404, Stop: 10131, Start Num: 11

Candidate Starts for Jams\_8:

(Start: 11 @8404 has 46 MA's), (16, 8440), (26, 8521), (29, 8557), (33, 8605), (38, 8653), (45, 8728), (49, 8755), (58, 8887), (61, 8917), (67, 8995), (70, 9013), (78, 9130), (85, 9202), (95, 9274), (97, 9304), (98, 9313), (99, 9325), (104, 9373), (115, 9469), (117, 9481), (119, 9493), (122, 9529), (130, 9631), (148, 9811), (156, 9907), (160, 9946), (163, 9967), (164, 9976), (165, 10000), (167, 10015), (168, 10024), (173, 10045),

Gene: Jellybones\_11 Start: 9200, Stop: 10924, Start Num: 11

Candidate Starts for Jellybones\_11:

(Start: 11 @9200 has 46 MA's), (26, 9317), (28, 9332), (29, 9353), (33, 9401), (38, 9449), (45, 9524), (49, 9551), (50, 9590), (68, 9803), (70, 9809), (85, 9998), (91, 10037), (95, 10070), (99, 10121), (104, 10169), (109, 10202), (113, 10253), (115, 10265), (117, 10277), (119, 10289), (122, 10325), (134, 10457), (156, 10700), (160, 10739), (163, 10760), (164, 10769), (165, 10793), (167, 10808),

Gene: John316\_11 Start: 9165, Stop: 10889, Start Num: 11

Candidate Starts for John316\_11:

(Start: 11 @9165 has 46 MA's), (26, 9282), (28, 9297), (29, 9318), (33, 9366), (38, 9414), (45, 9489), (49, 9516), (50, 9555), (68, 9768), (70, 9774), (85, 9963), (91, 10002), (95, 10035), (99, 10086), (104, 10134), (109, 10167), (113, 10218), (115, 10230), (117, 10242), (119, 10254), (122, 10290), (134, 10422), (156, 10665), (160, 10704), (163, 10725), (164, 10734), (165, 10758), (167, 10773),

Gene: Jumbo\_8 Start: 10158, Stop: 12023, Start Num: 11

Candidate Starts for Jumbo\_8:

(Start: 11 @10158 has 46 MA's), (30, 10344), (33, 10368), (38, 10416), (40, 10428), (41, 10440), (48, 10509), (49, 10518), (58, 10650), (66, 10818), (68, 10842), (70, 10848), (76, 10926), (85, 11037), (87, 11046), (94, 11100), (96, 11124), (97, 11139), (99, 11160), (101, 11187), (107, 11235), (110, 11277), (112, 11286), (118, 11319), (119, 11328), (120, 11331), (122, 11364), (124, 11409), (126, 11448), (127, 11457), (135, 11502), (136, 11508), (139, 11526), (147, 11613), (151, 11736), (152, 11748), (154, 11763), (159, 11814), (175, 11940), (176, 11943),

Gene: Kampe\_11 Start: 8747, Stop: 10516, Start Num: 11

Candidate Starts for Kampe\_11:

(7, 8735), (Start: 11 @8747 has 46 MA's), (27, 8867), (32, 8942), (33, 8945), (35, 8981), (38, 8993), (42, 9038), (49, 9095), (50, 9134), (51, 9167), (52, 9170), (55, 9191), (69, 9386), (71, 9404), (72, 9419), (75, 9461), (76, 9467), (85, 9578), (90, 9599), (93, 9623), (95, 9650), (99, 9701), (101, 9728), (108, 9779), (113, 9833), (117, 9857), (118, 9860), (119, 9869), (122, 9905), (136, 10046), (182, 10484), (183, 10493),

Gene: Kaseim\_8 Start: 8395, Stop: 10122, Start Num: 11

Candidate Starts for Kaseim\_8:

(4, 8368), (Start: 11 @8395 has 46 MA's), (16, 8431), (26, 8512), (29, 8548), (33, 8596), (38, 8644), (49, 8746), (61, 8908), (67, 8986), (70, 9004), (78, 9121), (85, 9193), (95, 9265), (97, 9295), (98, 9304), (99, 9316), (104, 9364), (115, 9460), (117, 9472), (119, 9484), (121, 9511), (122, 9520), (130, 9622), (148, 9802), (156, 9898), (160, 9937), (163, 9958), (164, 9967), (165, 9991), (167, 10006), (168, 10015), (173, 10036),

Gene: Katyusha\_11 Start: 10878, Stop: 12617, Start Num: 12

Candidate Starts for Katyusha\_11:

(9, 10872), (Start: 12 @10878 has 9 MA's), (16, 10911), (26, 11001), (31, 11067), (33, 11085), (35, 11121), (38, 11133), (39, 11136), (46, 11211), (48, 11226), (50, 11274), (53, 11313), (57, 11352), (63, 11415), (65, 11460), (66, 11466), (67, 11478), (70, 11496), (80, 11646), (85, 11685), (91, 11724), (92, 11727), (95, 11757), (99, 11808), (104, 11856), (113, 11940), (115, 11952), (121, 12003), (122, 12012), (132, 12132), (133, 12135), (143, 12198), (153, 12366), (169, 12504), (175, 12555), (183, 12600),

Gene: Kvothe\_11 Start: 10815, Stop: 12554, Start Num: 12

Candidate Starts for Kvothe\_11:

(9, 10809), (Start: 12 @10815 has 9 MA's), (16, 10848), (26, 10938), (31, 11004), (33, 11022), (35, 11058), (38, 11070), (39, 11073), (46, 11148), (48, 11163), (50, 11211), (53, 11250), (57, 11289), (63, 11352), (65, 11397), (66, 11403), (67, 11415), (70, 11433), (80, 11583), (85, 11622), (91, 11661), (92, 11664), (95, 11694), (99, 11745), (104, 11793), (113, 11877), (115, 11889), (121, 11940), (122, 11949), (132, 12069), (133, 12072), (143, 12135), (153, 12303), (169, 12441), (175, 12492), (183, 12537),

Gene: Linetti\_12 Start: 9316, Stop: 11043, Start Num: 11

Candidate Starts for Linetti\_12:

(Start: 11 @9316 has 46 MA's), (28, 9448), (29, 9469), (33, 9517), (38, 9565), (42, 9610), (45, 9640), (49, 9667), (50, 9706), (58, 9799), (70, 9925), (85, 10114), (95, 10186), (99, 10237), (104, 10285), (108, 10315), (113, 10369), (115, 10381), (117, 10393), (119, 10405), (122, 10441), (126, 10522),

(128, 10534), (130, 10543), (156, 10819), (160, 10858), (163, 10879), (164, 10888), (165, 10912), (167, 10927),

Gene: Lizzo\_11 Start: 9165, Stop: 10892, Start Num: 11

Candidate Starts for Lizzo\_11:

(Start: 11 @9165 has 46 MA's), (26, 9282), (28, 9297), (29, 9318), (33, 9366), (38, 9414), (45, 9489), (47, 9504), (49, 9516), (70, 9774), (85, 9963), (95, 10035), (99, 10086), (104, 10134), (113, 10218), (115, 10230), (117, 10242), (119, 10254), (122, 10290), (128, 10383), (134, 10422), (156, 10668), (160, 10707), (163, 10728), (164, 10737), (165, 10761), (167, 10776),

Gene: Mbo2\_8 Start: 4883, Stop: 6661, Start Num: 11

Candidate Starts for Mbo2\_8:

(8, 4877), (Start: 11 @4883 has 46 MA's), (18, 4925), (30, 5051), (32, 5072), (33, 5075), (38, 5123), (40, 5135), (47, 5213), (54, 5312), (58, 5357), (63, 5408), (70, 5486), (74, 5555), (76, 5564), (79, 5609), (85, 5678), (89, 5696), (90, 5699), (91, 5717), (92, 5720), (97, 5780), (99, 5801), (100, 5825), (108, 5879), (109, 5882), (110, 5918), (113, 5933), (115, 5945), (122, 6005), (125, 6071), (145, 6269), (150, 6380), (155, 6440), (174, 6590), (175, 6602), (183, 6647),

Gene: Monty\_10 Start: 9178, Stop: 10905, Start Num: 11

Candidate Starts for Monty\_10:

(Start: 11 @9178 has 46 MA's), (26, 9295), (28, 9310), (29, 9331), (33, 9379), (38, 9427), (45, 9502), (49, 9529), (70, 9787), (85, 9976), (95, 10048), (99, 10099), (104, 10147), (113, 10231), (115, 10243), (117, 10255), (119, 10267), (122, 10303), (128, 10396), (134, 10435), (156, 10681), (160, 10720), (163, 10741), (164, 10750), (165, 10774), (167, 10789),

Gene: MrWormie\_8 Start: 8373, Stop: 10100, Start Num: 11

Candidate Starts for MrWormie\_8:

(Start: 11 @8373 has 46 MA's), (16, 8409), (26, 8490), (29, 8526), (33, 8574), (38, 8622), (45, 8697), (49, 8724), (61, 8886), (67, 8964), (70, 8982), (78, 9099), (85, 9171), (95, 9243), (97, 9273), (98, 9282), (99, 9294), (104, 9342), (108, 9372), (115, 9438), (117, 9450), (119, 9462), (122, 9498), (130, 9600), (148, 9780), (156, 9876), (160, 9915), (163, 9936), (164, 9945), (165, 9969), (167, 9984), (168, 9993), (173, 10014),

Gene: Msay19\_12 Start: 9355, Stop: 11079, Start Num: 11

Candidate Starts for Msay19\_12:

(Start: 11 @9355 has 46 MA's), (28, 9487), (29, 9508), (33, 9556), (38, 9604), (45, 9679), (49, 9706), (50, 9745), (68, 9958), (70, 9964), (85, 10153), (91, 10192), (95, 10225), (99, 10276), (104, 10324), (109, 10357), (113, 10408), (115, 10420), (117, 10432), (119, 10444), (122, 10480), (134, 10612), (156, 10855), (160, 10894), (163, 10915), (164, 10924), (167, 10963),

Gene: Niagara\_11 Start: 10835, Stop: 12574, Start Num: 12

Candidate Starts for Niagara\_11:

(9, 10829), (Start: 12 @10835 has 9 MA's), (16, 10868), (26, 10958), (31, 11024), (33, 11042), (35, 11078), (38, 11090), (39, 11093), (46, 11168), (48, 11183), (50, 11231), (53, 11270), (57, 11309), (63, 11372), (65, 11417), (66, 11423), (70, 11453), (78, 11570), (85, 11642), (91, 11681), (92, 11684), (95, 11714), (97, 11744), (99, 11765), (103, 11801), (104, 11813), (113, 11897), (115, 11909), (122, 11969), (132, 12089), (133, 12092), (143, 12155), (153, 12323), (169, 12461), (175, 12512), (183, 12557),

Gene: Orchid\_11 Start: 8747, Stop: 10516, Start Num: 11

Candidate Starts for Orchid\_11:

(7, 8735), (Start: 11 @8747 has 46 MA's), (27, 8867), (32, 8942), (33, 8945), (35, 8981), (38, 8993), (42, 9038), (49, 9095), (50, 9134), (51, 9167), (52, 9170), (55, 9191), (69, 9386), (71, 9404), (72,

9419), (75, 9461), (76, 9467), (85, 9578), (90, 9599), (93, 9623), (95, 9650), (99, 9701), (101, 9728), (108, 9779), (113, 9833), (117, 9857), (118, 9860), (119, 9869), (122, 9905), (136, 10046), (182, 10484), (183, 10493),

Gene: PatrickStar\_11 Start: 8747, Stop: 10516, Start Num: 11

Candidate Starts for PatrickStar\_11:

(7, 8735), (Start: 11 @8747 has 46 MA's), (27, 8867), (32, 8942), (33, 8945), (35, 8981), (38, 8993), (42, 9038), (49, 9095), (50, 9134), (51, 9167), (52, 9170), (55, 9191), (69, 9386), (71, 9404), (72, 9419), (75, 9461), (76, 9467), (85, 9578), (90, 9599), (93, 9623), (95, 9650), (99, 9701), (101, 9728), (108, 9779), (113, 9833), (117, 9857), (118, 9860), (119, 9869), (122, 9905), (136, 10046), (182, 10484), (183, 10493),

Gene: PierreThree\_11 Start: 9163, Stop: 10890, Start Num: 11

Candidate Starts for PierreThree\_11:

(Start: 11 @9163 has 46 MA's), (28, 9295), (29, 9316), (33, 9364), (38, 9412), (42, 9457), (45, 9487), (49, 9514), (50, 9553), (58, 9646), (70, 9772), (85, 9961), (95, 10033), (99, 10084), (104, 10132), (108, 10162), (113, 10216), (115, 10228), (117, 10240), (119, 10252), (122, 10288), (126, 10369), (128, 10381), (130, 10390), (156, 10666), (160, 10705), (163, 10726), (164, 10735), (165, 10759), (167, 10774),

Gene: PokyPuppy\_10 Start: 9058, Stop: 10785, Start Num: 11

Candidate Starts for PokyPuppy\_10:

(Start: 11 @9058 has 46 MA's), (23, 9145), (28, 9190), (29, 9211), (33, 9259), (38, 9307), (45, 9382), (47, 9397), (49, 9409), (70, 9667), (85, 9856), (95, 9928), (99, 9979), (104, 10027), (113, 10111), (115, 10123), (117, 10135), (119, 10147), (122, 10183), (128, 10276), (148, 10465), (156, 10561), (160, 10600), (163, 10621), (164, 10630), (165, 10654), (167, 10669),

Gene: Poland\_12 Start: 9331, Stop: 11055, Start Num: 11

Candidate Starts for Poland\_12:

(Start: 11 @9331 has 46 MA's), (28, 9463), (29, 9484), (33, 9532), (38, 9580), (45, 9655), (49, 9682), (50, 9721), (68, 9934), (70, 9940), (85, 10129), (91, 10168), (95, 10201), (99, 10252), (104, 10300), (109, 10333), (113, 10384), (115, 10396), (117, 10408), (119, 10420), (122, 10456), (134, 10588), (156, 10831), (160, 10870), (163, 10891), (164, 10900), (167, 10939),

Gene: RemRem\_12 Start: 9177, Stop: 10901, Start Num: 11

Candidate Starts for RemRem\_12:

(Start: 11 @9177 has 46 MA's), (26, 9294), (28, 9309), (29, 9330), (33, 9378), (38, 9426), (40, 9438), (45, 9501), (49, 9528), (50, 9567), (70, 9786), (85, 9975), (95, 10047), (99, 10098), (104, 10146), (113, 10230), (115, 10242), (117, 10254), (119, 10266), (122, 10302), (128, 10395), (134, 10434), (156, 10677), (160, 10716), (163, 10737), (164, 10746), (165, 10770), (167, 10785),

Gene: Reynauld\_16 Start: 11632, Stop: 13386, Start Num: 11

Candidate Starts for Reynauld\_16:

(Start: 11 @11632 has 46 MA's), (24, 11719), (25, 11734), (32, 11824), (33, 11827), (35, 11863), (38, 11875), (41, 11899), (58, 12103), (65, 12193), (66, 12199), (70, 12229), (79, 12352), (85, 12436), (86, 12439), (88, 12448), (90, 12457), (91, 12475), (92, 12478), (94, 12499), (97, 12538), (99, 12559), (108, 12637), (109, 12640), (110, 12676), (111, 12679), (113, 12691), (115, 12703), (122, 12763), (132, 12895), (137, 12925), (151, 13126), (166, 13264), (171, 13288), (172, 13291), (182, 13357),

Gene: RobinSparkles\_15 Start: 9340, Stop: 11109, Start Num: 11

Candidate Starts for RobinSparkles\_15:

(7, 9328), (Start: 11 @9340 has 46 MA's), (14, 9352), (27, 9460), (32, 9535), (33, 9538), (35, 9574), (38, 9586), (49, 9688), (50, 9727), (52, 9763), (55, 9784), (66, 9952), (69, 9979), (71, 9997), (72,

10012), (75, 10054), (76, 10060), (85, 10171), (90, 10192), (95, 10243), (99, 10294), (101, 10321), (108, 10372), (113, 10426), (119, 10462), (122, 10498), (182, 11077), (183, 11086),

Gene: RoyalG\_12 Start: 9366, Stop: 11090, Start Num: 11

Candidate Starts for RoyalG\_12:

(Start: 11 @9366 has 46 MA's), (13, 9378), (17, 9414), (28, 9498), (29, 9519), (33, 9567), (38, 9615), (41, 9639), (45, 9690), (46, 9693), (49, 9717), (56, 9816), (58, 9849), (68, 9969), (70, 9975), (85, 10164), (95, 10236), (99, 10287), (104, 10335), (108, 10365), (113, 10419), (115, 10431), (117, 10443), (119, 10455), (122, 10491), (128, 10584), (134, 10623), (148, 10770), (156, 10866), (160, 10905), (163, 10926), (164, 10935), (165, 10959), (167, 10974),

Gene: Sam12\_11 Start: 9177, Stop: 10901, Start Num: 11

Candidate Starts for Sam12\_11:

(Start: 11 @9177 has 46 MA's), (26, 9294), (28, 9309), (29, 9330), (33, 9378), (38, 9426), (45, 9501), (47, 9516), (49, 9528), (70, 9786), (85, 9975), (95, 10047), (99, 10098), (104, 10146), (113, 10230), (115, 10242), (117, 10254), (119, 10266), (122, 10302), (128, 10395), (134, 10434), (156, 10677), (160, 10716), (163, 10737), (164, 10746), (165, 10770), (167, 10785),

Gene: Shelley\_8 Start: 8418, Stop: 10145, Start Num: 11

Candidate Starts for Shelley\_8:

(4, 8391), (Start: 11 @8418 has 46 MA's), (16, 8454), (26, 8535), (29, 8571), (33, 8619), (38, 8667), (49, 8769), (61, 8931), (67, 9009), (70, 9027), (78, 9144), (85, 9216), (95, 9288), (97, 9318), (98, 9327), (99, 9339), (104, 9387), (115, 9483), (117, 9495), (119, 9507), (121, 9534), (122, 9543), (130, 9645), (148, 9825), (156, 9921), (160, 9960), (163, 9981), (164, 9990), (165, 10014), (167, 10029), (168, 10038), (173, 10059),

Gene: Sombrero\_11 Start: 9211, Stop: 10935, Start Num: 11

Candidate Starts for Sombrero\_11:

(Start: 11 @9211 has 46 MA's), (26, 9328), (28, 9343), (29, 9364), (33, 9412), (38, 9460), (45, 9535), (47, 9550), (49, 9562), (68, 9814), (70, 9820), (85, 10009), (91, 10048), (95, 10081), (99, 10132), (104, 10180), (109, 10213), (113, 10264), (115, 10276), (117, 10288), (119, 10300), (122, 10336), (134, 10468), (156, 10711), (160, 10750), (163, 10771), (164, 10780), (167, 10819),

Gene: Squibbles\_11 Start: 9165, Stop: 10892, Start Num: 11

Candidate Starts for Squibbles\_11:

(Start: 11 @9165 has 46 MA's), (26, 9282), (28, 9297), (29, 9318), (33, 9366), (38, 9414), (45, 9489), (47, 9504), (49, 9516), (70, 9774), (85, 9963), (95, 10035), (99, 10086), (104, 10134), (113, 10218), (115, 10230), (117, 10242), (119, 10254), (122, 10290), (128, 10383), (134, 10422), (156, 10668), (160, 10707), (163, 10728), (164, 10737), (165, 10761), (167, 10776),

Gene: SteveFrench\_10 Start: 8960, Stop: 10684, Start Num: 11

Candidate Starts for SteveFrench\_10:

(Start: 11 @8960 has 46 MA's), (13, 8972), (17, 9008), (28, 9092), (29, 9113), (33, 9161), (38, 9209), (41, 9233), (45, 9284), (46, 9287), (49, 9311), (58, 9443), (70, 9569), (85, 9758), (95, 9830), (99, 9881), (104, 9929), (113, 10013), (115, 10025), (117, 10037), (119, 10049), (122, 10085), (126, 10166), (128, 10178), (134, 10217), (156, 10460), (160, 10499), (163, 10520), (164, 10529), (165, 10553), (167, 10568),

Gene: Teatealatte\_11 Start: 10798, Stop: 12537, Start Num: 12

Candidate Starts for Teatealatte\_11:

(9, 10792), (Start: 12 @10798 has 9 MA's), (16, 10831), (26, 10921), (31, 10987), (33, 11005), (35, 11041), (38, 11053), (39, 11056), (46, 11131), (48, 11146), (50, 11194), (53, 11233), (63, 11335), (65, 11380), (66, 11386), (70, 11416), (78, 11533), (80, 11566), (85, 11605), (91, 11644), (92, 11647), (95,

11677), (97, 11707), (99, 11728), (104, 11776), (113, 11860), (115, 11872), (122, 11932), (132, 12052), (133, 12055), (143, 12118), (153, 12286), (169, 12424), (175, 12475), (183, 12520),

Gene: Teech\_11 Start: 10870, Stop: 12609, Start Num: 12

Candidate Starts for Teech\_11:

(9, 10864), (Start: 12 @10870 has 9 MA's), (16, 10903), (26, 10993), (31, 11059), (33, 11077), (35, 11113), (38, 11125), (39, 11128), (46, 11203), (48, 11218), (50, 11266), (53, 11305), (57, 11344), (63, 11407), (65, 11452), (66, 11458), (70, 11488), (78, 11605), (80, 11638), (85, 11677), (91, 11716), (92, 11719), (95, 11749), (97, 11779), (99, 11800), (104, 11848), (113, 11932), (115, 11944), (122, 12004), (132, 12124), (133, 12127), (143, 12190), (153, 12358), (169, 12496), (175, 12547), (183, 12592),

Gene: Tredge\_11 Start: 10798, Stop: 12537, Start Num: 12

Candidate Starts for Tredge\_11:

(9, 10792), (Start: 12 @10798 has 9 MA's), (16, 10831), (26, 10921), (31, 10987), (33, 11005), (35, 11041), (38, 11053), (39, 11056), (46, 11131), (48, 11146), (50, 11194), (53, 11233), (63, 11335), (65, 11380), (66, 11386), (70, 11416), (78, 11533), (80, 11566), (85, 11605), (91, 11644), (92, 11647), (95, 11677), (97, 11707), (99, 11728), (104, 11776), (113, 11860), (115, 11872), (122, 11932), (132, 12052), (133, 12055), (143, 12118), (153, 12286), (169, 12424), (175, 12475), (183, 12520),

Gene: Trogglehumper\_30 Start: 17919, Stop: 19799, Start Num: 1

Candidate Starts for Trogglehumper\_30:

(Start: 1 @17919 has 1 MA's), (2, 17985), (5, 18042), (6, 18045), (15, 18090), (19, 18120), (22, 18153), (32, 18267), (33, 18270), (34, 18288), (38, 18318), (39, 18321), (45, 18393), (49, 18420), (56, 18519), (70, 18684), (73, 18750), (75, 18756), (77, 18780), (85, 18873), (87, 18882), (89, 18891), (92, 18915), (95, 18945), (102, 19029), (106, 19068), (110, 19113), (111, 19116), (114, 19134), (115, 19140), (122, 19200), (126, 19281), (127, 19290), (130, 19302), (131, 19305), (139, 19359), (142, 19383), (144, 19416), (149, 19470), (179, 19752), (180, 19755),