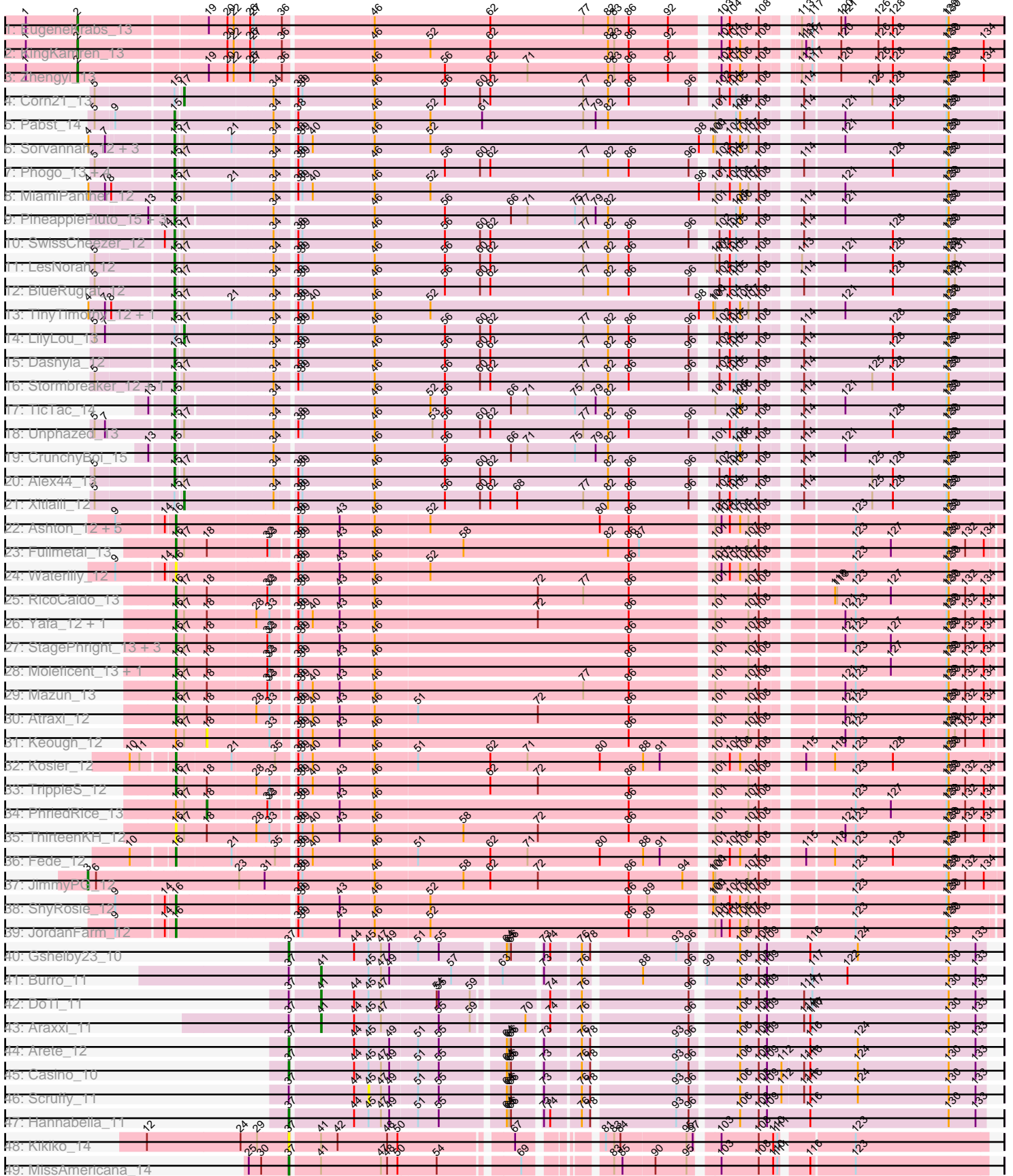


Pham 294698



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 294698 Report

This analysis was run 04/18/26 on database version 643.

Pham number 294698 has 71 members, 12 are drafts.

Phages represented in each track:

- Track 1 : EugeneKrabs\_13
- Track 2 : KingKamren\_13
- Track 3 : Zhengyi\_13
- Track 4 : Corn21\_13
- Track 5 : Pabst\_14
- Track 6 : Sorvannah\_12, YellowPanda\_12, Salvatore2000\_12, JessellCookie\_12
- Track 7 : Phogo\_13, DumpQuist\_12, Birdfeeder\_12, ArMaWen\_12, Conditioner\_13
- Track 8 : MiamiPanther\_12
- Track 9 : PineapplePluto\_15, Biozilla\_14, HitchHiker\_15, Oatly\_14
- Track 10 : SwissCheezer\_12
- Track 11 : LesNorah\_12
- Track 12 : BlueRugrat\_12
- Track 13 : TinyTimothy\_12, Wesak\_12
- Track 14 : LilyLou\_13
- Track 15 : Dashyla\_12
- Track 16 : Stormbreaker\_12, TownLake\_12
- Track 17 : TicTac\_14
- Track 18 : Unphazed\_13
- Track 19 : CrunchyBoi\_15
- Track 20 : Alex44\_13
- Track 21 : Xitlalli\_12
- Track 22 : Ashton\_12, Akoni\_12, AloeVera\_12, Truong\_12, SoilSleuth\_12, Barroma\_12
- Track 23 : Fullmetal\_13
- Track 24 : Waterlily\_12
- Track 25 : RicoCaldo\_13
- Track 26 : Yafa\_12, Morrill\_12
- Track 27 : StagePhright\_13, Phedro\_13, Phracted\_13, Pharky\_13
- Track 28 : Moleficent\_13, Astartes\_13
- Track 29 : Mazun\_13
- Track 30 : Atraxi\_12
- Track 31 : Keough\_12
- Track 32 : Kosier\_12
- Track 33 : TrippleS\_12
- Track 34 : PhriedRice\_13
- Track 35 : ThirteenKH\_12
- Track 36 : Fede\_12

- Track 37 : JimmyPG\_12
- Track 38 : ShyRosie\_12
- Track 39 : JordanFarm\_12
- Track 40 : Gshelby23\_10
- Track 41 : Burro\_11
- Track 42 : DoTi\_11
- Track 43 : Araxxi\_11
- Track 44 : Arete\_12
- Track 45 : Casino\_10
- Track 46 : Scruffy\_11
- Track 47 : Hannabella\_11
- Track 48 : Kikiko\_14
- Track 49 : MissAmericana\_14

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

The start number called the most often in the published annotations is 15, it was called in 22 of the 59 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Alex44\_13, ArMaWen\_12, Biozilla\_14, Birdfeeder\_12, BlueRugrat\_12, Conditioner\_13, CrunchyBoi\_15, Dashyla\_12, DumpQuist\_12, HitchHiker\_15, JessellCookie\_12, LesNorah\_12, MiamiPanther\_12, Oatly\_14, Pabst\_14, Phogo\_13, PineapplePluto\_15, Salvatore2000\_12, Sorvannah\_12, Stormbreaker\_12, SwissCheezer\_12, TicTac\_14, TinyTimothy\_12, TownLake\_12, Unphazed\_13, Wesak\_12, YellowPanda\_12,

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

- Corn21\_13, LilyLou\_13, Xitlalli\_12,

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

- Akoni\_12, AloeVera\_12, Araxxi\_11, Arete\_12, Ashton\_12, Astartes\_13, Atraxi\_12, Barroma\_12, Burro\_11, Casino\_10, DoTi\_11, EugeneKrabs\_13, Fede\_12, Fullmetal\_13, Gshelby23\_10, Hannabella\_11, JimmyPG\_12, JordanFarm\_12, Keough\_12, Kikiko\_14, KingKamren\_13, Kosier\_12, Mazun\_13, MissAmericana\_14, Moleficent\_13, Morrill\_12, Pharky\_13, Phedro\_13, Phraptured\_13, PhriedRice\_13, RicoCaldo\_13, Scruffy\_11, ShyRosie\_12, SoilSleuth\_12, StagePhright\_13, ThirteenKH\_12, TrippleS\_12, Truong\_12, Waterlily\_12, Yafa\_12, Zhengyi\_13,

**Summary by start number:**

Start 2:

- Found in 3 of 71 ( 4.2% ) of genes in pham
- Manual Annotations of this start: 3 of 59
- Called 100.0% of time when present
- Phage (with cluster) where this start called: EugeneKrabs\_13 (EK), KingKamren\_13 (EK), Zhengyi\_13 (EK),

Start 3:

- Found in 1 of 71 ( 1.4% ) of genes in pham

- Manual Annotations of this start: 1 of 59
- Called 100.0% of time when present
- Phage (with cluster) where this start called: JimmyPG\_12 (EK2),

#### Start 15:

- Found in 30 of 71 ( 42.3% ) of genes in pham
- Manual Annotations of this start: 22 of 59
- Called 90.0% of time when present
- Phage (with cluster) where this start called: Alex44\_13 (EK1), ArMaWen\_12 (EK1), Biozilla\_14 (EK1), Birdfeeder\_12 (EK1), BlueRugrat\_12 (EK1), Conditioner\_13 (EK1), CrunchyBoi\_15 (EK1), Dashyla\_12 (EK1), DumpQuist\_12 (EK1), HitchHiker\_15 (EK1), JessellCookie\_12 (EK1), LesNorah\_12 (EK1), MiamiPanther\_12 (EK1), Oatly\_14 (EK1), Pabst\_14 (EK1), Phogo\_13 (EK1), PineapplePluto\_15 (EK1), Salvatore2000\_12 (EK1), Sorvannah\_12 (EK1), Stormbreaker\_12 (EK1), SwissCheezer\_12 (EK1), TicTac\_14 (EK1), TinyTimothy\_12 (EK1), TownLake\_12 (EK1), Unphazed\_13 (EK1), Wesak\_12 (EK1), YellowPanda\_12 (EK1),

#### Start 16:

- Found in 27 of 71 ( 38.0% ) of genes in pham
- Manual Annotations of this start: 21 of 59
- Called 92.6% of time when present
- Phage (with cluster) where this start called: Akoni\_12 (EK2), AloeVera\_12 (EK2), Ashton\_12 (EK2), Astartes\_13 (EK2), Atraxi\_12 (EK2), Barroma\_12 (EK2), Fede\_12 (EK2), Fullmetal\_13 (EK2), JordanFarm\_12 (EK2), Kosier\_12 (EK2), Mazun\_13 (EK2), Moleficent\_13 (EK2), Morrill\_12 (EK2), Pharky\_13 (EK2), Phedro\_13 (EK2), Phractured\_13 (EK2), RicoCaldo\_13 (EK2), ShyRosie\_12 (EK2), SoilSleuth\_12 (EK2), StagePhright\_13 (EK2), ThirteenKH\_12 (EK2), TrippleS\_12 (EK2), Truong\_12 (EK2), Waterlily\_12 (EK2), Yafa\_12 (EK2),

#### Start 17:

- Found in 39 of 71 ( 54.9% ) of genes in pham
- Manual Annotations of this start: 3 of 59
- Called 7.7% of time when present
- Phage (with cluster) where this start called: Corn21\_13 (EK1), LilyLou\_13 (EK1), Xitlalli\_12 (EK1),

#### Start 18:

- Found in 16 of 71 ( 22.5% ) of genes in pham
- Manual Annotations of this start: 1 of 59
- Called 12.5% of time when present
- Phage (with cluster) where this start called: Keough\_12 (EK2), PhriedRice\_13 (EK2),

#### Start 37:

- Found in 10 of 71 ( 14.1% ) of genes in pham
- Manual Annotations of this start: 5 of 59
- Called 60.0% of time when present
- Phage (with cluster) where this start called: Arete\_12 (EM1), Casino\_10 (EM1), Gshelby23\_10 (EM1), Hannabella\_11 (EM1), Kikiko\_14 (EM2), MissAmericana\_14 (EM2),

#### Start 41:

- Found in 5 of 71 ( 7.0% ) of genes in pham
- Manual Annotations of this start: 3 of 59

- Called 60.0% of time when present
- Phage (with cluster) where this start called: Araxxi\_11 (EM1), Burro\_11 (EM1), DoTi\_11 (EM1),

Start 45:

- Found in 8 of 71 ( 11.3% ) of genes in pham
- No Manual Annotations of this start.
- Called 12.5% of time when present
- Phage (with cluster) where this start called: Scruffy\_11 (EM1),

### **Summary by clusters:**

There are 5 clusters represented in this pham: EM1, EK1, EK2, EK, EM2,

Info for manual annotations of cluster EK:

- Start number 2 was manually annotated 3 times for cluster EK.

Info for manual annotations of cluster EK1:

- Start number 15 was manually annotated 22 times for cluster EK1.
- Start number 17 was manually annotated 3 times for cluster EK1.

Info for manual annotations of cluster EK2:

- Start number 3 was manually annotated 1 time for cluster EK2.
- Start number 16 was manually annotated 21 times for cluster EK2.
- Start number 18 was manually annotated 1 time for cluster EK2.

Info for manual annotations of cluster EM1:

- Start number 37 was manually annotated 4 times for cluster EM1.
- Start number 41 was manually annotated 3 times for cluster EM1.

Info for manual annotations of cluster EM2:

- Start number 37 was manually annotated 1 time for cluster EM2.

### **Gene Information:**

Gene: Akoni\_12 Start: 9909, Stop: 8791, Start Num: 16

Candidate Starts for Akoni\_12:

(9, 9984), (14, 9921), (Start: 16 @9909 has 21 MA's), (38, 9756), (39, 9750), (43, 9696), (46, 9648), (52, 9570), (80, 9324), (86, 9282), (101, 9174), (103, 9165), (104, 9153), (106, 9138), (107, 9126), (108, 9111), (123, 8997), (129, 8865), (130, 8862),

Gene: Alex44\_13 Start: 10186, Stop: 9059, Start Num: 15

Candidate Starts for Alex44\_13:

(5, 10288), (Start: 15 @10186 has 22 MA's), (Start: 17 @10177 has 3 MA's), (34, 10057), (38, 10033), (39, 10027), (46, 9925), (56, 9823), (60, 9772), (62, 9757), (82, 9586), (86, 9556), (96, 9469), (102, 9442), (104, 9427), (105, 9418), (108, 9385), (114, 9340), (125, 9247), (128, 9217), (129, 9139), (130, 9136),

Gene: AloeVera\_12 Start: 9909, Stop: 8791, Start Num: 16

Candidate Starts for AloeVera\_12:

(9, 9984), (14, 9921), (Start: 16 @9909 has 21 MA's), (38, 9756), (39, 9750), (43, 9696), (46, 9648), (52, 9570), (80, 9324), (86, 9282), (101, 9174), (103, 9165), (104, 9153), (106, 9138), (107, 9126), (108, 9111), (123, 8997), (129, 8865), (130, 8862),

Gene: ArMaWen\_12 Start: 9986, Stop: 8859, Start Num: 15

Candidate Starts for ArMaWen\_12:

(5, 10088), (Start: 15 @9986 has 22 MA's), (Start: 17 @9977 has 3 MA's), (34, 9857), (38, 9833), (39, 9827), (46, 9725), (56, 9623), (60, 9572), (62, 9557), (77, 9422), (82, 9386), (86, 9356), (96, 9269), (102, 9242), (104, 9227), (105, 9218), (108, 9185), (114, 9140), (128, 9017), (129, 8939), (130, 8936),

Gene: Araxxi\_11 Start: 9119, Stop: 8229, Start Num: 41

Candidate Starts for Araxxi\_11:

(Start: 37 @9158 has 5 MA's), (Start: 41 @9119 has 3 MA's), (44, 9071), (45, 9050), (47, 9032), (55, 8954), (59, 8909), (70, 8846), (74, 8819), (76, 8780), (96, 8639), (106, 8582), (108, 8555), (109, 8543), (114, 8492), (116, 8483), (117, 8480), (130, 8282), (133, 8243),

Gene: Arete\_12 Start: 9062, Stop: 8124, Start Num: 37

Candidate Starts for Arete\_12:

(Start: 37 @9062 has 5 MA's), (44, 8975), (45, 8954), (49, 8924), (51, 8888), (55, 8858), (64, 8771), (65, 8768), (66, 8765), (73, 8729), (76, 8681), (78, 8669), (93, 8558), (96, 8540), (106, 8477), (108, 8450), (109, 8438), (116, 8378), (124, 8309), (130, 8177), (133, 8138),

Gene: Ashton\_12 Start: 9913, Stop: 8795, Start Num: 16

Candidate Starts for Ashton\_12:

(9, 9988), (14, 9925), (Start: 16 @9913 has 21 MA's), (38, 9760), (39, 9754), (43, 9700), (46, 9652), (52, 9574), (80, 9328), (86, 9286), (101, 9178), (103, 9169), (104, 9157), (106, 9142), (107, 9130), (108, 9115), (123, 9001), (129, 8869), (130, 8866),

Gene: Astartes\_13 Start: 10147, Stop: 9032, Start Num: 16

Candidate Starts for Astartes\_13:

(Start: 16 @10147 has 21 MA's), (Start: 17 @10135 has 3 MA's), (Start: 18 @10105 has 1 MA's), (32, 10024), (33, 10021), (38, 9997), (39, 9991), (43, 9937), (46, 9889), (86, 9523), (101, 9415), (107, 9367), (108, 9352), (123, 9238), (127, 9187), (129, 9106), (130, 9103), (132, 9079), (134, 9052),

Gene: Atraxi\_12 Start: 9905, Stop: 8790, Start Num: 16

Candidate Starts for Atraxi\_12:

(Start: 16 @9905 has 21 MA's), (Start: 17 @9893 has 3 MA's), (Start: 18 @9863 has 1 MA's), (28, 9797), (33, 9779), (38, 9755), (39, 9749), (40, 9734), (43, 9695), (46, 9647), (51, 9587), (72, 9413), (86, 9281), (101, 9173), (107, 9125), (108, 9110), (121, 9011), (123, 8996), (129, 8864), (130, 8861), (132, 8837), (134, 8810),

Gene: Barroma\_12 Start: 9909, Stop: 8791, Start Num: 16

Candidate Starts for Barroma\_12:

(9, 9984), (14, 9921), (Start: 16 @9909 has 21 MA's), (38, 9756), (39, 9750), (43, 9696), (46, 9648), (52, 9570), (80, 9324), (86, 9282), (101, 9174), (103, 9165), (104, 9153), (106, 9138), (107, 9126), (108, 9111), (123, 8997), (129, 8865), (130, 8862),

Gene: Biozilla\_14 Start: 10458, Stop: 9313, Start Num: 15

Candidate Starts for Biozilla\_14:

(13, 10488), (Start: 15 @10458 has 22 MA's), (34, 10335), (46, 10200), (56, 10098), (66, 10002), (71, 9978), (75, 9909), (77, 9897), (79, 9879), (82, 9861), (101, 9705), (105, 9675), (106, 9669), (108, 9642), (114, 9597), (121, 9543), (129, 9396), (130, 9393),

Gene: Birdfeeder\_12 Start: 10346, Stop: 9219, Start Num: 15

Candidate Starts for Birdfeeder\_12:

(5, 10448), (Start: 15 @10346 has 22 MA's), (Start: 17 @10337 has 3 MA's), (34, 10217), (38, 10193), (39, 10187), (46, 10085), (56, 9983), (60, 9932), (62, 9917), (77, 9782), (82, 9746), (86, 9716), (96, 9629), (102, 9602), (104, 9587), (105, 9578), (108, 9545), (114, 9500), (128, 9377), (129, 9299), (130, 9296),

Gene: BlueRugrat\_12 Start: 10420, Stop: 9293, Start Num: 15

Candidate Starts for BlueRugrat\_12:

(5, 10522), (Start: 15 @10420 has 22 MA's), (Start: 17 @10411 has 3 MA's), (34, 10291), (38, 10267), (39, 10261), (46, 10159), (56, 10057), (60, 10006), (62, 9991), (77, 9856), (82, 9820), (86, 9790), (96, 9703), (102, 9676), (104, 9661), (105, 9652), (108, 9619), (114, 9574), (128, 9451), (129, 9373), (130, 9370), (131, 9361),

Gene: Burro\_11 Start: 8812, Stop: 7916, Start Num: 41

Candidate Starts for Burro\_11:

(Start: 37 @8851 has 5 MA's), (Start: 41 @8812 has 3 MA's), (45, 8743), (47, 8725), (49, 8713), (57, 8629), (63, 8563), (73, 8515), (76, 8467), (88, 8392), (96, 8326), (99, 8317), (106, 8269), (108, 8242), (109, 8230), (117, 8167), (122, 8116), (130, 7969), (133, 7930),

Gene: Casino\_10 Start: 8891, Stop: 7953, Start Num: 37

Candidate Starts for Casino\_10:

(Start: 37 @8891 has 5 MA's), (44, 8804), (45, 8783), (47, 8765), (49, 8753), (51, 8717), (55, 8687), (64, 8600), (65, 8597), (66, 8594), (73, 8558), (76, 8510), (78, 8498), (93, 8387), (96, 8369), (106, 8306), (108, 8279), (109, 8267), (112, 8246), (114, 8216), (116, 8207), (124, 8138), (130, 8006), (133, 7967),

Gene: Conditioner\_13 Start: 10696, Stop: 9569, Start Num: 15

Candidate Starts for Conditioner\_13:

(5, 10798), (Start: 15 @10696 has 22 MA's), (Start: 17 @10687 has 3 MA's), (34, 10567), (38, 10543), (39, 10537), (46, 10435), (56, 10333), (60, 10282), (62, 10267), (77, 10132), (82, 10096), (86, 10066), (96, 9979), (102, 9952), (104, 9937), (105, 9928), (108, 9895), (114, 9850), (128, 9727), (129, 9649), (130, 9646),

Gene: Corn21\_13 Start: 10714, Stop: 9596, Start Num: 17

Candidate Starts for Corn21\_13:

(5, 10825), (Start: 15 @10723 has 22 MA's), (Start: 17 @10714 has 3 MA's), (34, 10594), (38, 10570), (39, 10564), (46, 10462), (56, 10360), (60, 10309), (62, 10294), (77, 10159), (82, 10123), (86, 10093), (96, 10006), (102, 9979), (104, 9964), (105, 9955), (108, 9922), (114, 9877), (125, 9784), (128, 9754), (129, 9676), (130, 9673),

Gene: CrunchyBoi\_15 Start: 10593, Stop: 9448, Start Num: 15

Candidate Starts for CrunchyBoi\_15:

(13, 10623), (Start: 15 @10593 has 22 MA's), (34, 10470), (46, 10335), (56, 10233), (66, 10137), (71, 10113), (75, 10044), (79, 10014), (82, 9996), (101, 9840), (105, 9810), (106, 9804), (108, 9777), (114, 9732), (121, 9678), (129, 9531), (130, 9528),

Gene: Dashyla\_12 Start: 9992, Stop: 8865, Start Num: 15

Candidate Starts for Dashyla\_12:

(Start: 15 @9992 has 22 MA's), (Start: 17 @9983 has 3 MA's), (34, 9863), (38, 9839), (39, 9833), (46, 9731), (56, 9629), (60, 9578), (62, 9563), (77, 9428), (82, 9392), (86, 9362), (96, 9275), (102, 9248), (104, 9233), (105, 9224), (108, 9191), (114, 9146), (128, 9023), (129, 8945), (130, 8942),

Gene: DoTi\_11 Start: 9101, Stop: 8211, Start Num: 41

Candidate Starts for DoTi\_11:

(Start: 37 @9140 has 5 MA's), (Start: 41 @9101 has 3 MA's), (44, 9053), (45, 9032), (47, 9014), (54, 8939), (55, 8936), (59, 8891), (74, 8801), (76, 8762), (96, 8621), (106, 8564), (108, 8537), (109, 8525), (114, 8474), (117, 8462), (130, 8264), (133, 8225),

Gene: DumpQuist\_12 Start: 9989, Stop: 8862, Start Num: 15

Candidate Starts for DumpQuist\_12:

(5, 10091), (Start: 15 @9989 has 22 MA's), (Start: 17 @9980 has 3 MA's), (34, 9860), (38, 9836), (39, 9830), (46, 9728), (56, 9626), (60, 9575), (62, 9560), (77, 9425), (82, 9389), (86, 9359), (96, 9272), (102, 9245), (104, 9230), (105, 9221), (108, 9188), (114, 9143), (128, 9020), (129, 8942), (130, 8939),

Gene: EugeneKrabs\_13 Start: 10338, Stop: 9070, Start Num: 2

Candidate Starts for EugeneKrabs\_13:

(1, 10413), (Start: 2 @10338 has 3 MA's), (19, 10158), (20, 10131), (22, 10122), (26, 10101), (27, 10098), (36, 10059), (46, 9936), (62, 9768), (77, 9633), (82, 9597), (83, 9588), (86, 9567), (92, 9510), (103, 9450), (104, 9438), (108, 9396), (113, 9357), (117, 9342), (120, 9306), (121, 9300), (126, 9252), (128, 9231), (129, 9153), (130, 9150),

Gene: Fede\_12 Start: 10179, Stop: 9067, Start Num: 16

Candidate Starts for Fede\_12:

(10, 10233), (Start: 16 @10179 has 21 MA's), (21, 10107), (35, 10053), (38, 10032), (39, 10026), (40, 10011), (46, 9924), (51, 9864), (62, 9759), (71, 9705), (80, 9600), (88, 9537), (91, 9513), (101, 9450), (104, 9429), (106, 9414), (108, 9387), (115, 9339), (118, 9303), (123, 9273), (128, 9219), (129, 9141), (130, 9138),

Gene: Fullmetal\_13 Start: 10144, Stop: 9029, Start Num: 16

Candidate Starts for Fullmetal\_13:

(Start: 16 @10144 has 21 MA's), (Start: 17 @10132 has 3 MA's), (Start: 18 @10102 has 1 MA's), (32, 10021), (33, 10018), (38, 9994), (39, 9988), (43, 9934), (46, 9886), (58, 9760), (82, 9550), (86, 9520), (87, 9505), (101, 9412), (107, 9364), (108, 9349), (123, 9235), (127, 9184), (129, 9103), (130, 9100), (132, 9076), (134, 9049),

Gene: Gshelby23\_10 Start: 9008, Stop: 8067, Start Num: 37

Candidate Starts for Gshelby23\_10:

(Start: 37 @9008 has 5 MA's), (44, 8921), (45, 8900), (47, 8882), (49, 8870), (51, 8834), (55, 8804), (64, 8717), (65, 8714), (66, 8711), (73, 8675), (74, 8666), (76, 8627), (78, 8615), (93, 8504), (96, 8486), (106, 8423), (108, 8396), (109, 8384), (116, 8321), (124, 8252), (130, 8120), (133, 8081),

Gene: Hannabella\_11 Start: 8888, Stop: 7947, Start Num: 37

Candidate Starts for Hannabella\_11:

(Start: 37 @8888 has 5 MA's), (44, 8801), (45, 8780), (47, 8762), (49, 8750), (51, 8714), (55, 8684), (64, 8597), (65, 8594), (66, 8591), (73, 8555), (74, 8546), (76, 8507), (78, 8495), (93, 8384), (96, 8366), (106, 8303), (108, 8276), (109, 8264), (116, 8201), (130, 8000), (133, 7961),

Gene: HitchHiker\_15 Start: 10458, Stop: 9313, Start Num: 15

Candidate Starts for HitchHiker\_15:

(13, 10488), (Start: 15 @10458 has 22 MA's), (34, 10335), (46, 10200), (56, 10098), (66, 10002), (71, 9978), (75, 9909), (77, 9897), (79, 9879), (82, 9861), (101, 9705), (105, 9675), (106, 9669), (108, 9642), (114, 9597), (121, 9543), (129, 9396), (130, 9393),

Gene: JessellCookie\_12 Start: 9805, Stop: 8660, Start Num: 15

Candidate Starts for JessellCookie\_12:

(4, 9913), (7, 9889), (Start: 15 @9805 has 22 MA's), (Start: 17 @9796 has 3 MA's), (21, 9730), (34, 9676), (38, 9652), (39, 9646), (40, 9631), (46, 9544), (52, 9463), (98, 9073), (100, 9052), (101, 9049), (104, 9028), (106, 9013), (107, 9001), (108, 8986), (121, 8887), (129, 8740), (130, 8737),

Gene: JimmyPG\_12 Start: 10099, Stop: 8834, Start Num: 3

Candidate Starts for JimmyPG\_12:

(Start: 3 @10099 has 1 MA's), (6, 10087), (23, 9889), (31, 9853), (38, 9805), (39, 9799), (46, 9697), (58, 9571), (62, 9532), (72, 9463), (86, 9331), (94, 9253), (100, 9226), (101, 9223), (107, 9175), (108, 9160), (123, 9046), (129, 8914), (130, 8911), (132, 8887), (134, 8860),

Gene: JordanFarm\_12 Start: 9909, Stop: 8791, Start Num: 16

Candidate Starts for JordanFarm\_12:

(9, 9984), (14, 9921), (Start: 16 @9909 has 21 MA's), (38, 9756), (39, 9750), (43, 9696), (46, 9648), (52, 9570), (86, 9282), (89, 9255), (101, 9174), (103, 9165), (104, 9153), (106, 9138), (107, 9126), (108, 9111), (123, 8997), (129, 8865), (130, 8862),

Gene: Keough\_12 Start: 9833, Stop: 8760, Start Num: 18

Candidate Starts for Keough\_12:

(Start: 16 @9875 has 21 MA's), (Start: 17 @9863 has 3 MA's), (Start: 18 @9833 has 1 MA's), (33, 9749), (38, 9725), (39, 9719), (40, 9704), (43, 9665), (46, 9617), (86, 9251), (101, 9143), (107, 9095), (108, 9080), (121, 8981), (123, 8966), (129, 8834), (130, 8831), (131, 8822), (132, 8807), (134, 8780),

Gene: Kikiko\_14 Start: 10158, Stop: 9262, Start Num: 37

Candidate Starts for Kikiko\_14:

(12, 10362), (24, 10227), (29, 10203), (Start: 37 @10158 has 5 MA's), (Start: 41 @10119 has 3 MA's), (42, 10095), (48, 10023), (50, 10008), (67, 9861), (81, 9774), (83, 9762), (84, 9753), (95, 9660), (97, 9651), (103, 9627), (108, 9573), (110, 9552), (111, 9546), (123, 9453),

Gene: KingKamren\_13 Start: 10353, Stop: 9085, Start Num: 2

Candidate Starts for KingKamren\_13:

(1, 10428), (Start: 2 @10353 has 3 MA's), (20, 10146), (22, 10137), (26, 10116), (27, 10113), (36, 10074), (46, 9951), (52, 9870), (62, 9783), (82, 9612), (83, 9603), (86, 9582), (92, 9525), (103, 9465), (104, 9453), (106, 9438), (108, 9411), (113, 9372), (115, 9366), (117, 9357), (120, 9321), (126, 9267), (128, 9246), (129, 9168), (130, 9165), (134, 9114),

Gene: Kosier\_12 Start: 10179, Stop: 9067, Start Num: 16

Candidate Starts for Kosier\_12:

(10, 10233), (11, 10221), (Start: 16 @10179 has 21 MA's), (21, 10107), (35, 10053), (38, 10032), (39, 10026), (40, 10011), (46, 9924), (51, 9864), (62, 9759), (71, 9705), (80, 9600), (88, 9537), (91, 9513), (101, 9450), (104, 9429), (106, 9414), (108, 9387), (115, 9339), (118, 9303), (123, 9273), (128, 9219), (129, 9141), (130, 9138),

Gene: LesNorah\_12 Start: 10513, Stop: 9368, Start Num: 15

Candidate Starts for LesNorah\_12:

(5, 10615), (Start: 15 @10513 has 22 MA's), (Start: 17 @10504 has 3 MA's), (34, 10384), (38, 10360), (39, 10354), (46, 10252), (56, 10150), (60, 10099), (62, 10084), (77, 9949), (82, 9913), (86, 9883), (101, 9757), (102, 9751), (104, 9736), (105, 9727), (108, 9694), (113, 9652), (121, 9595), (128, 9526), (129, 9448), (130, 9445), (131, 9436),

Gene: LilyLou\_13 Start: 10354, Stop: 9236, Start Num: 17

Candidate Starts for LilyLou\_13:

(5, 10465), (7, 10450), (Start: 15 @10363 has 22 MA's), (Start: 17 @10354 has 3 MA's), (34, 10234), (38, 10210), (39, 10204), (46, 10102), (56, 10000), (60, 9949), (62, 9934), (77, 9799), (82, 9763), (86,

9733), (96, 9646), (102, 9619), (104, 9604), (105, 9595), (108, 9562), (114, 9517), (128, 9394), (129, 9316), (130, 9313),

Gene: Mazun\_13 Start: 10145, Stop: 9030, Start Num: 16

Candidate Starts for Mazun\_13:

(Start: 16 @10145 has 21 MA's), (Start: 17 @10133 has 3 MA's), (Start: 18 @10103 has 1 MA's), (32, 10022), (33, 10019), (38, 9995), (39, 9989), (40, 9974), (43, 9935), (46, 9887), (77, 9587), (86, 9521), (101, 9413), (107, 9365), (108, 9350), (121, 9251), (123, 9236), (129, 9104), (130, 9101), (132, 9077), (134, 9050),

Gene: MiamiPanther\_12 Start: 9805, Stop: 8660, Start Num: 15

Candidate Starts for MiamiPanther\_12:

(4, 9913), (7, 9889), (8, 9883), (Start: 15 @9805 has 22 MA's), (Start: 17 @9796 has 3 MA's), (21, 9730), (34, 9676), (38, 9652), (39, 9646), (40, 9631), (46, 9544), (52, 9463), (98, 9073), (101, 9049), (104, 9028), (106, 9013), (107, 9001), (108, 8986), (121, 8887), (129, 8740), (130, 8737),

Gene: MissAmericana\_14 Start: 9931, Stop: 9035, Start Num: 37

Candidate Starts for MissAmericana\_14:

(25, 9988), (30, 9970), (Start: 37 @9931 has 5 MA's), (Start: 41 @9892 has 3 MA's), (47, 9805), (48, 9796), (50, 9781), (54, 9727), (69, 9625), (83, 9535), (85, 9523), (90, 9478), (95, 9433), (103, 9400), (108, 9346), (110, 9325), (111, 9319), (116, 9286), (123, 9226),

Gene: Moleficent\_13 Start: 10141, Stop: 9026, Start Num: 16

Candidate Starts for Moleficent\_13:

(Start: 16 @10141 has 21 MA's), (Start: 17 @10129 has 3 MA's), (Start: 18 @10099 has 1 MA's), (32, 10018), (33, 10015), (38, 9991), (39, 9985), (43, 9931), (46, 9883), (86, 9517), (101, 9409), (107, 9361), (108, 9346), (123, 9232), (127, 9181), (129, 9100), (130, 9097), (132, 9073), (134, 9046),

Gene: Morrill\_12 Start: 9883, Stop: 8768, Start Num: 16

Candidate Starts for Morrill\_12:

(Start: 16 @9883 has 21 MA's), (Start: 17 @9871 has 3 MA's), (Start: 18 @9841 has 1 MA's), (28, 9775), (33, 9757), (38, 9733), (39, 9727), (40, 9712), (43, 9673), (46, 9625), (72, 9391), (86, 9259), (101, 9151), (107, 9103), (108, 9088), (121, 8989), (123, 8974), (129, 8842), (130, 8839), (132, 8815), (134, 8788),

Gene: Oatly\_14 Start: 10458, Stop: 9313, Start Num: 15

Candidate Starts for Oatly\_14:

(13, 10488), (Start: 15 @10458 has 22 MA's), (34, 10335), (46, 10200), (56, 10098), (66, 10002), (71, 9978), (75, 9909), (77, 9897), (79, 9879), (82, 9861), (101, 9705), (105, 9675), (106, 9669), (108, 9642), (114, 9597), (121, 9543), (129, 9396), (130, 9393),

Gene: Pabst\_14 Start: 10327, Stop: 9179, Start Num: 15

Candidate Starts for Pabst\_14:

(5, 10426), (9, 10402), (Start: 15 @10327 has 22 MA's), (34, 10198), (38, 10171), (46, 10063), (52, 9982), (61, 9907), (77, 9760), (79, 9742), (82, 9724), (101, 9568), (105, 9538), (106, 9532), (108, 9505), (114, 9460), (121, 9406), (128, 9337), (129, 9259), (130, 9256),

Gene: Pharky\_13 Start: 10108, Stop: 8993, Start Num: 16

Candidate Starts for Pharky\_13:

(Start: 16 @10108 has 21 MA's), (Start: 17 @10096 has 3 MA's), (Start: 18 @10066 has 1 MA's), (32, 9985), (33, 9982), (38, 9958), (39, 9952), (43, 9898), (46, 9850), (86, 9484), (101, 9376), (107, 9328), (108, 9313), (121, 9214), (123, 9199), (127, 9148), (129, 9067), (130, 9064), (132, 9040), (134, 9013),

Gene: Phedro\_13 Start: 10108, Stop: 8993, Start Num: 16

Candidate Starts for Phedro\_13:

(Start: 16 @10108 has 21 MA's), (Start: 17 @10096 has 3 MA's), (Start: 18 @10066 has 1 MA's), (32, 9985), (33, 9982), (38, 9958), (39, 9952), (43, 9898), (46, 9850), (86, 9484), (101, 9376), (107, 9328), (108, 9313), (121, 9214), (123, 9199), (127, 9148), (129, 9067), (130, 9064), (132, 9040), (134, 9013),

Gene: Phogo\_13 Start: 10195, Stop: 9068, Start Num: 15

Candidate Starts for Phogo\_13:

(5, 10297), (Start: 15 @10195 has 22 MA's), (Start: 17 @10186 has 3 MA's), (34, 10066), (38, 10042), (39, 10036), (46, 9934), (56, 9832), (60, 9781), (62, 9766), (77, 9631), (82, 9595), (86, 9565), (96, 9478), (102, 9451), (104, 9436), (105, 9427), (108, 9394), (114, 9349), (128, 9226), (129, 9148), (130, 9145),

Gene: Phractured\_13 Start: 10108, Stop: 8993, Start Num: 16

Candidate Starts for Phractured\_13:

(Start: 16 @10108 has 21 MA's), (Start: 17 @10096 has 3 MA's), (Start: 18 @10066 has 1 MA's), (32, 9985), (33, 9982), (38, 9958), (39, 9952), (43, 9898), (46, 9850), (86, 9484), (101, 9376), (107, 9328), (108, 9313), (121, 9214), (123, 9199), (127, 9148), (129, 9067), (130, 9064), (132, 9040), (134, 9013),

Gene: PhriedRice\_13 Start: 10066, Stop: 8993, Start Num: 18

Candidate Starts for PhriedRice\_13:

(Start: 16 @10108 has 21 MA's), (Start: 17 @10096 has 3 MA's), (Start: 18 @10066 has 1 MA's), (32, 9985), (33, 9982), (38, 9958), (39, 9952), (43, 9898), (46, 9850), (86, 9484), (101, 9376), (107, 9328), (108, 9313), (123, 9199), (127, 9148), (129, 9067), (130, 9064), (132, 9040), (134, 9013),

Gene: PineapplePluto\_15 Start: 10602, Stop: 9457, Start Num: 15

Candidate Starts for PineapplePluto\_15:

(13, 10632), (Start: 15 @10602 has 22 MA's), (34, 10479), (46, 10344), (56, 10242), (66, 10146), (71, 10122), (75, 10053), (77, 10041), (79, 10023), (82, 10005), (101, 9849), (105, 9819), (106, 9813), (108, 9786), (114, 9741), (121, 9687), (129, 9540), (130, 9537),

Gene: RicoCaldo\_13 Start: 10136, Stop: 9021, Start Num: 16

Candidate Starts for RicoCaldo\_13:

(Start: 16 @10136 has 21 MA's), (Start: 17 @10124 has 3 MA's), (Start: 18 @10094 has 1 MA's), (32, 10013), (33, 10010), (38, 9986), (39, 9980), (43, 9926), (46, 9878), (72, 9644), (77, 9578), (86, 9512), (101, 9404), (107, 9356), (108, 9341), (118, 9257), (119, 9254), (123, 9227), (127, 9176), (129, 9095), (130, 9092), (132, 9068), (134, 9041),

Gene: Salvatore2000\_12 Start: 9805, Stop: 8660, Start Num: 15

Candidate Starts for Salvatore2000\_12:

(4, 9913), (7, 9889), (Start: 15 @9805 has 22 MA's), (Start: 17 @9796 has 3 MA's), (21, 9730), (34, 9676), (38, 9652), (39, 9646), (40, 9631), (46, 9544), (52, 9463), (98, 9073), (100, 9052), (101, 9049), (104, 9028), (106, 9013), (107, 9001), (108, 8986), (121, 8887), (129, 8740), (130, 8737),

Gene: Scruffy\_11 Start: 9179, Stop: 8349, Start Num: 45

Candidate Starts for Scruffy\_11:

(Start: 37 @9287 has 5 MA's), (44, 9200), (45, 9179), (47, 9161), (49, 9149), (51, 9113), (55, 9083), (64, 8996), (65, 8993), (66, 8990), (73, 8954), (76, 8906), (78, 8894), (93, 8783), (96, 8765), (106, 8702), (108, 8675), (109, 8663), (112, 8642), (114, 8612), (116, 8603), (124, 8534), (130, 8402), (133, 8363),

Gene: ShyRosie\_12 Start: 9909, Stop: 8791, Start Num: 16

Candidate Starts for ShyRosie\_12:

(9, 9984), (14, 9921), (Start: 16 @9909 has 21 MA's), (38, 9756), (39, 9750), (43, 9696), (46, 9648), (52, 9570), (86, 9282), (89, 9255), (100, 9177), (101, 9174), (104, 9153), (106, 9138), (107, 9126), (108, 9111), (123, 8997), (129, 8865), (130, 8862),

Gene: SoilSleuth\_12 Start: 9909, Stop: 8791, Start Num: 16

Candidate Starts for SoilSleuth\_12:

(9, 9984), (14, 9921), (Start: 16 @9909 has 21 MA's), (38, 9756), (39, 9750), (43, 9696), (46, 9648), (52, 9570), (80, 9324), (86, 9282), (101, 9174), (103, 9165), (104, 9153), (106, 9138), (107, 9126), (108, 9111), (123, 8997), (129, 8865), (130, 8862),

Gene: Sorvannah\_12 Start: 9805, Stop: 8660, Start Num: 15

Candidate Starts for Sorvannah\_12:

(4, 9913), (7, 9889), (Start: 15 @9805 has 22 MA's), (Start: 17 @9796 has 3 MA's), (21, 9730), (34, 9676), (38, 9652), (39, 9646), (40, 9631), (46, 9544), (52, 9463), (98, 9073), (100, 9052), (101, 9049), (104, 9028), (106, 9013), (107, 9001), (108, 8986), (121, 8887), (129, 8740), (130, 8737),

Gene: StagePhright\_13 Start: 10108, Stop: 8993, Start Num: 16

Candidate Starts for StagePhright\_13:

(Start: 16 @10108 has 21 MA's), (Start: 17 @10096 has 3 MA's), (Start: 18 @10066 has 1 MA's), (32, 9985), (33, 9982), (38, 9958), (39, 9952), (43, 9898), (46, 9850), (86, 9484), (101, 9376), (107, 9328), (108, 9313), (121, 9214), (123, 9199), (127, 9148), (129, 9067), (130, 9064), (132, 9040), (134, 9013),

Gene: Stormbreaker\_12 Start: 10325, Stop: 9198, Start Num: 15

Candidate Starts for Stormbreaker\_12:

(5, 10427), (Start: 15 @10325 has 22 MA's), (Start: 17 @10316 has 3 MA's), (34, 10196), (38, 10172), (39, 10166), (46, 10064), (56, 9962), (60, 9911), (62, 9896), (77, 9761), (82, 9725), (86, 9695), (96, 9608), (102, 9581), (104, 9566), (105, 9557), (108, 9524), (114, 9479), (125, 9386), (128, 9356), (129, 9278), (130, 9275),

Gene: SwissCheezer\_12 Start: 9962, Stop: 8835, Start Num: 15

Candidate Starts for SwissCheezer\_12:

(14, 9974), (Start: 15 @9962 has 22 MA's), (Start: 17 @9953 has 3 MA's), (34, 9833), (38, 9809), (39, 9803), (46, 9701), (56, 9599), (60, 9548), (62, 9533), (77, 9398), (82, 9362), (86, 9332), (96, 9245), (102, 9218), (104, 9203), (105, 9194), (108, 9161), (114, 9116), (128, 8993), (129, 8915), (130, 8912),

Gene: ThirteenKH\_12 Start: 9883, Stop: 8768, Start Num: 16

Candidate Starts for ThirteenKH\_12:

(Start: 16 @9883 has 21 MA's), (Start: 17 @9871 has 3 MA's), (Start: 18 @9841 has 1 MA's), (28, 9775), (33, 9757), (38, 9733), (39, 9727), (40, 9712), (43, 9673), (46, 9625), (58, 9499), (72, 9391), (86, 9259), (101, 9151), (107, 9103), (108, 9088), (121, 8989), (123, 8974), (129, 8842), (130, 8839), (132, 8815), (134, 8788),

Gene: TicTac\_14 Start: 10467, Stop: 9322, Start Num: 15

Candidate Starts for TicTac\_14:

(13, 10497), (Start: 15 @10467 has 22 MA's), (34, 10344), (46, 10209), (52, 10128), (56, 10107), (66, 10011), (71, 9987), (75, 9918), (79, 9888), (82, 9870), (101, 9714), (105, 9684), (106, 9678), (108, 9651), (114, 9606), (121, 9552), (129, 9405), (130, 9402),

Gene: TinyTimothy\_12 Start: 9805, Stop: 8660, Start Num: 15

Candidate Starts for TinyTimothy\_12:

(4, 9913), (7, 9889), (8, 9883), (Start: 15 @9805 has 22 MA's), (Start: 17 @9796 has 3 MA's), (21, 9730), (34, 9676), (38, 9652), (39, 9646), (40, 9631), (46, 9544), (52, 9463), (98, 9073), (100, 9052), (101, 9049), (104, 9028), (106, 9013), (107, 9001), (108, 8986), (121, 8887), (129, 8740), (130, 8737),

Gene: TownLake\_12 Start: 10255, Stop: 9128, Start Num: 15

Candidate Starts for TownLake\_12:

(5, 10357), (Start: 15 @10255 has 22 MA's), (Start: 17 @10246 has 3 MA's), (34, 10126), (38, 10102), (39, 10096), (46, 9994), (56, 9892), (60, 9841), (62, 9826), (77, 9691), (82, 9655), (86, 9625), (96, 9538), (102, 9511), (104, 9496), (105, 9487), (108, 9454), (114, 9409), (125, 9316), (128, 9286), (129, 9208), (130, 9205),

Gene: TrippleS\_12 Start: 9889, Stop: 8774, Start Num: 16

Candidate Starts for TrippleS\_12:

(Start: 16 @9889 has 21 MA's), (Start: 17 @9877 has 3 MA's), (Start: 18 @9847 has 1 MA's), (28, 9781), (33, 9763), (38, 9739), (39, 9733), (40, 9718), (43, 9679), (46, 9631), (62, 9466), (72, 9397), (86, 9265), (101, 9157), (107, 9109), (108, 9094), (123, 8980), (129, 8848), (130, 8845), (132, 8821), (134, 8794),

Gene: Truong\_12 Start: 9909, Stop: 8791, Start Num: 16

Candidate Starts for Truong\_12:

(9, 9984), (14, 9921), (Start: 16 @9909 has 21 MA's), (38, 9756), (39, 9750), (43, 9696), (46, 9648), (52, 9570), (80, 9324), (86, 9282), (101, 9174), (103, 9165), (104, 9153), (106, 9138), (107, 9126), (108, 9111), (123, 8997), (129, 8865), (130, 8862),

Gene: Unphazed\_13 Start: 10222, Stop: 9095, Start Num: 15

Candidate Starts for Unphazed\_13:

(5, 10324), (7, 10309), (Start: 15 @10222 has 22 MA's), (Start: 17 @10213 has 3 MA's), (34, 10093), (38, 10069), (39, 10063), (46, 9961), (53, 9877), (56, 9859), (60, 9808), (62, 9793), (77, 9658), (82, 9622), (86, 9592), (96, 9505), (104, 9463), (105, 9454), (108, 9421), (114, 9376), (128, 9253), (129, 9175), (130, 9172),

Gene: Waterlily\_12 Start: 9909, Stop: 8791, Start Num: 16

Candidate Starts for Waterlily\_12:

(9, 9984), (14, 9921), (Start: 16 @9909 has 21 MA's), (38, 9756), (39, 9750), (43, 9696), (46, 9648), (52, 9570), (86, 9282), (101, 9174), (103, 9165), (104, 9153), (106, 9138), (107, 9126), (108, 9111), (123, 8997), (129, 8865), (130, 8862),

Gene: Wesak\_12 Start: 9805, Stop: 8660, Start Num: 15

Candidate Starts for Wesak\_12:

(4, 9913), (7, 9889), (8, 9883), (Start: 15 @9805 has 22 MA's), (Start: 17 @9796 has 3 MA's), (21, 9730), (34, 9676), (38, 9652), (39, 9646), (40, 9631), (46, 9544), (52, 9463), (98, 9073), (100, 9052), (101, 9049), (104, 9028), (106, 9013), (107, 9001), (108, 8986), (121, 8887), (129, 8740), (130, 8737),

Gene: Xitlalli\_12 Start: 10319, Stop: 9201, Start Num: 17

Candidate Starts for Xitlalli\_12:

(5, 10430), (Start: 15 @10328 has 22 MA's), (Start: 17 @10319 has 3 MA's), (34, 10199), (38, 10175), (39, 10169), (46, 10067), (56, 9965), (60, 9914), (62, 9899), (68, 9860), (77, 9764), (82, 9728), (86, 9698), (96, 9611), (102, 9584), (104, 9569), (105, 9560), (108, 9527), (114, 9482), (125, 9389), (128, 9359), (129, 9281), (130, 9278),

Gene: Yafa\_12 Start: 9906, Stop: 8791, Start Num: 16

Candidate Starts for Yafa\_12:

(Start: 16 @9906 has 21 MA's), (Start: 17 @9894 has 3 MA's), (Start: 18 @9864 has 1 MA's), (28, 9798), (33, 9780), (38, 9756), (39, 9750), (40, 9735), (43, 9696), (46, 9648), (72, 9414), (86, 9282), (101, 9174), (107, 9126), (108, 9111), (121, 9012), (123, 8997), (129, 8865), (130, 8862), (132, 8838), (134, 8811),

Gene: YellowPanda\_12 Start: 9805, Stop: 8660, Start Num: 15

Candidate Starts for YellowPanda\_12:

(4, 9913), (7, 9889), (Start: 15 @9805 has 22 MA's), (Start: 17 @9796 has 3 MA's), (21, 9730), (34, 9676), (38, 9652), (39, 9646), (40, 9631), (46, 9544), (52, 9463), (98, 9073), (100, 9052), (101, 9049), (104, 9028), (106, 9013), (107, 9001), (108, 8986), (121, 8887), (129, 8740), (130, 8737),

Gene: Zhengyi\_13 Start: 10356, Stop: 9088, Start Num: 2

Candidate Starts for Zhengyi\_13:

(1, 10431), (Start: 2 @10356 has 3 MA's), (19, 10176), (20, 10149), (22, 10140), (26, 10119), (27, 10116), (36, 10077), (46, 9954), (56, 9852), (62, 9786), (71, 9732), (82, 9615), (83, 9606), (86, 9585), (92, 9528), (103, 9468), (104, 9456), (106, 9441), (108, 9414), (113, 9375), (117, 9360), (120, 9324), (126, 9270), (128, 9249), (129, 9171), (130, 9168), (134, 9117),