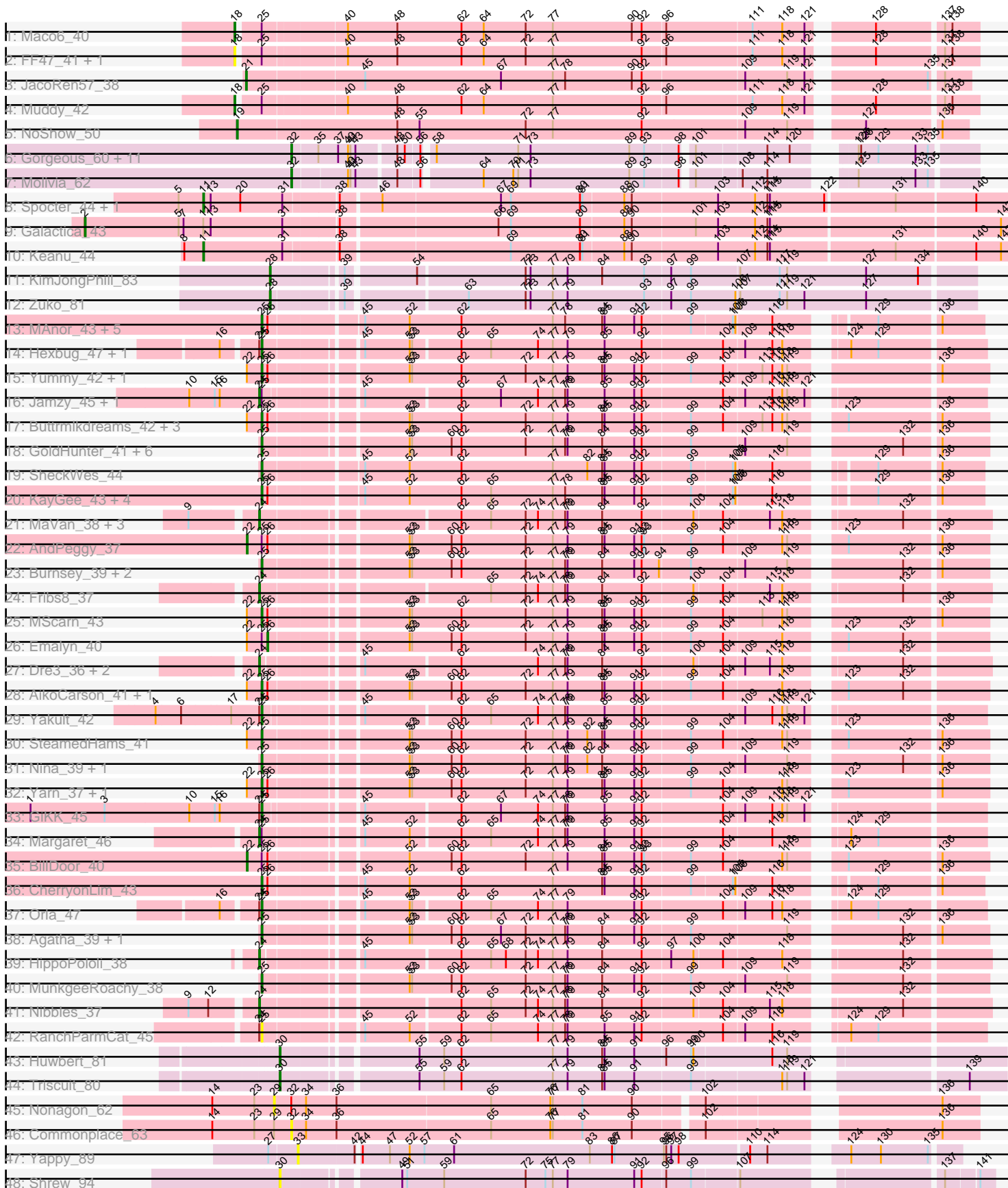


Pham 196444



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 196444 Report

This analysis was run 12/09/24 on database version 580.

Pham number 196444 has 93 members, 15 are drafts.

Phages represented in each track:

- Track 1 : Maco6\_40
- Track 2 : FF47\_41, 8UZL\_42
- Track 3 : JacoRen57\_38
- Track 4 : Muddy\_42
- Track 5 : NoShow\_50
- Track 6 : Gorgeous\_60, Jaek\_60, Boersma\_63, Heylee\_63, SorJuana\_60, Thunderclap\_60, Amavida\_62, Rings\_61, Yeezus\_60, Amigo\_61, Ichor\_60, Anansi\_60
- Track 7 : Molivia\_62
- Track 8 : Spocter\_44, Hiyaa\_45
- Track 9 : Galactica\_43
- Track 10 : Keanu\_44
- Track 11 : KimJongPhill\_83
- Track 12 : Zuko\_81
- Track 13 : MAnor\_43, PotPie\_42, SummitAcademy\_41, BigChungus\_41, Mayweather\_45, Feastonyeet\_41
- Track 14 : Hexbug\_47, Nodigi\_47
- Track 15 : Yummy\_42, Horseradish\_42
- Track 16 : Jamzy\_45, Button\_43
- Track 17 : Buttrmilkdreams\_42, Troje\_42, SketchMex\_40, Biskit\_42
- Track 18 : GoldHunter\_41, Axym\_39, Sopespian\_39, PsychoKiller\_39, Quasar\_40, Elliott\_40, Carsonalex\_43
- Track 19 : SheckWes\_44
- Track 20 : KayGee\_43, Elinal\_45, Vine\_44, Lauer\_38, Pons\_43
- Track 21 : MaVan\_38, Azira\_38, Zareef\_40, Survivors\_38
- Track 22 : AndPeggy\_37
- Track 23 : Burnsey\_39, RedBaron\_42, Typhonmarchy\_39
- Track 24 : Fribs8\_37
- Track 25 : MScarn\_43
- Track 26 : Emalyn\_40
- Track 27 : Dre3\_36, Gibbous\_36, Cleo\_36
- Track 28 : AikoCarson\_41, Amok\_41
- Track 29 : Yakult\_42
- Track 30 : SteamedHams\_41
- Track 31 : Nina\_39, SweatNTears\_41
- Track 32 : Yarn\_37, Tolls\_41
- Track 33 : GiKK\_45

- Track 34 : Margaret\_46
- Track 35 : BillDoor\_40
- Track 36 : CherryonLim\_43
- Track 37 : Orla\_47
- Track 38 : Agatha\_39, Cozz\_38
- Track 39 : HippoPololi\_38
- Track 40 : MunkgeeRoachy\_38
- Track 41 : Nibbles\_37
- Track 42 : RanchParmCat\_45
- Track 43 : Huwbert\_81
- Track 44 : Triscuit\_80
- Track 45 : Nonagon\_62
- Track 46 : Commonplace\_63
- Track 47 : Yappy\_89
- Track 48 : Shrew\_94

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

The start number called the most often in the published annotations is 25, it was called in 38 of the 78 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Agatha\_39, AikoCarson\_41, Amok\_41, Axym\_39, BigChungus\_41, Biskit\_42, Burnsey\_39, Buttrmlkdreams\_42, Carsonalex\_43, CherryonLim\_43, Cozz\_38, Elinal\_45, Elliott\_40, Feastonyeet\_41, GiKK\_45, GoldHunter\_41, Hexbug\_47, Horseradish\_42, KayGee\_43, Lauer\_38, MAnor\_43, MScarn\_43, Mayweather\_45, MunkgeeRoachy\_38, Nina\_39, Nodigi\_47, Orla\_47, Pons\_43, PotPie\_42, PsychoKiller\_39, Quasar\_40, RanchParmCat\_45, RedBaron\_42, SheckWes\_44, SketchMex\_40, Sopespian\_39, SteamedHams\_41, SummitAcademy\_41, SweatNTears\_41, Tolls\_41, Troje\_42, Typhonomachy\_39, Vine\_44, Yakult\_42, Yarn\_37, Yummy\_42,

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

- 8UZL\_42, AndPeggy\_37, BillDoor\_40, Button\_43, Emalyn\_40, FF47\_41, Jamzy\_45, Maco6\_40, Margaret\_46, Muddy\_42,

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

- Amavida\_62, Amigo\_61, Anansi\_60, Azira\_38, Boersma\_63, Cleo\_36, Commonplace\_63, Dre3\_36, Fribs8\_37, Galactica\_43, Gibbous\_36, Gorgeous\_60, Heylee\_63, HippoPololi\_38, Hiyaa\_45, Huwbert\_81, Ichor\_60, JacoRen57\_38, Jaek\_60, Keanu\_44, KimJongPhill\_83, MaVan\_38, Molivia\_62, Nibbles\_37, NoShow\_50, Nonagon\_62, Rings\_61, Shrew\_94, SorJuana\_60, Spocter\_44, Survivors\_38, Thunderclap\_60, Triscuit\_80, Yappy\_89, Yeezus\_60, Zareef\_40, Zuko\_81,

**Summary by start number:**

Start 2:

- Found in 1 of 93 ( 1.1% ) of genes in pham
- Manual Annotations of this start: 1 of 78

- Called 100.0% of time when present
- Phage (with cluster) where this start called: Galactica\_43 (BQ),

Start 11:

- Found in 4 of 93 ( 4.3% ) of genes in pham
- Manual Annotations of this start: 3 of 78
- Called 75.0% of time when present
- Phage (with cluster) where this start called: Hiyaa\_45 (BQ), Keanu\_44 (BQ), Spocter\_44 (BQ),

Start 18:

- Found in 4 of 93 ( 4.3% ) of genes in pham
- Manual Annotations of this start: 2 of 78
- Called 100.0% of time when present
- Phage (with cluster) where this start called: 8UZL\_42 (AB), FF47\_41 (AB), Maco6\_40 (AB), Muddy\_42 (AB),

Start 19:

- Found in 1 of 93 ( 1.1% ) of genes in pham
- Manual Annotations of this start: 1 of 78
- Called 100.0% of time when present
- Phage (with cluster) where this start called: NoShow\_50 (AB),

Start 21:

- Found in 1 of 93 ( 1.1% ) of genes in pham
- Manual Annotations of this start: 1 of 78
- Called 100.0% of time when present
- Phage (with cluster) where this start called: JacoRen57\_38 (AB),

Start 22:

- Found in 15 of 93 ( 16.1% ) of genes in pham
- Manual Annotations of this start: 2 of 78
- Called 13.3% of time when present
- Phage (with cluster) where this start called: AndPeggy\_37 (CT), BillDoor\_40 (CT),

Start 24:

- Found in 19 of 93 ( 20.4% ) of genes in pham
- Manual Annotations of this start: 12 of 78
- Called 68.4% of time when present
- Phage (with cluster) where this start called: Azira\_38 (CT), Button\_43 (CT), Cleo\_36 (CT), Dre3\_36 (CT), Fribs8\_37 (CT), Gibbous\_36 (CT), HippoPololi\_38 (CT), Jamzy\_45 (CT), MaVan\_38 (CT), Margaret\_46 (CT), Nibbles\_37 (CT), Survivors\_38 (CT), Zareef\_40 (CT),

Start 25:

- Found in 56 of 93 ( 60.2% ) of genes in pham
- Manual Annotations of this start: 38 of 78
- Called 82.1% of time when present
- Phage (with cluster) where this start called: Agatha\_39 (CT), AikoCarson\_41 (CT), Amok\_41 (CT), Axym\_39 (CT), BigChungus\_41 (CT), Biskit\_42 (CT), Burnsey\_39 (CT), Buttrmlkdreams\_42 (CT), Carsonalex\_43 (CT), CherryonLim\_43 (CT), Cozz\_38 (CT), Elinal\_45 (CT), Eliott\_40 (CT), Feastonyeet\_41 (CT), GiKK\_45 (CT), GoldHunter\_41 (CT), Hexbug\_47 (CT), Horseradish\_42 (CT), KayGee\_43 (CT),

Lauer\_38 (CT), MAnor\_43 (CT), MScarn\_43 (CT), Mayweather\_45 (CT), MunkgeeRoachy\_38 (CT), Nina\_39 (CT), Nodigi\_47 (CT), Orla\_47 (CT), Pons\_43 (CT), PotPie\_42 (CT), PsychoKiller\_39 (CT), Quasar\_40 (CT), RanchParmCat\_45 (CT), RedBaron\_42 (CT), SheckWes\_44 (CT), SketchMex\_40 (CT), Sopespian\_39 (CT), SteamedHams\_41 (CT), SummitAcademy\_41 (CT), SweatNTears\_41 (CT), Tolls\_41 (CT), Troje\_42 (CT), Typhonomachy\_39 (CT), Vine\_44 (CT), Yakult\_42 (CT), Yarn\_37 (CT), Yummy\_42 (CT),

Start 26:

- Found in 26 of 93 ( 28.0% ) of genes in pham
- Manual Annotations of this start: 1 of 78
- Called 3.8% of time when present
- Phage (with cluster) where this start called: Emalyn\_40 (CT),

Start 28:

- Found in 2 of 93 ( 2.2% ) of genes in pham
- Manual Annotations of this start: 2 of 78
- Called 100.0% of time when present
- Phage (with cluster) where this start called: KimJongPhill\_83 (BR), Zuko\_81 (BR),

Start 29:

- Found in 2 of 93 ( 2.2% ) of genes in pham
- No Manual Annotations of this start.
- Called 50.0% of time when present
- Phage (with cluster) where this start called: Nonagon\_62 (JD),

Start 30:

- Found in 3 of 93 ( 3.2% ) of genes in pham
- Manual Annotations of this start: 2 of 78
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Huwbert\_81 (GG), Shrew\_94 (singleton), Triscuit\_80 (GG),

Start 32:

- Found in 15 of 93 ( 16.1% ) of genes in pham
- Manual Annotations of this start: 13 of 78
- Called 93.3% of time when present
- Phage (with cluster) where this start called: Amavida\_62 (AQ), Amigo\_61 (AQ), Anansi\_60 (AQ), Boersma\_63 (AQ), Commonplace\_63 (JD), Gorgeous\_60 (AQ), Heylee\_63 (AQ), Ichor\_60 (AQ), Jaek\_60 (AQ), Molivia\_62 (AQ), Rings\_61 (AQ), SorJuana\_60 (AQ), Thunderclap\_60 (AQ), Yeezus\_60 (AQ),

Start 33:

- Found in 1 of 93 ( 1.1% ) of genes in pham
- No Manual Annotations of this start.
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Yappy\_89 (singleton),

### Summary by clusters:

There are 8 clusters represented in this pham: GG, singleton, AB, AQ, BQ, BR, JD, CT,

Info for manual annotations of cluster AB:

- Start number 18 was manually annotated 2 times for cluster AB.
- Start number 19 was manually annotated 1 time for cluster AB.
- Start number 21 was manually annotated 1 time for cluster AB.

Info for manual annotations of cluster AQ:

- Start number 32 was manually annotated 13 times for cluster AQ.

Info for manual annotations of cluster BQ:

- Start number 2 was manually annotated 1 time for cluster BQ.
- Start number 11 was manually annotated 3 times for cluster BQ.

Info for manual annotations of cluster BR:

- Start number 28 was manually annotated 2 times for cluster BR.

Info for manual annotations of cluster CT:

- Start number 22 was manually annotated 2 times for cluster CT.
- Start number 24 was manually annotated 12 times for cluster CT.
- Start number 25 was manually annotated 38 times for cluster CT.
- Start number 26 was manually annotated 1 time for cluster CT.

Info for manual annotations of cluster GG:

- Start number 30 was manually annotated 2 times for cluster GG.

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

Gene: 8UZL\_42 Start: 30925, Stop: 30080, Start Num: 18

Candidate Starts for 8UZL\_42:

(Start: 18 @30925 has 2 MA's), (Start: 25 @30901 has 38 MA's), (40, 30808), (48, 30748), (62, 30670), (64, 30643), (72, 30592), (77, 30559), (92, 30451), (96, 30424), (111, 30322), (118, 30286), (121, 30259), (128, 30196), (137, 30121), (138, 30112),

Gene: Agatha\_39 Start: 28608, Stop: 27790, Start Num: 25

Candidate Starts for Agatha\_39:

(Start: 25 @28608 has 38 MA's), (52, 28452), (53, 28449), (60, 28401), (62, 28389), (67, 28341), (72, 28311), (77, 28278), (78, 28263), (79, 28260), (84, 28218), (91, 28179), (92, 28170), (99, 28113), (119, 27999), (132, 27885), (136, 27846),

Gene: AikoCarson\_41 Start: 28965, Stop: 28147, Start Num: 25

Candidate Starts for AikoCarson\_41:

(Start: 22 @28983 has 2 MA's), (Start: 25 @28965 has 38 MA's), (Start: 26 @28959 has 1 MA's), (52, 28809), (53, 28806), (60, 28758), (62, 28746), (72, 28668), (77, 28635), (79, 28617), (84, 28575), (85, 28572), (91, 28536), (92, 28527), (99, 28470), (104, 28431), (118, 28362), (123, 28308), (132, 28242),

Gene: Amavida\_62 Start: 40997, Stop: 40257, Start Num: 32

Candidate Starts for Amavida\_62:

(Start: 32 @40997 has 13 MA's), (35, 40967), (37, 40943), (40, 40931), (41, 40928), (43, 40922), (48, 40880), (50, 40871), (56, 40856), (58, 40847), (71, 40748), (73, 40733), (89, 40613), (93, 40595), (98, 40556), (101, 40547), (114, 40466), (120, 40439), (125, 40394), (126, 40391), (129, 40370), (133, 40325), (135, 40310),

Gene: Amigo\_61 Start: 41212, Stop: 40472, Start Num: 32

Candidate Starts for Amigo\_61:

(Start: 32 @41212 has 13 MA's), (35, 41182), (37, 41158), (40, 41146), (41, 41143), (43, 41137), (48, 41095), (50, 41086), (56, 41071), (58, 41062), (71, 40963), (73, 40948), (89, 40828), (93, 40810), (98, 40771), (101, 40762), (114, 40681), (120, 40654), (125, 40609), (126, 40606), (129, 40585), (133, 40540), (135, 40525),

Gene: Amok\_41 Start: 28989, Stop: 28171, Start Num: 25

Candidate Starts for Amok\_41:

(Start: 22 @29007 has 2 MA's), (Start: 25 @28989 has 38 MA's), (Start: 26 @28983 has 1 MA's), (52, 28833), (53, 28830), (60, 28782), (62, 28770), (72, 28692), (77, 28659), (79, 28641), (84, 28599), (85, 28596), (91, 28560), (92, 28551), (99, 28494), (104, 28455), (118, 28386), (123, 28332), (132, 28266),

Gene: Anansi\_60 Start: 40819, Stop: 40079, Start Num: 32

Candidate Starts for Anansi\_60:

(Start: 32 @40819 has 13 MA's), (35, 40789), (37, 40765), (40, 40753), (41, 40750), (43, 40744), (48, 40702), (50, 40693), (56, 40678), (58, 40669), (71, 40570), (73, 40555), (89, 40435), (93, 40417), (98, 40378), (101, 40369), (114, 40288), (120, 40261), (125, 40216), (126, 40213), (129, 40192), (133, 40147), (135, 40132),

Gene: AndPeggy\_37 Start: 28407, Stop: 27571, Start Num: 22

Candidate Starts for AndPeggy\_37:

(Start: 22 @28407 has 2 MA's), (Start: 25 @28389 has 38 MA's), (Start: 26 @28383 has 1 MA's), (52, 28233), (53, 28230), (60, 28182), (62, 28170), (72, 28092), (77, 28059), (79, 28041), (84, 27999), (85, 27996), (91, 27960), (92, 27951), (93, 27948), (99, 27894), (104, 27855), (118, 27786), (119, 27780), (123, 27732), (136, 27627),

Gene: Axym\_39 Start: 28586, Stop: 27768, Start Num: 25

Candidate Starts for Axym\_39:

(Start: 25 @28586 has 38 MA's), (52, 28430), (53, 28427), (60, 28379), (62, 28367), (72, 28289), (77, 28256), (78, 28241), (79, 28238), (84, 28196), (91, 28157), (92, 28148), (99, 28091), (109, 28028), (119, 27977), (132, 27863), (136, 27824),

Gene: Azira\_38 Start: 28635, Stop: 27823, Start Num: 24

Candidate Starts for Azira\_38:

(9, 28707), (Start: 24 @28635 has 12 MA's), (62, 28419), (65, 28383), (72, 28341), (74, 28326), (77, 28308), (78, 28293), (79, 28290), (84, 28248), (92, 28200), (100, 28140), (104, 28107), (115, 28053), (118, 28038), (132, 27921),

Gene: BigChungus\_41 Start: 30191, Stop: 29385, Start Num: 25

Candidate Starts for BigChungus\_41:

(Start: 25 @30191 has 38 MA's), (Start: 26 @30185 has 1 MA's), (45, 30083), (52, 30029), (62, 29966), (77, 29855), (78, 29840), (84, 29795), (85, 29792), (91, 29756), (92, 29747), (99, 29690), (105, 29642), (106, 29639), (116, 29597), (129, 29504), (136, 29435),

Gene: BillDoor\_40 Start: 28078, Stop: 27242, Start Num: 22

Candidate Starts for BillDoor\_40:

(Start: 22 @28078 has 2 MA's), (Start: 25 @28060 has 38 MA's), (Start: 26 @28054 has 1 MA's), (52, 27904), (60, 27853), (62, 27841), (72, 27763), (77, 27730), (79, 27712), (84, 27670), (85, 27667), (91, 27631), (92, 27622), (93, 27619), (99, 27565), (104, 27526), (118, 27457), (119, 27451), (123, 27403), (136, 27298),

Gene: Biskit\_42 Start: 28753, Stop: 27935, Start Num: 25

Candidate Starts for Biskit\_42:

(Start: 22 @28771 has 2 MA's), (Start: 25 @28753 has 38 MA's), (Start: 26 @28747 has 1 MA's), (52, 28597), (53, 28594), (62, 28534), (72, 28456), (77, 28423), (79, 28405), (84, 28363), (85, 28360), (91, 28324), (92, 28315), (99, 28258), (104, 28219), (113, 28174), (116, 28162), (118, 28150), (119, 28144), (123, 28096), (136, 27991),

Gene: Boersma\_63 Start: 41212, Stop: 40472, Start Num: 32

Candidate Starts for Boersma\_63:

(Start: 32 @41212 has 13 MA's), (35, 41182), (37, 41158), (40, 41146), (41, 41143), (43, 41137), (48, 41095), (50, 41086), (56, 41071), (58, 41062), (71, 40963), (73, 40948), (89, 40828), (93, 40810), (98, 40771), (101, 40762), (114, 40681), (120, 40654), (125, 40609), (126, 40606), (129, 40585), (133, 40540), (135, 40525),

Gene: Burnsey\_39 Start: 28599, Stop: 27781, Start Num: 25

Candidate Starts for Burnsey\_39:

(Start: 25 @28599 has 38 MA's), (52, 28443), (53, 28440), (60, 28392), (62, 28380), (72, 28302), (77, 28269), (78, 28254), (79, 28251), (84, 28209), (91, 28170), (92, 28161), (94, 28140), (99, 28104), (109, 28041), (119, 27990), (132, 27876), (136, 27837),

Gene: Button\_43 Start: 29230, Stop: 28424, Start Num: 24

Candidate Starts for Button\_43:

(10, 29314), (15, 29284), (16, 29278), (Start: 24 @29230 has 12 MA's), (Start: 25 @29227 has 38 MA's), (45, 29128), (62, 29017), (67, 28969), (74, 28924), (77, 28906), (78, 28891), (79, 28888), (85, 28843), (91, 28807), (92, 28798), (104, 28702), (109, 28678), (116, 28645), (118, 28633), (119, 28627), (121, 28606),

Gene: Buttrmlkdreams\_42 Start: 29086, Stop: 28268, Start Num: 25

Candidate Starts for Buttrmlkdreams\_42:

(Start: 22 @29104 has 2 MA's), (Start: 25 @29086 has 38 MA's), (Start: 26 @29080 has 1 MA's), (52, 28930), (53, 28927), (62, 28867), (72, 28789), (77, 28756), (79, 28738), (84, 28696), (85, 28693), (91, 28657), (92, 28648), (99, 28591), (104, 28552), (113, 28507), (116, 28495), (118, 28483), (119, 28477), (123, 28429), (136, 28324),

Gene: Carsonalex\_43 Start: 28636, Stop: 27818, Start Num: 25

Candidate Starts for Carsonalex\_43:

(Start: 25 @28636 has 38 MA's), (52, 28480), (53, 28477), (60, 28429), (62, 28417), (72, 28339), (77, 28306), (78, 28291), (79, 28288), (84, 28246), (91, 28207), (92, 28198), (99, 28141), (109, 28078), (119, 28027), (132, 27913), (136, 27874),

Gene: CherryonLim\_43 Start: 31329, Stop: 30523, Start Num: 25

Candidate Starts for CherryonLim\_43:

(Start: 25 @31329 has 38 MA's), (Start: 26 @31323 has 1 MA's), (45, 31221), (52, 31167), (62, 31104), (77, 30993), (84, 30933), (85, 30930), (91, 30894), (92, 30885), (99, 30828), (105, 30780), (106, 30777), (116, 30735), (129, 30642), (136, 30573),

Gene: Cleo\_36 Start: 28180, Stop: 27371, Start Num: 24

Candidate Starts for Cleo\_36:

(Start: 24 @28180 has 12 MA's), (45, 28078), (62, 27967), (74, 27874), (77, 27856), (78, 27841), (79, 27838), (84, 27796), (92, 27748), (100, 27688), (104, 27655), (109, 27631), (115, 27601), (118, 27586), (132, 27469),

Gene: Commonplace\_63 Start: 41801, Stop: 41034, Start Num: 32



Candidate Starts for Commonplace\_63:

(14, 41897), (23, 41846), (29, 41822), (Start: 32 @41801 has 13 MA's), (34, 41783), (36, 41747), (65, 41564), (76, 41492), (77, 41489), (81, 41456), (90, 41396), (102, 41321), (136, 41078),

Gene: Cozz\_38 Start: 28196, Stop: 27378, Start Num: 25

Candidate Starts for Cozz\_38:

(Start: 25 @28196 has 38 MA's), (52, 28040), (53, 28037), (60, 27989), (62, 27977), (67, 27929), (72, 27899), (77, 27866), (78, 27851), (79, 27848), (84, 27806), (91, 27767), (92, 27758), (99, 27701), (119, 27587), (132, 27473), (136, 27434),

Gene: Dre3\_36 Start: 27923, Stop: 27114, Start Num: 24

Candidate Starts for Dre3\_36:

(Start: 24 @27923 has 12 MA's), (45, 27821), (62, 27710), (74, 27617), (77, 27599), (78, 27584), (79, 27581), (84, 27539), (92, 27491), (100, 27431), (104, 27398), (109, 27374), (115, 27344), (118, 27329), (132, 27212),

Gene: Elinal\_45 Start: 30579, Stop: 29773, Start Num: 25

Candidate Starts for Elinal\_45:

(Start: 25 @30579 has 38 MA's), (Start: 26 @30573 has 1 MA's), (45, 30471), (52, 30417), (62, 30354), (65, 30318), (77, 30243), (78, 30228), (84, 30183), (85, 30180), (91, 30144), (92, 30135), (99, 30078), (105, 30030), (106, 30027), (116, 29985), (129, 29892), (136, 29823),

Gene: Elliott\_40 Start: 28607, Stop: 27789, Start Num: 25

Candidate Starts for Elliott\_40:

(Start: 25 @28607 has 38 MA's), (52, 28451), (53, 28448), (60, 28400), (62, 28388), (72, 28310), (77, 28277), (78, 28262), (79, 28259), (84, 28217), (91, 28178), (92, 28169), (99, 28112), (109, 28049), (119, 27998), (132, 27884), (136, 27845),

Gene: Emalyn\_40 Start: 28151, Stop: 27339, Start Num: 26

Candidate Starts for Emalyn\_40:

(Start: 22 @28175 has 2 MA's), (Start: 25 @28157 has 38 MA's), (Start: 26 @28151 has 1 MA's), (52, 28001), (53, 27998), (60, 27950), (62, 27938), (72, 27860), (77, 27827), (79, 27809), (84, 27767), (85, 27764), (91, 27728), (92, 27719), (99, 27662), (104, 27623), (118, 27554), (123, 27500), (132, 27434),

Gene: FF47\_41 Start: 30836, Stop: 29991, Start Num: 18

Candidate Starts for FF47\_41:

(Start: 18 @30836 has 2 MA's), (Start: 25 @30812 has 38 MA's), (40, 30719), (48, 30659), (62, 30581), (64, 30554), (72, 30503), (77, 30470), (92, 30362), (96, 30335), (111, 30233), (118, 30197), (121, 30170), (128, 30107), (137, 30032), (138, 30023),

Gene: Feastonyeet\_41 Start: 30191, Stop: 29385, Start Num: 25

Candidate Starts for Feastonyeet\_41:

(Start: 25 @30191 has 38 MA's), (Start: 26 @30185 has 1 MA's), (45, 30083), (52, 30029), (62, 29966), (77, 29855), (78, 29840), (84, 29795), (85, 29792), (91, 29756), (92, 29747), (99, 29690), (105, 29642), (106, 29639), (116, 29597), (129, 29504), (136, 29435),

Gene: Fribs8\_37 Start: 28362, Stop: 27550, Start Num: 24

Candidate Starts for Fribs8\_37:

(Start: 24 @28362 has 12 MA's), (65, 28110), (72, 28068), (74, 28053), (77, 28035), (78, 28020), (79, 28017), (84, 27975), (92, 27927), (100, 27867), (104, 27834), (115, 27780), (118, 27765), (132, 27648),

Gene: Galactica\_43 Start: 30869, Stop: 31960, Start Num: 2

Candidate Starts for Galactica\_43:

(Start: 2 @30869 has 1 MA's), (5, 30983), (7, 30989), (Start: 11 @31013 has 3 MA's), (13, 31022), (31, 31109), (38, 31172), (66, 31355), (69, 31370), (80, 31454), (88, 31505), (90, 31514), (101, 31589), (103, 31616), (112, 31661), (114, 31676), (115, 31679), (142, 31949),

Gene: GiKK\_45 Start: 29557, Stop: 28754, Start Num: 25

Candidate Starts for GiKK\_45:

(1, 29836), (3, 29746), (10, 29644), (15, 29614), (16, 29608), (Start: 24 @29560 has 12 MA's), (Start: 25 @29557 has 38 MA's), (45, 29458), (62, 29347), (67, 29299), (74, 29254), (77, 29236), (78, 29221), (79, 29218), (85, 29173), (91, 29137), (92, 29128), (104, 29032), (109, 29008), (116, 28975), (118, 28963), (119, 28957), (121, 28936),

Gene: Gibbous\_36 Start: 27923, Stop: 27114, Start Num: 24

Candidate Starts for Gibbous\_36:

(Start: 24 @27923 has 12 MA's), (45, 27821), (62, 27710), (74, 27617), (77, 27599), (78, 27584), (79, 27581), (84, 27539), (92, 27491), (100, 27431), (104, 27398), (109, 27374), (115, 27344), (118, 27329), (132, 27212),

Gene: GoldHunter\_41 Start: 28608, Stop: 27790, Start Num: 25

Candidate Starts for GoldHunter\_41:

(Start: 25 @28608 has 38 MA's), (52, 28452), (53, 28449), (60, 28401), (62, 28389), (72, 28311), (77, 28278), (78, 28263), (79, 28260), (84, 28218), (91, 28179), (92, 28170), (99, 28113), (109, 28050), (119, 27999), (132, 27885), (136, 27846),

Gene: Gorgeous\_60 Start: 40819, Stop: 40079, Start Num: 32

Candidate Starts for Gorgeous\_60:

(Start: 32 @40819 has 13 MA's), (35, 40789), (37, 40765), (40, 40753), (41, 40750), (43, 40744), (48, 40702), (50, 40693), (56, 40678), (58, 40669), (71, 40570), (73, 40555), (89, 40435), (93, 40417), (98, 40378), (101, 40369), (114, 40288), (120, 40261), (125, 40216), (126, 40213), (129, 40192), (133, 40147), (135, 40132),

Gene: Hexbug\_47 Start: 31341, Stop: 30535, Start Num: 25

Candidate Starts for Hexbug\_47:

(16, 31383), (Start: 24 @31344 has 12 MA's), (Start: 25 @31341 has 38 MA's), (45, 31239), (52, 31185), (53, 31182), (62, 31128), (65, 31092), (74, 31035), (77, 31017), (79, 30999), (85, 30954), (92, 30909), (104, 30813), (109, 30789), (116, 30756), (118, 30744), (124, 30690), (129, 30657),

Gene: Heylee\_63 Start: 40997, Stop: 40257, Start Num: 32

Candidate Starts for Heylee\_63:

(Start: 32 @40997 has 13 MA's), (35, 40967), (37, 40943), (40, 40931), (41, 40928), (43, 40922), (48, 40880), (50, 40871), (56, 40856), (58, 40847), (71, 40748), (73, 40733), (89, 40613), (93, 40595), (98, 40556), (101, 40547), (114, 40466), (120, 40439), (125, 40394), (126, 40391), (129, 40370), (133, 40325), (135, 40310),

Gene: HippoPololi\_38 Start: 28375, Stop: 27566, Start Num: 24

Candidate Starts for HippoPololi\_38:

(Start: 24 @28375 has 12 MA's), (45, 28273), (62, 28162), (65, 28126), (68, 28108), (72, 28084), (74, 28069), (77, 28051), (79, 28033), (84, 27991), (92, 27943), (97, 27910), (100, 27883), (104, 27850), (118, 27781), (132, 27664),

Gene: Hiyaa\_45 Start: 32492, Stop: 33436, Start Num: 11

Candidate Starts for Hiyaa\_45:

(5, 32462), (Start: 11 @32492 has 3 MA's), (13, 32501), (20, 32537), (31, 32588), (38, 32648), (46, 32693), (67, 32834), (69, 32846), (80, 32930), (81, 32933), (88, 32981), (90, 32990), (103, 33092), (112, 33137), (114, 33152), (115, 33155), (122, 33221), (131, 33302), (140, 33395),

Gene: Horseradish\_42 Start: 28614, Stop: 27796, Start Num: 25

Candidate Starts for Horseradish\_42:

(Start: 22 @28632 has 2 MA's), (Start: 25 @28614 has 38 MA's), (Start: 26 @28608 has 1 MA's), (52, 28458), (53, 28455), (62, 28395), (72, 28317), (77, 28284), (79, 28266), (84, 28224), (85, 28221), (91, 28185), (92, 28176), (99, 28119), (104, 28080), (113, 28035), (116, 28023), (118, 28011), (119, 28005), (136, 27852),

Gene: Huwbert\_81 Start: 49790, Stop: 50599, Start Num: 30

Candidate Starts for Huwbert\_81:

(Start: 30 @49790 has 2 MA's), (55, 49937), (59, 49967), (62, 49988), (77, 50099), (79, 50117), (84, 50159), (85, 50162), (91, 50198), (96, 50234), (99, 50264), (100, 50267), (116, 50360), (119, 50378),

Gene: Ichor\_60 Start: 41212, Stop: 40472, Start Num: 32

Candidate Starts for Ichor\_60:

(Start: 32 @41212 has 13 MA's), (35, 41182), (37, 41158), (40, 41146), (41, 41143), (43, 41137), (48, 41095), (50, 41086), (56, 41071), (58, 41062), (71, 40963), (73, 40948), (89, 40828), (93, 40810), (98, 40771), (101, 40762), (114, 40681), (120, 40654), (125, 40609), (126, 40606), (129, 40585), (133, 40540), (135, 40525),

Gene: JacoRen57\_38 Start: 31703, Stop: 30873, Start Num: 21

Candidate Starts for JacoRen57\_38:

(Start: 21 @31703 has 1 MA's), (45, 31568), (67, 31403), (77, 31340), (78, 31325), (90, 31244), (92, 31232), (109, 31112), (119, 31061), (121, 31040), (135, 30914), (137, 30902),

Gene: Jaek\_60 Start: 41212, Stop: 40472, Start Num: 32

Candidate Starts for Jaek\_60:

(Start: 32 @41212 has 13 MA's), (35, 41182), (37, 41158), (40, 41146), (41, 41143), (43, 41137), (48, 41095), (50, 41086), (56, 41071), (58, 41062), (71, 40963), (73, 40948), (89, 40828), (93, 40810), (98, 40771), (101, 40762), (114, 40681), (120, 40654), (125, 40609), (126, 40606), (129, 40585), (133, 40540), (135, 40525),

Gene: Jamzy\_45 Start: 29543, Stop: 28737, Start Num: 24

Candidate Starts for Jamzy\_45:

(10, 29627), (15, 29597), (16, 29591), (Start: 24 @29543 has 12 MA's), (Start: 25 @29540 has 38 MA's), (45, 29441), (62, 29330), (67, 29282), (74, 29237), (77, 29219), (78, 29204), (79, 29201), (85, 29156), (91, 29120), (92, 29111), (104, 29015), (109, 28991), (116, 28958), (118, 28946), (119, 28940), (121, 28919),

Gene: KayGee\_43 Start: 30579, Stop: 29773, Start Num: 25

Candidate Starts for KayGee\_43:

(Start: 25 @30579 has 38 MA's), (Start: 26 @30573 has 1 MA's), (45, 30471), (52, 30417), (62, 30354), (65, 30318), (77, 30243), (78, 30228), (84, 30183), (85, 30180), (91, 30144), (92, 30135), (99, 30078), (105, 30030), (106, 30027), (116, 29985), (129, 29892), (136, 29823),

Gene: Keanu\_44 Start: 32166, Stop: 33110, Start Num: 11

Candidate Starts for Keanu\_44:

(8, 32145), (Start: 11 @32166 has 3 MA's), (31, 32262), (38, 32322), (69, 32520), (80, 32604), (81, 32607), (88, 32655), (90, 32664), (103, 32766), (112, 32811), (114, 32826), (115, 32829), (131, 32976), (140, 33069), (142, 33099),

Gene: KimJongPhill\_83 Start: 61930, Stop: 62745, Start Num: 28

Candidate Starts for KimJongPhill\_83:

(Start: 28 @61930 has 2 MA's), (39, 62008), (54, 62086), (72, 62212), (73, 62218), (77, 62245), (79, 62263), (84, 62305), (93, 62356), (97, 62386), (99, 62410), (107, 62467), (117, 62515), (119, 62524), (127, 62620), (134, 62683),

Gene: Lauer\_38 Start: 31388, Stop: 30582, Start Num: 25

Candidate Starts for Lauer\_38:

(Start: 25 @31388 has 38 MA's), (Start: 26 @31382 has 1 MA's), (45, 31280), (52, 31226), (62, 31163), (65, 31127), (77, 31052), (78, 31037), (84, 30992), (85, 30989), (91, 30953), (92, 30944), (99, 30887), (105, 30839), (106, 30836), (116, 30794), (129, 30701), (136, 30632),

Gene: MAnor\_43 Start: 30921, Stop: 30115, Start Num: 25

Candidate Starts for MAnor\_43:

(Start: 25 @30921 has 38 MA's), (Start: 26 @30915 has 1 MA's), (45, 30813), (52, 30759), (62, 30696), (77, 30585), (78, 30570), (84, 30525), (85, 30522), (91, 30486), (92, 30477), (99, 30420), (105, 30372), (106, 30369), (116, 30327), (129, 30234), (136, 30165),

Gene: MScarn\_43 Start: 28754, Stop: 27936, Start Num: 25

Candidate Starts for MScarn\_43:

(Start: 22 @28772 has 2 MA's), (Start: 25 @28754 has 38 MA's), (Start: 26 @28748 has 1 MA's), (52, 28598), (53, 28595), (62, 28535), (72, 28457), (77, 28424), (79, 28406), (84, 28364), (85, 28361), (91, 28325), (92, 28316), (99, 28259), (104, 28220), (113, 28175), (118, 28151), (119, 28145), (136, 27992),

Gene: MaVan\_38 Start: 28664, Stop: 27852, Start Num: 24

Candidate Starts for MaVan\_38:

(9, 28736), (Start: 24 @28664 has 12 MA's), (62, 28448), (65, 28412), (72, 28370), (74, 28355), (77, 28337), (78, 28322), (79, 28319), (84, 28277), (92, 28229), (100, 28169), (104, 28136), (115, 28082), (118, 28067), (132, 27950),

Gene: Maco6\_40 Start: 30176, Stop: 29331, Start Num: 18

Candidate Starts for Maco6\_40:

(Start: 18 @30176 has 2 MA's), (Start: 25 @30152 has 38 MA's), (40, 30059), (48, 29999), (62, 29921), (64, 29894), (72, 29843), (77, 29810), (90, 29714), (92, 29702), (96, 29675), (111, 29573), (118, 29537), (121, 29510), (128, 29447), (137, 29372), (138, 29363),

Gene: Margaret\_46 Start: 30292, Stop: 29483, Start Num: 24

Candidate Starts for Margaret\_46:

(Start: 24 @30292 has 12 MA's), (Start: 25 @30289 has 38 MA's), (45, 30187), (52, 30133), (62, 30076), (65, 30040), (74, 29983), (77, 29965), (78, 29950), (79, 29947), (85, 29902), (91, 29866), (92, 29857), (104, 29761), (116, 29704), (124, 29638), (129, 29605),

Gene: Mayweather\_45 Start: 31200, Stop: 30394, Start Num: 25

Candidate Starts for Mayweather\_45:

(Start: 25 @31200 has 38 MA's), (Start: 26 @31194 has 1 MA's), (45, 31092), (52, 31038), (62, 30975), (77, 30864), (78, 30849), (84, 30804), (85, 30801), (91, 30765), (92, 30756), (99, 30699), (105, 30651), (106, 30648), (116, 30606), (129, 30513), (136, 30444),

Gene: Molivia\_62 Start: 39615, Stop: 38878, Start Num: 32

Candidate Starts for Molivia\_62:

(Start: 32 @39615 has 13 MA's), (40, 39552), (41, 39549), (43, 39543), (48, 39501), (56, 39477), (64, 39411), (70, 39375), (71, 39369), (73, 39354), (89, 39234), (93, 39216), (98, 39177), (101, 39168), (108, 39117), (114, 39087), (125, 39015), (133, 38946), (135, 38931),

Gene: Muddy\_42 Start: 31408, Stop: 30563, Start Num: 18

Candidate Starts for Muddy\_42:

(Start: 18 @31408 has 2 MA's), (Start: 25 @31384 has 38 MA's), (40, 31291), (48, 31231), (62, 31153), (64, 31126), (77, 31042), (92, 30934), (96, 30907), (111, 30805), (118, 30769), (121, 30742), (128, 30679), (137, 30604), (138, 30595),

Gene: MunkgeeRoachy\_38 Start: 28070, Stop: 27252, Start Num: 25

Candidate Starts for MunkgeeRoachy\_38:

(Start: 25 @28070 has 38 MA's), (52, 27914), (53, 27911), (60, 27863), (62, 27851), (72, 27773), (77, 27740), (78, 27725), (79, 27722), (84, 27680), (91, 27641), (92, 27632), (99, 27575), (109, 27512), (119, 27461), (132, 27347),

Gene: Nibbles\_37 Start: 28351, Stop: 27539, Start Num: 24

Candidate Starts for Nibbles\_37:

(9, 28423), (12, 28399), (Start: 24 @28351 has 12 MA's), (62, 28135), (65, 28099), (72, 28057), (74, 28042), (77, 28024), (78, 28009), (79, 28006), (84, 27964), (92, 27916), (100, 27856), (104, 27823), (115, 27769), (118, 27754), (132, 27637),

Gene: Nina\_39 Start: 28732, Stop: 27914, Start Num: 25

Candidate Starts for Nina\_39:

(Start: 25 @28732 has 38 MA's), (52, 28576), (53, 28573), (60, 28525), (62, 28513), (72, 28435), (77, 28402), (78, 28387), (79, 28384), (82, 28360), (84, 28342), (91, 28303), (92, 28294), (99, 28237), (109, 28174), (119, 28123), (132, 28009), (136, 27970),

Gene: NoShow\_50 Start: 34311, Stop: 33472, Start Num: 19

Candidate Starts for NoShow\_50:

(Start: 19 @34311 has 1 MA's), (48, 34125), (55, 34098), (72, 33969), (77, 33936), (92, 33828), (109, 33708), (119, 33657), (127, 33585), (136, 33501),

Gene: Nodigi\_47 Start: 31327, Stop: 30521, Start Num: 25

Candidate Starts for Nodigi\_47:

(16, 31369), (Start: 24 @31330 has 12 MA's), (Start: 25 @31327 has 38 MA's), (45, 31225), (52, 31171), (53, 31168), (62, 31114), (65, 31078), (74, 31021), (77, 31003), (79, 30985), (85, 30940), (92, 30895), (104, 30799), (109, 30775), (116, 30742), (118, 30730), (124, 30676), (129, 30643),

Gene: Nonagon\_62 Start: 41528, Stop: 40740, Start Num: 29

Candidate Starts for Nonagon\_62:

(14, 41603), (23, 41552), (29, 41528), (Start: 32 @41507 has 13 MA's), (34, 41489), (36, 41453), (65, 41270), (76, 41198), (77, 41195), (81, 41162), (90, 41102), (102, 41027), (136, 40784),

Gene: Orla\_47 Start: 31300, Stop: 30494, Start Num: 25

Candidate Starts for Orla\_47:

(16, 31342), (Start: 24 @31303 has 12 MA's), (Start: 25 @31300 has 38 MA's), (45, 31198), (52, 31144), (53, 31141), (62, 31087), (65, 31051), (74, 30994), (77, 30976), (79, 30958), (91, 30877), (92, 30868), (104, 30772), (109, 30748), (116, 30715), (118, 30703), (124, 30649), (129, 30616),

Gene: Pons\_43 Start: 30551, Stop: 29745, Start Num: 25

Candidate Starts for Pons\_43:

(Start: 25 @30551 has 38 MA's), (Start: 26 @30545 has 1 MA's), (45, 30443), (52, 30389), (62, 30326), (65, 30290), (77, 30215), (78, 30200), (84, 30155), (85, 30152), (91, 30116), (92, 30107), (99, 30050), (105, 30002), (106, 29999), (116, 29957), (129, 29864), (136, 29795),

Gene: PotPie\_42 Start: 31482, Stop: 30676, Start Num: 25

Candidate Starts for PotPie\_42:

(Start: 25 @31482 has 38 MA's), (Start: 26 @31476 has 1 MA's), (45, 31374), (52, 31320), (62, 31257), (77, 31146), (78, 31131), (84, 31086), (85, 31083), (91, 31047), (92, 31038), (99, 30981), (105, 30933), (106, 30930), (116, 30888), (129, 30795), (136, 30726),

Gene: PsychoKiller\_39 Start: 28608, Stop: 27790, Start Num: 25

Candidate Starts for PsychoKiller\_39:

(Start: 25 @28608 has 38 MA's), (52, 28452), (53, 28449), (60, 28401), (62, 28389), (72, 28311), (77, 28278), (78, 28263), (79, 28260), (84, 28218), (91, 28179), (92, 28170), (99, 28113), (109, 28050), (119, 27999), (132, 27885), (136, 27846),

Gene: Quasar\_40 Start: 29156, Stop: 28338, Start Num: 25

Candidate Starts for Quasar\_40:

(Start: 25 @29156 has 38 MA's), (52, 29000), (53, 28997), (60, 28949), (62, 28937), (72, 28859), (77, 28826), (78, 28811), (79, 28808), (84, 28766), (91, 28727), (92, 28718), (99, 28661), (109, 28598), (119, 28547), (132, 28433), (136, 28394),

Gene: RanchParmCat\_45 Start: 30427, Stop: 29621, Start Num: 25

Candidate Starts for RanchParmCat\_45:

(Start: 24 @30430 has 12 MA's), (Start: 25 @30427 has 38 MA's), (45, 30325), (52, 30271), (62, 30214), (65, 30178), (74, 30121), (77, 30103), (78, 30088), (79, 30085), (85, 30040), (91, 30004), (92, 29995), (104, 29899), (109, 29875), (116, 29842), (124, 29776), (129, 29743),

Gene: RedBaron\_42 Start: 28845, Stop: 28027, Start Num: 25

Candidate Starts for RedBaron\_42:

(Start: 25 @28845 has 38 MA's), (52, 28689), (53, 28686), (60, 28638), (62, 28626), (72, 28548), (77, 28515), (78, 28500), (79, 28497), (84, 28455), (91, 28416), (92, 28407), (94, 28386), (99, 28350), (109, 28287), (119, 28236), (132, 28122), (136, 28083),

Gene: Rings\_61 Start: 41260, Stop: 40520, Start Num: 32

Candidate Starts for Rings\_61:

(Start: 32 @41260 has 13 MA's), (35, 41230), (37, 41206), (40, 41194), (41, 41191), (43, 41185), (48, 41143), (50, 41134), (56, 41119), (58, 41110), (71, 41011), (73, 40996), (89, 40876), (93, 40858), (98, 40819), (101, 40810), (114, 40729), (120, 40702), (125, 40657), (126, 40654), (129, 40633), (133, 40588), (135, 40573),

Gene: SheckWes\_44 Start: 30075, Stop: 29269, Start Num: 25

Candidate Starts for SheckWes\_44:

(Start: 25 @30075 has 38 MA's), (45, 29967), (52, 29913), (62, 29850), (77, 29739), (82, 29697), (84, 29679), (85, 29676), (91, 29640), (92, 29631), (99, 29574), (105, 29526), (106, 29523), (116, 29481), (129, 29388), (136, 29319),

Gene: Shrew\_94 Start: 51163, Stop: 51948, Start Num: 30

Candidate Starts for Shrew\_94:

(Start: 30 @51163 has 2 MA's), (49, 51289), (51, 51295), (59, 51340), (72, 51439), (75, 51463), (77, 51472), (79, 51490), (91, 51571), (92, 51580), (96, 51607), (99, 51637), (107, 51691), (137, 51895), (141, 51931),

Gene: SketchMex\_40 Start: 28753, Stop: 27935, Start Num: 25

Candidate Starts for SketchMex\_40:

(Start: 22 @28771 has 2 MA's), (Start: 25 @28753 has 38 MA's), (Start: 26 @28747 has 1 MA's), (52, 28597), (53, 28594), (62, 28534), (72, 28456), (77, 28423), (79, 28405), (84, 28363), (85, 28360), (91, 28324), (92, 28315), (99, 28258), (104, 28219), (113, 28174), (116, 28162), (118, 28150), (119, 28144), (123, 28096), (136, 27991),

Gene: Sopespian\_39 Start: 28609, Stop: 27791, Start Num: 25

Candidate Starts for Sopespian\_39:

(Start: 25 @28609 has 38 MA's), (52, 28453), (53, 28450), (60, 28402), (62, 28390), (72, 28312), (77, 28279), (78, 28264), (79, 28261), (84, 28219), (91, 28180), (92, 28171), (99, 28114), (109, 28051), (119, 28000), (132, 27886), (136, 27847),

Gene: SorJuana\_60 Start: 40819, Stop: 40079, Start Num: 32

Candidate Starts for SorJuana\_60:

(Start: 32 @40819 has 13 MA's), (35, 40789), (37, 40765), (40, 40753), (41, 40750), (43, 40744), (48, 40702), (50, 40693), (56, 40678), (58, 40669), (71, 40570), (73, 40555), (89, 40435), (93, 40417), (98, 40378), (101, 40369), (114, 40288), (120, 40261), (125, 40216), (126, 40213), (129, 40192), (133, 40147), (135, 40132),

Gene: Spocter\_44 Start: 32522, Stop: 33466, Start Num: 11

Candidate Starts for Spocter\_44:

(5, 32492), (Start: 11 @32522 has 3 MA's), (13, 32531), (20, 32567), (31, 32618), (38, 32678), (46, 32723), (67, 32864), (69, 32876), (80, 32960), (81, 32963), (88, 33011), (90, 33020), (103, 33122), (112, 33167), (114, 33182), (115, 33185), (122, 33251), (131, 33332), (140, 33425),

Gene: SteamedHams\_41 Start: 28529, Stop: 27711, Start Num: 25

Candidate Starts for SteamedHams\_41:

(Start: 22 @28547 has 2 MA's), (Start: 25 @28529 has 38 MA's), (52, 28373), (53, 28370), (60, 28322), (62, 28310), (72, 28232), (77, 28199), (79, 28181), (82, 28157), (84, 28139), (85, 28136), (91, 28100), (92, 28091), (99, 28034), (104, 27995), (118, 27926), (119, 27920), (123, 27872), (136, 27767),

Gene: SummitAcademy\_41 Start: 30111, Stop: 29305, Start Num: 25

Candidate Starts for SummitAcademy\_41:

(Start: 25 @30111 has 38 MA's), (Start: 26 @30105 has 1 MA's), (45, 30003), (52, 29949), (62, 29886), (77, 29775), (78, 29760), (84, 29715), (85, 29712), (91, 29676), (92, 29667), (99, 29610), (105, 29562), (106, 29559), (116, 29517), (129, 29424), (136, 29355),

Gene: Survivors\_38 Start: 28560, Stop: 27748, Start Num: 24

Candidate Starts for Survivors\_38:

(9, 28632), (Start: 24 @28560 has 12 MA's), (62, 28344), (65, 28308), (72, 28266), (74, 28251), (77, 28233), (78, 28218), (79, 28215), (84, 28173), (92, 28125), (100, 28065), (104, 28032), (115, 27978), (118, 27963), (132, 27846),

Gene: SweatNTears\_41 Start: 28505, Stop: 27687, Start Num: 25

Candidate Starts for SweatNTears\_41:

(Start: 25 @28505 has 38 MA's), (52, 28349), (53, 28346), (60, 28298), (62, 28286), (72, 28208), (77, 28175), (78, 28160), (79, 28157), (82, 28133), (84, 28115), (91, 28076), (92, 28067), (99, 28010), (109, 27947), (119, 27896), (132, 27782), (136, 27743),

Gene: Thunderclap\_60 Start: 41241, Stop: 40501, Start Num: 32

Candidate Starts for Thunderclap\_60:

(Start: 32 @41241 has 13 MA's), (35, 41211), (37, 41187), (40, 41175), (41, 41172), (43, 41166), (48, 41124), (50, 41115), (56, 41100), (58, 41091), (71, 40992), (73, 40977), (89, 40857), (93, 40839), (98, 40800), (101, 40791), (114, 40710), (120, 40683), (125, 40638), (126, 40635), (129, 40614), (133, 40569), (135, 40554),

Gene: Tolls\_41 Start: 28634, Stop: 27816, Start Num: 25

Candidate Starts for Tolls\_41:

(Start: 22 @28652 has 2 MA's), (Start: 25 @28634 has 38 MA's), (Start: 26 @28628 has 1 MA's), (52, 28478), (53, 28475), (60, 28427), (62, 28415), (72, 28337), (77, 28304), (79, 28286), (84, 28244), (85, 28241), (91, 28205), (92, 28196), (99, 28139), (104, 28100), (118, 28031), (119, 28025), (123, 27977), (136, 27872),

Gene: Triscuit\_80 Start: 49756, Stop: 50565, Start Num: 30

Candidate Starts for Triscuit\_80:

(Start: 30 @49756 has 2 MA's), (55, 49903), (59, 49933), (62, 49954), (77, 50065), (79, 50083), (84, 50125), (85, 50128), (91, 50164), (99, 50230), (118, 50335), (119, 50341), (121, 50362), (139, 50521),

Gene: Troje\_42 Start: 29091, Stop: 28273, Start Num: 25

Candidate Starts for Troje\_42:

(Start: 22 @29109 has 2 MA's), (Start: 25 @29091 has 38 MA's), (Start: 26 @29085 has 1 MA's), (52, 28935), (53, 28932), (62, 28872), (72, 28794), (77, 28761), (79, 28743), (84, 28701), (85, 28698), (91, 28662), (92, 28653), (99, 28596), (104, 28557), (113, 28512), (116, 28500), (118, 28488), (119, 28482), (123, 28434), (136, 28329),

Gene: Typhonomachy\_39 Start: 28227, Stop: 27409, Start Num: 25

Candidate Starts for Typhonomachy\_39:

(Start: 25 @28227 has 38 MA's), (52, 28071), (53, 28068), (60, 28020), (62, 28008), (72, 27930), (77, 27897), (78, 27882), (79, 27879), (84, 27837), (91, 27798), (92, 27789), (94, 27768), (99, 27732), (109, 27669), (119, 27618), (132, 27504), (136, 27465),

Gene: Vine\_44 Start: 30838, Stop: 30032, Start Num: 25

Candidate Starts for Vine\_44:

(Start: 25 @30838 has 38 MA's), (Start: 26 @30832 has 1 MA's), (45, 30730), (52, 30676), (62, 30613), (65, 30577), (77, 30502), (78, 30487), (84, 30442), (85, 30439), (91, 30403), (92, 30394), (99, 30337), (105, 30289), (106, 30286), (116, 30244), (129, 30151), (136, 30082),

Gene: Yakult\_42 Start: 29373, Stop: 28570, Start Num: 25

Candidate Starts for Yakult\_42:

(4, 29496), (6, 29466), (17, 29409), (Start: 24 @29376 has 12 MA's), (Start: 25 @29373 has 38 MA's), (45, 29274), (62, 29163), (65, 29127), (74, 29070), (77, 29052), (78, 29037), (79, 29034), (85, 28989), (91, 28953), (92, 28944), (109, 28824), (116, 28791), (118, 28779), (119, 28773), (121, 28752),

Gene: Yappy\_89 Start: 44513, Stop: 43758, Start Num: 33

Candidate Starts for Yappy\_89:

(27, 44546), (33, 44513), (42, 44447), (44, 44444), (47, 44411), (52, 44387), (57, 44369), (61, 44333), (83, 44168), (86, 44141), (87, 44138), (95, 44078), (96, 44075), (97, 44069), (98, 44060), (110, 43979), (114, 43958), (124, 43883), (130, 43847), (135, 43790),

Gene: Yarn\_37 Start: 28394, Stop: 27576, Start Num: 25

Candidate Starts for Yarn\_37:

(Start: 22 @28412 has 2 MA's), (Start: 25 @28394 has 38 MA's), (Start: 26 @28388 has 1 MA's), (52, 28238), (53, 28235), (60, 28187), (62, 28175), (72, 28097), (77, 28064), (79, 28046), (84, 28004), (85, 28001), (91, 27965), (92, 27956), (99, 27899), (104, 27860), (118, 27791), (119, 27785), (123, 27737),



(136, 27632),

Gene: Yeezus\_60 Start: 41211, Stop: 40471, Start Num: 32

Candidate Starts for Yeezus\_60:

(Start: 32 @41211 has 13 MA's), (35, 41181), (37, 41157), (40, 41145), (41, 41142), (43, 41136), (48, 41094), (50, 41085), (56, 41070), (58, 41061), (71, 40962), (73, 40947), (89, 40827), (93, 40809), (98, 40770), (101, 40761), (114, 40680), (120, 40653), (125, 40608), (126, 40605), (129, 40584), (133, 40539), (135, 40524),

Gene: Yummy\_42 Start: 28728, Stop: 27910, Start Num: 25

Candidate Starts for Yummy\_42:

(Start: 22 @28746 has 2 MA's), (Start: 25 @28728 has 38 MA's), (Start: 26 @28722 has 1 MA's), (52, 28572), (53, 28569), (62, 28509), (72, 28431), (77, 28398), (79, 28380), (84, 28338), (85, 28335), (91, 28299), (92, 28290), (99, 28233), (104, 28194), (113, 28149), (116, 28137), (118, 28125), (119, 28119), (136, 27966),

Gene: Zareef\_40 Start: 28654, Stop: 27842, Start Num: 24

Candidate Starts for Zareef\_40:

(9, 28726), (Start: 24 @28654 has 12 MA's), (62, 28438), (65, 28402), (72, 28360), (74, 28345), (77, 28327), (78, 28312), (79, 28309), (84, 28267), (92, 28219), (100, 28159), (104, 28126), (115, 28072), (118, 28057), (132, 27940),

Gene: Zuko\_81 Start: 61795, Stop: 62607, Start Num: 28

Candidate Starts for Zuko\_81:

(Start: 28 @61795 has 2 MA's), (39, 61870), (63, 62005), (72, 62074), (73, 62080), (77, 62107), (79, 62125), (93, 62218), (97, 62248), (99, 62272), (106, 62326), (107, 62329), (117, 62377), (119, 62386), (121, 62407), (127, 62482),