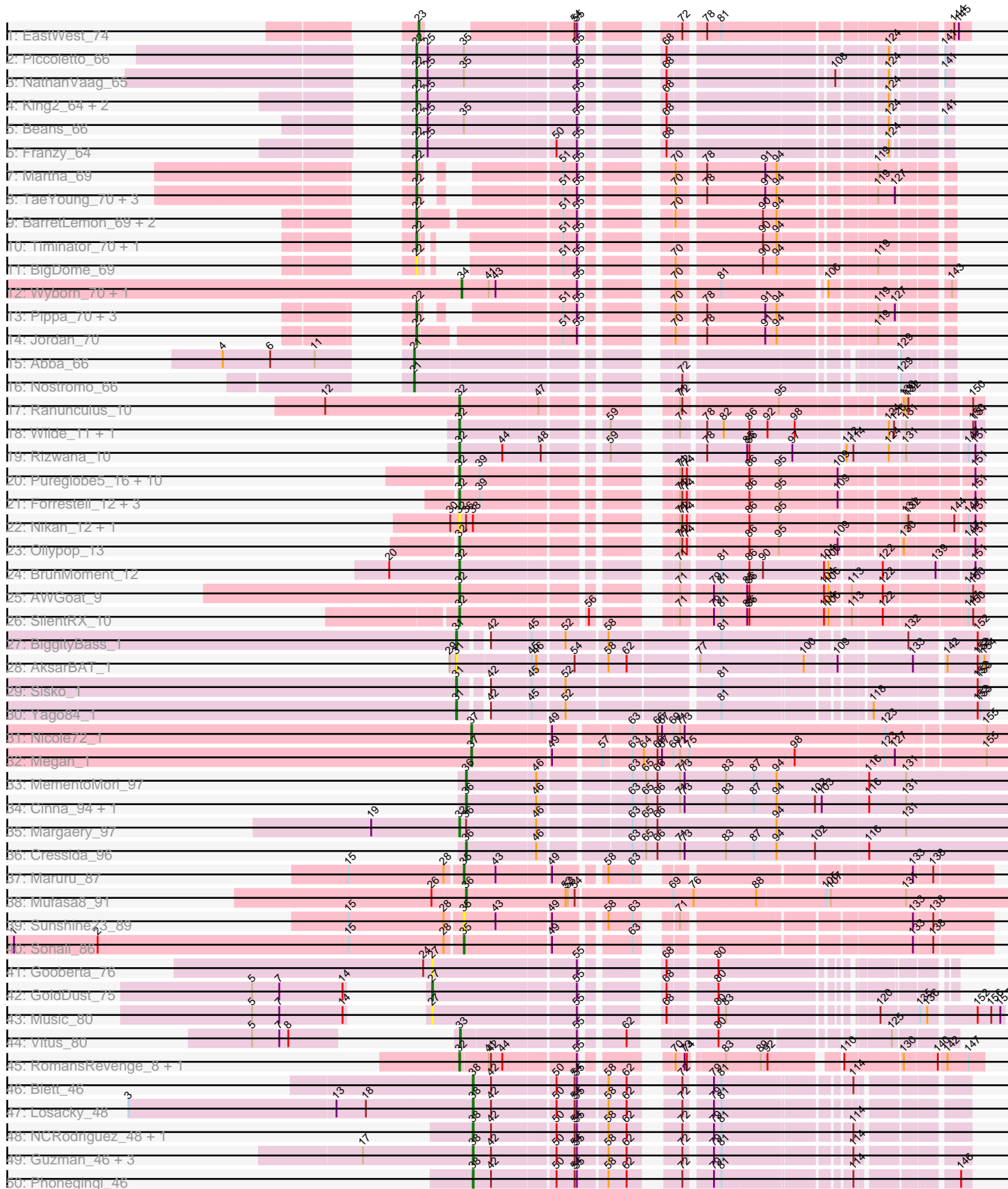
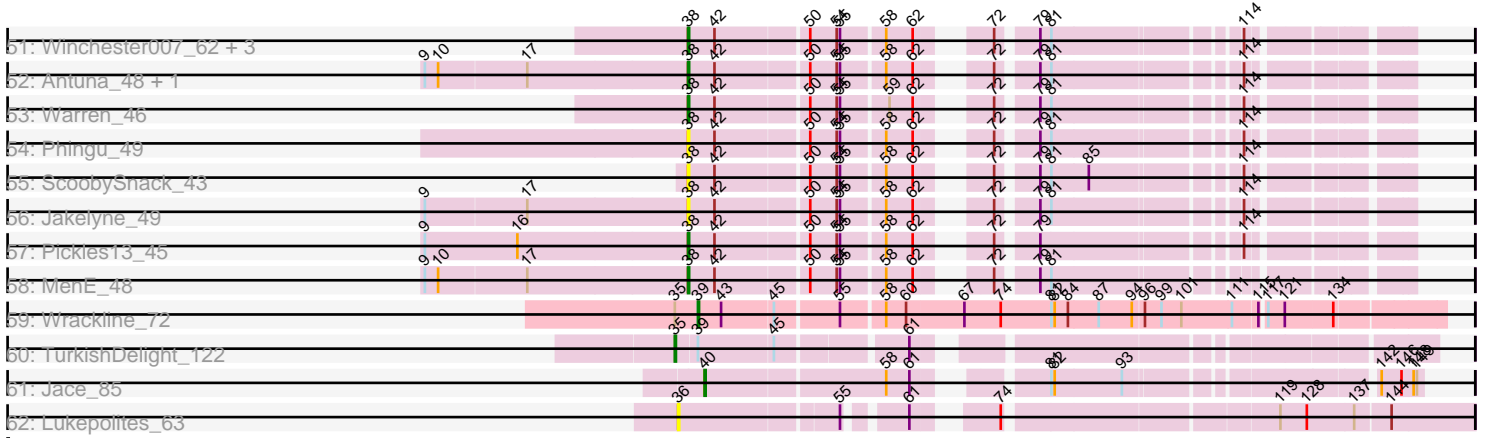


Pham 296429



Pham 296429



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 296429 Report

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

Pham number 296429 has 99 members, 25 are drafts.

Phages represented in each track:

- Track 1 : EastWest\_74
- Track 2 : Piccoletto\_66
- Track 3 : NathanVaag\_65
- Track 4 : King2\_64, Brent\_66, Jawnski\_65
- Track 5 : Beans\_66
- Track 6 : Franzy\_64
- Track 7 : Martha\_69
- Track 8 : TaeYoung\_70, JKerns\_69, Grekaycon\_70, BossLady\_71
- Track 9 : BarretLemon\_69, GravityBall\_69, StevieBAY\_70
- Track 10 : Timinator\_70, LeeroyJ\_70
- Track 11 : BigDome\_69
- Track 12 : Wyborn\_70, Sicarius2\_71
- Track 13 : Pippa\_70, Shade\_69, Sonny\_69, Zartrosa\_71
- Track 14 : Jordan\_70
- Track 15 : Abba\_66
- Track 16 : Nostromo\_66
- Track 17 : Ranunculus\_10
- Track 18 : Wilde\_11, Tank\_11
- Track 19 : Rizwana\_10
- Track 20 : Pureglobe5\_16, Hive\_13, PhuzzTulsa\_12, Kubulix\_15, DogYard\_14, Popstraw\_13, Odyssey395\_16, Beagle\_15, Pointis\_14, RIPWilbur\_12, BetaFish\_14
- Track 21 : Forrestell\_12, NyleyClemson\_12, MellowYellow\_12, RazzB\_11
- Track 22 : Nikan\_12, Ren19\_10
- Track 23 : Ollypop\_13
- Track 24 : BruhMoment\_12
- Track 25 : AWGoat\_9
- Track 26 : SilentRX\_10
- Track 27 : BiggityBass\_1
- Track 28 : AksarBAT\_1
- Track 29 : Sisko\_1
- Track 30 : Yago84\_1
- Track 31 : Nicole72\_1
- Track 32 : Megan\_1
- Track 33 : MementoMori\_97
- Track 34 : Cinna\_94, Matzah\_98
- Track 35 : Margaery\_97
- Track 36 : Cressida\_96

- Track 37 : Maruru\_87
- Track 38 : Mufasa8\_91
- Track 39 : Sunshine23\_89
- Track 40 : Sonali\_86
- Track 41 : Gooberta\_76
- Track 42 : GoldDust\_75
- Track 43 : Music\_80
- Track 44 : Vitus\_80
- Track 45 : RomansRevenge\_8, Boise\_8
- Track 46 : Blett\_46
- Track 47 : Losacky\_48
- Track 48 : NCRodriguez\_48, Bush\_47
- Track 49 : Guzman\_46, CookieDog\_46, Carrillo\_48, Violeta\_48
- Track 50 : Phonegingi\_46
- Track 51 : Winchester007\_62, Appa\_46, PhillyJawn\_47, Dropshot\_46
- Track 52 : Antuna\_48, Mariel\_49
- Track 53 : Warren\_46
- Track 54 : Phingu\_49
- Track 55 : ScoobySnack\_43
- Track 56 : Jakelyne\_49
- Track 57 : Pickles13\_45
- Track 58 : MenE\_48
- Track 59 : Wrackline\_72
- Track 60 : TurkishDelight\_122
- Track 61 : Jace\_85
- Track 62 : Lukepolites\_63

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

The start number called the most often in the published annotations is 22, it was called in 22 of the 74 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- BarretLemon\_69, Beans\_66, BigDome\_69, BossLady\_71, Brent\_66, Franzy\_64, GravityBall\_69, Grekaycon\_70, JKerns\_69, Jawnski\_65, Jordan\_70, King2\_64, LeeroyJ\_70, Martha\_69, NathanVaag\_65, Piccoletto\_66, Pippa\_70, Shade\_69, Sonny\_69, StevieBAY\_70, TaeYoung\_70, Timinator\_70, Zartrosa\_71,

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

- 

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

- AWGoat\_9, Abba\_66, AksarBAT\_1, Antuna\_48, Appa\_46, Beagle\_15, BetaFish\_14, BiggityBass\_1, Blett\_46, Boise\_8, BruhMoment\_12, Bush\_47, Carrillo\_48, Cinna\_94, CookieDog\_46, Cressida\_96, DogYard\_14, Dropshot\_46, EastWest\_74, Forrestell\_12, GoldDust\_75, Gooberta\_76, Guzman\_46, Hive\_13, Jace\_85, Jakelyne\_49, Kubulix\_15, Losacky\_48, Lukepolites\_63, Margaery\_97, Mariel\_49, Maruru\_87, Matzah\_98, Megan\_1, MellowYellow\_12, MementoMori\_97, MenE\_48, Mufasa8\_91, Music\_80, NCRodriguez\_48, Nicole72\_1, Nikan\_12, Nostromo\_66, NyleyClemson\_12, Odyssey395\_16, Ollypop\_13, PhillyJawn\_47, Phingu\_49,

Phonegingi\_46, PhuzzTulsa\_12, Pickles13\_45, Pointis\_14, Popstraw\_13, Pureglobe5\_16, RIPWilbur\_12, Ranunculus\_10, RazzB\_11, Ren19\_10, Rizwana\_10, RomansRevenge\_8, ScoobySnack\_43, Sicarius2\_71, SilentRX\_10, Sisko\_1, Sonali\_86, Sunshine23\_89, Tank\_11, TurkishDelight\_122, Violeta\_48, Vitus\_80, Warren\_46, Wilde\_11, Winchester007\_62, Wrackline\_72, Wyborn\_70, Yago84\_1,

### Summary by start number:

#### Start 21:

- Found in 2 of 99 ( 2.0% ) of genes in pham
- Manual Annotations of this start: 2 of 74
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Abba\_66 (AO3), Nostromo\_66 (AO3),

#### Start 22:

- Found in 23 of 99 ( 23.2% ) of genes in pham
- Manual Annotations of this start: 22 of 74
- Called 100.0% of time when present
- Phage (with cluster) where this start called: BarretLemon\_69 (AO2), Beans\_66 (AO1), BigDome\_69 (AO2), BossLady\_71 (AO2), Brent\_66 (AO1), Franzy\_64 (AO1), GravityBall\_69 (AO2), Grekaycon\_70 (AO2), JKerns\_69 (AO2), Jawnski\_65 (AO1), Jordan\_70 (AO2), King2\_64 (AO1), LeeroyJ\_70 (AO2), Martha\_69 (AO2), NathanVaag\_65 (AO1), Piccoletto\_66 (AO1), Pippa\_70 (AO2), Shade\_69 (AO2), Sonny\_69 (AO2), StevieBAY\_70 (AO2), TaeYoung\_70 (AO2), Timinator\_70 (AO2), Zartrosa\_71 (AO2),

#### Start 23:

- Found in 1 of 99 ( 1.0% ) of genes in pham
- Manual Annotations of this start: 1 of 74
- Called 100.0% of time when present
- Phage (with cluster) where this start called: EastWest\_74 (AO),

#### Start 27:

- Found in 3 of 99 ( 3.0% ) of genes in pham
- Manual Annotations of this start: 1 of 74
- Called 100.0% of time when present
- Phage (with cluster) where this start called: GoldDust\_75 (FL), Gooberta\_76 (FL), Music\_80 (FL),

#### Start 31:

- Found in 4 of 99 ( 4.0% ) of genes in pham
- Manual Annotations of this start: 3 of 74
- Called 100.0% of time when present
- Phage (with cluster) where this start called: AksarBAT\_1 (DR), BiggityBass\_1 (DR), Sisko\_1 (DR), Yago84\_1 (DR),

#### Start 32:

- Found in 28 of 99 ( 28.3% ) of genes in pham
- Manual Annotations of this start: 19 of 74
- Called 100.0% of time when present
- Phage (with cluster) where this start called: AWGoat\_9 (AP4), Beagle\_15 (AP2), BetaFish\_14 (AP2), Boise\_8 (FT), BruhMoment\_12 (AP3), DogYard\_14 (AP2), Forrestell\_12 (AP2), Hive\_13 (AP2), Kubulix\_15 (AP2), Margaery\_97 (EI),

MellowYellow\_12 (AP2), Nikan\_12 (AP2), NyleyClemson\_12 (AP2), Odyssey395\_16 (AP2), Ollypop\_13 (AP2), PhuzzTulsa\_12 (AP2), Pointis\_14 (AP2), Popstraw\_13 (AP2), Pureglobe5\_16 (AP2), RIPWilbur\_12 (AP2), Ranunculus\_10 (AP), RazzB\_11 (AP2), Ren19\_10 (AP2), Rizwana\_10 (AP1), RomansRevenge\_8 (FT), SilentRX\_10 (AP4), Tank\_11 (AP1), Wilde\_11 (AP1),

Start 33:

- Found in 1 of 99 ( 1.0% ) of genes in pham
- Manual Annotations of this start: 1 of 74
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Vitus\_80 (FL),

Start 34:

- Found in 2 of 99 ( 2.0% ) of genes in pham
- Manual Annotations of this start: 2 of 74
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Sicarius2\_71 (AO2), Wyborn\_70 (AO2),

Start 35:

- Found in 8 of 99 ( 8.1% ) of genes in pham
- Manual Annotations of this start: 3 of 74
- Called 50.0% of time when present
- Phage (with cluster) where this start called: Maruru\_87 (FG), Sonali\_86 (FG), Sunshine23\_89 (FG), TurkishDelight\_122 (singleton),

Start 36:

- Found in 9 of 99 ( 9.1% ) of genes in pham
- Manual Annotations of this start: 5 of 74
- Called 66.7% of time when present
- Phage (with cluster) where this start called: Cinna\_94 (EI), Cressida\_96 (EI), Lukepolites\_63 (singleton), Matzah\_98 (EI), MementoMori\_97 (EI), Mufasa8\_91 (FG),

Start 37:

- Found in 2 of 99 ( 2.0% ) of genes in pham
- Manual Annotations of this start: 2 of 74
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Megan\_1 (EC), Nicole72\_1 (EC),

Start 38:

- Found in 23 of 99 ( 23.2% ) of genes in pham
- Manual Annotations of this start: 11 of 74
- Called 91.3% of time when present
- Phage (with cluster) where this start called: Antuna\_48 (GA), Appa\_46 (GA), Blett\_46 (GA), Bush\_47 (GA), Carrillo\_48 (GA), CookieDog\_46 (GA), Dropshot\_46 (GA), Guzman\_46 (GA), Jakelyne\_49 (GA), Losacky\_48 (GA), Mariel\_49 (GA), MenE\_48 (GA), NCRodriguez\_48 (GA), PhillyJawn\_47 (GA), Phingu\_49 (GA), Phonegingi\_46 (GA), Pickles13\_45 (GA), ScoobySnack\_43 (GA), Violeta\_48 (GA), Warren\_46 (GA), Winchester007\_62 (GA),

Start 39:

- Found in 17 of 99 ( 17.2% ) of genes in pham
- Manual Annotations of this start: 1 of 74
- Called 5.9% of time when present

- Phage (with cluster) where this start called: Wrackline\_72 (GF),

Start 40:

- Found in 1 of 99 ( 1.0% ) of genes in pham
- Manual Annotations of this start: 1 of 74
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Jace\_85 (singleton),

### **Summary by clusters:**

There are 18 clusters represented in this pham: AO, singleton, EI, AO1, AP, AP2, DR, AP1, AP4, AP3, GF, EC, AO3, AO2, GA, FG, FT, FL,

Info for manual annotations of cluster AO:

- Start number 23 was manually annotated 1 time for cluster AO.

Info for manual annotations of cluster AO1:

- Start number 22 was manually annotated 7 times for cluster AO1.

Info for manual annotations of cluster AO2:

- Start number 22 was manually annotated 15 times for cluster AO2.
- Start number 34 was manually annotated 2 times for cluster AO2.

Info for manual annotations of cluster AO3:

- Start number 21 was manually annotated 2 times for cluster AO3.

Info for manual annotations of cluster AP:

- Start number 32 was manually annotated 1 time for cluster AP.

Info for manual annotations of cluster AP1:

- Start number 32 was manually annotated 3 times for cluster AP1.

Info for manual annotations of cluster AP2:

- Start number 32 was manually annotated 10 times for cluster AP2.

Info for manual annotations of cluster AP3:

- Start number 32 was manually annotated 1 time for cluster AP3.

Info for manual annotations of cluster AP4:

- Start number 32 was manually annotated 2 times for cluster AP4.

Info for manual annotations of cluster DR:

- Start number 31 was manually annotated 3 times for cluster DR.

Info for manual annotations of cluster EC:

- Start number 37 was manually annotated 2 times for cluster EC.

Info for manual annotations of cluster EI:

- Start number 32 was manually annotated 1 time for cluster EI.
- Start number 36 was manually annotated 4 times for cluster EI.

Info for manual annotations of cluster FG:

- Start number 35 was manually annotated 2 times for cluster FG.

- Start number 36 was manually annotated 1 time for cluster FG.

Info for manual annotations of cluster FL:

- Start number 27 was manually annotated 1 time for cluster FL.
- Start number 33 was manually annotated 1 time for cluster FL.

Info for manual annotations of cluster FT:

- Start number 32 was manually annotated 1 time for cluster FT.

Info for manual annotations of cluster GA:

- Start number 38 was manually annotated 11 times for cluster GA.

Info for manual annotations of cluster GF:

- Start number 39 was manually annotated 1 time for cluster GF.

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

Gene: AWGoat\_9 Start: 3580, Stop: 4173, Start Num: 32

Candidate Starts for AWGoat\_9:

(Start: 32 @3580 has 19 MA's), (71, 3808), (79, 3844), (81, 3853), (85, 3886), (86, 3889), (104, 3985), (106, 3991), (113, 4015), (122, 4051), (147, 4153), (150, 4159),

Gene: Abba\_66 Start: 41901, Stop: 42479, Start Num: 21

Candidate Starts for Abba\_66:

(4, 41721), (6, 41784), (11, 41841), (Start: 21 @41901 has 2 MA's), (129, 42423),

Gene: AksarBAT\_1 Start: 10, Stop: 633, Start Num: 31

Candidate Starts for AksarBAT\_1:

(29, 1), (Start: 31 @10 has 3 MA's), (45, 103), (46, 109), (54, 154), (58, 193), (62, 217), (77, 292), (100, 424), (109, 463), (133, 547), (142, 580), (152, 619), (153, 622), (154, 628),

Gene: Antuna\_48 Start: 29370, Stop: 29903, Start Num: 38

Candidate Starts for Antuna\_48:

(9, 29136), (10, 29148), (17, 29226), (Start: 38 @29370 has 11 MA's), (42, 29394), (50, 29472), (54, 29496), (55, 29499), (58, 29535), (62, 29559), (72, 29598), (79, 29628), (81, 29637), (114, 29784),

Gene: Appa\_46 Start: 29135, Stop: 29668, Start Num: 38

Candidate Starts for Appa\_46:

(Start: 38 @29135 has 11 MA's), (42, 29159), (50, 29237), (54, 29261), (55, 29264), (58, 29300), (62, 29324), (72, 29363), (79, 29393), (81, 29402), (114, 29549),

Gene: BarretLemon\_69 Start: 44545, Stop: 45120, Start Num: 22

Candidate Starts for BarretLemon\_69:

(Start: 22 @44545 has 22 MA's), (51, 44716), (55, 44734), (70, 44809), (90, 44911), (94, 44929),

Gene: Beagle\_15 Start: 4696, Stop: 5277, Start Num: 32

Candidate Starts for Beagle\_15:

(Start: 32 @4696 has 19 MA's), (Start: 39 @4723 has 1 MA's), (71, 4924), (72, 4927), (74, 4933), (86, 5002), (95, 5041), (109, 5116), (151, 5266),

Gene: Beans\_66 Start: 44464, Stop: 45042, Start Num: 22

Candidate Starts for Beans\_66:

(Start: 22 @44464 has 22 MA's), (25, 44479), (Start: 35 @44527 has 3 MA's), (55, 44668), (68, 44737), (124, 44980), (141, 45031),

Gene: BetaFish\_14 Start: 4896, Stop: 5477, Start Num: 32

Candidate Starts for BetaFish\_14:

(Start: 32 @4896 has 19 MA's), (Start: 39 @4923 has 1 MA's), (71, 5124), (72, 5127), (74, 5133), (86, 5202), (95, 5241), (109, 5316), (151, 5466),

Gene: BigDome\_69 Start: 44829, Stop: 45359, Start Num: 22

Candidate Starts for BigDome\_69:

(Start: 22 @44829 has 22 MA's), (51, 44955), (55, 44973), (70, 45048), (90, 45150), (94, 45168), (119, 45276),

Gene: BiggityBass\_1 Start: 1, Stop: 600, Start Num: 31

Candidate Starts for BiggityBass\_1:

(Start: 31 @1 has 3 MA's), (42, 28), (45, 79), (52, 118), (58, 169), (81, 295), (132, 508), (152, 586),

Gene: Blett\_46 Start: 29321, Stop: 29854, Start Num: 38

Candidate Starts for Blett\_46:

(Start: 38 @29321 has 11 MA's), (42, 29345), (50, 29423), (54, 29447), (55, 29450), (58, 29486), (62, 29510), (72, 29549), (79, 29579), (81, 29588), (114, 29735),

Gene: Boise\_8 Start: 3035, Stop: 3610, Start Num: 32

Candidate Starts for Boise\_8:

(Start: 32 @3035 has 19 MA's), (41, 3071), (42, 3074), (44, 3089), (55, 3179), (70, 3254), (73, 3266), (74, 3269), (83, 3308), (89, 3353), (92, 3362), (110, 3443), (130, 3512), (140, 3554), (142, 3563), (147, 3590),

Gene: BossLady\_71 Start: 45159, Stop: 45689, Start Num: 22

Candidate Starts for BossLady\_71:

(Start: 22 @45159 has 22 MA's), (51, 45285), (55, 45303), (70, 45378), (78, 45408), (91, 45483), (94, 45498), (119, 45606), (127, 45627),

Gene: Brent\_66 Start: 44549, Stop: 45127, Start Num: 22

Candidate Starts for Brent\_66:

(Start: 22 @44549 has 22 MA's), (25, 44564), (55, 44753), (68, 44822), (124, 45065),

Gene: BruhMoment\_12 Start: 4721, Stop: 5308, Start Num: 32

Candidate Starts for BruhMoment\_12:

(20, 4628), (Start: 32 @4721 has 19 MA's), (71, 4949), (81, 4994), (86, 5030), (90, 5048), (104, 5126), (106, 5132), (122, 5189), (139, 5255), (151, 5297),

Gene: Bush\_47 Start: 29269, Stop: 29802, Start Num: 38

Candidate Starts for Bush\_47:

(Start: 38 @29269 has 11 MA's), (42, 29293), (50, 29371), (54, 29395), (55, 29398), (58, 29434), (62, 29458), (72, 29497), (79, 29527), (81, 29536), (114, 29683),

Gene: Carrillo\_48 Start: 29243, Stop: 29776, Start Num: 38

Candidate Starts for Carrillo\_48:

(17, 29099), (Start: 38 @29243 has 11 MA's), (42, 29267), (50, 29345), (54, 29369), (55, 29372), (58, 29408), (62, 29432), (72, 29471), (79, 29501), (81, 29510), (114, 29657),

Gene: Cinna\_94 Start: 54580, Stop: 55263, Start Num: 36

Candidate Starts for Cinna\_94:

(Start: 36 @54580 has 5 MA's), (46, 54667), (63, 54775), (65, 54793), (66, 54808), (71, 54838), (73, 54844), (83, 54898), (87, 54934), (94, 54964), (102, 55015), (103, 55024), (116, 55081), (131, 55129),

Gene: CookieDog\_46 Start: 29243, Stop: 29776, Start Num: 38

Candidate Starts for CookieDog\_46:

(17, 29099), (Start: 38 @29243 has 11 MA's), (42, 29267), (50, 29345), (54, 29369), (55, 29372), (58, 29408), (62, 29432), (72, 29471), (79, 29501), (81, 29510), (114, 29657),

Gene: Cressida\_96 Start: 55174, Stop: 55857, Start Num: 36

Candidate Starts for Cressida\_96:

(Start: 36 @55174 has 5 MA's), (46, 55261), (63, 55369), (65, 55387), (66, 55402), (71, 55432), (73, 55438), (83, 55492), (87, 55528), (94, 55558), (102, 55609), (116, 55675),

Gene: DogYard\_14 Start: 4766, Stop: 5347, Start Num: 32

Candidate Starts for DogYard\_14:

(Start: 32 @4766 has 19 MA's), (Start: 39 @4793 has 1 MA's), (71, 4994), (72, 4997), (74, 5003), (86, 5072), (95, 5111), (109, 5186), (151, 5336),

Gene: Dropshot\_46 Start: 28970, Stop: 29503, Start Num: 38

Candidate Starts for Dropshot\_46:

(Start: 38 @28970 has 11 MA's), (42, 28994), (50, 29072), (54, 29096), (55, 29099), (58, 29135), (62, 29159), (72, 29198), (79, 29228), (81, 29237), (114, 29384),

Gene: EastWest\_74 Start: 43726, Stop: 44280, Start Num: 23

Candidate Starts for EastWest\_74:

(Start: 23 @43726 has 1 MA's), (54, 43861), (55, 43864), (72, 43951), (78, 43972), (81, 43990), (144, 44260), (145, 44266),

Gene: Forrestell\_12 Start: 4123, Stop: 4704, Start Num: 32

Candidate Starts for Forrestell\_12:

(Start: 32 @4123 has 19 MA's), (Start: 39 @4150 has 1 MA's), (71, 4351), (72, 4354), (74, 4360), (86, 4429), (95, 4468), (109, 4543), (151, 4693),

Gene: Franzy\_64 Start: 44565, Stop: 45143, Start Num: 22

Candidate Starts for Franzy\_64:

(Start: 22 @44565 has 22 MA's), (25, 44580), (50, 44742), (55, 44769), (68, 44838), (124, 45081),

Gene: GoldDust\_75 Start: 47538, Stop: 48089, Start Num: 27

Candidate Starts for GoldDust\_75:

(5, 47406), (7, 47442), (14, 47526), (Start: 27 @47538 has 1 MA's), (55, 47721), (68, 47787), (80, 47841),

Gene: Gooberta\_76 Start: 48265, Stop: 48816, Start Num: 27

Candidate Starts for Gooberta\_76:

(24, 48253), (Start: 27 @48265 has 1 MA's), (55, 48448), (68, 48514), (80, 48568),

Gene: GravityBall\_69 Start: 44845, Stop: 45375, Start Num: 22

Candidate Starts for GravityBall\_69:

(Start: 22 @44845 has 22 MA's), (51, 44971), (55, 44989), (70, 45064), (90, 45166), (94, 45184),

Gene: Grekaycon\_70 Start: 45072, Stop: 45602, Start Num: 22

Candidate Starts for Grekaycon\_70:

(Start: 22 @45072 has 22 MA's), (51, 45198), (55, 45216), (70, 45291), (78, 45321), (91, 45396), (94, 45411), (119, 45519), (127, 45540),

Gene: Guzman\_46 Start: 29226, Stop: 29759, Start Num: 38

Candidate Starts for Guzman\_46:

(17, 29082), (Start: 38 @29226 has 11 MA's), (42, 29250), (50, 29328), (54, 29352), (55, 29355), (58, 29391), (62, 29415), (72, 29454), (79, 29484), (81, 29493), (114, 29640),

Gene: Hive\_13 Start: 4780, Stop: 5361, Start Num: 32

Candidate Starts for Hive\_13:

(Start: 32 @4780 has 19 MA's), (Start: 39 @4807 has 1 MA's), (71, 5008), (72, 5011), (74, 5017), (86, 5086), (95, 5125), (109, 5200), (151, 5350),

Gene: JKerns\_69 Start: 45051, Stop: 45626, Start Num: 22

Candidate Starts for JKerns\_69:

(Start: 22 @45051 has 22 MA's), (51, 45222), (55, 45240), (70, 45315), (78, 45345), (91, 45420), (94, 45435), (119, 45543), (127, 45564),

Gene: Jace\_85 Start: 47046, Stop: 47594, Start Num: 40

Candidate Starts for Jace\_85:

(Start: 40 @47046 has 1 MA's), (58, 47202), (61, 47223), (81, 47304), (82, 47307), (93, 47367), (142, 47559), (146, 47577), (148, 47586), (149, 47589),

Gene: Jakelyne\_49 Start: 29336, Stop: 29869, Start Num: 38

Candidate Starts for Jakelyne\_49:

(9, 29102), (17, 29192), (Start: 38 @29336 has 11 MA's), (42, 29360), (50, 29438), (54, 29462), (55, 29465), (58, 29501), (62, 29525), (72, 29564), (79, 29594), (81, 29603), (114, 29750),

Gene: Jawnski\_65 Start: 44074, Stop: 44652, Start Num: 22

Candidate Starts for Jawnski\_65:

(Start: 22 @44074 has 22 MA's), (25, 44089), (55, 44278), (68, 44347), (124, 44590),

Gene: Jordan\_70 Start: 45176, Stop: 45751, Start Num: 22

Candidate Starts for Jordan\_70:

(Start: 22 @45176 has 22 MA's), (51, 45347), (55, 45365), (70, 45440), (78, 45470), (91, 45545), (94, 45560), (119, 45668),

Gene: King2\_64 Start: 44610, Stop: 45188, Start Num: 22

Candidate Starts for King2\_64:

(Start: 22 @44610 has 22 MA's), (25, 44625), (55, 44814), (68, 44883), (124, 45126),

Gene: Kubulix\_15 Start: 4895, Stop: 5476, Start Num: 32

Candidate Starts for Kubulix\_15:

(Start: 32 @4895 has 19 MA's), (Start: 39 @4922 has 1 MA's), (71, 5123), (72, 5126), (74, 5132), (86, 5201), (95, 5240), (109, 5315), (151, 5465),

Gene: LeeroyJ\_70 Start: 44774, Stop: 45304, Start Num: 22

Candidate Starts for LeeroyJ\_70:

(Start: 22 @44774 has 22 MA's), (51, 44900), (55, 44918), (90, 45095), (94, 45113),

Gene: Losacky\_48 Start: 29501, Stop: 30034, Start Num: 38

Candidate Starts for Losacky\_48:

(3, 29048), (13, 29321), (18, 29360), (Start: 38 @29501 has 11 MA's), (42, 29525), (50, 29603), (54, 29627), (55, 29630), (58, 29666), (62, 29690), (72, 29729), (79, 29759), (81, 29768),

Gene: Lukepolites\_63 Start: 41719, Stop: 42342, Start Num: 36

Candidate Starts for Lukepolites\_63:

(Start: 36 @41719 has 5 MA's), (55, 41854), (61, 41896), (74, 41947), (119, 42172), (128, 42196), (137, 42238), (144, 42268),

Gene: Margaery\_97 Start: 55238, Stop: 55930, Start Num: 32

Candidate Starts for Margaery\_97:

(19, 55121), (Start: 32 @55238 has 19 MA's), (Start: 36 @55247 has 5 MA's), (46, 55334), (63, 55442), (65, 55460), (66, 55475), (94, 55631), (131, 55796),

Gene: Mariel\_49 Start: 29708, Stop: 30241, Start Num: 38

Candidate Starts for Mariel\_49:

(9, 29474), (10, 29486), (17, 29564), (Start: 38 @29708 has 11 MA's), (42, 29732), (50, 29810), (54, 29834), (55, 29837), (58, 29873), (62, 29897), (72, 29936), (79, 29966), (81, 29975), (114, 30122),

Gene: Martha\_69 Start: 45008, Stop: 45538, Start Num: 22

Candidate Starts for Martha\_69:

(Start: 22 @45008 has 22 MA's), (51, 45134), (55, 45152), (70, 45227), (78, 45257), (91, 45332), (94, 45347), (119, 45455),

Gene: Maruru\_87 Start: 52831, Stop: 53424, Start Num: 35

Candidate Starts for Maruru\_87:

(15, 52684), (28, 52810), (Start: 35 @52831 has 3 MA's), (43, 52873), (49, 52939), (58, 52993), (63, 53023), (133, 53326), (138, 53350),

Gene: Matzah\_98 Start: 54900, Stop: 55583, Start Num: 36

Candidate Starts for Matzah\_98:

(Start: 36 @54900 has 5 MA's), (46, 54987), (63, 55095), (65, 55113), (66, 55128), (71, 55158), (73, 55164), (83, 55218), (87, 55254), (94, 55284), (102, 55335), (103, 55344), (116, 55401), (131, 55449),

Gene: Megan\_1 Start: 1, Stop: 666, Start Num: 37

Candidate Starts for Megan\_1:

(Start: 37 @1 has 2 MA's), (49, 97), (57, 154), (63, 190), (64, 205), (66, 223), (67, 229), (69, 244), (71, 253), (75, 265), (98, 403), (123, 517), (127, 529), (155, 637),

Gene: MellowYellow\_12 Start: 4153, Stop: 4734, Start Num: 32

Candidate Starts for MellowYellow\_12:

(Start: 32 @4153 has 19 MA's), (Start: 39 @4180 has 1 MA's), (71, 4381), (72, 4384), (74, 4390), (86, 4459), (95, 4498), (109, 4573), (151, 4723),

Gene: MementoMori\_97 Start: 54789, Stop: 55472, Start Num: 36

Candidate Starts for MementoMori\_97:

(Start: 36 @54789 has 5 MA's), (46, 54876), (63, 54984), (65, 55002), (66, 55017), (71, 55047), (73, 55053), (83, 55107), (87, 55143), (94, 55173), (116, 55290), (131, 55338),

Gene: MenE\_48 Start: 29392, Stop: 29925, Start Num: 38

Candidate Starts for MenE\_48:

(9, 29158), (10, 29170), (17, 29248), (Start: 38 @29392 has 11 MA's), (42, 29416), (50, 29494), (54, 29518), (55, 29521), (58, 29557), (62, 29581), (72, 29620), (79, 29650), (81, 29659),

Gene: Mufasa8\_91 Start: 53065, Stop: 53769, Start Num: 36

Candidate Starts for Mufasa8\_91:

(26, 53020), (Start: 36 @53065 has 5 MA's), (52, 53197), (53, 53200), (54, 53209), (69, 53332), (76, 53359), (88, 53440), (105, 53530), (107, 53536), (131, 53635),

Gene: Music\_80 Start: 47968, Stop: 48591, Start Num: 27

Candidate Starts for Music\_80:

(5, 47836), (7, 47872), (14, 47956), (Start: 27 @47968 has 1 MA's), (55, 48151), (68, 48217), (80, 48271), (83, 48280), (120, 48445), (135, 48493), (136, 48502), (152, 48556), (156, 48574), (157, 48586),

Gene: NCRodriguez\_48 Start: 29462, Stop: 29995, Start Num: 38

Candidate Starts for NCRodriguez\_48:

(Start: 38 @29462 has 11 MA's), (42, 29486), (50, 29564), (54, 29588), (55, 29591), (58, 29627), (62, 29651), (72, 29690), (79, 29720), (81, 29729), (114, 29876),

Gene: NathanVaag\_65 Start: 44298, Stop: 44876, Start Num: 22

Candidate Starts for NathanVaag\_65:

(Start: 22 @44298 has 22 MA's), (25, 44313), (Start: 35 @44361 has 3 MA's), (55, 44502), (68, 44571), (108, 44763), (124, 44814), (141, 44865),

Gene: Nicole72\_1 Start: 1, Stop: 666, Start Num: 37

Candidate Starts for Nicole72\_1:

(Start: 37 @1 has 2 MA's), (49, 97), (63, 190), (66, 223), (67, 229), (69, 244), (71, 253), (73, 259), (123, 517), (155, 637),

Gene: Nikan\_12 Start: 4634, Stop: 5215, Start Num: 32

Candidate Starts for Nikan\_12:

(30, 4622), (Start: 32 @4634 has 19 MA's), (Start: 36 @4643 has 5 MA's), (Start: 38 @4652 has 11 MA's), (71, 4862), (72, 4865), (74, 4871), (86, 4940), (95, 4979), (131, 5126), (132, 5129), (144, 5183), (147, 5195), (151, 5204),

Gene: Nostromo\_66 Start: 42650, Stop: 43228, Start Num: 21

Candidate Starts for Nostromo\_66:

(Start: 21 @42650 has 2 MA's), (72, 42941), (129, 43172),

Gene: NyleyClemson\_12 Start: 4095, Stop: 4676, Start Num: 32

Candidate Starts for NyleyClemson\_12:

(Start: 32 @4095 has 19 MA's), (Start: 39 @4122 has 1 MA's), (71, 4323), (72, 4326), (74, 4332), (86, 4401), (95, 4440), (109, 4515), (151, 4665),

Gene: Odyssey395\_16 Start: 4894, Stop: 5475, Start Num: 32

Candidate Starts for Odyssey395\_16:

(Start: 32 @4894 has 19 MA's), (Start: 39 @4921 has 1 MA's), (71, 5122), (72, 5125), (74, 5131), (86, 5200), (95, 5239), (109, 5314), (151, 5464),

Gene: Ollypop\_13 Start: 4602, Stop: 5183, Start Num: 32

Candidate Starts for Ollypop\_13:

(Start: 32 @4602 has 19 MA's), (71, 4830), (72, 4833), (74, 4839), (86, 4908), (95, 4947), (109, 5022), (130, 5091), (147, 5163), (151, 5172),

Gene: PhillyJawn\_47 Start: 29132, Stop: 29665, Start Num: 38

Candidate Starts for PhillyJawn\_47:

(Start: 38 @29132 has 11 MA's), (42, 29156), (50, 29234), (54, 29258), (55, 29261), (58, 29297), (62, 29321), (72, 29360), (79, 29390), (81, 29399), (114, 29546),

Gene: Phingu\_49 Start: 29357, Stop: 29890, Start Num: 38

Candidate Starts for Phingu\_49:

(Start: 38 @29357 has 11 MA's), (42, 29381), (50, 29459), (54, 29483), (55, 29486), (58, 29522), (62, 29546), (72, 29585), (79, 29615), (81, 29624), (114, 29771),

Gene: Phonegingi\_46 Start: 29171, Stop: 29704, Start Num: 38

Candidate Starts for Phonegingi\_46:

(Start: 38 @29171 has 11 MA's), (42, 29195), (50, 29273), (54, 29297), (55, 29300), (58, 29336), (62, 29360), (72, 29399), (79, 29429), (81, 29438), (114, 29585), (146, 29693),

Gene: PhuzzTulsa\_12 Start: 4684, Stop: 5265, Start Num: 32

Candidate Starts for PhuzzTulsa\_12:

(Start: 32 @4684 has 19 MA's), (Start: 39 @4711 has 1 MA's), (71, 4912), (72, 4915), (74, 4921), (86, 4990), (95, 5029), (109, 5104), (151, 5254),

Gene: Piccoletto\_66 Start: 44460, Stop: 45038, Start Num: 22

Candidate Starts for Piccoletto\_66:

(Start: 22 @44460 has 22 MA's), (25, 44475), (Start: 35 @44523 has 3 MA's), (55, 44664), (68, 44733), (124, 44976), (141, 45027),

Gene: Pickles13\_45 Start: 29439, Stop: 29972, Start Num: 38

Candidate Starts for Pickles13\_45:

(9, 29202), (16, 29286), (Start: 38 @29439 has 11 MA's), (42, 29463), (50, 29541), (54, 29565), (55, 29568), (58, 29604), (62, 29628), (72, 29667), (79, 29697), (114, 29853),

Gene: Pippa\_70 Start: 45043, Stop: 45573, Start Num: 22

Candidate Starts for Pippa\_70:

(Start: 22 @45043 has 22 MA's), (51, 45169), (55, 45187), (70, 45262), (78, 45292), (91, 45367), (94, 45382), (119, 45490), (127, 45511),

Gene: Pointis\_14 Start: 4895, Stop: 5476, Start Num: 32

Candidate Starts for Pointis\_14:

(Start: 32 @4895 has 19 MA's), (Start: 39 @4922 has 1 MA's), (71, 5123), (72, 5126), (74, 5132), (86, 5201), (95, 5240), (109, 5315), (151, 5465),

Gene: Popstraw\_13 Start: 4684, Stop: 5265, Start Num: 32

Candidate Starts for Popstraw\_13:

(Start: 32 @4684 has 19 MA's), (Start: 39 @4711 has 1 MA's), (71, 4912), (72, 4915), (74, 4921), (86, 4990), (95, 5029), (109, 5104), (151, 5254),

Gene: Pureglobe5\_16 Start: 4908, Stop: 5489, Start Num: 32

Candidate Starts for Pureglobe5\_16:

(Start: 32 @4908 has 19 MA's), (Start: 39 @4935 has 1 MA's), (71, 5136), (72, 5139), (74, 5145), (86, 5214), (95, 5253), (109, 5328), (151, 5478),

Gene: RIPWilbur\_12 Start: 4548, Stop: 5129, Start Num: 32

Candidate Starts for RIPWilbur\_12:

(Start: 32 @4548 has 19 MA's), (Start: 39 @4575 has 1 MA's), (71, 4776), (72, 4779), (74, 4785), (86, 4854), (95, 4893), (109, 4968), (151, 5118),

Gene: Ranunculus\_10 Start: 4388, Stop: 4969, Start Num: 32

Candidate Starts for Ranunculus\_10:

(12, 4211), (Start: 32 @4388 has 19 MA's), (47, 4490), (71, 4616), (72, 4619), (95, 4733), (130, 4877), (131, 4880), (132, 4883), (150, 4955),

Gene: RazzB\_11 Start: 3923, Stop: 4504, Start Num: 32

Candidate Starts for RazzB\_11:

(Start: 32 @3923 has 19 MA's), (Start: 39 @3950 has 1 MA's), (71, 4151), (72, 4154), (74, 4160), (86, 4229), (95, 4268), (109, 4343), (151, 4493),

Gene: Ren19\_10 Start: 4634, Stop: 5215, Start Num: 32

Candidate Starts for Ren19\_10:

(30, 4622), (Start: 32 @4634 has 19 MA's), (Start: 36 @4643 has 5 MA's), (Start: 38 @4652 has 11 MA's), (71, 4862), (72, 4865), (74, 4871), (86, 4940), (95, 4979), (131, 5126), (132, 5129), (144, 5183), (147, 5195), (151, 5204),

Gene: Rizwana\_10 Start: 4484, Stop: 5074, Start Num: 32

Candidate Starts for Rizwana\_10:

(Start: 32 @4484 has 19 MA's), (44, 4541), (48, 4589), (59, 4655), (78, 4739), (85, 4790), (86, 4793), (97, 4850), (112, 4913), (114, 4922), (124, 4964), (131, 4982), (147, 5054), (151, 5063),

Gene: RomansRevenge\_8 Start: 3035, Stop: 3610, Start Num: 32

Candidate Starts for RomansRevenge\_8:

(Start: 32 @3035 has 19 MA's), (41, 3071), (42, 3074), (44, 3089), (55, 3179), (70, 3254), (73, 3266), (74, 3269), (83, 3308), (89, 3353), (92, 3362), (110, 3443), (130, 3512), (140, 3554), (142, 3563), (147, 3590),

Gene: ScoobySnack\_43 Start: 28932, Stop: 29465, Start Num: 38

Candidate Starts for ScoobySnack\_43:

(Start: 38 @28932 has 11 MA's), (42, 28956), (50, 29034), (54, 29058), (55, 29061), (58, 29097), (62, 29121), (72, 29160), (79, 29190), (81, 29199), (85, 29232), (114, 29346),

Gene: Shade\_69 Start: 44814, Stop: 45389, Start Num: 22

Candidate Starts for Shade\_69:

(Start: 22 @44814 has 22 MA's), (51, 44985), (55, 45003), (70, 45078), (78, 45108), (91, 45183), (94, 45198), (119, 45306), (127, 45327),

Gene: Sicarius2\_71 Start: 43199, Stop: 43729, Start Num: 34

Candidate Starts for Sicarius2\_71:

(Start: 34 @43199 has 2 MA's), (41, 43235), (43, 43244), (55, 43343), (70, 43421), (81, 43469), (106, 43592), (143, 43724),

Gene: SilentRX\_10 Start: 3301, Stop: 3894, Start Num: 32

Candidate Starts for SilentRX\_10:

(Start: 32 @3301 has 19 MA's), (56, 3454), (71, 3529), (79, 3565), (81, 3574), (85, 3607), (86, 3610), (104, 3706), (106, 3712), (113, 3736), (122, 3772), (147, 3874), (150, 3880),

Gene: Sisko\_1 Start: 1, Stop: 600, Start Num: 31

Candidate Starts for Sisko\_1:

(Start: 31 @1 has 3 MA's), (42, 28), (45, 79), (52, 118), (81, 295), (152, 586), (153, 589),

Gene: Sonali\_86 Start: 53450, Stop: 54043, Start Num: 35

Candidate Starts for Sonali\_86:

(1, 52859), (2, 52970), (15, 53303), (28, 53429), (Start: 35 @53450 has 3 MA's), (49, 53558), (63, 53642), (133, 53945), (138, 53969),

Gene: Sonny\_69 Start: 44737, Stop: 45312, Start Num: 22

Candidate Starts for Sonny\_69:

(Start: 22 @44737 has 22 MA's), (51, 44908), (55, 44926), (70, 45001), (78, 45031), (91, 45106), (94, 45121), (119, 45229), (127, 45250),

Gene: StevieBAY\_70 Start: 45067, Stop: 45597, Start Num: 22

Candidate Starts for StevieBAY\_70:

(Start: 22 @45067 has 22 MA's), (51, 45193), (55, 45211), (70, 45286), (90, 45388), (94, 45406),

Gene: Sunshine23\_89 Start: 53186, Stop: 53779, Start Num: 35

Candidate Starts for Sunshine23\_89:

(15, 53039), (28, 53165), (Start: 35 @53186 has 3 MA's), (43, 53228), (49, 53294), (58, 53348), (63, 53378), (71, 53408), (133, 53681), (138, 53705),

Gene: TaeYoung\_70 Start: 44980, Stop: 45510, Start Num: 22

Candidate Starts for TaeYoung\_70:

(Start: 22 @44980 has 22 MA's), (51, 45106), (55, 45124), (70, 45199), (78, 45229), (91, 45304), (94, 45319), (119, 45427), (127, 45448),

Gene: Tank\_11 Start: 4502, Stop: 5092, Start Num: 32

Candidate Starts for Tank\_11:

(Start: 32 @4502 has 19 MA's), (59, 4673), (71, 4730), (78, 4757), (82, 4778), (86, 4811), (92, 4835), (98, 4871), (124, 4982), (126, 4988), (131, 5000), (150, 5078), (151, 5081),

Gene: Timinator\_70 Start: 44887, Stop: 45417, Start Num: 22

Candidate Starts for Timinator\_70:

(Start: 22 @44887 has 22 MA's), (51, 45013), (55, 45031), (90, 45208), (94, 45226),

Gene: TurkishDelight\_122 Start: 89500, Stop: 90093, Start Num: 35

Candidate Starts for TurkishDelight\_122:

(Start: 35 @89500 has 3 MA's), (Start: 39 @89518 has 1 MA's), (45, 89584), (61, 89689),

Gene: Violeta\_48 Start: 29234, Stop: 29767, Start Num: 38

Candidate Starts for Violeta\_48:

(17, 29090), (Start: 38 @29234 has 11 MA's), (42, 29258), (50, 29336), (54, 29360), (55, 29363), (58, 29399), (62, 29423), (72, 29462), (79, 29492), (81, 29501), (114, 29648),

Gene: Vitus\_80 Start: 46317, Stop: 46829, Start Num: 33

Candidate Starts for Vitus\_80:

(5, 46197), (7, 46233), (8, 46245), (Start: 33 @46317 has 1 MA's), (55, 46458), (62, 46503), (80, 46578), (125, 46764),

Gene: Warren\_46 Start: 29178, Stop: 29711, Start Num: 38

Candidate Starts for Warren\_46:

(Start: 38 @29178 has 11 MA's), (42, 29202), (50, 29280), (54, 29304), (55, 29307), (59, 29346), (62, 29367), (72, 29406), (79, 29436), (81, 29445), (114, 29592),

Gene: Wilde\_11 Start: 4430, Stop: 5020, Start Num: 32

Candidate Starts for Wilde\_11:

(Start: 32 @4430 has 19 MA's), (59, 4601), (71, 4658), (78, 4685), (82, 4706), (86, 4739), (92, 4763), (98, 4799), (124, 4910), (126, 4916), (131, 4928), (150, 5006), (151, 5009),

Gene: Winchester007\_62 Start: 35247, Stop: 35780, Start Num: 38

Candidate Starts for Winchester007\_62:

(Start: 38 @35247 has 11 MA's), (42, 35271), (50, 35349), (54, 35373), (55, 35376), (58, 35412), (62, 35436), (72, 35475), (79, 35505), (81, 35514), (114, 35661),

Gene: Wrackline\_72 Start: 37846, Stop: 38481, Start Num: 39

Candidate Starts for Wrackline\_72:

(Start: 35 @37825 has 3 MA's), (Start: 39 @37846 has 1 MA's), (43, 37867), (45, 37912), (55, 37966), (58, 38002), (60, 38020), (67, 38071), (74, 38104), (81, 38149), (82, 38152), (84, 38164), (87, 38191), (94, 38221), (96, 38230), (99, 38245), (101, 38263), (111, 38308), (115, 38329), (117, 38332), (121, 38347), (134, 38389),

Gene: Wyborn\_70 Start: 43934, Stop: 44464, Start Num: 34

Candidate Starts for Wyborn\_70:

(Start: 34 @43934 has 2 MA's), (41, 43970), (43, 43979), (55, 44078), (70, 44156), (81, 44204), (106, 44327), (143, 44459),

Gene: Yago84\_1 Start: 1, Stop: 600, Start Num: 31

Candidate Starts for Yago84\_1:

(Start: 31 @1 has 3 MA's), (42, 28), (45, 79), (52, 118), (81, 295), (118, 463), (152, 586), (153, 589),

Gene: Zartrosa\_71 Start: 45067, Stop: 45642, Start Num: 22

Candidate Starts for Zartrosa\_71:

(Start: 22 @45067 has 22 MA's), (51, 45238), (55, 45256), (70, 45331), (78, 45361), (91, 45436), (94, 45451), (119, 45559), (127, 45580),