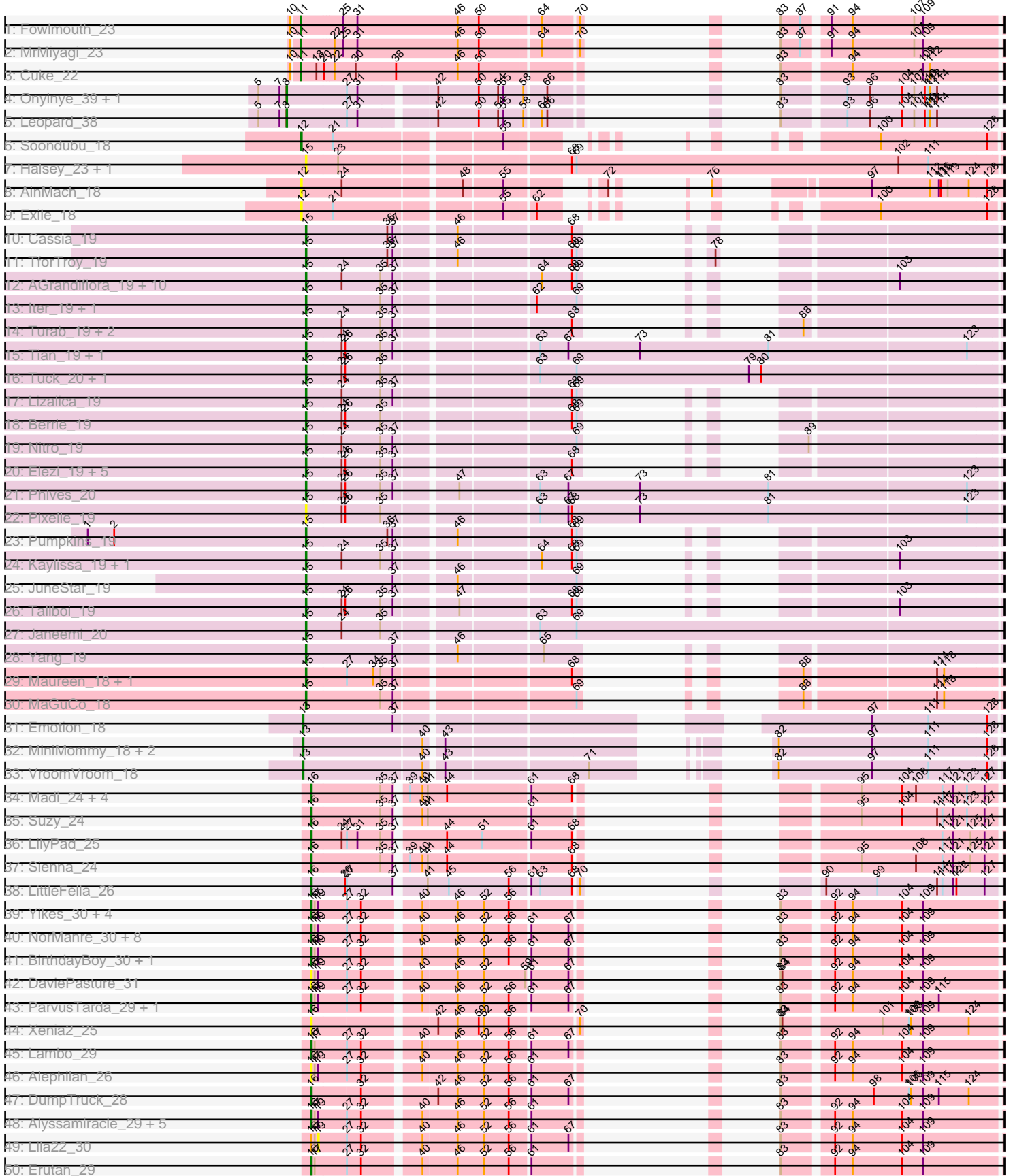
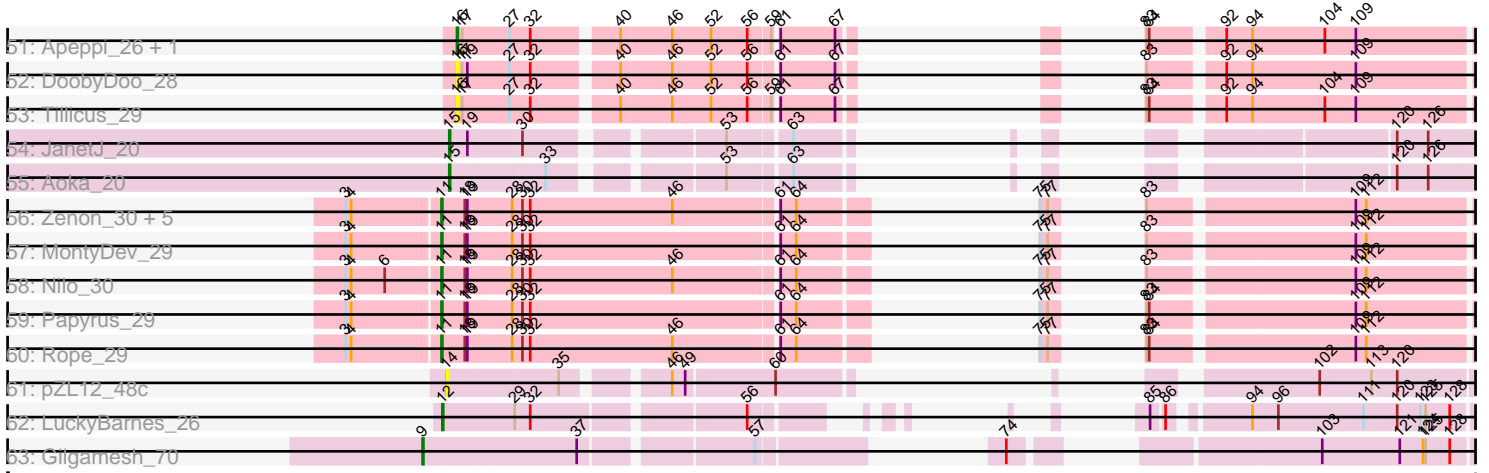


# Zoomed Pham 171310



# Zoomed Pham 171310



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 171310 Report

This analysis was run 07/10/24 on database version 566.

Pham number 171310 has 118 members, 30 are drafts.

Phages represented in each track:

- Track 1 : Fowlmouth\_23
- Track 2 : MrMiyagi\_23
- Track 3 : Cuke\_22
- Track 4 : Onyinye\_39, Aikoy\_38
- Track 5 : Leopard\_38
- Track 6 : Soondubu\_18
- Track 7 : Halsey\_23, Moss\_21
- Track 8 : AinMach\_18
- Track 9 : Exile\_18
- Track 10 : Cassia\_19
- Track 11 : TforTroy\_19
- Track 12 : AGrandiflora\_19, Mudpuppy\_20, Lego\_19, YesChef\_19, Powerpuff\_19, Warda\_19, Tutumahutu\_19, Tbone\_19, Cyan\_19, Joemato\_21, Simpson\_21
- Track 13 : Iter\_19, Ascela\_19
- Track 14 : Turab\_19, Adumb2043\_19, AEgle\_19
- Track 15 : Tian\_19, Amyev\_19
- Track 16 : Tuck\_20, Community\_19
- Track 17 : Lizalica\_19
- Track 18 : Berrie\_19
- Track 19 : Nitro\_19
- Track 20 : Elezi\_19, Eraser\_19, London\_19, Jstan\_20, Niobe\_19, Asa16\_19
- Track 21 : Phives\_20
- Track 22 : Pixelle\_19
- Track 23 : Pumpkins\_19
- Track 24 : Kaylissa\_19, JohnDoe\_19
- Track 25 : JuneStar\_19
- Track 26 : Tallboi\_19
- Track 27 : Janeemi\_20
- Track 28 : Yang\_19
- Track 29 : Maureen\_18, Liebe\_18
- Track 30 : MaGuCo\_18
- Track 31 : Emotion\_18
- Track 32 : MiniMommy\_18, JasmineDragon\_18, ShakeltOph\_19
- Track 33 : VroomVroom\_18
- Track 34 : Madi\_24, BiteSize\_24, Terapin\_24, Beyoncage\_24, Djokovic\_24
- Track 35 : Suzy\_24
- Track 36 : LilyPad\_25

- Track 37 : Sienna\_24
- Track 38 : LittleFella\_26
- Track 39 : Yikes\_30, Sampudon\_29, OtterstedtS21\_29, MoiGyank\_32, Jalebi\_28
- Track 40 : NorManre\_30, Sadboi\_29, Fulcrum\_30, Gibbin\_30, Mima20\_29, Patos\_30, GretellLyn\_29, GOATification\_30, Ranch\_29
- Track 41 : BirthdayBoy\_30, Zany\_28
- Track 42 : DaviePasture\_31
- Track 43 : ParvusTarda\_29, Wojtek\_28
- Track 44 : Xenia2\_25
- Track 45 : Lambo\_29
- Track 46 : Alephilan\_26
- Track 47 : DumpTruck\_28
- Track 48 : Alyssmiracle\_29, Avian\_27, Genamy16\_29, Rumi\_28, Jamemuya19\_27, NovaSharks\_28
- Track 49 : Lila22\_30
- Track 50 : Erutan\_29
- Track 51 : Apeppi\_26, LuckyLeo\_28
- Track 52 : DoobyDoo\_28
- Track 53 : Tillicus\_29
- Track 54 : JanetJ\_20
- Track 55 : Aoka\_20
- Track 56 : Zenon\_30, Yelo\_29, Send513\_29, Candle\_29, Weiss13\_29, Riparian\_29
- Track 57 : MontyDev\_29
- Track 58 : Nilo\_30
- Track 59 : Papyrus\_29
- Track 60 : Rope\_29
- Track 61 : pZL12\_48c
- Track 62 : LuckyBarnes\_26
- Track 63 : Gilgamesh\_70

***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 34 of the 88 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- AEgle\_19, AGrandiflora\_19, Adumb2043\_19, Amyev\_19, Aoka\_20, Asa16\_19, Ascela\_19, Berrie\_19, Cassia\_19, Community\_19, Cyan\_19, Elezi\_19, Eraser\_19, Halsey\_23, Iter\_19, Janeemi\_20, JanetJ\_20, Joemato\_21, JohnDoe\_19, Jstan\_20, JuneStar\_19, Kaylissa\_19, Lego\_19, Liebe\_18, Lizalica\_19, London\_19, MaGuCo\_18, Maureen\_18, Moss\_21, Mudpuppy\_20, Niobe\_19, Nitro\_19, Phives\_20, Pixelle\_19, Powerpuff\_19, Pumpkins\_19, Simpson\_21, Tallboi\_19, Tbone\_19, TforTroy\_19, Tian\_19, Tuck\_20, Turab\_19, Tutumahutu\_19, Warda\_19, Yang\_19, YesChef\_19,

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

- 

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

- Aikoy\_38, AinMach\_18, Alephilan\_26, Alyssamiracle\_29, Apeppi\_26, Avian\_27, Beyoncage\_24, BirthdayBoy\_30, BiteSize\_24, Candle\_29, Cuke\_22, DaviePasture\_31, Djokovic\_24, DoobyDoo\_28, DumpTruck\_28, Emotion\_18, Erutan\_29, Exile\_18, Fowlmouth\_23, Fulcrum\_30, GOATification\_30, Genamy16\_29, Gibbin\_30, Gilgamesh\_70, Gretellyn\_29, Jalebi\_28, Jamemuya19\_27, JasmineDragon\_18, Lambo\_29, Leopard\_38, Lila22\_30, LilyPad\_25, LittleFella\_26, LuckyBarnes\_26, LuckyLeo\_28, Madi\_24, Mima20\_29, MiniMommy\_18, MoiGyank\_32, MontyDev\_29, MrMiyagi\_23, Nilo\_30, NorManre\_30, NovaSharks\_28, Onyinye\_39, OtterstedtS21\_29, Papyrus\_29, ParvusTarda\_29, Patos\_30, Ranch\_29, Riparian\_29, Rope\_29, Rumi\_28, Sadboi\_29, Sampudon\_29, Send513\_29, ShakeltOph\_19, Sienna\_24, Soondubu\_18, Suzy\_24, Terapin\_24, Tillicus\_29, VroomVroom\_18, Weiss13\_29, Wojtek\_28, Xenia2\_25, Yelo\_29, Yikes\_30, Zany\_28, Zenon\_30, pZL12\_48c,

### Summary by start number:

#### Start 8:

- Found in 3 of 118 ( 2.5% ) of genes in pham
- Manual Annotations of this start: 3 of 88
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Aikoy\_38 (AE), Leopard\_38 (AE), Onyinye\_39 (AE),

#### Start 9:

- Found in 1 of 118 ( 0.8% ) of genes in pham
- Manual Annotations of this start: 1 of 88
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Gilgamesh\_70 (singleton),

#### Start 11:

- Found in 13 of 118 ( 11.0% ) of genes in pham
- Manual Annotations of this start: 12 of 88
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Candle\_29 (R), Cuke\_22 (AC), Fowlmouth\_23 (AC), MontyDev\_29 (R), MrMiyagi\_23 (AC), Nilo\_30 (R), Papyrus\_29 (R), Riparian\_29 (R), Rope\_29 (R), Send513\_29 (R), Weiss13\_29 (R), Yelo\_29 (R), Zenon\_30 (R),

#### Start 12:

- Found in 4 of 118 ( 3.4% ) of genes in pham
- Manual Annotations of this start: 2 of 88
- Called 100.0% of time when present
- Phage (with cluster) where this start called: AinMach\_18 (AZ), Exile\_18 (AZ), LuckyBarnes\_26 (singleton), Soondubu\_18 (AZ),

#### Start 13:

- Found in 5 of 118 ( 4.2% ) of genes in pham
- Manual Annotations of this start: 3 of 88
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Emotion\_18 (AZ4), JasmineDragon\_18 (AZ4), MiniMommy\_18 (AZ4), ShakeltOph\_19 (AZ4), VroomVroom\_18 (AZ4),

#### Start 14:

- Found in 1 of 118 ( 0.8% ) of genes in pham
- No Manual Annotations of this start.
- Called 100.0% of time when present
- Phage (with cluster) where this start called: pZL12\_48c (singleton),

#### Start 15:

- Found in 47 of 118 ( 39.8% ) of genes in pham
- Manual Annotations of this start: 34 of 88
- Called 100.0% of time when present
- Phage (with cluster) where this start called: AEgle\_19 (AZ1), AGrandiflora\_19 (AZ1), Adumb2043\_19 (AZ1), Amyev\_19 (AZ1), Aoka\_20 (FO), Asa16\_19 (AZ1), Ascela\_19 (AZ1), Berrie\_19 (AZ1), Cassia\_19 (AZ1), Community\_19 (AZ1), Cyan\_19 (AZ1), Elezi\_19 (AZ1), Eraser\_19 (AZ1), Halsey\_23 (AZ), Iter\_19 (AZ1), Janeemi\_20 (AZ1), JanetJ\_20 (FO), Joemato\_21 (AZ1), JohnDoe\_19 (AZ1), Jstan\_20 (AZ1), JuneStar\_19 (AZ1), Kaylissa\_19 (AZ1), Lego\_19 (AZ1), Liebe\_18 (AZ2), Lizalica\_19 (AZ1), London\_19 (AZ1), MaGuCo\_18 (AZ2), Maureen\_18 (AZ2), Moss\_21 (AZ), Mudpuppy\_20 (AZ1), Niobe\_19 (AZ1), Nitro\_19 (AZ1), Phives\_20 (AZ1), Pixelle\_19 (AZ1), Powerpuff\_19 (AZ1), Pumpkins\_19 (AZ1), Simpson\_21 (AZ1), Tallboi\_19 (AZ1), Tbone\_19 (AZ1), TforTroy\_19 (AZ1), Tian\_19 (AZ1), Tuck\_20 (AZ1), Turab\_19 (AZ1), Tutumahutu\_19 (AZ1), Warda\_19 (AZ1), Yang\_19 (AZ1), YesChef\_19 (AZ1),

#### Start 16:

- Found in 44 of 118 ( 37.3% ) of genes in pham
- Manual Annotations of this start: 33 of 88
- Called 97.7% of time when present
- Phage (with cluster) where this start called: Alephilan\_26 (DV), Alyssamiracle\_29 (DV), Apeppi\_26 (DV), Avian\_27 (DV), Beyoncage\_24 (DG1), BirthdayBoy\_30 (DV), BiteSize\_24 (DG1), DaviePasture\_31 (DV), Djokovic\_24 (DG1), DoobyDoo\_28 (DV), DumpTruck\_28 (DV), Erutan\_29 (DV), Fulcrum\_30 (DV), GOATification\_30 (DV), Genamy16\_29 (DV), Gibbin\_30 (DV), GretelLyn\_29 (DV), Jalebi\_28 (DV), Jamemuya19\_27 (DV), Lambo\_29 (DV), LilyPad\_25 (DG1), LittleFella\_26 (DG2), LuckyLeo\_28 (DV), Madi\_24 (DG1), Mima20\_29 (DV), MoiGyank\_32 (DV), NorManre\_30 (DV), NovaSharks\_28 (DV), OtterstedtS21\_29 (DV), ParvusTarda\_29 (DV), Patos\_30 (DV), Ranch\_29 (DV), Rumi\_28 (DV), Sadboi\_29 (DV), Sampudon\_29 (DV), Sienna\_24 (DG1), Suzy\_24 (DG1), Terapin\_24 (DG1), Tillicus\_29 (DV), Wojtek\_28 (DV), Xenia2\_25 (DV), Yikes\_30 (DV), Zany\_28 (DV),

#### Start 19:

- Found in 39 of 118 ( 33.1% ) of genes in pham
- No Manual Annotations of this start.
- Called 2.6% of time when present
- Phage (with cluster) where this start called: Lila22\_30 (DV),

### Summary by clusters:

There are 12 clusters represented in this pham: singleton, AE, AC, DG2, R, DV, AZ1, DG1, AZ, AZ4, AZ2, FO,

Info for manual annotations of cluster AC:

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

Info for manual annotations of cluster AE:

- Start number 8 was manually annotated 3 times for cluster AE.

Info for manual annotations of cluster AZ:

- Start number 12 was manually annotated 1 time for cluster AZ.

Info for manual annotations of cluster AZ1:

- Start number 15 was manually annotated 29 times for cluster AZ1.

Info for manual annotations of cluster AZ2:

- Start number 15 was manually annotated 3 times for cluster AZ2.

Info for manual annotations of cluster AZ4:

- Start number 13 was manually annotated 3 times for cluster AZ4.

Info for manual annotations of cluster DG1:

- Start number 16 was manually annotated 8 times for cluster DG1.

Info for manual annotations of cluster DG2:

- Start number 16 was manually annotated 1 time for cluster DG2.

Info for manual annotations of cluster DV:

- Start number 16 was manually annotated 24 times for cluster DV.

Info for manual annotations of cluster FO:

- Start number 15 was manually annotated 2 times for cluster FO.

Info for manual annotations of cluster R:

- Start number 11 was manually annotated 9 times for cluster R.

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

Gene: AEgle\_19 Start: 14931, Stop: 16052, Start Num: 15

Candidate Starts for AEgle\_19:

(Start: 15 @14931 has 34 MA's), (24, 14991), (35, 15054), (37, 15075), (68, 15339), (88, 15423), (133, 15783), (135, 15801), (141, 15861),

Gene: AGrandiflora\_19 Start: 14916, Stop: 16037, Start Num: 15

Candidate Starts for AGrandiflora\_19:

(Start: 15 @14916 has 34 MA's), (24, 14976), (35, 15039), (37, 15060), (64, 15273), (68, 15324), (69, 15330), (103, 15552), (133, 15768), (135, 15786), (141, 15846),

Gene: Adumb2043\_19 Start: 14930, Stop: 16051, Start Num: 15

Candidate Starts for Adumb2043\_19:

(Start: 15 @14930 has 34 MA's), (24, 14990), (35, 15053), (37, 15074), (68, 15338), (88, 15422), (133, 15782), (135, 15800), (141, 15860),

Gene: Aikoy\_38 Start: 28234, Stop: 29478, Start Num: 8

Candidate Starts for Aikoy\_38:

(5, 28186), (7, 28222), (Start: 8 @28234 has 3 MA's), (27, 28333), (31, 28351), (42, 28468), (50, 28537), (54, 28570), (55, 28579), (58, 28606), (66, 28639), (83, 28714), (93, 28810), (96, 28846), (104, 28900), (107, 28921), (110, 28939), (111, 28945), (112, 28948), (114, 28960), (130, 29092),

(131, 29095), (148, 29257), (150, 29269), (152, 29278), (166, 29413), (167, 29455),

Gene: AinMach\_18 Start: 14089, Stop: 15219, Start Num: 12

Candidate Starts for AinMach\_18:

(Start: 12 @14089 has 2 MA's), (24, 14158), (48, 14341), (55, 14404), (72, 14509), (76, 14524), (97, 14692), (112, 14788), (115, 14803), (116, 14806), (119, 14818), (124, 14854), (128, 14884), (129, 14938), (132, 14947), (158, 15163), (159, 15190),

Gene: Alephilan\_26 Start: 24820, Stop: 25944, Start Num: 16

Candidate Starts for Alephilan\_26:

(Start: 16 @24820 has 33 MA's), (17, 24826), (19, 24832), (27, 24877), (32, 24901), (40, 24988), (46, 25045), (52, 25090), (56, 25132), (61, 25156), (83, 25258), (92, 25333), (94, 25363), (104, 25444), (109, 25480), (129, 25633), (140, 25735), (146, 25783), (150, 25813),

Gene: Alyssamiracle\_29 Start: 23630, Stop: 24754, Start Num: 16

Candidate Starts for Alyssamiracle\_29:

(Start: 16 @23630 has 33 MA's), (17, 23636), (19, 23642), (27, 23687), (32, 23711), (40, 23798), (46, 23855), (52, 23900), (56, 23942), (61, 23966), (83, 24068), (92, 24143), (94, 24173), (104, 24254), (109, 24290), (129, 24443), (134, 24476), (150, 24623), (161, 24704),

Gene: Amyev\_19 Start: 14951, Stop: 16393, Start Num: 15

Candidate Starts for Amyev\_19:

(Start: 15 @14951 has 34 MA's), (24, 15011), (26, 15017), (35, 15074), (37, 15095), (63, 15305), (67, 15353), (73, 15473), (81, 15692), (123, 16022), (133, 16124), (135, 16142), (162, 16361),

Gene: Aoka\_20 Start: 16034, Stop: 17083, Start Num: 15

Candidate Starts for Aoka\_20:

(Start: 15 @16034 has 34 MA's), (33, 16139), (53, 16304), (63, 16370), (120, 16700), (126, 16736), (159, 17057),

Gene: Apeppi\_26 Start: 24963, Stop: 26087, Start Num: 16

Candidate Starts for Apeppi\_26:

(Start: 16 @24963 has 33 MA's), (17, 24969), (27, 25020), (32, 25044), (40, 25131), (46, 25188), (52, 25233), (56, 25275), (59, 25296), (61, 25299), (67, 25362), (83, 25401), (84, 25404), (92, 25476), (94, 25506), (104, 25587), (109, 25623), (129, 25776), (150, 25956),

Gene: Asa16\_19 Start: 14900, Stop: 16021, Start Num: 15

Candidate Starts for Asa16\_19:

(Start: 15 @14900 has 34 MA's), (24, 14960), (26, 14966), (35, 15023), (37, 15044), (68, 15308), (135, 15770),

Gene: Ascela\_19 Start: 14928, Stop: 16049, Start Num: 15

Candidate Starts for Ascela\_19:

(Start: 15 @14928 has 34 MA's), (35, 15051), (37, 15072), (62, 15276), (69, 15342), (135, 15798), (141, 15858),

Gene: Avian\_27 Start: 23612, Stop: 24736, Start Num: 16

Candidate Starts for Avian\_27:

(Start: 16 @23612 has 33 MA's), (17, 23618), (19, 23624), (27, 23669), (32, 23693), (40, 23780), (46, 23837), (52, 23882), (56, 23924), (61, 23948), (83, 24050), (92, 24125), (94, 24155), (104, 24236), (109, 24272), (129, 24425), (134, 24458), (150, 24605), (161, 24686),

Gene: Berrie\_19 Start: 15065, Stop: 16186, Start Num: 15



Candidate Starts for Berrie\_19:

(Start: 15 @15065 has 34 MA's), (24, 15125), (26, 15131), (35, 15188), (68, 15473), (69, 15479), (135, 15935), (141, 15995),

Gene: Beyoncage\_24 Start: 20204, Stop: 21337, Start Num: 16

Candidate Starts for Beyoncage\_24:

(Start: 16 @20204 has 33 MA's), (35, 20321), (37, 20342), (39, 20354), (40, 20375), (41, 20384), (44, 20417), (61, 20546), (68, 20615), (95, 20765), (104, 20834), (108, 20858), (117, 20903), (121, 20921), (123, 20945), (127, 20975), (142, 21131), (144, 21137), (150, 21203), (151, 21209), (156, 21242), (160, 21281),

Gene: BirthdayBoy\_30 Start: 25673, Stop: 26797, Start Num: 16

Candidate Starts for BirthdayBoy\_30:

(Start: 16 @25673 has 33 MA's), (17, 25679), (19, 25685), (27, 25730), (32, 25754), (40, 25841), (46, 25898), (52, 25943), (56, 25985), (61, 26009), (67, 26072), (83, 26111), (92, 26186), (94, 26216), (104, 26297), (109, 26333), (129, 26486), (150, 26666), (161, 26747),

Gene: BiteSize\_24 Start: 20204, Stop: 21337, Start Num: 16

Candidate Starts for BiteSize\_24:

(Start: 16 @20204 has 33 MA's), (35, 20321), (37, 20342), (39, 20354), (40, 20375), (41, 20384), (44, 20417), (61, 20546), (68, 20615), (95, 20765), (104, 20834), (108, 20858), (117, 20903), (121, 20921), (123, 20945), (127, 20975), (142, 21131), (144, 21137), (150, 21203), (151, 21209), (156, 21242), (160, 21281),

Gene: Candle\_29 Start: 23449, Stop: 24636, Start Num: 11

Candidate Starts for Candle\_29:

(3, 23344), (4, 23350), (Start: 11 @23449 has 12 MA's), (18, 23476), (19, 23479), (28, 23524), (30, 23536), (32, 23545), (46, 23710), (61, 23821), (64, 23839), (75, 23917), (77, 23926), (83, 23941), (109, 24163), (112, 24175), (129, 24316), (130, 24319), (141, 24424), (146, 24469), (150, 24499), (154, 24523), (155, 24535), (156, 24538), (162, 24586), (165, 24625),

Gene: Cassia\_19 Start: 15026, Stop: 16147, Start Num: 15

Candidate Starts for Cassia\_19:

(Start: 15 @15026 has 34 MA's), (36, 15161), (37, 15170), (46, 15260), (68, 15434), (135, 15896),

Gene: Community\_19 Start: 16147, Stop: 17589, Start Num: 15

Candidate Starts for Community\_19:

(Start: 15 @16147 has 34 MA's), (24, 16207), (26, 16213), (35, 16270), (63, 16501), (69, 16561), (79, 16855), (80, 16876), (135, 17338), (143, 17404),

Gene: Cuke\_22 Start: 19244, Stop: 20422, Start Num: 11

Candidate Starts for Cuke\_22:

(10, 19232), (Start: 11 @19244 has 12 MA's), (18, 19271), (20, 19283), (22, 19298), (30, 19331), (38, 19400), (46, 19505), (50, 19541), (83, 19718), (94, 19823), (109, 19940), (112, 19952), (130, 20096), (150, 20273), (156, 20312), (157, 20315), (159, 20345), (162, 20360),

Gene: Cyan\_19 Start: 14919, Stop: 16040, Start Num: 15

Candidate Starts for Cyan\_19:

(Start: 15 @14919 has 34 MA's), (24, 14979), (35, 15042), (37, 15063), (64, 15276), (68, 15327), (69, 15333), (103, 15555), (133, 15771), (135, 15789), (141, 15849),

Gene: DaviePasture\_31 Start: 25439, Stop: 26563, Start Num: 16

Candidate Starts for DaviePasture\_31:

(Start: 16 @25439 has 33 MA's), (17, 25445), (19, 25451), (27, 25496), (32, 25520), (40, 25607), (46, 25664), (52, 25709), (59, 25772), (61, 25775), (67, 25838), (83, 25877), (84, 25880), (92, 25952), (94, 25982), (104, 26063), (109, 26099), (129, 26252), (139, 26333), (140, 26354), (150, 26432), (161, 26513),

Gene: Djokovic\_24 Start: 20204, Stop: 21337, Start Num: 16

Candidate Starts for Djokovic\_24:

(Start: 16 @20204 has 33 MA's), (35, 20321), (37, 20342), (39, 20354), (40, 20375), (41, 20384), (44, 20417), (61, 20546), (68, 20615), (95, 20765), (104, 20834), (108, 20858), (117, 20903), (121, 20921), (123, 20945), (127, 20975), (142, 21131), (144, 21137), (150, 21203), (151, 21209), (156, 21242), (160, 21281),

Gene: DoobyDoo\_28 Start: 24595, Stop: 25719, Start Num: 16

Candidate Starts for DoobyDoo\_28:

(Start: 16 @24595 has 33 MA's), (17, 24601), (19, 24607), (27, 24652), (32, 24676), (40, 24763), (46, 24820), (52, 24865), (56, 24907), (61, 24931), (67, 24994), (83, 25033), (92, 25108), (94, 25138), (109, 25255), (129, 25408), (139, 25489), (140, 25510), (150, 25588), (161, 25669),

Gene: DumpTruck\_28 Start: 24905, Stop: 26032, Start Num: 16

Candidate Starts for DumpTruck\_28:

(Start: 16 @24905 has 33 MA's), (32, 24986), (42, 25097), (46, 25130), (52, 25175), (56, 25217), (61, 25241), (67, 25304), (83, 25343), (98, 25481), (105, 25541), (106, 25544), (109, 25565), (115, 25592), (124, 25643), (129, 25718), (146, 25868), (150, 25898), (153, 25916), (160, 25973),

Gene: Elezi\_19 Start: 14901, Stop: 16022, Start Num: 15

Candidate Starts for Elezi\_19:

(Start: 15 @14901 has 34 MA's), (24, 14961), (26, 14967), (35, 15024), (37, 15045), (68, 15309), (135, 15771),

Gene: Emotion\_18 Start: 13147, Stop: 14427, Start Num: 13

Candidate Starts for Emotion\_18:

(Start: 13 @13147 has 3 MA's), (37, 13297), (97, 13915), (111, 14008), (128, 14107),

Gene: Eraser\_19 Start: 14901, Stop: 16022, Start Num: 15

Candidate Starts for Eraser\_19:

(Start: 15 @14901 has 34 MA's), (24, 14961), (26, 14967), (35, 15024), (37, 15045), (68, 15309), (135, 15771),

Gene: Erutan\_29 Start: 25117, Stop: 26241, Start Num: 16

Candidate Starts for Erutan\_29:

(Start: 16 @25117 has 33 MA's), (17, 25123), (27, 25174), (32, 25198), (40, 25285), (46, 25342), (52, 25387), (56, 25429), (61, 25453), (83, 25555), (92, 25630), (94, 25660), (104, 25741), (109, 25777), (129, 25930), (150, 26110), (161, 26191),

Gene: Exile\_18 Start: 15565, Stop: 16650, Start Num: 12

Candidate Starts for Exile\_18:

(Start: 12 @15565 has 2 MA's), (21, 15619), (55, 15877), (62, 15919), (100, 16138), (128, 16315), (129, 16360), (136, 16408), (158, 16585), (159, 16612), (164, 16642),

Gene: Fowlmouth\_23 Start: 19374, Stop: 20546, Start Num: 11

Candidate Starts for Fowlmouth\_23:

(10, 19362), (Start: 11 @19374 has 12 MA's), (25, 19443), (31, 19464), (46, 19635), (50, 19671), (64, 19764), (70, 19821), (83, 19848), (87, 19881), (91, 19917), (94, 19953), (107, 20055), (109, 20070),

(130, 20226), (150, 20403), (152, 20412), (153, 20421), (156, 20442), (157, 20445), (162, 20490),

Gene: Fulcrum\_30 Start: 25641, Stop: 26765, Start Num: 16

Candidate Starts for Fulcrum\_30:

(Start: 16 @25641 has 33 MA's), (17, 25647), (19, 25653), (27, 25698), (32, 25722), (40, 25809), (46, 25866), (52, 25911), (56, 25953), (61, 25977), (67, 26040), (83, 26079), (92, 26154), (94, 26184), (104, 26265), (109, 26301), (129, 26454), (139, 26535), (140, 26556), (150, 26634), (161, 26715),

Gene: GOATification\_30 Start: 25641, Stop: 26765, Start Num: 16

Candidate Starts for GOATification\_30:

(Start: 16 @25641 has 33 MA's), (17, 25647), (19, 25653), (27, 25698), (32, 25722), (40, 25809), (46, 25866), (52, 25911), (56, 25953), (61, 25977), (67, 26040), (83, 26079), (92, 26154), (94, 26184), (104, 26265), (109, 26301), (129, 26454), (139, 26535), (140, 26556), (150, 26634), (161, 26715),

Gene: Genamy16\_29 Start: 23630, Stop: 24754, Start Num: 16

Candidate Starts for Genamy16\_29:

(Start: 16 @23630 has 33 MA's), (17, 23636), (19, 23642), (27, 23687), (32, 23711), (40, 23798), (46, 23855), (52, 23900), (56, 23942), (61, 23966), (83, 24068), (92, 24143), (94, 24173), (104, 24254), (109, 24290), (129, 24443), (134, 24476), (150, 24623), (161, 24704),

Gene: Gibbin\_30 Start: 25722, Stop: 26846, Start Num: 16

Candidate Starts for Gibbin\_30:

(Start: 16 @25722 has 33 MA's), (17, 25728), (19, 25734), (27, 25779), (32, 25803), (40, 25890), (46, 25947), (52, 25992), (56, 26034), (61, 26058), (67, 26121), (83, 26160), (92, 26235), (94, 26265), (104, 26346), (109, 26382), (129, 26535), (139, 26616), (140, 26637), (150, 26715), (161, 26796),

Gene: Gilgamesh\_70 Start: 64726, Stop: 65949, Start Num: 9

Candidate Starts for Gilgamesh\_70:

(Start: 9 @64726 has 1 MA's), (37, 64900), (57, 65080), (74, 65218), (103, 65470), (121, 65560), (124, 65587), (125, 65590), (128, 65617), (129, 65662), (130, 65665), (149, 65833), (150, 65839), (154, 65863), (161, 65920),

Gene: Gretellyn\_29 Start: 25984, Stop: 27108, Start Num: 16

Candidate Starts for Gretellyn\_29:

(Start: 16 @25984 has 33 MA's), (17, 25990), (19, 25996), (27, 26041), (32, 26065), (40, 26152), (46, 26209), (52, 26254), (56, 26296), (61, 26320), (67, 26383), (83, 26422), (92, 26497), (94, 26527), (104, 26608), (109, 26644), (129, 26797), (139, 26878), (140, 26899), (150, 26977), (161, 27058),

Gene: Halsey\_23 Start: 14619, Stop: 16067, Start Num: 15

Candidate Starts for Halsey\_23:

(Start: 15 @14619 has 34 MA's), (23, 14673), (68, 15027), (69, 15033), (102, 15579), (111, 15630), (137, 15825),

Gene: Iter\_19 Start: 14928, Stop: 16049, Start Num: 15

Candidate Starts for Iter\_19:

(Start: 15 @14928 has 34 MA's), (35, 15051), (37, 15072), (62, 15276), (69, 15342), (135, 15798), (141, 15858),

Gene: Jalebi\_28 Start: 26151, Stop: 27275, Start Num: 16

Candidate Starts for Jalebi\_28:

(Start: 16 @26151 has 33 MA's), (17, 26157), (19, 26163), (27, 26208), (32, 26232), (40, 26319), (46, 26376), (52, 26421), (56, 26463), (83, 26589), (92, 26664), (94, 26694), (104, 26775), (109, 26811), (129, 26964), (139, 27045), (140, 27066), (150, 27144), (161, 27225),

Gene: Jamemuya19\_27 Start: 23220, Stop: 24344, Start Num: 16

Candidate Starts for Jamemuya19\_27:

(Start: 16 @23220 has 33 MA's), (17, 23226), (19, 23232), (27, 23277), (32, 23301), (40, 23388), (46, 23445), (52, 23490), (56, 23532), (61, 23556), (83, 23658), (92, 23733), (94, 23763), (104, 23844), (109, 23880), (129, 24033), (134, 24066), (150, 24213), (161, 24294),

Gene: Janeemi\_20 Start: 16175, Stop: 17617, Start Num: 15

Candidate Starts for Janeemi\_20:

(Start: 15 @16175 has 34 MA's), (24, 16235), (35, 16298), (63, 16529), (69, 16589), (135, 17366), (146, 17471),

Gene: JanetJ\_20 Start: 15852, Stop: 16901, Start Num: 15

Candidate Starts for JanetJ\_20:

(Start: 15 @15852 has 34 MA's), (19, 15870), (30, 15930), (53, 16122), (63, 16188), (120, 16518), (126, 16554), (159, 16875), (160, 16881),

Gene: JasmineDragon\_18 Start: 13074, Stop: 14306, Start Num: 13

Candidate Starts for JasmineDragon\_18:

(Start: 13 @13074 has 3 MA's), (40, 13269), (43, 13293), (82, 13644), (97, 13800), (111, 13890), (128, 13989), (144, 14145), (153, 14226),

Gene: Joemato\_21 Start: 14919, Stop: 16040, Start Num: 15

Candidate Starts for Joemato\_21:

(Start: 15 @14919 has 34 MA's), (24, 14979), (35, 15042), (37, 15063), (64, 15276), (68, 15327), (69, 15333), (103, 15555), (133, 15771), (135, 15789), (141, 15849),

Gene: JohnDoe\_19 Start: 14914, Stop: 16035, Start Num: 15

Candidate Starts for JohnDoe\_19:

(Start: 15 @14914 has 34 MA's), (24, 14974), (35, 15037), (37, 15058), (64, 15271), (68, 15322), (69, 15328), (103, 15550), (135, 15784), (141, 15844),

Gene: Jstan\_20 Start: 14901, Stop: 16022, Start Num: 15

Candidate Starts for Jstan\_20:

(Start: 15 @14901 has 34 MA's), (24, 14961), (26, 14967), (35, 15024), (37, 15045), (68, 15309), (135, 15771),

Gene: JuneStar\_19 Start: 15024, Stop: 16145, Start Num: 15

Candidate Starts for JuneStar\_19:

(Start: 15 @15024 has 34 MA's), (37, 15168), (46, 15258), (69, 15438), (135, 15894), (161, 16110),

Gene: Kaylissa\_19 Start: 14920, Stop: 16041, Start Num: 15

Candidate Starts for Kaylissa\_19:

(Start: 15 @14920 has 34 MA's), (24, 14980), (35, 15043), (37, 15064), (64, 15277), (68, 15328), (69, 15334), (103, 15556), (135, 15790), (141, 15850),

Gene: Lambo\_29 Start: 25656, Stop: 26780, Start Num: 16

Candidate Starts for Lambo\_29:

(Start: 16 @25656 has 33 MA's), (17, 25662), (27, 25713), (32, 25737), (40, 25824), (46, 25881), (52, 25926), (56, 25968), (61, 25992), (67, 26055), (83, 26094), (92, 26169), (94, 26199), (104, 26280), (109, 26316), (129, 26469), (150, 26649),

Gene: Lego\_19 Start: 14919, Stop: 16040, Start Num: 15

Candidate Starts for Lego\_19:

(Start: 15 @14919 has 34 MA's), (24, 14979), (35, 15042), (37, 15063), (64, 15276), (68, 15327), (69, 15333), (103, 15555), (133, 15771), (135, 15789), (141, 15849),

Gene: Leopard\_38 Start: 28522, Stop: 29766, Start Num: 8

Candidate Starts for Leopard\_38:

(5, 28474), (7, 28510), (Start: 8 @28522 has 3 MA's), (27, 28621), (31, 28639), (42, 28756), (50, 28825), (54, 28858), (55, 28867), (58, 28894), (64, 28918), (66, 28927), (83, 29002), (93, 29098), (96, 29134), (104, 29188), (107, 29209), (110, 29227), (111, 29233), (112, 29236), (114, 29248), (130, 29380), (131, 29383), (148, 29545), (150, 29557), (152, 29566), (166, 29701), (167, 29743),

Gene: Liebe\_18 Start: 13443, Stop: 14564, Start Num: 15

Candidate Starts for Liebe\_18:

(Start: 15 @13443 has 34 MA's), (27, 13512), (34, 13554), (35, 13566), (37, 13587), (68, 13851), (88, 13935), (114, 14142), (118, 14154), (135, 14313), (141, 14373), (147, 14430), (152, 14457), (153, 14466),

Gene: Lila22\_30 Start: 25623, Stop: 26735, Start Num: 19

Candidate Starts for Lila22\_30:

(Start: 16 @25611 has 33 MA's), (17, 25617), (19, 25623), (27, 25668), (32, 25692), (40, 25779), (46, 25836), (52, 25881), (56, 25923), (61, 25947), (67, 26010), (83, 26049), (92, 26124), (94, 26154), (104, 26235), (109, 26271), (129, 26424), (139, 26505), (140, 26526), (150, 26604),

Gene: LilyPad\_25 Start: 20787, Stop: 21920, Start Num: 16

Candidate Starts for LilyPad\_25:

(Start: 16 @20787 has 33 MA's), (24, 20838), (27, 20847), (31, 20865), (35, 20904), (37, 20925), (44, 21000), (51, 21060), (61, 21129), (68, 21198), (117, 21486), (121, 21504), (125, 21534), (127, 21558), (129, 21606), (144, 21720), (150, 21786), (151, 21792), (156, 21825), (158, 21831), (160, 21864), (163, 21879),

Gene: LittleFella\_26 Start: 22663, Stop: 23796, Start Num: 16

Candidate Starts for LittleFella\_26:

(Start: 16 @22663 has 33 MA's), (26, 22720), (27, 22723), (37, 22801), (41, 22843), (45, 22879), (56, 22981), (61, 23005), (63, 23020), (68, 23074), (70, 23080), (90, 23167), (99, 23251), (114, 23353), (117, 23362), (121, 23380), (122, 23386), (127, 23434), (129, 23482), (139, 23563), (142, 23590), (144, 23596), (150, 23662), (151, 23668), (156, 23701), (158, 23707), (160, 23740), (161, 23746), (163, 23755),

Gene: Lizalica\_19 Start: 14904, Stop: 16025, Start Num: 15

Candidate Starts for Lizalica\_19:

(Start: 15 @14904 has 34 MA's), (24, 14964), (35, 15027), (37, 15048), (68, 15312), (69, 15318), (133, 15756), (135, 15774), (141, 15834),

Gene: London\_19 Start: 14901, Stop: 16022, Start Num: 15

Candidate Starts for London\_19:

(Start: 15 @14901 has 34 MA's), (24, 14961), (26, 14967), (35, 15024), (37, 15045), (68, 15309), (135, 15771),

Gene: LuckyBarnes\_26 Start: 21950, Stop: 23038, Start Num: 12

Candidate Starts for LuckyBarnes\_26:

(Start: 12 @21950 has 2 MA's), (29, 22034), (32, 22049), (56, 22274), (85, 22403), (86, 22415), (94, 22487), (96, 22514), (111, 22607), (120, 22646), (123, 22673), (125, 22679), (128, 22706), (138, 22805), (143, 22859), (145, 22883), (155, 22964),

Gene: LuckyLeo\_28 Start: 24963, Stop: 26087, Start Num: 16

Candidate Starts for LuckyLeo\_28:

(Start: 16 @24963 has 33 MA's), (17, 24969), (27, 25020), (32, 25044), (40, 25131), (46, 25188), (52, 25233), (56, 25275), (59, 25296), (61, 25299), (67, 25362), (83, 25401), (84, 25404), (92, 25476), (94, 25506), (104, 25587), (109, 25623), (129, 25776), (150, 25956),

Gene: MaGuCo\_18 Start: 13377, Stop: 14498, Start Num: 15

Candidate Starts for MaGuCo\_18:

(Start: 15 @13377 has 34 MA's), (35, 13500), (37, 13521), (69, 13791), (88, 13869), (114, 14076), (118, 14088), (133, 14229), (135, 14247), (141, 14307), (147, 14364), (152, 14391), (153, 14400),

Gene: Madi\_24 Start: 20204, Stop: 21337, Start Num: 16

Candidate Starts for Madi\_24:

(Start: 16 @20204 has 33 MA's), (35, 20321), (37, 20342), (39, 20354), (40, 20375), (41, 20384), (44, 20417), (61, 20546), (68, 20615), (95, 20765), (104, 20834), (108, 20858), (117, 20903), (121, 20921), (123, 20945), (127, 20975), (142, 21131), (144, 21137), (150, 21203), (151, 21209), (156, 21242), (160, 21281),

Gene: Maureen\_18 Start: 13443, Stop: 14564, Start Num: 15

Candidate Starts for Maureen\_18:

(Start: 15 @13443 has 34 MA's), (27, 13512), (34, 13554), (35, 13566), (37, 13587), (68, 13851), (88, 13935), (114, 14142), (118, 14154), (135, 14313), (141, 14373), (147, 14430), (152, 14457), (153, 14466),

Gene: Mima20\_29 Start: 25340, Stop: 26464, Start Num: 16

Candidate Starts for Mima20\_29:

(Start: 16 @25340 has 33 MA's), (17, 25346), (19, 25352), (27, 25397), (32, 25421), (40, 25508), (46, 25565), (52, 25610), (56, 25652), (61, 25676), (67, 25739), (83, 25778), (92, 25853), (94, 25883), (104, 25964), (109, 26000), (129, 26153), (139, 26234), (140, 26255), (150, 26333), (161, 26414),

Gene: MiniMommy\_18 Start: 13075, Stop: 14307, Start Num: 13

Candidate Starts for MiniMommy\_18:

(Start: 13 @13075 has 3 MA's), (40, 13270), (43, 13294), (82, 13645), (97, 13801), (111, 13891), (128, 13990), (144, 14146), (153, 14227),

Gene: MoiGyank\_32 Start: 26021, Stop: 27145, Start Num: 16

Candidate Starts for MoiGyank\_32:

(Start: 16 @26021 has 33 MA's), (17, 26027), (19, 26033), (27, 26078), (32, 26102), (40, 26189), (46, 26246), (52, 26291), (56, 26333), (83, 26459), (92, 26534), (94, 26564), (104, 26645), (109, 26681), (129, 26834), (139, 26915), (140, 26936), (150, 27014), (161, 27095),

Gene: MontyDev\_29 Start: 23090, Stop: 24277, Start Num: 11

Candidate Starts for MontyDev\_29:

(3, 22985), (4, 22991), (Start: 11 @23090 has 12 MA's), (18, 23117), (19, 23120), (28, 23165), (30, 23177), (32, 23186), (61, 23462), (64, 23480), (75, 23558), (77, 23567), (83, 23582), (109, 23804), (112, 23816), (129, 23957), (130, 23960), (141, 24065), (146, 24110), (150, 24140), (154, 24164), (155, 24176), (156, 24179), (162, 24227), (165, 24266),

Gene: Moss\_21 Start: 14619, Stop: 16067, Start Num: 15

Candidate Starts for Moss\_21:

(Start: 15 @14619 has 34 MA's), (23, 14673), (68, 15027), (69, 15033), (102, 15579), (111, 15630), (137, 15825),

Gene: MrMiyagi\_23 Start: 19394, Stop: 20566, Start Num: 11

Candidate Starts for MrMiyagi\_23:

(10, 19382), (Start: 11 @19394 has 12 MA's), (22, 19448), (25, 19463), (31, 19484), (46, 19655), (50, 19691), (64, 19784), (70, 19841), (83, 19868), (87, 19901), (91, 19937), (94, 19973), (107, 20075), (109, 20090), (130, 20246), (150, 20423), (152, 20432), (153, 20441), (156, 20462), (157, 20465), (162, 20510),

Gene: Mudpuppy\_20 Start: 14918, Stop: 16039, Start Num: 15

Candidate Starts for Mudpuppy\_20:

(Start: 15 @14918 has 34 MA's), (24, 14978), (35, 15041), (37, 15062), (64, 15275), (68, 15326), (69, 15332), (103, 15554), (133, 15770), (135, 15788), (141, 15848),

Gene: Nilo\_30 Start: 23446, Stop: 24633, Start Num: 11

Candidate Starts for Nilo\_30:

(3, 23341), (4, 23347), (6, 23386), (Start: 11 @23446 has 12 MA's), (18, 23473), (19, 23476), (28, 23521), (30, 23533), (32, 23542), (46, 23707), (61, 23818), (64, 23836), (75, 23914), (77, 23923), (83, 23938), (109, 24160), (112, 24172), (129, 24313), (130, 24316), (141, 24421), (146, 24466), (150, 24496), (154, 24520), (155, 24532), (156, 24535), (162, 24583), (165, 24622),

Gene: Niobe\_19 Start: 14901, Stop: 16022, Start Num: 15

Candidate Starts for Niobe\_19:

(Start: 15 @14901 has 34 MA's), (24, 14961), (26, 14967), (35, 15024), (37, 15045), (68, 15309), (135, 15771),

Gene: Nitro\_19 Start: 14929, Stop: 16050, Start Num: 15

Candidate Starts for Nitro\_19:

(Start: 15 @14929 has 34 MA's), (24, 14989), (35, 15052), (37, 15073), (69, 15343), (89, 15430), (135, 15799),

Gene: NorManre\_30 Start: 25228, Stop: 26352, Start Num: 16

Candidate Starts for NorManre\_30:

(Start: 16 @25228 has 33 MA's), (17, 25234), (19, 25240), (27, 25285), (32, 25309), (40, 25396), (46, 25453), (52, 25498), (56, 25540), (61, 25564), (67, 25627), (83, 25666), (92, 25741), (94, 25771), (104, 25852), (109, 25888), (129, 26041), (139, 26122), (140, 26143), (150, 26221), (161, 26302),

Gene: NovaSharks\_28 Start: 23220, Stop: 24344, Start Num: 16

Candidate Starts for NovaSharks\_28:

(Start: 16 @23220 has 33 MA's), (17, 23226), (19, 23232), (27, 23277), (32, 23301), (40, 23388), (46, 23445), (52, 23490), (56, 23532), (61, 23556), (83, 23658), (92, 23733), (94, 23763), (104, 23844), (109, 23880), (129, 24033), (134, 24066), (150, 24213), (161, 24294),

Gene: Onyinye\_39 Start: 28401, Stop: 29645, Start Num: 8

Candidate Starts for Onyinye\_39:

(5, 28353), (7, 28389), (Start: 8 @28401 has 3 MA's), (27, 28500), (31, 28518), (42, 28635), (50, 28704), (54, 28737), (55, 28746), (58, 28773), (66, 28806), (83, 28881), (93, 28977), (96, 29013), (104, 29067), (107, 29088), (110, 29106), (111, 29112), (112, 29115), (114, 29127), (130, 29259), (131, 29262), (148, 29424), (150, 29436), (152, 29445), (166, 29580), (167, 29622),

Gene: OtterstedtS21\_29 Start: 25306, Stop: 26430, Start Num: 16

Candidate Starts for OtterstedtS21\_29:

(Start: 16 @25306 has 33 MA's), (17, 25312), (19, 25318), (27, 25363), (32, 25387), (40, 25474), (46, 25531), (52, 25576), (56, 25618), (83, 25744), (92, 25819), (94, 25849), (104, 25930), (109, 25966),

(129, 26119), (139, 26200), (140, 26221), (150, 26299), (161, 26380),

Gene: Papyrus\_29 Start: 23111, Stop: 24298, Start Num: 11

Candidate Starts for Papyrus\_29:

(3, 23006), (4, 23012), (Start: 11 @23111 has 12 MA's), (18, 23138), (19, 23141), (28, 23186), (30, 23198), (32, 23207), (61, 23483), (64, 23501), (75, 23579), (77, 23588), (83, 23603), (84, 23606), (109, 23825), (112, 23837), (129, 23978), (130, 23981), (141, 24086), (146, 24131), (150, 24161), (154, 24185), (155, 24197), (156, 24200), (162, 24248), (165, 24287),

Gene: ParvusTarda\_29 Start: 24788, Stop: 25912, Start Num: 16

Candidate Starts for ParvusTarda\_29:

(Start: 16 @24788 has 33 MA's), (17, 24794), (19, 24800), (27, 24845), (32, 24869), (40, 24956), (46, 25013), (52, 25058), (56, 25100), (61, 25124), (67, 25187), (83, 25226), (92, 25301), (94, 25331), (104, 25412), (109, 25448), (115, 25475), (129, 25601), (150, 25781),

Gene: Patos\_30 Start: 25228, Stop: 26352, Start Num: 16

Candidate Starts for Patos\_30:

(Start: 16 @25228 has 33 MA's), (17, 25234), (19, 25240), (27, 25285), (32, 25309), (40, 25396), (46, 25453), (52, 25498), (56, 25540), (61, 25564), (67, 25627), (83, 25666), (92, 25741), (94, 25771), (104, 25852), (109, 25888), (129, 26041), (139, 26122), (140, 26143), (150, 26221), (161, 26302),

Gene: Phives\_20 Start: 16011, Stop: 17453, Start Num: 15

Candidate Starts for Phives\_20:

(Start: 15 @16011 has 34 MA's), (24, 16071), (26, 16077), (35, 16134), (37, 16155), (47, 16248), (63, 16365), (67, 16413), (73, 16533), (81, 16752), (123, 17082), (133, 17184), (135, 17202), (162, 17421),

Gene: Pixelle\_19 Start: 14954, Stop: 16396, Start Num: 15

Candidate Starts for Pixelle\_19:

(Start: 15 @14954 has 34 MA's), (24, 15014), (26, 15020), (35, 15077), (63, 15308), (67, 15356), (68, 15362), (73, 15476), (81, 15695), (123, 16025), (133, 16127), (135, 16145), (162, 16364),

Gene: Powerpuff\_19 Start: 14970, Stop: 16091, Start Num: 15

Candidate Starts for Powerpuff\_19:

(Start: 15 @14970 has 34 MA's), (24, 15030), (35, 15093), (37, 15114), (64, 15327), (68, 15378), (69, 15384), (103, 15606), (133, 15822), (135, 15840), (141, 15900),

Gene: Pumpkins\_19 Start: 15036, Stop: 16157, Start Num: 15

Candidate Starts for Pumpkins\_19:

(1, 14664), (2, 14709), (Start: 15 @15036 has 34 MA's), (36, 15171), (37, 15180), (46, 15270), (68, 15444), (69, 15450), (135, 15906),

Gene: Ranch\_29 Start: 24142, Stop: 25266, Start Num: 16

Candidate Starts for Ranch\_29:

(Start: 16 @24142 has 33 MA's), (17, 24148), (19, 24154), (27, 24199), (32, 24223), (40, 24310), (46, 24367), (52, 24412), (56, 24454), (61, 24478), (67, 24541), (83, 24580), (92, 24655), (94, 24685), (104, 24766), (109, 24802), (129, 24955), (139, 25036), (140, 25057), (150, 25135), (161, 25216),

Gene: Riparian\_29 Start: 22907, Stop: 24094, Start Num: 11

Candidate Starts for Riparian\_29:

(3, 22802), (4, 22808), (Start: 11 @22907 has 12 MA's), (18, 22934), (19, 22937), (28, 22982), (30, 22994), (32, 23003), (46, 23168), (61, 23279), (64, 23297), (75, 23375), (77, 23384), (83, 23399), (109, 23621), (112, 23633), (129, 23774), (130, 23777), (141, 23882), (146, 23927), (150, 23957), (154, 23981), (155, 23993), (156, 23996), (162, 24044), (165, 24083),



Gene: Rope\_29 Start: 23093, Stop: 24280, Start Num: 11

Candidate Starts for Rope\_29:

(3, 22988), (4, 22994), (Start: 11 @23093 has 12 MA's), (18, 23120), (19, 23123), (28, 23168), (30, 23180), (32, 23189), (46, 23354), (61, 23465), (64, 23483), (75, 23561), (77, 23570), (83, 23585), (84, 23588), (109, 23807), (112, 23819), (129, 23960), (130, 23963), (141, 24068), (146, 24113), (150, 24143), (154, 24167), (155, 24179), (156, 24182), (162, 24230), (165, 24269),

Gene: Rumi\_28 Start: 23223, Stop: 24347, Start Num: 16

Candidate Starts for Rumi\_28:

(Start: 16 @23223 has 33 MA's), (17, 23229), (19, 23235), (27, 23280), (32, 23304), (40, 23391), (46, 23448), (52, 23493), (56, 23535), (61, 23559), (83, 23661), (92, 23736), (94, 23766), (104, 23847), (109, 23883), (129, 24036), (134, 24069), (150, 24216), (161, 24297),

Gene: Sadboi\_29 Start: 25984, Stop: 27108, Start Num: 16

Candidate Starts for Sadboi\_29:

(Start: 16 @25984 has 33 MA's), (17, 25990), (19, 25996), (27, 26041), (32, 26065), (40, 26152), (46, 26209), (52, 26254), (56, 26296), (61, 26320), (67, 26383), (83, 26422), (92, 26497), (94, 26527), (104, 26608), (109, 26644), (129, 26797), (139, 26878), (140, 26899), (150, 26977), (161, 27058),

Gene: Sampudon\_29 Start: 26151, Stop: 27275, Start Num: 16

Candidate Starts for Sampudon\_29:

(Start: 16 @26151 has 33 MA's), (17, 26157), (19, 26163), (27, 26208), (32, 26232), (40, 26319), (46, 26376), (52, 26421), (56, 26463), (83, 26589), (92, 26664), (94, 26694), (104, 26775), (109, 26811), (129, 26964), (139, 27045), (140, 27066), (150, 27144), (161, 27225),

Gene: Send513\_29 Start: 23449, Stop: 24636, Start Num: 11

Candidate Starts for Send513\_29:

(3, 23344), (4, 23350), (Start: 11 @23449 has 12 MA's), (18, 23476), (19, 23479), (28, 23524), (30, 23536), (32, 23545), (46, 23710), (61, 23821), (64, 23839), (75, 23917), (77, 23926), (83, 23941), (109, 24163), (112, 24175), (129, 24316), (130, 24319), (141, 24424), (146, 24469), (150, 24499), (154, 24523), (155, 24535), (156, 24538), (162, 24586), (165, 24625),

Gene: ShakeltOph\_19 Start: 13074, Stop: 14306, Start Num: 13

Candidate Starts for ShakeltOph\_19:

(Start: 13 @13074 has 3 MA's), (40, 13269), (43, 13293), (82, 13644), (97, 13800), (111, 13890), (128, 13989), (144, 14145), (153, 14226),

Gene: Sienna\_24 Start: 20204, Stop: 21337, Start Num: 16

Candidate Starts for Sienna\_24:

(Start: 16 @20204 has 33 MA's), (35, 20321), (37, 20342), (39, 20354), (40, 20375), (41, 20384), (44, 20417), (68, 20615), (95, 20765), (108, 20858), (117, 20903), (121, 20921), (125, 20951), (127, 20975), (142, 21131), (144, 21137), (146, 21173), (150, 21203), (151, 21209), (156, 21242), (160, 21281),

Gene: Simpson\_21 Start: 14919, Stop: 16040, Start Num: 15

Candidate Starts for Simpson\_21:

(Start: 15 @14919 has 34 MA's), (24, 14979), (35, 15042), (37, 15063), (64, 15276), (68, 15327), (69, 15333), (103, 15555), (133, 15771), (135, 15789), (141, 15849),

Gene: Soondubu\_18 Start: 15573, Stop: 16658, Start Num: 12

Candidate Starts for Soondubu\_18:

(Start: 12 @15573 has 2 MA's), (21, 15627), (55, 15885), (100, 16146), (128, 16323), (129, 16368), (158, 16593), (159, 16620), (164, 16650),

Gene: Suzy\_24 Start: 21365, Stop: 22498, Start Num: 16

Candidate Starts for Suzy\_24:

(Start: 16 @21365 has 33 MA's), (35, 21482), (37, 21503), (40, 21536), (41, 21545), (61, 21707), (95, 21926), (104, 21995), (114, 22055), (117, 22064), (121, 22082), (123, 22106), (127, 22136), (142, 22292), (144, 22298), (150, 22364), (151, 22370), (156, 22403), (160, 22442), (163, 22457),

Gene: Tallboi\_19 Start: 14933, Stop: 16054, Start Num: 15

Candidate Starts for Tallboi\_19:

(Start: 15 @14933 has 34 MA's), (24, 14993), (26, 14999), (35, 15056), (37, 15077), (47, 15170), (68, 15341), (69, 15347), (103, 15569), (133, 15785), (135, 15803),

Gene: Tbone\_19 Start: 14923, Stop: 16044, Start Num: 15

Candidate Starts for Tbone\_19:

(Start: 15 @14923 has 34 MA's), (24, 14983), (35, 15046), (37, 15067), (64, 15280), (68, 15331), (69, 15337), (103, 15559), (133, 15775), (135, 15793), (141, 15853),

Gene: Terapin\_24 Start: 20204, Stop: 21337, Start Num: 16

Candidate Starts for Terapin\_24:

(Start: 16 @20204 has 33 MA's), (35, 20321), (37, 20342), (39, 20354), (40, 20375), (41, 20384), (44, 20417), (61, 20546), (68, 20615), (95, 20765), (104, 20834), (108, 20858), (117, 20903), (121, 20921), (123, 20945), (127, 20975), (142, 21131), (144, 21137), (150, 21203), (151, 21209), (156, 21242), (160, 21281),

Gene: TforTroy\_19 Start: 15054, Stop: 16175, Start Num: 15

Candidate Starts for TforTroy\_19:

(Start: 15 @15054 has 34 MA's), (36, 15189), (37, 15198), (46, 15288), (68, 15462), (69, 15468), (78, 15501), (135, 15924),

Gene: Tian\_19 Start: 14951, Stop: 16393, Start Num: 15

Candidate Starts for Tian\_19:

(Start: 15 @14951 has 34 MA's), (24, 15011), (26, 15017), (35, 15074), (37, 15095), (63, 15305), (67, 15353), (73, 15473), (81, 15692), (123, 16022), (133, 16124), (135, 16142), (162, 16361),

Gene: Tillicus\_29 Start: 24557, Stop: 25681, Start Num: 16

Candidate Starts for Tillicus\_29:

(Start: 16 @24557 has 33 MA's), (17, 24563), (27, 24614), (32, 24638), (40, 24725), (46, 24782), (52, 24827), (56, 24869), (59, 24890), (61, 24893), (67, 24956), (83, 24995), (84, 24998), (92, 25070), (94, 25100), (104, 25181), (109, 25217), (129, 25370), (140, 25472), (142, 25478), (150, 25550),

Gene: Tuck\_20 Start: 16127, Stop: 17569, Start Num: 15

Candidate Starts for Tuck\_20:

(Start: 15 @16127 has 34 MA's), (24, 16187), (26, 16193), (35, 16250), (63, 16481), (69, 16541), (79, 16835), (80, 16856), (135, 17318), (143, 17384),

Gene: Turab\_19 Start: 14930, Stop: 16051, Start Num: 15

Candidate Starts for Turab\_19:

(Start: 15 @14930 has 34 MA's), (24, 14990), (35, 15053), (37, 15074), (68, 15338), (88, 15422), (133, 15782), (135, 15800), (141, 15860),

Gene: Tutumahutu\_19 Start: 14970, Stop: 16091, Start Num: 15

Candidate Starts for Tutumahutu\_19:

(Start: 15 @14970 has 34 MA's), (24, 15030), (35, 15093), (37, 15114), (64, 15327), (68, 15378), (69, 15384), (103, 15606), (133, 15822), (135, 15840), (141, 15900),

Gene: VroomVroom\_18 Start: 13087, Stop: 14322, Start Num: 13

Candidate Starts for VroomVroom\_18:

(Start: 13 @13087 has 3 MA's), (40, 13282), (43, 13306), (71, 13528), (82, 13657), (97, 13813), (111, 13906), (128, 14005), (144, 14161), (153, 14242),

Gene: Warda\_19 Start: 14915, Stop: 16036, Start Num: 15

Candidate Starts for Warda\_19:

(Start: 15 @14915 has 34 MA's), (24, 14975), (35, 15038), (37, 15059), (64, 15272), (68, 15323), (69, 15329), (103, 15551), (133, 15767), (135, 15785), (141, 15845),

Gene: Weiss13\_29 Start: 23139, Stop: 24326, Start Num: 11

Candidate Starts for Weiss13\_29:

(3, 23034), (4, 23040), (Start: 11 @23139 has 12 MA's), (18, 23166), (19, 23169), (28, 23214), (30, 23226), (32, 23235), (46, 23400), (61, 23511), (64, 23529), (75, 23607), (77, 23616), (83, 23631), (109, 23853), (112, 23865), (129, 24006), (130, 24009), (141, 24114), (146, 24159), (150, 24189), (154, 24213), (155, 24225), (156, 24228), (162, 24276), (165, 24315),

Gene: Wojtek\_28 Start: 24861, Stop: 25985, Start Num: 16

Candidate Starts for Wojtek\_28:

(Start: 16 @24861 has 33 MA's), (17, 24867), (19, 24873), (27, 24918), (32, 24942), (40, 25029), (46, 25086), (52, 25131), (56, 25173), (61, 25197), (67, 25260), (83, 25299), (92, 25374), (94, 25404), (104, 25485), (109, 25521), (115, 25548), (129, 25674), (150, 25854),

Gene: Xenia2\_25 Start: 24947, Stop: 26074, Start Num: 16

Candidate Starts for Xenia2\_25:

(Start: 16 @24947 has 33 MA's), (42, 25139), (46, 25172), (50, 25208), (52, 25217), (56, 25259), (70, 25358), (83, 25385), (84, 25388), (101, 25538), (105, 25583), (106, 25586), (109, 25607), (124, 25685), (129, 25760), (146, 25910), (150, 25940), (154, 25964), (160, 26015),

Gene: Yang\_19 Start: 15026, Stop: 16147, Start Num: 15

Candidate Starts for Yang\_19:

(Start: 15 @15026 has 34 MA's), (37, 15170), (46, 15260), (65, 15386), (133, 15878), (135, 15896), (161, 16112),

Gene: Yelo\_29 Start: 23432, Stop: 24619, Start Num: 11

Candidate Starts for Yelo\_29:

(3, 23327), (4, 23333), (Start: 11 @23432 has 12 MA's), (18, 23459), (19, 23462), (28, 23507), (30, 23519), (32, 23528), (46, 23693), (61, 23804), (64, 23822), (75, 23900), (77, 23909), (83, 23924), (109, 24146), (112, 24158), (129, 24299), (130, 24302), (141, 24407), (146, 24452), (150, 24482), (154, 24506), (155, 24518), (156, 24521), (162, 24569), (165, 24608),

Gene: YesChef\_19 Start: 14970, Stop: 16091, Start Num: 15

Candidate Starts for YesChef\_19:

(Start: 15 @14970 has 34 MA's), (24, 15030), (35, 15093), (37, 15114), (64, 15327), (68, 15378), (69, 15384), (103, 15606), (133, 15822), (135, 15840), (141, 15900),

Gene: Yikes\_30 Start: 26236, Stop: 27360, Start Num: 16

Candidate Starts for Yikes\_30:

(Start: 16 @26236 has 33 MA's), (17, 26242), (19, 26248), (27, 26293), (32, 26317), (40, 26404), (46, 26461), (52, 26506), (56, 26548), (83, 26674), (92, 26749), (94, 26779), (104, 26860), (109, 26896), (129, 27049), (139, 27130), (140, 27151), (150, 27229), (161, 27310),

Gene: Zany\_28 Start: 25757, Stop: 26881, Start Num: 16

Candidate Starts for Zany\_28:

(Start: 16 @25757 has 33 MA's), (17, 25763), (19, 25769), (27, 25814), (32, 25838), (40, 25925), (46, 25982), (52, 26027), (56, 26069), (61, 26093), (67, 26156), (83, 26195), (92, 26270), (94, 26300), (104, 26381), (109, 26417), (129, 26570), (150, 26750), (161, 26831),

Gene: Zenon\_30 Start: 23451, Stop: 24638, Start Num: 11

Candidate Starts for Zenon\_30:

(3, 23346), (4, 23352), (Start: 11 @23451 has 12 MA's), (18, 23478), (19, 23481), (28, 23526), (30, 23538), (32, 23547), (46, 23712), (61, 23823), (64, 23841), (75, 23919), (77, 23928), (83, 23943), (109, 24165), (112, 24177), (129, 24318), (130, 24321), (141, 24426), (146, 24471), (150, 24501), (154, 24525), (155, 24537), (156, 24540), (162, 24588), (165, 24627),

Gene: pZL12\_48c Start: 37533, Stop: 36430, Start Num: 14

Candidate Starts for pZL12\_48c:

(14, 37533), (35, 37407), (46, 37308), (49, 37293), (60, 37194), (102, 36936), (113, 36876), (120, 36846), (147, 36582),