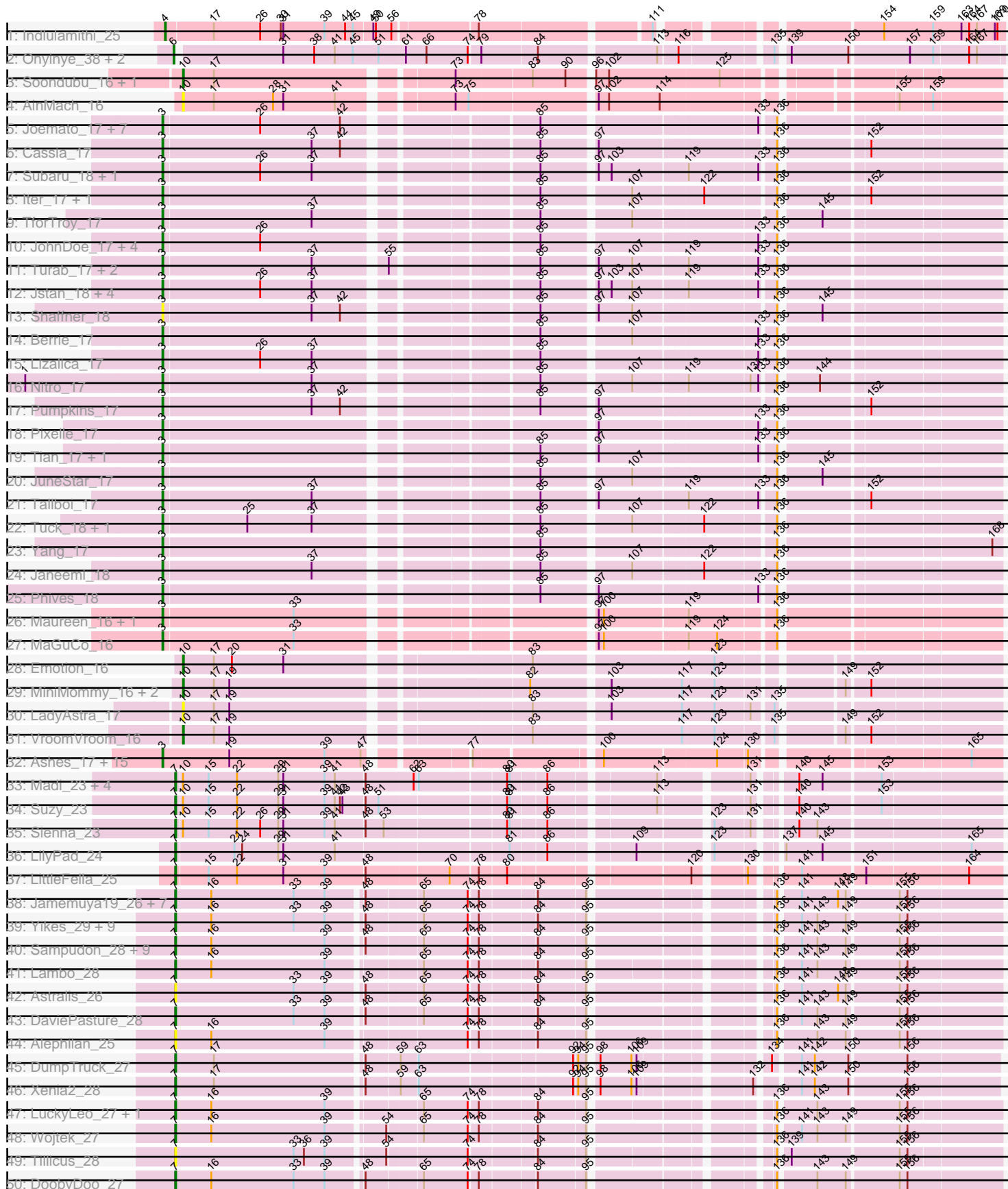
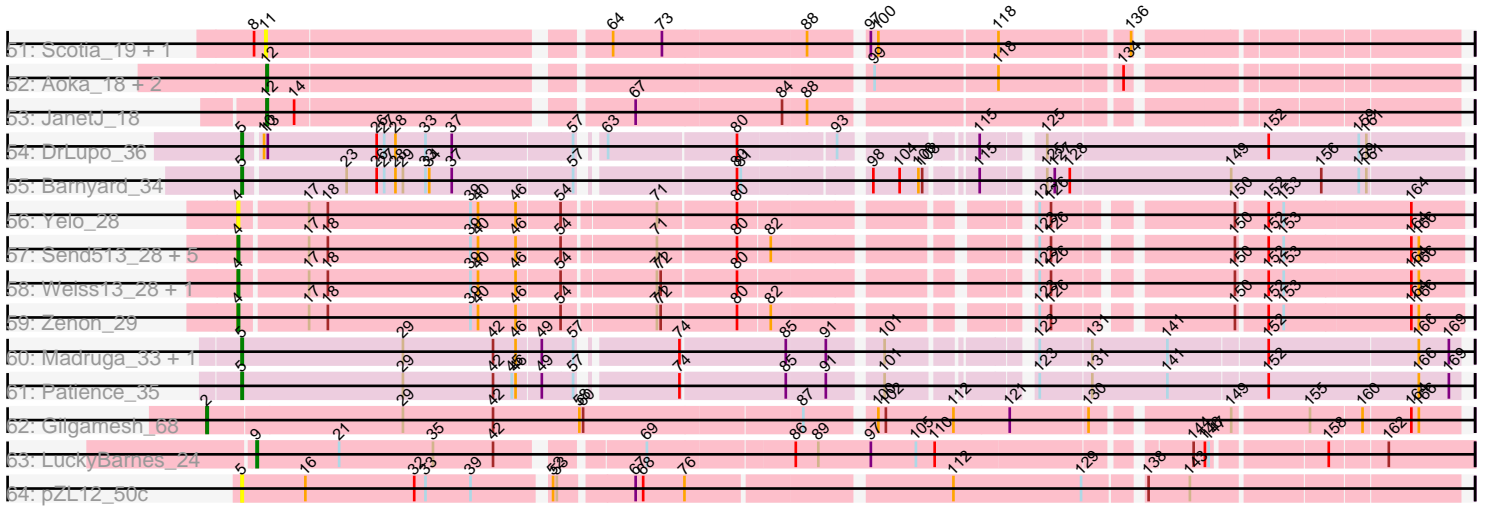


Pham 224364



Pham 224364



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 224364 Report

This analysis was run 03/28/25 on database version 593.

Pham number 224364 has 146 members, 34 are drafts.

Phages represented in each track:

- Track 1 : Indlulamithi\_25
- Track 2 : Onyinye\_38, Leopard\_37, Aikoy\_37
- Track 3 : Soondubu\_16, Exile\_16
- Track 4 : AinMach\_16
- Track 5 : Joemato\_17, AGrandiflora\_17, Lego\_17, YesChef\_17, Kaylissa\_17, Simpson\_19, Cyan\_17, Powerpuff\_17
- Track 6 : Cassia\_17
- Track 7 : Subaru\_18, Elezi\_17
- Track 8 : Iter\_17, Ascela\_17
- Track 9 : TforTroy\_17
- Track 10 : JohnDoe\_17, Tutumahutu\_17, Tbone\_17, Warda\_17, Mudpuppy\_17
- Track 11 : Turab\_17, Adumb2043\_17, AEgle\_17
- Track 12 : Jstan\_18, Eraser\_17, London\_17, Niobe\_17, Asa16\_17
- Track 13 : Shaffner\_18
- Track 14 : Berrie\_17
- Track 15 : Lizalica\_17
- Track 16 : Nitro\_17
- Track 17 : Pumpkins\_17
- Track 18 : Pixelle\_17
- Track 19 : Tian\_17, Amyev\_17
- Track 20 : JuneStar\_17
- Track 21 : Tallboi\_17
- Track 22 : Tuck\_18, Community\_17
- Track 23 : Yang\_17
- Track 24 : Janeemi\_18
- Track 25 : Phives\_18
- Track 26 : Maureen\_16, Liebe\_16
- Track 27 : MaGuCo\_16
- Track 28 : Emotion\_16
- Track 29 : MiniMommy\_16, JasmineDragon\_16, ShakeltOph\_17
- Track 30 : LadyAstra\_17
- Track 31 : VroomVroom\_16
- Track 32 : Ashes\_17, RockScotty\_17, Mysterium\_17, SpecialK\_17, Beaupre\_17, Stuu\_18, Cappuccino\_17, Kalimba\_17, Donkey\_17, Halsey\_17, Sabourin\_17, Giorgio\_17, Moss\_17, Gambol\_17, Gumpizza\_17, Sooty\_17
- Track 33 : Madi\_23, BiteSize\_23, Terapin\_23, Beyoncage\_23, Djokovic\_23
- Track 34 : Suzy\_23

- Track 35 : Sienna\_23
- Track 36 : LilyPad\_24
- Track 37 : LittleFella\_25
- Track 38 : Jamemuya19\_26, Alyssamiracle\_28, Genamy16\_28, Stormer\_27, Rumi\_27, RazorC\_26, NovaSharks\_27, Avian\_26
- Track 39 : Yikes\_29, MoiGyank\_30, Fulcrum\_29, Mima20\_28, GretelLyn\_28, Sadboi\_28, BirthdayBoy\_29, GOATification\_29, Erutan\_28, LavAbarElk\_26
- Track 40 : Sampudon\_28, ParvusTarda\_28, OtterstedtS21\_28, Lila22\_27, Gibbin\_29, Patos\_29, Ranch\_28, Zany\_27, NorManre\_29, Jalebi\_27
- Track 41 : Lambo\_28
- Track 42 : Astralis\_26
- Track 43 : DaviePasture\_28
- Track 44 : Alephilan\_25
- Track 45 : DumpTruck\_27
- Track 46 : Xenia2\_28
- Track 47 : LuckyLeo\_27, Apeppi\_25
- Track 48 : Wojtek\_27
- Track 49 : Tillicus\_28
- Track 50 : DoobyDoo\_27
- Track 51 : Scotia\_19, NoSwimming\_19
- Track 52 : Aoka\_18, PrairieDogTown\_27, EvenBluerMoon\_18
- Track 53 : JanetJ\_18
- Track 54 : DrLupo\_36
- Track 55 : Barnyard\_34
- Track 56 : Yelo\_28
- Track 57 : Send513\_28, Papyrus\_28, MontyDev\_28, Candle\_28, Nilo\_29, Rope\_28
- Track 58 : Weiss13\_28, Riparian\_28
- Track 59 : Zenon\_29
- Track 60 : Madruga\_33, Labelle\_34
- Track 61 : Patience\_35
- Track 62 : Gilgamesh\_68
- Track 63 : LuckyBarnes\_24
- Track 64 : pZL12\_50c

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

The start number called the most often in the published annotations is 3, it was called in 46 of the 112 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- AEgle\_17, AGrandiflora\_17, Adumb2043\_17, Amyev\_17, Asa16\_17, Ascela\_17, Ashes\_17, Beaupre\_17, Berrie\_17, Cappuccino\_17, Cassia\_17, Community\_17, Cyan\_17, Donkey\_17, Elezi\_17, Eraser\_17, Gambol\_17, Giorgio\_17, Gumpizza\_17, Halsey\_17, Iter\_17, Janeemi\_18, Joemato\_17, JohnDoe\_17, Jstan\_18, JuneStar\_17, Kalimba\_17, Kaylissa\_17, Lego\_17, Liebe\_16, Lizalica\_17, London\_17, MaGuCo\_16, Maureen\_16, Moss\_17, Mudpuppy\_17, Mysterium\_17, Niobe\_17, Nitro\_17, Phives\_18, Pixelle\_17, Powerpuff\_17, Pumpkins\_17, RockScotty\_17, Sabourin\_17, Shaffner\_18, Simpson\_19, Sooty\_17, SpecialK\_17, Stuu\_18, Subaru\_18, Tallboi\_17, Tbone\_17, TforTroy\_17, Tian\_17, Tuck\_18, Turab\_17, Tutumahutu\_17, Warda\_17, Yang\_17, YesChef\_17,

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

- 

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

- Aikoy\_37, AinMach\_16, Alephilan\_25, Alyssamiracle\_28, Aoka\_18, Apeppi\_25, Astralis\_26, Avian\_26, Barnyard\_34, Beyoncage\_23, BirthdayBoy\_29, BiteSize\_23, Candle\_28, DaviePasture\_28, Djokovic\_23, DoobyDoo\_27, DrLupo\_36, DumpTruck\_27, Emotion\_16, Erutan\_28, EvenBluerMoon\_18, Exile\_16, Fulcrum\_29, GOATification\_29, Genamy16\_28, Gibbin\_29, Gilgamesh\_68, Gretellyn\_28, Indlulamithi\_25, Jalebi\_27, Jamemuya19\_26, JanetJ\_18, JasmineDragon\_16, Labelle\_34, LadyAstra\_17, Lambo\_28, LavAbarElk\_26, Leopard\_37, Lila22\_27, LilyPad\_24, LittleFella\_25, LuckyBarnes\_24, LuckyLeo\_27, Madi\_23, Madrugua\_33, Mima20\_28, MiniMommy\_16, MoiGyank\_30, MontyDev\_28, Nilo\_29, NoSwimming\_19, NorManre\_29, NovaSharks\_27, Onyinye\_38, OtterstedtS21\_28, Papyrus\_28, ParvusTarda\_28, Patience\_35, Patos\_29, PrairieDogTown\_27, Ranch\_28, RazorC\_26, Riparian\_28, Rope\_28, Rumi\_27, Sadboi\_28, Sampudon\_28, Scotia\_19, Send513\_28, ShakeltOph\_17, Sienna\_23, Soondubu\_16, Stormer\_27, Suzy\_23, Terapin\_23, Tillicus\_28, VroomVroom\_16, Weiss13\_28, Wojtek\_27, Xenia2\_28, Yelo\_28, Yikes\_29, Zany\_27, Zenon\_29, pZL12\_50c,

### Summary by start number:

Start 2:

- Found in 1 of 146 ( 0.7% ) of genes in pham
- Manual Annotations of this start: 1 of 112
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Gilgamesh\_68 (singleton),

Start 3:

- Found in 61 of 146 ( 41.8% ) of genes in pham
- Manual Annotations of this start: 46 of 112
- Called 100.0% of time when present
- Phage (with cluster) where this start called: AEgle\_17 (AZ1), AGrandiflora\_17 (AZ1), Adumb2043\_17 (AZ1), Amyev\_17 (AZ1), Asa16\_17 (AZ1), Ascela\_17 (AZ1), Ashes\_17 (AZ5), Beaupre\_17 (AZ5), Berrie\_17 (AZ1), Cappuccino\_17 (AZ5), Cassia\_17 (AZ1), Community\_17 (AZ1), Cyan\_17 (AZ1), Donkey\_17 (AZ5), Elezi\_17 (AZ1), Eraser\_17 (AZ1), Gambol\_17 (AZ5), Giorgio\_17 (AZ5), Gumpizza\_17 (AZ5), Halsey\_17 (AZ5), Iter\_17 (AZ1), Janeemi\_18 (AZ1), Joemato\_17 (AZ1), JohnDoe\_17 (AZ1), Jstan\_18 (AZ1), JuneStar\_17 (AZ1), Kalimba\_17 (AZ5), Kaylissa\_17 (AZ1), Lego\_17 (AZ1), Liebe\_16 (AZ2), Lizalica\_17 (AZ1), London\_17 (AZ1), MaGuCo\_16 (AZ2), Maureen\_16 (AZ2), Moss\_17 (AZ5), Mudpuppy\_17 (AZ1), Mysterium\_17 (AZ5), Niobe\_17 (AZ1), Nitro\_17 (AZ1), Phives\_18 (AZ1), Pixelle\_17 (AZ1), Powerpuff\_17 (AZ1), Pumpkins\_17 (AZ1), RockScotty\_17 (AZ5), Sabourin\_17 (AZ5), Shaffner\_18 (AZ1), Simpson\_19 (AZ1), Sooty\_17 (AZ5), SpecialK\_17 (AZ5), Stuu\_18 (AZ5), Subaru\_18 (AZ1), Tallboi\_17 (AZ1), Tbone\_17 (AZ1), TforTroy\_17 (AZ1), Tian\_17 (AZ1), Tuck\_18 (AZ1), Turab\_17 (AZ1), Tutumahutu\_17 (AZ1), Warda\_17 (AZ1), Yang\_17 (AZ1), YesChef\_17 (AZ1),

Start 4:

- Found in 11 of 146 ( 7.5% ) of genes in pham
- Manual Annotations of this start: 10 of 112
- Called 100.0% of time when present

- Phage (with cluster) where this start called: Candle\_28 (R), Indlulamithi\_25 (AC), MontyDev\_28 (R), Nilo\_29 (R), Papyrus\_28 (R), Riparian\_28 (R), Rope\_28 (R), Send513\_28 (R), Weiss13\_28 (R), Yelo\_28 (R), Zenon\_29 (R),

#### Start 5:

- Found in 6 of 146 ( 4.1% ) of genes in pham
- Manual Annotations of this start: 5 of 112
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Barnyard\_34 (H2), DrLupo\_36 (H2), Labelle\_34 (U), Madruga\_33 (U), Patience\_35 (U), pZL12\_50c (singleton),

#### Start 6:

- Found in 3 of 146 ( 2.1% ) of genes in pham
- Manual Annotations of this start: 3 of 112
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Aikoy\_37 (AE), Leopard\_37 (AE), Onyinye\_38 (AE),

#### Start 7:

- Found in 48 of 146 ( 32.9% ) of genes in pham
- Manual Annotations of this start: 39 of 112
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Alephilan\_25 (DV), Alyssamiracle\_28 (DV), Apeppi\_25 (DV), Astralis\_26 (DV), Avian\_26 (DV), Beyoncage\_23 (DG1), BirthdayBoy\_29 (DV), BiteSize\_23 (DG1), DaviePasture\_28 (DV), Djokovic\_23 (DG1), DoobyDoo\_27 (DV), DumpTruck\_27 (DV), Erutan\_28 (DV), Fulcrum\_29 (DV), GOATification\_29 (DV), Genamy16\_28 (DV), Gibbin\_29 (DV), Gretellyn\_28 (DV), Jalebi\_27 (DV), Jamemuya19\_26 (DV), Lambo\_28 (DV), LavAbarElk\_26 (DV), Lila22\_27 (DV), LilyPad\_24 (DG1), LittleFella\_25 (DG2), LuckyLeo\_27 (DV), Madi\_23 (DG1), Mima20\_28 (DV), MoiGyank\_30 (DV), NorManre\_29 (DV), NovaSharks\_27 (DV), OtterstedtS21\_28 (DV), ParvusTarda\_28 (DV), Patos\_29 (DV), Ranch\_28 (DV), RazorC\_26 (DV), Rumi\_27 (DV), Sadboi\_28 (DV), Sampudon\_28 (DV), Sienna\_23 (DG1), Stormer\_27 (DV), Suzy\_23 (DG1), Terapin\_23 (DG1), Tillicus\_28 (DV), Wojtek\_27 (DV), Xenia2\_28 (DV), Yikes\_29 (DV), Zany\_27 (DV),

#### Start 9:

- Found in 1 of 146 ( 0.7% ) of genes in pham
- Manual Annotations of this start: 1 of 112
- Called 100.0% of time when present
- Phage (with cluster) where this start called: LuckyBarnes\_24 (singleton),

#### Start 10:

- Found in 17 of 146 ( 11.6% ) of genes in pham
- Manual Annotations of this start: 4 of 112
- Called 52.9% of time when present
- Phage (with cluster) where this start called: AinMach\_16 (AZ), Emotion\_16 (AZ4), Exile\_16 (AZ), JasmineDragon\_16 (AZ4), LadyAstra\_17 (AZ4), MiniMommy\_16 (AZ4), ShakeltOph\_17 (AZ4), Soondubu\_16 (AZ), VroomVroom\_16 (AZ4),

#### Start 11:

- Found in 2 of 146 ( 1.4% ) of genes in pham
- No Manual Annotations of this start.
- Called 100.0% of time when present

- Phage (with cluster) where this start called: NoSwimming\_19 (FO), Scotia\_19 (FO),

Start 12:

- Found in 4 of 146 ( 2.7% ) of genes in pham
- Manual Annotations of this start: 3 of 112
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Aoka\_18 (FO), EvenBluerMoon\_18 (FO), JanetJ\_18 (FO), PrairieDogTown\_27 (FO),

### **Summary by clusters:**

There are 15 clusters represented in this pham: singleton, AE, H2, AC, DG2, AZ2, DG1, U, DV, AZ1, R, AZ, AZ4, AZ5, FO,

Info for manual annotations of cluster AC:

- Start number 4 was manually annotated 1 time for cluster AC.

Info for manual annotations of cluster AE:

- Start number 6 was manually annotated 3 times for cluster AE.

Info for manual annotations of cluster AZ:

- Start number 10 was manually annotated 1 time for cluster AZ.

Info for manual annotations of cluster AZ1:

- Start number 3 was manually annotated 33 times for cluster AZ1.

Info for manual annotations of cluster AZ2:

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

Info for manual annotations of cluster AZ4:

- Start number 10 was manually annotated 3 times for cluster AZ4.

Info for manual annotations of cluster AZ5:

- Start number 3 was manually annotated 10 times for cluster AZ5.

Info for manual annotations of cluster DG1:

- Start number 7 was manually annotated 8 times for cluster DG1.

Info for manual annotations of cluster DG2:

- Start number 7 was manually annotated 1 time for cluster DG2.

Info for manual annotations of cluster DV:

- Start number 7 was manually annotated 30 times for cluster DV.

Info for manual annotations of cluster FO:

- Start number 12 was manually annotated 3 times for cluster FO.

Info for manual annotations of cluster H2:

- Start number 5 was manually annotated 2 times for cluster H2.

Info for manual annotations of cluster R:

- Start number 4 was manually annotated 9 times for cluster R.

Info for manual annotations of cluster U:

•Start number 5 was manually annotated 3 times for cluster U.

**Gene Information:**

Gene: AEgle\_17 Start: 13051, Stop: 13926, Start Num: 3

Candidate Starts for AEgle\_17:

(Start: 3 @13051 has 46 MA's), (37, 13222), (55, 13297), (85, 13447), (97, 13501), (107, 13540), (119, 13597), (133, 13675), (136, 13690),

Gene: AGrandiflora\_17 Start: 13035, Stop: 13910, Start Num: 3

Candidate Starts for AGrandiflora\_17:

(Start: 3 @13035 has 46 MA's), (26, 13146), (42, 13239), (85, 13431), (133, 13659), (136, 13674),

Gene: Adumb2043\_17 Start: 13050, Stop: 13925, Start Num: 3

Candidate Starts for Adumb2043\_17:

(Start: 3 @13050 has 46 MA's), (37, 13221), (55, 13296), (85, 13446), (97, 13500), (107, 13539), (119, 13596), (133, 13674), (136, 13689),

Gene: Aikoy\_37 Start: 27354, Stop: 28244, Start Num: 6

Candidate Starts for Aikoy\_37:

(Start: 6 @27354 has 3 MA's), (31, 27471), (38, 27507), (41, 27531), (45, 27552), (51, 27582), (61, 27612), (66, 27636), (74, 27684), (79, 27696), (84, 27759), (113, 27882), (116, 27903), (135, 27999), (139, 28008), (150, 28074), (157, 28140), (159, 28167), (164, 28206), (167, 28215),

Gene: AinMach\_16 Start: 12225, Stop: 13082, Start Num: 10

Candidate Starts for AinMach\_16:

(Start: 10 @12225 has 4 MA's), (17, 12261), (28, 12330), (31, 12342), (41, 12402), (73, 12516), (75, 12531), (97, 12663), (102, 12675), (114, 12732), (155, 12969), (159, 13005),

Gene: Alephilan\_25 Start: 23941, Stop: 24804, Start Num: 7

Candidate Starts for Alephilan\_25:

(Start: 7 @23941 has 39 MA's), (16, 23983), (39, 24115), (74, 24262), (78, 24271), (84, 24331), (95, 24382), (136, 24559), (143, 24598), (149, 24631), (155, 24688), (156, 24697),

Gene: Alyssamiracle\_28 Start: 22751, Stop: 23614, Start Num: 7

Candidate Starts for Alyssamiracle\_28:

(Start: 7 @22751 has 39 MA's), (16, 22793), (33, 22889), (39, 22925), (48, 22961), (65, 23021), (74, 23072), (78, 23081), (84, 23141), (95, 23192), (136, 23369), (141, 23390), (148, 23432), (149, 23441), (155, 23498), (156, 23507),

Gene: Amyev\_17 Start: 13063, Stop: 13938, Start Num: 3

Candidate Starts for Amyev\_17:

(Start: 3 @13063 has 46 MA's), (85, 13459), (97, 13513), (133, 13687), (136, 13702),

Gene: Aoka\_18 Start: 14198, Stop: 15058, Start Num: 12

Candidate Starts for Aoka\_18:

(Start: 12 @14198 has 3 MA's), (99, 14639), (118, 14732), (134, 14822),

Gene: Apeppi\_25 Start: 24090, Stop: 24947, Start Num: 7

Candidate Starts for Apeppi\_25:



(Start: 7 @24090 has 39 MA's), (16, 24132), (39, 24264), (65, 24360), (74, 24411), (78, 24420), (84, 24480), (95, 24531), (136, 24705), (143, 24744), (155, 24834), (156, 24843),

Gene: Asa16\_17 Start: 13020, Stop: 13895, Start Num: 3

Candidate Starts for Asa16\_17:

(Start: 3 @13020 has 46 MA's), (26, 13131), (37, 13191), (85, 13416), (97, 13470), (103, 13485), (107, 13509), (119, 13566), (133, 13644), (136, 13659),

Gene: Ascela\_17 Start: 13047, Stop: 13922, Start Num: 3

Candidate Starts for Ascela\_17:

(Start: 3 @13047 has 46 MA's), (85, 13443), (107, 13536), (122, 13611), (136, 13686), (152, 13776),

Gene: Ashes\_17 Start: 12748, Stop: 13623, Start Num: 3

Candidate Starts for Ashes\_17:

(Start: 3 @12748 has 46 MA's), (19, 12826), (39, 12937), (47, 12979), (77, 13078), (100, 13204), (124, 13327), (130, 13360), (165, 13588),

Gene: Astralis\_26 Start: 22341, Stop: 23204, Start Num: 7

Candidate Starts for Astralis\_26:

(Start: 7 @22341 has 39 MA's), (33, 22479), (39, 22515), (48, 22551), (65, 22611), (74, 22662), (78, 22671), (84, 22731), (95, 22782), (136, 22959), (141, 22980), (148, 23022), (149, 23031), (155, 23088), (156, 23097),

Gene: Avian\_26 Start: 22733, Stop: 23596, Start Num: 7

Candidate Starts for Avian\_26:

(Start: 7 @22733 has 39 MA's), (16, 22775), (33, 22871), (39, 22907), (48, 22943), (65, 23003), (74, 23054), (78, 23063), (84, 23123), (95, 23174), (136, 23351), (141, 23372), (148, 23414), (149, 23423), (155, 23480), (156, 23489),

Gene: Barnyard\_34 Start: 24251, Stop: 25135, Start Num: 5

Candidate Starts for Barnyard\_34:

(Start: 5 @24251 has 5 MA's), (23, 24329), (26, 24353), (27, 24359), (28, 24368), (29, 24374), (33, 24392), (34, 24395), (37, 24413), (57, 24506), (80, 24614), (81, 24617), (98, 24701), (104, 24722), (106, 24737), (108, 24740), (115, 24770), (125, 24809), (127, 24815), (128, 24827), (149, 24953), (156, 25025), (159, 25055), (161, 25061),

Gene: Beaupre\_17 Start: 12749, Stop: 13624, Start Num: 3

Candidate Starts for Beaupre\_17:

(Start: 3 @12749 has 46 MA's), (19, 12827), (39, 12938), (47, 12980), (77, 13079), (100, 13205), (124, 13328), (130, 13361), (165, 13589),

Gene: Berrie\_17 Start: 13181, Stop: 14056, Start Num: 3

Candidate Starts for Berrie\_17:

(Start: 3 @13181 has 46 MA's), (85, 13577), (107, 13670), (133, 13805), (136, 13820),

Gene: Beyoncage\_23 Start: 19319, Stop: 20188, Start Num: 7

Candidate Starts for Beyoncage\_23:

(Start: 7 @19319 has 39 MA's), (Start: 10 @19325 has 4 MA's), (15, 19355), (22, 19388), (29, 19436), (31, 19442), (39, 19490), (41, 19502), (48, 19535), (62, 19589), (63, 19592), (80, 19688), (81, 19691), (86, 19727), (113, 19838), (131, 19928), (140, 19964), (145, 19991), (153, 20054),

Gene: BirthdayBoy\_29 Start: 24794, Stop: 25657, Start Num: 7

Candidate Starts for BirthdayBoy\_29:

(Start: 7 @24794 has 39 MA's), (16, 24836), (33, 24932), (39, 24968), (48, 25004), (65, 25064), (74, 25115), (78, 25124), (84, 25184), (95, 25235), (136, 25412), (141, 25433), (143, 25451), (149, 25484), (155, 25541), (156, 25550),

Gene: BiteSize\_23 Start: 19319, Stop: 20188, Start Num: 7

Candidate Starts for BiteSize\_23:

(Start: 7 @19319 has 39 MA's), (Start: 10 @19325 has 4 MA's), (15, 19355), (22, 19388), (29, 19436), (31, 19442), (39, 19490), (41, 19502), (48, 19535), (62, 19589), (63, 19592), (80, 19688), (81, 19691), (86, 19727), (113, 19838), (131, 19928), (140, 19964), (145, 19991), (153, 20054),

Gene: Candle\_28 Start: 22572, Stop: 23444, Start Num: 4

Candidate Starts for Candle\_28:

(Start: 4 @22572 has 10 MA's), (17, 22623), (18, 22638), (39, 22752), (40, 22758), (46, 22788), (54, 22821), (71, 22890), (80, 22950), (82, 22974), (123, 23139), (126, 23148), (150, 23271), (152, 23292), (153, 23304), (164, 23403), (166, 23409),

Gene: Cappuccino\_17 Start: 12656, Stop: 13531, Start Num: 3

Candidate Starts for Cappuccino\_17:

(Start: 3 @12656 has 46 MA's), (19, 12734), (39, 12845), (47, 12887), (77, 12986), (100, 13112), (124, 13235), (130, 13268), (165, 13496),

Gene: Cassia\_17 Start: 13143, Stop: 14018, Start Num: 3

Candidate Starts for Cassia\_17:

(Start: 3 @13143 has 46 MA's), (37, 13314), (42, 13347), (85, 13539), (97, 13593), (136, 13782), (152, 13872),

Gene: Community\_17 Start: 14263, Stop: 15138, Start Num: 3

Candidate Starts for Community\_17:

(Start: 3 @14263 has 46 MA's), (25, 14359), (37, 14434), (85, 14659), (107, 14752), (122, 14827), (136, 14902),

Gene: Cyan\_17 Start: 13038, Stop: 13913, Start Num: 3

Candidate Starts for Cyan\_17:

(Start: 3 @13038 has 46 MA's), (26, 13149), (42, 13242), (85, 13434), (133, 13662), (136, 13677),

Gene: DaviePasture\_28 Start: 24560, Stop: 25423, Start Num: 7

Candidate Starts for DaviePasture\_28:

(Start: 7 @24560 has 39 MA's), (33, 24698), (39, 24734), (48, 24770), (65, 24830), (74, 24881), (78, 24890), (84, 24950), (95, 25001), (136, 25178), (141, 25199), (143, 25217), (149, 25250), (155, 25307), (156, 25316),

Gene: Djokovic\_23 Start: 19319, Stop: 20188, Start Num: 7

Candidate Starts for Djokovic\_23:

(Start: 7 @19319 has 39 MA's), (Start: 10 @19325 has 4 MA's), (15, 19355), (22, 19388), (29, 19436), (31, 19442), (39, 19490), (41, 19502), (48, 19535), (62, 19589), (63, 19592), (80, 19688), (81, 19691), (86, 19727), (113, 19838), (131, 19928), (140, 19964), (145, 19991), (153, 20054),

Gene: Donkey\_17 Start: 12656, Stop: 13531, Start Num: 3

Candidate Starts for Donkey\_17:

(Start: 3 @12656 has 46 MA's), (19, 12734), (39, 12845), (47, 12887), (77, 12986), (100, 13112), (124, 13235), (130, 13268), (165, 13496),

Gene: DoobyDoo\_27 Start: 23716, Stop: 24579, Start Num: 7

Candidate Starts for DoobyDoo\_27:

(Start: 7 @23716 has 39 MA's), (16, 23758), (33, 23854), (39, 23890), (48, 23926), (65, 23986), (74, 24037), (78, 24046), (84, 24106), (95, 24157), (136, 24334), (143, 24373), (149, 24406), (155, 24463), (156, 24472),

Gene: DrLupo\_36 Start: 24651, Stop: 25535, Start Num: 5

Candidate Starts for DrLupo\_36:

(Start: 5 @24651 has 5 MA's), (Start: 10 @24663 has 4 MA's), (13, 24666), (26, 24753), (27, 24759), (28, 24768), (33, 24792), (37, 24813), (57, 24906), (63, 24915), (80, 25014), (93, 25083), (115, 25170), (125, 25209), (152, 25383), (159, 25455), (161, 25461),

Gene: DumpTruck\_27 Start: 24026, Stop: 24886, Start Num: 7

Candidate Starts for DumpTruck\_27:

(Start: 7 @24026 has 39 MA's), (17, 24071), (48, 24236), (59, 24272), (63, 24290), (92, 24455), (94, 24458), (95, 24467), (98, 24473), (106, 24509), (109, 24515), (134, 24638), (141, 24665), (142, 24680), (150, 24719), (156, 24782),

Gene: Elezi\_17 Start: 13021, Stop: 13896, Start Num: 3

Candidate Starts for Elezi\_17:

(Start: 3 @13021 has 46 MA's), (26, 13132), (37, 13192), (85, 13417), (97, 13471), (103, 13486), (119, 13567), (133, 13645), (136, 13660),

Gene: Emotion\_16 Start: 11297, Stop: 12160, Start Num: 10

Candidate Starts for Emotion\_16:

(Start: 10 @11297 has 4 MA's), (17, 11333), (20, 11354), (31, 11414), (83, 11672), (123, 11864),

Gene: Eraser\_17 Start: 13021, Stop: 13896, Start Num: 3

Candidate Starts for Eraser\_17:

(Start: 3 @13021 has 46 MA's), (26, 13132), (37, 13192), (85, 13417), (97, 13471), (103, 13486), (107, 13510), (119, 13567), (133, 13645), (136, 13660),

Gene: Erutan\_28 Start: 24238, Stop: 25101, Start Num: 7

Candidate Starts for Erutan\_28:

(Start: 7 @24238 has 39 MA's), (16, 24280), (33, 24376), (39, 24412), (48, 24448), (65, 24508), (74, 24559), (78, 24568), (84, 24628), (95, 24679), (136, 24856), (141, 24877), (143, 24895), (149, 24928), (155, 24985), (156, 24994),

Gene: EvenBluerMoon\_18 Start: 14233, Stop: 15093, Start Num: 12

Candidate Starts for EvenBluerMoon\_18:

(Start: 12 @14233 has 3 MA's), (99, 14674), (118, 14767), (134, 14857),

Gene: Exile\_16 Start: 13694, Stop: 14551, Start Num: 10

Candidate Starts for Exile\_16:

(Start: 10 @13694 has 4 MA's), (17, 13730), (73, 13985), (83, 14069), (90, 14105), (96, 14129), (102, 14144), (125, 14267),

Gene: Fulcrum\_29 Start: 24762, Stop: 25625, Start Num: 7

Candidate Starts for Fulcrum\_29:

(Start: 7 @24762 has 39 MA's), (16, 24804), (33, 24900), (39, 24936), (48, 24972), (65, 25032), (74, 25083), (78, 25092), (84, 25152), (95, 25203), (136, 25380), (141, 25401), (143, 25419), (149, 25452), (155, 25509), (156, 25518),

Gene: GOATification\_29 Start: 24762, Stop: 25625, Start Num: 7

Candidate Starts for GOATification\_29:

(Start: 7 @24762 has 39 MA's), (16, 24804), (33, 24900), (39, 24936), (48, 24972), (65, 25032), (74, 25083), (78, 25092), (84, 25152), (95, 25203), (136, 25380), (141, 25401), (143, 25419), (149, 25452), (155, 25509), (156, 25518),

Gene: Gambol\_17 Start: 12656, Stop: 13531, Start Num: 3

Candidate Starts for Gambol\_17:

(Start: 3 @12656 has 46 MA's), (19, 12734), (39, 12845), (47, 12887), (77, 12986), (100, 13112), (124, 13235), (130, 13268), (165, 13496),

Gene: Genamy16\_28 Start: 22751, Stop: 23614, Start Num: 7

Candidate Starts for Genamy16\_28:

(Start: 7 @22751 has 39 MA's), (16, 22793), (33, 22889), (39, 22925), (48, 22961), (65, 23021), (74, 23072), (78, 23081), (84, 23141), (95, 23192), (136, 23369), (141, 23390), (148, 23432), (149, 23441), (155, 23498), (156, 23507),

Gene: Gibbin\_29 Start: 24843, Stop: 25706, Start Num: 7

Candidate Starts for Gibbin\_29:

(Start: 7 @24843 has 39 MA's), (16, 24885), (39, 25017), (48, 25053), (65, 25113), (74, 25164), (78, 25173), (84, 25233), (95, 25284), (136, 25461), (141, 25482), (143, 25500), (149, 25533), (155, 25590), (156, 25599),

Gene: Gilgamesh\_68 Start: 62731, Stop: 63672, Start Num: 2

Candidate Starts for Gilgamesh\_68:

(Start: 2 @62731 has 1 MA's), (29, 62884), (42, 62956), (58, 63025), (60, 63028), (87, 63196), (100, 63244), (102, 63250), (112, 63304), (121, 63346), (130, 63406), (149, 63502), (155, 63559), (160, 63598), (164, 63634), (166, 63640),

Gene: Giorgio\_17 Start: 12756, Stop: 13631, Start Num: 3

Candidate Starts for Giorgio\_17:

(Start: 3 @12756 has 46 MA's), (19, 12834), (39, 12945), (47, 12987), (77, 13086), (100, 13212), (124, 13335), (130, 13368), (165, 13596),

Gene: Gretellyn\_28 Start: 25105, Stop: 25968, Start Num: 7

Candidate Starts for Gretellyn\_28:

(Start: 7 @25105 has 39 MA's), (16, 25147), (33, 25243), (39, 25279), (48, 25315), (65, 25375), (74, 25426), (78, 25435), (84, 25495), (95, 25546), (136, 25723), (141, 25744), (143, 25762), (149, 25795), (155, 25852), (156, 25861),

Gene: Gumpizza\_17 Start: 12749, Stop: 13624, Start Num: 3

Candidate Starts for Gumpizza\_17:

(Start: 3 @12749 has 46 MA's), (19, 12827), (39, 12938), (47, 12980), (77, 13079), (100, 13205), (124, 13328), (130, 13361), (165, 13589),

Gene: Halsey\_17 Start: 12748, Stop: 13623, Start Num: 3

Candidate Starts for Halsey\_17:

(Start: 3 @12748 has 46 MA's), (19, 12826), (39, 12937), (47, 12979), (77, 13078), (100, 13204), (124, 13327), (130, 13360), (165, 13588),

Gene: Indlulamithi\_25 Start: 20028, Stop: 20903, Start Num: 4

Candidate Starts for Indlulamithi\_25:

(Start: 4 @20028 has 10 MA's), (17, 20082), (26, 20136), (30, 20160), (31, 20163), (39, 20211), (44, 20235), (45, 20244), (49, 20265), (50, 20268), (56, 20286), (78, 20376), (111, 20553), (154, 20766),

(159, 20820), (163, 20853), (164, 20862), (167, 20871), (169, 20892), (170, 20895),

Gene: Iter\_17 Start: 13047, Stop: 13922, Start Num: 3

Candidate Starts for Iter\_17:

(Start: 3 @13047 has 46 MA's), (85, 13443), (107, 13536), (122, 13611), (136, 13686), (152, 13776),

Gene: Jalebi\_27 Start: 25272, Stop: 26135, Start Num: 7

Candidate Starts for Jalebi\_27:

(Start: 7 @25272 has 39 MA's), (16, 25314), (39, 25446), (48, 25482), (65, 25542), (74, 25593), (78, 25602), (84, 25662), (95, 25713), (136, 25890), (141, 25911), (143, 25929), (149, 25962), (155, 26019), (156, 26028),

Gene: Jamemuya19\_26 Start: 22341, Stop: 23204, Start Num: 7

Candidate Starts for Jamemuya19\_26:

(Start: 7 @22341 has 39 MA's), (16, 22383), (33, 22479), (39, 22515), (48, 22551), (65, 22611), (74, 22662), (78, 22671), (84, 22731), (95, 22782), (136, 22959), (141, 22980), (148, 23022), (149, 23031), (155, 23088), (156, 23097),

Gene: Janeemi\_18 Start: 14291, Stop: 15166, Start Num: 3

Candidate Starts for Janeemi\_18:

(Start: 3 @14291 has 46 MA's), (37, 14462), (85, 14687), (107, 14780), (122, 14855), (136, 14930),

Gene: JanetJ\_18 Start: 14015, Stop: 14875, Start Num: 12

Candidate Starts for JanetJ\_18:

(Start: 12 @14015 has 3 MA's), (14, 14036), (67, 14282), (84, 14396), (88, 14414),

Gene: JasmineDragon\_16 Start: 11227, Stop: 12087, Start Num: 10

Candidate Starts for JasmineDragon\_16:

(Start: 10 @11227 has 4 MA's), (17, 11263), (19, 11281), (82, 11599), (103, 11680), (117, 11758), (123, 11794), (149, 11920), (152, 11944),

Gene: Joemato\_17 Start: 13038, Stop: 13913, Start Num: 3

Candidate Starts for Joemato\_17:

(Start: 3 @13038 has 46 MA's), (26, 13149), (42, 13242), (85, 13434), (133, 13662), (136, 13677),

Gene: JohnDoe\_17 Start: 13033, Stop: 13908, Start Num: 3

Candidate Starts for JohnDoe\_17:

(Start: 3 @13033 has 46 MA's), (26, 13144), (85, 13429), (133, 13657), (136, 13672),

Gene: Jstan\_18 Start: 13021, Stop: 13896, Start Num: 3

Candidate Starts for Jstan\_18:

(Start: 3 @13021 has 46 MA's), (26, 13132), (37, 13192), (85, 13417), (97, 13471), (103, 13486), (107, 13510), (119, 13567), (133, 13645), (136, 13660),

Gene: JuneStar\_17 Start: 13141, Stop: 14016, Start Num: 3

Candidate Starts for JuneStar\_17:

(Start: 3 @13141 has 46 MA's), (85, 13537), (107, 13630), (136, 13780), (145, 13822),

Gene: Kalimba\_17 Start: 12657, Stop: 13532, Start Num: 3

Candidate Starts for Kalimba\_17:

(Start: 3 @12657 has 46 MA's), (19, 12735), (39, 12846), (47, 12888), (77, 12987), (100, 13113), (124, 13236), (130, 13269), (165, 13497),

Gene: Kaylissa\_17 Start: 13039, Stop: 13914, Start Num: 3

Candidate Starts for Kaylissa\_17:

(Start: 3 @13039 has 46 MA's), (26, 13150), (42, 13243), (85, 13435), (133, 13663), (136, 13678),

Gene: Labelle\_34 Start: 26211, Stop: 27101, Start Num: 5

Candidate Starts for Labelle\_34:

(Start: 5 @26211 has 5 MA's), (29, 26340), (42, 26412), (46, 26430), (49, 26448), (57, 26472), (74, 26538), (85, 26619), (91, 26649), (101, 26685), (123, 26778), (131, 26817), (141, 26877), (152, 26952), (166, 27069), (169, 27093),

Gene: LadyAstra\_17 Start: 11229, Stop: 12089, Start Num: 10

Candidate Starts for LadyAstra\_17:

(Start: 10 @11229 has 4 MA's), (17, 11265), (19, 11283), (83, 11604), (103, 11682), (117, 11760), (123, 11796), (131, 11835), (135, 11856),

Gene: Lambo\_28 Start: 24780, Stop: 25640, Start Num: 7

Candidate Starts for Lambo\_28:

(Start: 7 @24780 has 39 MA's), (16, 24822), (39, 24954), (65, 25050), (74, 25101), (78, 25110), (84, 25170), (95, 25221), (136, 25395), (141, 25416), (143, 25434), (149, 25467), (155, 25524), (156, 25533),

Gene: LavAbarElk\_26 Start: 23211, Stop: 24074, Start Num: 7

Candidate Starts for LavAbarElk\_26:

(Start: 7 @23211 has 39 MA's), (16, 23253), (33, 23349), (39, 23385), (48, 23421), (65, 23481), (74, 23532), (78, 23541), (84, 23601), (95, 23652), (136, 23829), (141, 23850), (143, 23868), (149, 23901), (155, 23958), (156, 23967),

Gene: Lego\_17 Start: 13038, Stop: 13913, Start Num: 3

Candidate Starts for Lego\_17:

(Start: 3 @13038 has 46 MA's), (26, 13149), (42, 13242), (85, 13434), (133, 13662), (136, 13677),

Gene: Leopard\_37 Start: 27642, Stop: 28532, Start Num: 6

Candidate Starts for Leopard\_37:

(Start: 6 @27642 has 3 MA's), (31, 27759), (38, 27795), (41, 27819), (45, 27840), (51, 27870), (61, 27900), (66, 27924), (74, 27972), (79, 27984), (84, 28047), (113, 28170), (116, 28191), (135, 28287), (139, 28296), (150, 28362), (157, 28428), (159, 28455), (164, 28494), (167, 28503),

Gene: Liebe\_16 Start: 11562, Stop: 12437, Start Num: 3

Candidate Starts for Liebe\_16:

(Start: 3 @11562 has 46 MA's), (33, 11712), (97, 12012), (100, 12018), (119, 12108), (136, 12201),

Gene: Lila22\_27 Start: 24732, Stop: 25595, Start Num: 7

Candidate Starts for Lila22\_27:

(Start: 7 @24732 has 39 MA's), (16, 24774), (39, 24906), (48, 24942), (65, 25002), (74, 25053), (78, 25062), (84, 25122), (95, 25173), (136, 25350), (141, 25371), (143, 25389), (149, 25422), (155, 25479), (156, 25488),

Gene: LilyPad\_24 Start: 19902, Stop: 20771, Start Num: 7

Candidate Starts for LilyPad\_24:

(Start: 7 @19902 has 39 MA's), (21, 19968), (24, 19977), (29, 20019), (31, 20025), (41, 20085), (81, 20274), (86, 20310), (109, 20397), (123, 20472), (137, 20532), (145, 20574), (165, 20736),

Gene: LittleFella\_25 Start: 21778, Stop: 22647, Start Num: 7

Candidate Starts for LittleFella\_25:

(Start: 7 @21778 has 39 MA's), (15, 21814), (22, 21847), (31, 21901), (39, 21949), (48, 21994), (70, 22087), (78, 22117), (80, 22147), (120, 22333), (130, 22384), (141, 22426), (151, 22495), (164, 22609),

Gene: Lizalica\_17 Start: 13023, Stop: 13898, Start Num: 3

Candidate Starts for Lizalica\_17:

(Start: 3 @13023 has 46 MA's), (26, 13134), (37, 13194), (85, 13419), (133, 13647), (136, 13662),

Gene: London\_17 Start: 13021, Stop: 13896, Start Num: 3

Candidate Starts for London\_17:

(Start: 3 @13021 has 46 MA's), (26, 13132), (37, 13192), (85, 13417), (97, 13471), (103, 13486), (107, 13510), (119, 13567), (133, 13645), (136, 13660),

Gene: LuckyBarnes\_24 Start: 20004, Stop: 20891, Start Num: 9

Candidate Starts for LuckyBarnes\_24:

(Start: 9 @20004 has 1 MA's), (21, 20070), (35, 20145), (42, 20193), (69, 20289), (86, 20400), (89, 20418), (97, 20460), (105, 20496), (110, 20511), (144, 20688), (146, 20697), (147, 20700), (158, 20781), (162, 20823),

Gene: LuckyLeo\_27 Start: 24090, Stop: 24947, Start Num: 7

Candidate Starts for LuckyLeo\_27:

(Start: 7 @24090 has 39 MA's), (16, 24132), (39, 24264), (65, 24360), (74, 24411), (78, 24420), (84, 24480), (95, 24531), (136, 24705), (143, 24744), (155, 24834), (156, 24843),

Gene: MaGuCo\_16 Start: 11496, Stop: 12371, Start Num: 3

Candidate Starts for MaGuCo\_16:

(Start: 3 @11496 has 46 MA's), (33, 11646), (97, 11946), (100, 11952), (119, 12042), (124, 12075), (136, 12135),

Gene: Madi\_23 Start: 19319, Stop: 20188, Start Num: 7

Candidate Starts for Madi\_23:

(Start: 7 @19319 has 39 MA's), (Start: 10 @19325 has 4 MA's), (15, 19355), (22, 19388), (29, 19436), (31, 19442), (39, 19490), (41, 19502), (48, 19535), (62, 19589), (63, 19592), (80, 19688), (81, 19691), (86, 19727), (113, 19838), (131, 19928), (140, 19964), (145, 19991), (153, 20054),

Gene: Madruga\_33 Start: 25880, Stop: 26770, Start Num: 5

Candidate Starts for Madruga\_33:

(Start: 5 @25880 has 5 MA's), (29, 26009), (42, 26081), (46, 26099), (49, 26117), (57, 26141), (74, 26207), (85, 26288), (91, 26318), (101, 26354), (123, 26447), (131, 26486), (141, 26546), (152, 26621), (166, 26738), (169, 26762),

Gene: Maureen\_16 Start: 11562, Stop: 12437, Start Num: 3

Candidate Starts for Maureen\_16:

(Start: 3 @11562 has 46 MA's), (33, 11712), (97, 12012), (100, 12018), (119, 12108), (136, 12201),

Gene: Mima20\_28 Start: 24461, Stop: 25324, Start Num: 7

Candidate Starts for Mima20\_28:

(Start: 7 @24461 has 39 MA's), (16, 24503), (33, 24599), (39, 24635), (48, 24671), (65, 24731), (74, 24782), (78, 24791), (84, 24851), (95, 24902), (136, 25079), (141, 25100), (143, 25118), (149, 25151), (155, 25208), (156, 25217),

Gene: MiniMommy\_16 Start: 11228, Stop: 12088, Start Num: 10

Candidate Starts for MiniMommy\_16:

(Start: 10 @11228 has 4 MA's), (17, 11264), (19, 11282), (82, 11600), (103, 11681), (117, 11759), (123, 11795), (149, 11921), (152, 11945),

Gene: MoiGyank\_30 Start: 25142, Stop: 26005, Start Num: 7

Candidate Starts for MoiGyank\_30:

(Start: 7 @25142 has 39 MA's), (16, 25184), (33, 25280), (39, 25316), (48, 25352), (65, 25412), (74, 25463), (78, 25472), (84, 25532), (95, 25583), (136, 25760), (141, 25781), (143, 25799), (149, 25832), (155, 25889), (156, 25898),

Gene: MontyDev\_28 Start: 22213, Stop: 23085, Start Num: 4

Candidate Starts for MontyDev\_28:

(Start: 4 @22213 has 10 MA's), (17, 22264), (18, 22279), (39, 22393), (40, 22399), (46, 22429), (54, 22462), (71, 22531), (80, 22591), (82, 22615), (123, 22780), (126, 22789), (150, 22912), (152, 22933), (153, 22945), (164, 23044), (166, 23050),

Gene: Moss\_17 Start: 12748, Stop: 13623, Start Num: 3

Candidate Starts for Moss\_17:

(Start: 3 @12748 has 46 MA's), (19, 12826), (39, 12937), (47, 12979), (77, 13078), (100, 13204), (124, 13327), (130, 13360), (165, 13588),

Gene: Mudpuppy\_17 Start: 13037, Stop: 13912, Start Num: 3

Candidate Starts for Mudpuppy\_17:

(Start: 3 @13037 has 46 MA's), (26, 13148), (85, 13433), (133, 13661), (136, 13676),

Gene: Mysterium\_17 Start: 12749, Stop: 13624, Start Num: 3

Candidate Starts for Mysterium\_17:

(Start: 3 @12749 has 46 MA's), (19, 12827), (39, 12938), (47, 12980), (77, 13079), (100, 13205), (124, 13328), (130, 13361), (165, 13589),

Gene: Nilo\_29 Start: 22569, Stop: 23441, Start Num: 4

Candidate Starts for Nilo\_29:

(Start: 4 @22569 has 10 MA's), (17, 22620), (18, 22635), (39, 22749), (40, 22755), (46, 22785), (54, 22818), (71, 22887), (80, 22947), (82, 22971), (123, 23136), (126, 23145), (150, 23268), (152, 23289), (153, 23301), (164, 23400), (166, 23406),

Gene: Niobe\_17 Start: 13021, Stop: 13896, Start Num: 3

Candidate Starts for Niobe\_17:

(Start: 3 @13021 has 46 MA's), (26, 13132), (37, 13192), (85, 13417), (97, 13471), (103, 13486), (107, 13510), (119, 13567), (133, 13645), (136, 13660),

Gene: Nitro\_17 Start: 13045, Stop: 13920, Start Num: 3

Candidate Starts for Nitro\_17:

(1, 12886), (Start: 3 @13045 has 46 MA's), (37, 13216), (85, 13441), (107, 13534), (119, 13591), (131, 13660), (133, 13669), (136, 13684), (144, 13723),

Gene: NoSwimming\_19 Start: 15157, Stop: 16017, Start Num: 11

Candidate Starts for NoSwimming\_19:

(8, 15148), (11, 15157), (64, 15406), (73, 15445), (88, 15556), (97, 15595), (100, 15601), (118, 15691), (136, 15787),

Gene: NorManre\_29 Start: 24349, Stop: 25212, Start Num: 7

Candidate Starts for NorManre\_29:



(Start: 7 @24349 has 39 MA's), (16, 24391), (39, 24523), (48, 24559), (65, 24619), (74, 24670), (78, 24679), (84, 24739), (95, 24790), (136, 24967), (141, 24988), (143, 25006), (149, 25039), (155, 25096), (156, 25105),

Gene: NovaSharks\_27 Start: 22341, Stop: 23204, Start Num: 7

Candidate Starts for NovaSharks\_27:

(Start: 7 @22341 has 39 MA's), (16, 22383), (33, 22479), (39, 22515), (48, 22551), (65, 22611), (74, 22662), (78, 22671), (84, 22731), (95, 22782), (136, 22959), (141, 22980), (148, 23022), (149, 23031), (155, 23088), (156, 23097),

Gene: Onyinye\_38 Start: 27521, Stop: 28411, Start Num: 6

Candidate Starts for Onyinye\_38:

(Start: 6 @27521 has 3 MA's), (31, 27638), (38, 27674), (41, 27698), (45, 27719), (51, 27749), (61, 27779), (66, 27803), (74, 27851), (79, 27863), (84, 27926), (113, 28049), (116, 28070), (135, 28166), (139, 28175), (150, 28241), (157, 28307), (159, 28334), (164, 28373), (167, 28382),

Gene: OtterstedtS21\_28 Start: 24427, Stop: 25290, Start Num: 7

Candidate Starts for OtterstedtS21\_28:

(Start: 7 @24427 has 39 MA's), (16, 24469), (39, 24601), (48, 24637), (65, 24697), (74, 24748), (78, 24757), (84, 24817), (95, 24868), (136, 25045), (141, 25066), (143, 25084), (149, 25117), (155, 25174), (156, 25183),

Gene: Papyrus\_28 Start: 22234, Stop: 23106, Start Num: 4

Candidate Starts for Papyrus\_28:

(Start: 4 @22234 has 10 MA's), (17, 22285), (18, 22300), (39, 22414), (40, 22420), (46, 22450), (54, 22483), (71, 22552), (80, 22612), (82, 22636), (123, 22801), (126, 22810), (150, 22933), (152, 22954), (153, 22966), (164, 23065), (166, 23071),

Gene: ParvusTarda\_28 Start: 23909, Stop: 24772, Start Num: 7

Candidate Starts for ParvusTarda\_28:

(Start: 7 @23909 has 39 MA's), (16, 23951), (39, 24083), (48, 24119), (65, 24179), (74, 24230), (78, 24239), (84, 24299), (95, 24350), (136, 24527), (141, 24548), (143, 24566), (149, 24599), (155, 24656), (156, 24665),

Gene: Patience\_35 Start: 26761, Stop: 27651, Start Num: 5

Candidate Starts for Patience\_35:

(Start: 5 @26761 has 5 MA's), (29, 26890), (42, 26962), (45, 26977), (46, 26980), (49, 26998), (57, 27022), (74, 27088), (85, 27169), (91, 27199), (101, 27235), (123, 27328), (131, 27367), (141, 27427), (152, 27502), (166, 27619), (169, 27643),

Gene: Patos\_29 Start: 24349, Stop: 25212, Start Num: 7

Candidate Starts for Patos\_29:

(Start: 7 @24349 has 39 MA's), (16, 24391), (39, 24523), (48, 24559), (65, 24619), (74, 24670), (78, 24679), (84, 24739), (95, 24790), (136, 24967), (141, 24988), (143, 25006), (149, 25039), (155, 25096), (156, 25105),

Gene: Phives\_18 Start: 14123, Stop: 14998, Start Num: 3

Candidate Starts for Phives\_18:

(Start: 3 @14123 has 46 MA's), (85, 14519), (97, 14573), (133, 14747), (136, 14762),

Gene: Pixelle\_17 Start: 13066, Stop: 13941, Start Num: 3

Candidate Starts for Pixelle\_17:

(Start: 3 @13066 has 46 MA's), (97, 13516), (133, 13690), (136, 13705),

Gene: Powerpuff\_17 Start: 13089, Stop: 13964, Start Num: 3

Candidate Starts for Powerpuff\_17:

(Start: 3 @13089 has 46 MA's), (26, 13200), (42, 13293), (85, 13485), (133, 13713), (136, 13728),

Gene: PrairieDogTown\_27 Start: 14235, Stop: 15095, Start Num: 12

Candidate Starts for PrairieDogTown\_27:

(Start: 12 @14235 has 3 MA's), (99, 14676), (118, 14769), (134, 14859),

Gene: Pumpkins\_17 Start: 13153, Stop: 14028, Start Num: 3

Candidate Starts for Pumpkins\_17:

(Start: 3 @13153 has 46 MA's), (37, 13324), (42, 13357), (85, 13549), (97, 13603), (136, 13792), (152, 13882),

Gene: Ranch\_28 Start: 23263, Stop: 24126, Start Num: 7

Candidate Starts for Ranch\_28:

(Start: 7 @23263 has 39 MA's), (16, 23305), (39, 23437), (48, 23473), (65, 23533), (74, 23584), (78, 23593), (84, 23653), (95, 23704), (136, 23881), (141, 23902), (143, 23920), (149, 23953), (155, 24010), (156, 24019),

Gene: RazorC\_26 Start: 22733, Stop: 23596, Start Num: 7

Candidate Starts for RazorC\_26:

(Start: 7 @22733 has 39 MA's), (16, 22775), (33, 22871), (39, 22907), (48, 22943), (65, 23003), (74, 23054), (78, 23063), (84, 23123), (95, 23174), (136, 23351), (141, 23372), (148, 23414), (149, 23423), (155, 23480), (156, 23489),

Gene: Riparian\_28 Start: 22030, Stop: 22902, Start Num: 4

Candidate Starts for Riparian\_28:

(Start: 4 @22030 has 10 MA's), (17, 22081), (18, 22096), (39, 22210), (40, 22216), (46, 22246), (54, 22279), (71, 22348), (72, 22351), (80, 22408), (123, 22597), (126, 22606), (150, 22729), (152, 22750), (153, 22762), (164, 22861), (166, 22867),

Gene: RockScotty\_17 Start: 12748, Stop: 13623, Start Num: 3

Candidate Starts for RockScotty\_17:

(Start: 3 @12748 has 46 MA's), (19, 12826), (39, 12937), (47, 12979), (77, 13078), (100, 13204), (124, 13327), (130, 13360), (165, 13588),

Gene: Rope\_28 Start: 22216, Stop: 23088, Start Num: 4

Candidate Starts for Rope\_28:

(Start: 4 @22216 has 10 MA's), (17, 22267), (18, 22282), (39, 22396), (40, 22402), (46, 22432), (54, 22465), (71, 22534), (80, 22594), (82, 22618), (123, 22783), (126, 22792), (150, 22915), (152, 22936), (153, 22948), (164, 23047), (166, 23053),

Gene: Rumi\_27 Start: 22344, Stop: 23207, Start Num: 7

Candidate Starts for Rumi\_27:

(Start: 7 @22344 has 39 MA's), (16, 22386), (33, 22482), (39, 22518), (48, 22554), (65, 22614), (74, 22665), (78, 22674), (84, 22734), (95, 22785), (136, 22962), (141, 22983), (148, 23025), (149, 23034), (155, 23091), (156, 23100),

Gene: Sabourin\_17 Start: 12655, Stop: 13530, Start Num: 3

Candidate Starts for Sabourin\_17:

(Start: 3 @12655 has 46 MA's), (19, 12733), (39, 12844), (47, 12886), (77, 12985), (100, 13111), (124, 13234), (130, 13267), (165, 13495),

Gene: Sadboi\_28 Start: 25105, Stop: 25968, Start Num: 7

Candidate Starts for Sadboi\_28:

(Start: 7 @25105 has 39 MA's), (16, 25147), (33, 25243), (39, 25279), (48, 25315), (65, 25375), (74, 25426), (78, 25435), (84, 25495), (95, 25546), (136, 25723), (141, 25744), (143, 25762), (149, 25795), (155, 25852), (156, 25861),

Gene: Sampudon\_28 Start: 25272, Stop: 26135, Start Num: 7

Candidate Starts for Sampudon\_28:

(Start: 7 @25272 has 39 MA's), (16, 25314), (39, 25446), (48, 25482), (65, 25542), (74, 25593), (78, 25602), (84, 25662), (95, 25713), (136, 25890), (141, 25911), (143, 25929), (149, 25962), (155, 26019), (156, 26028),

Gene: Scotia\_19 Start: 15157, Stop: 16017, Start Num: 11

Candidate Starts for Scotia\_19:

(8, 15148), (11, 15157), (64, 15406), (73, 15445), (88, 15556), (97, 15595), (100, 15601), (118, 15691), (136, 15787),

Gene: Send513\_28 Start: 22572, Stop: 23444, Start Num: 4

Candidate Starts for Send513\_28:

(Start: 4 @22572 has 10 MA's), (17, 22623), (18, 22638), (39, 22752), (40, 22758), (46, 22788), (54, 22821), (71, 22890), (80, 22950), (82, 22974), (123, 23139), (126, 23148), (150, 23271), (152, 23292), (153, 23304), (164, 23403), (166, 23409),

Gene: Shaffner\_18 Start: 13140, Stop: 14015, Start Num: 3

Candidate Starts for Shaffner\_18:

(Start: 3 @13140 has 46 MA's), (37, 13311), (42, 13344), (85, 13536), (97, 13590), (107, 13629), (136, 13779), (145, 13821),

Gene: ShakeltOph\_17 Start: 11227, Stop: 12087, Start Num: 10

Candidate Starts for ShakeltOph\_17:

(Start: 10 @11227 has 4 MA's), (17, 11263), (19, 11281), (82, 11599), (103, 11680), (117, 11758), (123, 11794), (149, 11920), (152, 11944),

Gene: Sienna\_23 Start: 19319, Stop: 20188, Start Num: 7

Candidate Starts for Sienna\_23:

(Start: 7 @19319 has 39 MA's), (Start: 10 @19325 has 4 MA's), (15, 19355), (22, 19388), (26, 19415), (29, 19436), (31, 19442), (39, 19490), (41, 19502), (48, 19535), (53, 19556), (80, 19688), (81, 19691), (86, 19727), (123, 19889), (131, 19928), (140, 19964), (143, 19985),

Gene: Simpson\_19 Start: 13038, Stop: 13913, Start Num: 3

Candidate Starts for Simpson\_19:

(Start: 3 @13038 has 46 MA's), (26, 13149), (42, 13242), (85, 13434), (133, 13662), (136, 13677),

Gene: Soondubu\_16 Start: 13702, Stop: 14559, Start Num: 10

Candidate Starts for Soondubu\_16:

(Start: 10 @13702 has 4 MA's), (17, 13738), (73, 13993), (83, 14077), (90, 14113), (96, 14137), (102, 14152), (125, 14275),

Gene: Sooty\_17 Start: 12658, Stop: 13533, Start Num: 3

Candidate Starts for Sooty\_17:

(Start: 3 @12658 has 46 MA's), (19, 12736), (39, 12847), (47, 12889), (77, 12988), (100, 13114), (124, 13237), (130, 13270), (165, 13498),

Gene: SpecialK\_17 Start: 12655, Stop: 13530, Start Num: 3

Candidate Starts for SpecialK\_17:

(Start: 3 @12655 has 46 MA's), (19, 12733), (39, 12844), (47, 12886), (77, 12985), (100, 13111), (124, 13234), (130, 13267), (165, 13495),

Gene: Stormer\_27 Start: 22344, Stop: 23207, Start Num: 7

Candidate Starts for Stormer\_27:

(Start: 7 @22344 has 39 MA's), (16, 22386), (33, 22482), (39, 22518), (48, 22554), (65, 22614), (74, 22665), (78, 22674), (84, 22734), (95, 22785), (136, 22962), (141, 22983), (148, 23025), (149, 23034), (155, 23091), (156, 23100),

Gene: Stuu\_18 Start: 12748, Stop: 13623, Start Num: 3

Candidate Starts for Stuu\_18:

(Start: 3 @12748 has 46 MA's), (19, 12826), (39, 12937), (47, 12979), (77, 13078), (100, 13204), (124, 13327), (130, 13360), (165, 13588),

Gene: Subaru\_18 Start: 13021, Stop: 13896, Start Num: 3

Candidate Starts for Subaru\_18:

(Start: 3 @13021 has 46 MA's), (26, 13132), (37, 13192), (85, 13417), (97, 13471), (103, 13486), (119, 13567), (133, 13645), (136, 13660),

Gene: Suzy\_23 Start: 20480, Stop: 21349, Start Num: 7

Candidate Starts for Suzy\_23:

(Start: 7 @20480 has 39 MA's), (Start: 10 @20486 has 4 MA's), (15, 20516), (22, 20549), (29, 20597), (31, 20603), (39, 20651), (41, 20663), (42, 20669), (43, 20672), (48, 20696), (51, 20711), (80, 20849), (81, 20852), (86, 20888), (113, 20999), (131, 21089), (140, 21125), (153, 21215),

Gene: Tallboi\_17 Start: 13048, Stop: 13923, Start Num: 3

Candidate Starts for Tallboi\_17:

(Start: 3 @13048 has 46 MA's), (37, 13219), (85, 13444), (97, 13498), (119, 13594), (133, 13672), (136, 13687), (152, 13777),

Gene: Tbone\_17 Start: 13042, Stop: 13917, Start Num: 3

Candidate Starts for Tbone\_17:

(Start: 3 @13042 has 46 MA's), (26, 13153), (85, 13438), (133, 13666), (136, 13681),

Gene: Terapin\_23 Start: 19319, Stop: 20188, Start Num: 7

Candidate Starts for Terapin\_23:

(Start: 7 @19319 has 39 MA's), (Start: 10 @19325 has 4 MA's), (15, 19355), (22, 19388), (29, 19436), (31, 19442), (39, 19490), (41, 19502), (48, 19535), (62, 19589), (63, 19592), (80, 19688), (81, 19691), (86, 19727), (113, 19838), (131, 19928), (140, 19964), (145, 19991), (153, 20054),

Gene: TforTroy\_17 Start: 13171, Stop: 14046, Start Num: 3

Candidate Starts for TforTroy\_17:

(Start: 3 @13171 has 46 MA's), (37, 13342), (85, 13567), (107, 13660), (136, 13810), (145, 13852),

Gene: Tian\_17 Start: 13063, Stop: 13938, Start Num: 3

Candidate Starts for Tian\_17:

(Start: 3 @13063 has 46 MA's), (85, 13459), (97, 13513), (133, 13687), (136, 13702),

Gene: Tillicus\_28 Start: 23684, Stop: 24541, Start Num: 7

Candidate Starts for Tillicus\_28:

(Start: 7 @23684 has 39 MA's), (33, 23822), (36, 23834), (39, 23858), (54, 23918), (74, 24005), (84, 24074), (95, 24125), (136, 24299), (139, 24308), (155, 24428), (156, 24437),

Gene: Tuck\_18 Start: 14243, Stop: 15118, Start Num: 3

Candidate Starts for Tuck\_18:

(Start: 3 @14243 has 46 MA's), (25, 14339), (37, 14414), (85, 14639), (107, 14732), (122, 14807), (136, 14882),

Gene: Turab\_17 Start: 13050, Stop: 13925, Start Num: 3

Candidate Starts for Turab\_17:

(Start: 3 @13050 has 46 MA's), (37, 13221), (55, 13296), (85, 13446), (97, 13500), (107, 13539), (119, 13596), (133, 13674), (136, 13689),

Gene: Tutumahutu\_17 Start: 13089, Stop: 13964, Start Num: 3

Candidate Starts for Tutumahutu\_17:

(Start: 3 @13089 has 46 MA's), (26, 13200), (85, 13485), (133, 13713), (136, 13728),

Gene: VroomVroom\_16 Start: 11238, Stop: 12098, Start Num: 10

Candidate Starts for VroomVroom\_16:

(Start: 10 @11238 has 4 MA's), (17, 11274), (19, 11292), (83, 11613), (117, 11769), (123, 11805), (135, 11865), (149, 11931), (152, 11955),

Gene: Warda\_17 Start: 13034, Stop: 13909, Start Num: 3

Candidate Starts for Warda\_17:

(Start: 3 @13034 has 46 MA's), (26, 13145), (85, 13430), (133, 13658), (136, 13673),

Gene: Weiss13\_28 Start: 22262, Stop: 23134, Start Num: 4

Candidate Starts for Weiss13\_28:

(Start: 4 @22262 has 10 MA's), (17, 22313), (18, 22328), (39, 22442), (40, 22448), (46, 22478), (54, 22511), (71, 22580), (72, 22583), (80, 22640), (123, 22829), (126, 22838), (150, 22961), (152, 22982), (153, 22994), (164, 23093), (166, 23099),

Gene: Wojtek\_27 Start: 23982, Stop: 24845, Start Num: 7

Candidate Starts for Wojtek\_27:

(Start: 7 @23982 has 39 MA's), (16, 24024), (39, 24156), (54, 24216), (65, 24252), (74, 24303), (78, 24312), (84, 24372), (95, 24423), (136, 24600), (141, 24621), (143, 24639), (149, 24672), (155, 24729), (156, 24738),

Gene: Xenia2\_28 Start: 24068, Stop: 24928, Start Num: 7

Candidate Starts for Xenia2\_28:

(Start: 7 @24068 has 39 MA's), (17, 24113), (48, 24278), (59, 24314), (63, 24332), (92, 24497), (94, 24500), (95, 24509), (98, 24515), (106, 24551), (109, 24557), (132, 24668), (141, 24707), (142, 24722), (150, 24761), (156, 24824),

Gene: Yang\_17 Start: 13141, Stop: 14016, Start Num: 3

Candidate Starts for Yang\_17:

(Start: 3 @13141 has 46 MA's), (85, 13537), (136, 13780), (168, 14005),

Gene: Yelo\_28 Start: 22555, Stop: 23427, Start Num: 4

Candidate Starts for Yelo\_28:

(Start: 4 @22555 has 10 MA's), (17, 22606), (18, 22621), (39, 22735), (40, 22741), (46, 22771), (54, 22804), (71, 22873), (80, 22933), (123, 23122), (126, 23131), (150, 23254), (152, 23275), (153, 23287), (164, 23386),

Gene: YesChef\_17 Start: 13089, Stop: 13964, Start Num: 3

Candidate Starts for YesChef\_17:

(Start: 3 @13089 has 46 MA's), (26, 13200), (42, 13293), (85, 13485), (133, 13713), (136, 13728),

Gene: Yikes\_29 Start: 25357, Stop: 26220, Start Num: 7

Candidate Starts for Yikes\_29:

(Start: 7 @25357 has 39 MA's), (16, 25399), (33, 25495), (39, 25531), (48, 25567), (65, 25627), (74, 25678), (78, 25687), (84, 25747), (95, 25798), (136, 25975), (141, 25996), (143, 26014), (149, 26047), (155, 26104), (156, 26113),

Gene: Zany\_27 Start: 24878, Stop: 25741, Start Num: 7

Candidate Starts for Zany\_27:

(Start: 7 @24878 has 39 MA's), (16, 24920), (39, 25052), (48, 25088), (65, 25148), (74, 25199), (78, 25208), (84, 25268), (95, 25319), (136, 25496), (141, 25517), (143, 25535), (149, 25568), (155, 25625), (156, 25634),

Gene: Zenon\_29 Start: 22574, Stop: 23446, Start Num: 4

Candidate Starts for Zenon\_29:

(Start: 4 @22574 has 10 MA's), (17, 22625), (18, 22640), (39, 22754), (40, 22760), (46, 22790), (54, 22823), (71, 22892), (72, 22895), (80, 22952), (82, 22976), (123, 23141), (126, 23150), (150, 23273), (152, 23294), (153, 23306), (164, 23405), (166, 23411),

Gene: pZL12\_50c Start: 39384, Stop: 38482, Start Num: 5

Candidate Starts for pZL12\_50c:

(Start: 5 @39384 has 5 MA's), (16, 39333), (32, 39246), (33, 39237), (39, 39201), (52, 39147), (53, 39144), (67, 39090), (68, 39084), (76, 39051), (112, 38856), (129, 38754), (138, 38715), (143, 38682),