





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 308154 Report

This analysis was run 06/27/26 on database version 652.

Pham number 308154 has 172 members, 23 are drafts.

Phages represented in each track:

- Track 1 : AppleCloud\_23, Hiro\_25, PhailMary\_24, Krishelle\_25, Jester\_25
- Track 2 : Alpacados\_24, Harlequin\_25, Rasputin\_25, Yoncess\_25, Bryce\_25, Yogi\_25, Bonanza\_25, BobbyDazzler\_25
- Track 3 : Alatin\_25, CosmicSans\_25, Rhodalysa\_25, StCroix\_25, TWAMP\_25, Naiad\_25, Gollum\_25, Lillie\_25
- Track 4 : Bradshaw\_25, Swann\_25, RER2\_18, Phrankenstein\_25, Erik\_25, Nancinator\_25, Espica\_25, RexFury\_25, Belenaria\_25, UhSalsa\_25, Natosaleda\_25
- Track 5 : Partridge\_25, Shuman\_25, Takoda\_25, AngryOrchard\_24, Dinger\_25
- Track 6 : RGL3\_18
- Track 7 : Widow\_22
- Track 8 : Puppies\_22
- Track 9 : GTE5\_41
- Track 10 : Flapper\_54
- Track 11 : Dalilpop\_54
- Track 12 : GRU1\_39
- Track 13 : Turuncu\_54
- Track 14 : Jifall16\_48, Kurt\_49, Phomeo\_48, Emianna\_49
- Track 15 : GTE8\_38
- Track 16 : Commandaria\_50
- Track 17 : Outis\_51, StarStruck\_51
- Track 18 : Kabluna\_53, Bonum\_53, SuperSulley\_51, Buggaboo\_51
- Track 19 : NovumRegina\_49, KidneyBean\_49, Arti\_49, GrootJr\_51, Foxboro\_50
- Track 20 : MerCougar\_51
- Track 21 : NatB6\_49
- Track 22 : Wheezy\_49
- Track 23 : Tracker\_49
- Track 24 : NosilaM\_53
- Track 25 : Ennea\_56, Patio\_53, Lollipop1437\_55, Float294\_52, Skysand\_52
- Track 26 : RedRaider\_57
- Track 27 : BiPauneto\_51, Pemberton\_52, NadineRae\_49, Sukkupi\_50, Yndexa\_50
- Track 28 : WhoseManz\_50, IDyn\_50, Marietta\_51, HubbaBubba\_46
- Track 29 : Scuba\_57
- Track 30 : HomeFry\_54
- Track 31 : Pleakley\_57, Fury\_57
- Track 32 : Horseradish\_23, MScarn\_24, Blondies\_23, Biskit\_23, Buttrmlkdreams\_22, Troje\_22, SketchMex\_21, Yummy\_23

- Track 33 : Carsonalex\_23, Starburst\_23, Axym\_22, Sopespian\_22, RSchmailzl\_23, RADical\_23, RedBaron\_24, GoldHunter\_23, Cozz\_22, PsychoKiller\_22, Elliott\_22
- Track 34 : Tolls\_24, CaramelLatte\_22, AndPeggy\_21, SteamedHams\_24, CanesSauce\_22, Yarn\_21, ChocoMunchkin\_22
- Track 35 : Fribs8\_23
- Track 36 : Survivors\_24, Wallaby\_26, Wolfwood\_24
- Track 37 : Dre3\_22, Gibbous\_22
- Track 38 : MaVan\_24, Azira\_24, Nibbles\_24
- Track 39 : ChickenTender\_24, MunkgeeRoachy\_22
- Track 40 : Amok\_21, AikoCarson\_21
- Track 41 : Emalyn\_21
- Track 42 : Nina\_23
- Track 43 : Typhonomachy\_22
- Track 44 : BillDoor\_24
- Track 45 : Burnsey\_22
- Track 46 : SweatNTears\_24
- Track 47 : Socotra\_23
- Track 48 : Malvina\_24, HippoPololi\_24
- Track 49 : Zareef\_24
- Track 50 : Bubble\_22, Quasar\_22
- Track 51 : Agatha\_22
- Track 52 : Cleo\_22
- Track 53 : Suscepit\_23, Eudoria\_23, Zameen\_23, Neobush\_23, Antonio\_23, PantheRoc\_22, Agueybana\_22, BaxterFox\_21, Maridalia\_22, Trumpet\_23, Tayonia\_23, Manasvini\_23, Kita\_23
- Track 54 : AlumE\_22, BoyNamedSue\_22
- Track 55 : Yeezy\_23
- Track 56 : Francois\_31, Hamood\_31, NancyRae\_31, DelRio\_32, Pimento\_31, Ayotoya\_31, GrandSlam\_31, Chop\_31
- Track 57 : Parada\_31, Nadeem\_31, WheatThin\_31, Brylie\_31, Mulch\_31
- Track 58 : BetterKatz\_31
- Track 59 : Bock\_31
- Track 60 : REQ2\_23
- Track 61 : Tailonex\_6

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

The start number called the most often in the published annotations is 30, it was called in 41 of the 149 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Arti\_49, BiPauneto\_51, Bonum\_53, Buggaboo\_51, Commandaria\_50, Dalilpop\_54, Emianna\_49, Ennea\_56, Flapper\_54, Float294\_52, Foxboro\_50, Fury\_57, GRU1\_39, GTE5\_41, GTE8\_38, GrootJr\_51, HomeFry\_54, HubbaBubba\_46, IDyn\_50, Jifall16\_48, Kabluna\_53, KidneyBean\_49, Kurt\_49, Lollipop1437\_55, Marietta\_51, MerCougar\_51, NadineRae\_49, NatB6\_49, NosilaM\_53, NovumRegina\_49, Outis\_51, Patio\_53, Pemberton\_52, Phomeo\_48, Pleakley\_57, RedRaider\_57, Scuba\_57, Skysand\_52, StarStruck\_51, Sukkupi\_50, SuperSulley\_51, Tracker\_49, Turuncu\_54, Wheezy\_49, WhoseManz\_50, Yndexa\_50,

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

- Tailonex\_6,

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

- Agatha\_22, Agueybana\_22, AikoCarson\_21, Alatin\_25, Alpacados\_24, AlumE\_22, Amok\_21, AndPeggy\_21, AngryOrchard\_24, Antonio\_23, AppleCloud\_23, Axym\_22, Ayotoya\_31, Azira\_24, BaxterFox\_21, Belenaria\_25, BetterKatz\_31, BillDoor\_24, Biskit\_23, Blondies\_23, BobbyDazzler\_25, Bock\_31, Bonanza\_25, BoyNamedSue\_22, Bradshaw\_25, Bryce\_25, Brylie\_31, Bubble\_22, Burnsey\_22, Buttrmlkdreams\_22, CanesSauce\_22, CaramelLatte\_22, Carsonalex\_23, ChickenTender\_24, ChocoMunchkin\_22, Chop\_31, Cleo\_22, CosmicSans\_25, Cozz\_22, DelRio\_32, Dinger\_25, Dre3\_22, Elliott\_22, Emalyn\_21, Erik\_25, Espica\_25, Eudoria\_23, Francois\_31, Fribs8\_23, Gibbous\_22, GoldHunter\_23, Gollum\_25, GrandSlam\_31, Hamood\_31, Harlequin\_25, HippoPololi\_24, Hiro\_25, Horseradish\_23, Jester\_25, Kita\_23, Krishelle\_25, Lillie\_25, MScarn\_24, MaVan\_24, Malvina\_24, Manasvini\_23, Maridalia\_22, Mulch\_31, MunkgeeRoachy\_22, Nadeem\_31, Naiad\_25, Nancinator\_25, NancyRae\_31, Natosaleda\_25, Neobush\_23, Nibbles\_24, Nina\_23, PantheRoc\_22, Parada\_31, Partridge\_25, PhailMary\_24, Phrankenstien\_25, Pimento\_31, PsychoKiller\_22, Puppies\_22, Quasar\_22, RADical\_23, REQ2\_23, RER2\_18, RGL3\_18, RSchmailzl\_23, Rasputin\_25, RedBaron\_24, RexFury\_25, Rhodalysa\_25, Shuman\_25, SketchMex\_21, Socotra\_23, Sopespian\_22, StCroix\_25, Starburst\_23, SteamedHams\_24, Survivors\_24, Suscepit\_23, Swann\_25, SweatNTears\_24, TWAMP\_25, Takoda\_25, Tayonia\_23, Tolls\_24, Troje\_22, Trumpet\_23, Typhonmarchy\_22, UhSalsa\_25, Wallaby\_26, WheatThin\_31, Widow\_22, Wolfwood\_24, Yarn\_21, Yeezy\_23, Yogi\_25, Yoncess\_25, Yummy\_23, Zameen\_23, Zareef\_24,

### Summary by start number:

Start 29:

- Found in 2 of 172 ( 1.2% ) of genes in pham
- Manual Annotations of this start: 2 of 149
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Puppies\_22 (CD), Widow\_22 (CD),

Start 30:

- Found in 47 of 172 ( 27.3% ) of genes in pham
- Manual Annotations of this start: 41 of 149
- Called 97.9% of time when present
- Phage (with cluster) where this start called: Arti\_49 (CR2), BiPauneto\_51 (CR4), Bonum\_53 (CR2), Buggaboo\_51 (CR2), Commandaria\_50 (CR2), Dalilpop\_54 (CR1), Emianna\_49 (CR2), Ennea\_56 (CR3), Flapper\_54 (CR1), Float294\_52 (CR3), Foxboro\_50 (CR2), Fury\_57 (CR5), GRU1\_39 (CR1), GTE5\_41 (CR1), GTE8\_38 (CR2), GrootJr\_51 (CR2), HomeFry\_54 (CR5), HubbaBubba\_46 (CR4), IDyn\_50 (CR4), Jifall16\_48 (CR2), Kabluna\_53 (CR2), KidneyBean\_49 (CR2), Kurt\_49 (CR2), Lollipop1437\_55 (CR3), Marietta\_51 (CR4), MerCougar\_51 (CR2), NadineRae\_49 (CR4), NatB6\_49 (CR2), NosilaM\_53 (CR2), NovumRegina\_49 (CR2), Outis\_51 (CR2), Patio\_53 (CR3), Pemberton\_52 (CR4), Phomeo\_48 (CR2), Pleakley\_57 (CR5), RedRaider\_57 (CR3), Scuba\_57 (CR5), Skysand\_52 (CR3), StarStruck\_51 (CR2), Sukkupi\_50 (CR4), SuperSulley\_51 (CR2), Tracker\_49 (CR2), Turuncu\_54 (CR1), Wheezy\_49 (CR2), WhoseManz\_50 (CR4), Yndexa\_50 (CR4),

Start 31:

- Found in 36 of 172 ( 20.9% ) of genes in pham
- Manual Annotations of this start: 26 of 149
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Agatha\_22 (CT), Axym\_22 (CT), Ayotoya\_31 (DI), BetterKatz\_31 (DI), Bock\_31 (DI), Brylie\_31 (DI), Bubble\_22 (CT), Burnsey\_22 (CT), Carsonalex\_23 (CT), ChickenTender\_24 (CT), Chop\_31 (DI), Cozz\_22 (CT), DelRio\_32 (DI), Elliott\_22 (CT), Francois\_31 (DI), GoldHunter\_23 (CT), GrandSlam\_31 (DI), Hamood\_31 (DI), Mulch\_31 (DI), MunkgeeRoachy\_22 (CT), Nadeem\_31 (DI), NancyRae\_31 (DI), Nina\_23 (CT), Parada\_31 (DI), Pimento\_31 (DI), PsychoKiller\_22 (CT), Quasar\_22 (CT), RADical\_23 (CT), RSchmailzl\_23 (CT), RedBaron\_24 (CT), Socotra\_23 (CT), Sopespian\_22 (CT), Starburst\_23 (CT), Tailonex\_6 (singleton), Typhonmachy\_22 (CT), WheatThin\_31 (DI),

#### Start 32:

- Found in 28 of 172 ( 16.3% ) of genes in pham
- Manual Annotations of this start: 26 of 149
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Agueybana\_22 (CZ1), AlumE\_22 (CZ1), Antonio\_23 (CZ1), Azira\_24 (CT), BaxterFox\_21 (CZ3), BoyNamedSue\_22 (CZ1), Cleo\_22 (CT), Dre3\_22 (CT), Eudoria\_23 (CZ1), Gibbous\_22 (CT), HippoPololi\_24 (CT), Kita\_23 (CZ1), MaVan\_24 (CT), Malvina\_24 (CT), Manasvini\_23 (CZ1), Maridalia\_22 (CZ1), Neobush\_23 (CZ1), Nibbles\_24 (CT), PantheRoc\_22 (CZ3), Survivors\_24 (CT), Suscepit\_23 (CZ1), Tayonia\_23 (CZ1), Trumpet\_23 (CZ1), Wallaby\_26 (CT), Wolfwood\_24 (CT), Yeezy\_23 (CZ3), Zameen\_23 (CZ1), Zareef\_24 (CT),

#### Start 33:

- Found in 37 of 172 ( 21.5% ) of genes in pham
- Manual Annotations of this start: 36 of 149
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Alatin\_25 (CA), Alpacados\_24 (CA), AngryOrchard\_24 (CA), AppleCloud\_23 (CA), Belenaria\_25 (CA), BobbyDazzler\_25 (CA), Bonanza\_25 (CA), Bradshaw\_25 (CA), Bryce\_25 (CA), CosmicSans\_25 (CA), Dinger\_25 (CA), Erik\_25 (CA), Espica\_25 (CA), Gollum\_25 (CA), Harlequin\_25 (CA), Hiro\_25 (CA), Jester\_25 (CA), Krishelle\_25 (CA), Lillie\_25 (CA), Naiad\_25 (CA), Nancinator\_25 (CA), Natosaleda\_25 (CA), Partridge\_25 (CA), PhailMary\_24 (CA), Phrankenstien\_25 (CA), RER2\_18 (CA), Rasputin\_25 (CA), RexFury\_25 (CA), Rhodalysa\_25 (CA), Shuman\_25 (CA), StCroix\_25 (CA), Swann\_25 (CA), TWAMP\_25 (CA), Takoda\_25 (CA), UhSalsa\_25 (CA), Yogi\_25 (CA), Yoncess\_25 (CA),

#### Start 34:

- Found in 1 of 172 ( 0.6% ) of genes in pham
- No Manual Annotations of this start.
- Called 100.0% of time when present
- Phage (with cluster) where this start called: RGL3\_18 (CA),

#### Start 35:

- Found in 7 of 172 ( 4.1% ) of genes in pham
- Manual Annotations of this start: 1 of 149
- Called 14.3% of time when present
- Phage (with cluster) where this start called: Fribs8\_23 (CT),

Start 37:

- Found in 19 of 172 ( 11.0% ) of genes in pham
- Manual Annotations of this start: 15 of 149
- Called 94.7% of time when present
- Phage (with cluster) where this start called: AndPeggy\_21 (CT), BillDoor\_24 (CT), Biskit\_23 (CT), Blondies\_23 (CT), Buttrmlkdreams\_22 (CT), CanesSauce\_22 (CT), CaramelLatte\_22 (CT), ChocoMunchkin\_22 (CT), Emalyn\_21 (CT), Horseradish\_23 (CT), MScarn\_24 (CT), SketchMex\_21 (CT), SteamedHams\_24 (CT), SweatNTears\_24 (CT), Tolls\_24 (CT), Troje\_22 (CT), Yarn\_21 (CT), Yummy\_23 (CT),

Start 38:

- Found in 26 of 172 ( 15.1% ) of genes in pham
- Manual Annotations of this start: 2 of 149
- Called 11.5% of time when present
- Phage (with cluster) where this start called: AikoCarson\_21 (CT), Amok\_21 (CT), REQ2\_23 (singleton),

**Summary by clusters:**

There are 12 clusters represented in this pham: CR2, CR3, singleton, CR5, CR4, DI, CZ3, CA, CZ1, CD, CR1, CT,

Info for manual annotations of cluster CA:

- Start number 33 was manually annotated 36 times for cluster CA.

Info for manual annotations of cluster CD:

- Start number 29 was manually annotated 2 times for cluster CD.

Info for manual annotations of cluster CR1:

- Start number 30 was manually annotated 3 times for cluster CR1.

Info for manual annotations of cluster CR2:

- Start number 30 was manually annotated 21 times for cluster CR2.

Info for manual annotations of cluster CR3:

- Start number 30 was manually annotated 6 times for cluster CR3.

Info for manual annotations of cluster CR4:

- Start number 30 was manually annotated 8 times for cluster CR4.

Info for manual annotations of cluster CR5:

- Start number 30 was manually annotated 3 times for cluster CR5.

Info for manual annotations of cluster CT:

- Start number 31 was manually annotated 11 times for cluster CT.
- Start number 32 was manually annotated 10 times for cluster CT.
- Start number 35 was manually annotated 1 time for cluster CT.
- Start number 37 was manually annotated 15 times for cluster CT.
- Start number 38 was manually annotated 2 times for cluster CT.

Info for manual annotations of cluster CZ1:

- Start number 32 was manually annotated 13 times for cluster CZ1.

Info for manual annotations of cluster CZ3:

- Start number 32 was manually annotated 3 times for cluster CZ3.

Info for manual annotations of cluster DI:

- Start number 31 was manually annotated 15 times for cluster DI.

### **Gene Information:**

Gene: Agatha\_22 Start: 19362, Stop: 19658, Start Num: 31

Candidate Starts for Agatha\_22:

(Start: 31 @19362 has 26 MA's), (Start: 38 @19380 has 2 MA's), (47, 19458), (49, 19470), (51, 19479), (64, 19533),

Gene: Agueybana\_22 Start: 21088, Stop: 21378, Start Num: 32

Candidate Starts for Agueybana\_22:

(18, 20596), (20, 20707), (21, 20725), (Start: 32 @21088 has 26 MA's), (51, 21199), (55, 21211), (58, 21223), (75, 21292), (76, 21301), (80, 21337),

Gene: AikoCarson\_21 Start: 18679, Stop: 18954, Start Num: 38

Candidate Starts for AikoCarson\_21:

(Start: 38 @18679 has 2 MA's), (47, 18754), (49, 18766), (58, 18799), (64, 18829), (75, 18868), (78, 18898),

Gene: Alatin\_25 Start: 18437, Stop: 18763, Start Num: 33

Candidate Starts for Alatin\_25:

(Start: 33 @18437 has 36 MA's), (47, 18539), (61, 18596), (65, 18617), (67, 18626), (70, 18638), (75, 18653), (78, 18683), (79, 18695),

Gene: Alpacados\_24 Start: 18373, Stop: 18699, Start Num: 33

Candidate Starts for Alpacados\_24:

(Start: 33 @18373 has 36 MA's), (47, 18475), (51, 18496), (65, 18553), (67, 18562), (70, 18574), (75, 18589), (78, 18619), (79, 18631),

Gene: AlumE\_22 Start: 21087, Stop: 21377, Start Num: 32

Candidate Starts for AlumE\_22:

(7, 20388), (9, 20436), (14, 20538), (20, 20706), (21, 20724), (Start: 32 @21087 has 26 MA's), (51, 21198), (55, 21210), (58, 21222), (75, 21291), (76, 21300), (80, 21336),

Gene: Amok\_21 Start: 18676, Stop: 18951, Start Num: 38

Candidate Starts for Amok\_21:

(Start: 38 @18676 has 2 MA's), (47, 18751), (49, 18763), (58, 18796), (64, 18826), (75, 18865), (78, 18895),

Gene: AndPeggy\_21 Start: 19045, Stop: 19326, Start Num: 37

Candidate Starts for AndPeggy\_21:

(Start: 37 @19045 has 15 MA's), (47, 19126), (49, 19138), (52, 19150), (55, 19159), (69, 19222), (75, 19240), (78, 19270),

Gene: AngryOrchard\_24 Start: 18356, Stop: 18682, Start Num: 33

Candidate Starts for AngryOrchard\_24:

(Start: 33 @18356 has 36 MA's), (47, 18458), (65, 18536), (67, 18545), (70, 18557), (75, 18572), (78, 18602), (79, 18614),

Gene: Antonio\_23 Start: 21208, Stop: 21498, Start Num: 32

Candidate Starts for Antonio\_23:

(18, 20716), (20, 20827), (21, 20845), (Start: 32 @21208 has 26 MA's), (51, 21319), (55, 21331), (58, 21343), (75, 21412), (76, 21421), (80, 21457),

Gene: AppleCloud\_23 Start: 18402, Stop: 18728, Start Num: 33

Candidate Starts for AppleCloud\_23:

(Start: 33 @18402 has 36 MA's), (47, 18504), (65, 18582), (67, 18591), (72, 18609), (75, 18618), (78, 18648), (79, 18660),

Gene: Arti\_49 Start: 38372, Stop: 38683, Start Num: 30

Candidate Starts for Arti\_49:

(5, 37676), (6, 37679), (9, 37751), (12, 37817), (14, 37853), (15, 37865), (Start: 30 @38372 has 41 MA's), (61, 38531), (72, 38579), (75, 38588), (89, 38663),

Gene: Axym\_22 Start: 19362, Stop: 19658, Start Num: 31

Candidate Starts for Axym\_22:

(Start: 31 @19362 has 26 MA's), (Start: 38 @19380 has 2 MA's), (47, 19458), (49, 19470), (51, 19479), (64, 19533),

Gene: Ayotoya\_31 Start: 27226, Stop: 27591, Start Num: 31

Candidate Starts for Ayotoya\_31:

(8, 26551), (10, 26590), (11, 26605), (18, 26737), (22, 26962), (23, 26971), (28, 27106), (Start: 31 @27226 has 26 MA's), (52, 27349), (62, 27388), (64, 27400), (67, 27412), (75, 27439), (76, 27448), (86, 27511),

Gene: Azira\_24 Start: 20334, Stop: 20621, Start Num: 32

Candidate Starts for Azira\_24:

(Start: 32 @20334 has 26 MA's), (47, 20421), (60, 20472), (64, 20496), (67, 20508),

Gene: BaxterFox\_21 Start: 20414, Stop: 20704, Start Num: 32

Candidate Starts for BaxterFox\_21:

(18, 19922), (20, 20033), (21, 20051), (Start: 32 @20414 has 26 MA's), (51, 20525), (55, 20537), (58, 20549), (75, 20618), (76, 20627), (80, 20663),

Gene: Belenaria\_25 Start: 18437, Stop: 18763, Start Num: 33

Candidate Starts for Belenaria\_25:

(Start: 33 @18437 has 36 MA's), (47, 18539), (61, 18596), (65, 18617), (67, 18626), (75, 18653), (78, 18683), (79, 18695),

Gene: BetterKatz\_31 Start: 26699, Stop: 27064, Start Num: 31

Candidate Starts for BetterKatz\_31:

(8, 26024), (10, 26063), (11, 26078), (18, 26210), (22, 26435), (23, 26444), (28, 26579), (Start: 31 @26699 has 26 MA's), (52, 26822), (62, 26861), (64, 26873), (67, 26885), (75, 26912), (76, 26921), (86, 26984),

Gene: BiPauneto\_51 Start: 37878, Stop: 38198, Start Num: 30

Candidate Starts for BiPauneto\_51:

(Start: 30 @37878 has 41 MA's), (47, 37992), (72, 38097),

Gene: BillDoor\_24 Start: 19013, Stop: 19294, Start Num: 37

Candidate Starts for BillDoor\_24:

(Start: 37 @19013 has 15 MA's), (47, 19094), (49, 19106), (52, 19118), (55, 19127), (75, 19208), (78, 19238),

Gene: Biskit\_23 Start: 19036, Stop: 19317, Start Num: 37

Candidate Starts for Biskit\_23:

(Start: 37 @19036 has 15 MA's), (39, 19048), (44, 19066), (47, 19117), (49, 19129), (55, 19150), (58, 19162), (64, 19192), (78, 19261), (90, 19312),

Gene: Blondies\_23 Start: 19019, Stop: 19300, Start Num: 37

Candidate Starts for Blondies\_23:

(Start: 37 @19019 has 15 MA's), (39, 19031), (44, 19049), (47, 19100), (49, 19112), (55, 19133), (58, 19145), (64, 19175), (78, 19244), (90, 19295),

Gene: BobbyDazzler\_25 Start: 18482, Stop: 18808, Start Num: 33

Candidate Starts for BobbyDazzler\_25:

(Start: 33 @18482 has 36 MA's), (47, 18584), (51, 18605), (65, 18662), (67, 18671), (70, 18683), (75, 18698), (78, 18728), (79, 18740),

Gene: Bock\_31 Start: 26449, Stop: 26814, Start Num: 31

Candidate Starts for Bock\_31:

(Start: 31 @26449 has 26 MA's), (52, 26572), (62, 26611), (64, 26623), (67, 26635), (75, 26662), (76, 26671), (86, 26734), (88, 26737),

Gene: Bonanza\_25 Start: 18411, Stop: 18737, Start Num: 33

Candidate Starts for Bonanza\_25:

(Start: 33 @18411 has 36 MA's), (47, 18513), (51, 18534), (65, 18591), (67, 18600), (70, 18612), (75, 18627), (78, 18657), (79, 18669),

Gene: Bonum\_53 Start: 39025, Stop: 39333, Start Num: 30

Candidate Starts for Bonum\_53:

(9, 38404), (12, 38470), (14, 38506), (17, 38545), (19, 38575), (Start: 30 @39025 has 41 MA's), (47, 39127), (71, 39229), (81, 39295),

Gene: BoyNamedSue\_22 Start: 21087, Stop: 21377, Start Num: 32

Candidate Starts for BoyNamedSue\_22:

(7, 20388), (9, 20436), (14, 20538), (20, 20706), (21, 20724), (Start: 32 @21087 has 26 MA's), (51, 21198), (55, 21210), (58, 21222), (75, 21291), (76, 21300), (80, 21336),

Gene: Bradshaw\_25 Start: 18437, Stop: 18763, Start Num: 33

Candidate Starts for Bradshaw\_25:

(Start: 33 @18437 has 36 MA's), (47, 18539), (61, 18596), (65, 18617), (67, 18626), (75, 18653), (78, 18683), (79, 18695),

Gene: Bryce\_25 Start: 18411, Stop: 18737, Start Num: 33

Candidate Starts for Bryce\_25:

(Start: 33 @18411 has 36 MA's), (47, 18513), (51, 18534), (65, 18591), (67, 18600), (70, 18612), (75, 18627), (78, 18657), (79, 18669),

Gene: Brylie\_31 Start: 26437, Stop: 26802, Start Num: 31

Candidate Starts for Brylie\_31:

(Start: 31 @26437 has 26 MA's), (52, 26560), (62, 26599), (64, 26611), (67, 26623), (75, 26650), (76, 26659), (86, 26722),

Gene: Bubble\_22 Start: 19362, Stop: 19658, Start Num: 31

Candidate Starts for Bubble\_22:

(Start: 31 @19362 has 26 MA's), (Start: 38 @19380 has 2 MA's), (47, 19458), (49, 19470), (51, 19479), (64, 19533), (72, 19563),

Gene: Buggaboo\_51 Start: 39504, Stop: 39812, Start Num: 30

Candidate Starts for Buggaboo\_51:

(9, 38883), (12, 38949), (14, 38985), (17, 39024), (19, 39054), (Start: 30 @39504 has 41 MA's), (47, 39606), (71, 39708), (81, 39774),

Gene: Burnsey\_22 Start: 19363, Stop: 19659, Start Num: 31

Candidate Starts for Burnsey\_22:

(Start: 31 @19363 has 26 MA's), (Start: 38 @19381 has 2 MA's), (47, 19459), (49, 19471), (64, 19534),

Gene: Buttrmlkdreams\_22 Start: 19018, Stop: 19299, Start Num: 37

Candidate Starts for Buttrmlkdreams\_22:

(Start: 37 @19018 has 15 MA's), (39, 19030), (44, 19048), (47, 19099), (49, 19111), (55, 19132), (58, 19144), (64, 19174), (78, 19243), (90, 19294),

Gene: CanesSauce\_22 Start: 19046, Stop: 19327, Start Num: 37

Candidate Starts for CanesSauce\_22:

(Start: 37 @19046 has 15 MA's), (47, 19127), (49, 19139), (52, 19151), (55, 19160), (69, 19223), (75, 19241), (78, 19271),

Gene: Caramellatte\_22 Start: 19046, Stop: 19327, Start Num: 37

Candidate Starts for Caramellatte\_22:

(Start: 37 @19046 has 15 MA's), (47, 19127), (49, 19139), (52, 19151), (55, 19160), (69, 19223), (75, 19241), (78, 19271),

Gene: Carsonalex\_23 Start: 19420, Stop: 19716, Start Num: 31

Candidate Starts for Carsonalex\_23:

(Start: 31 @19420 has 26 MA's), (Start: 38 @19438 has 2 MA's), (47, 19516), (49, 19528), (51, 19537), (64, 19591),

Gene: ChickenTender\_24 Start: 19427, Stop: 19720, Start Num: 31

Candidate Starts for ChickenTender\_24:

(Start: 31 @19427 has 26 MA's), (Start: 38 @19445 has 2 MA's), (47, 19523), (49, 19535), (51, 19544), (64, 19598),

Gene: ChocoMunchkin\_22 Start: 19046, Stop: 19327, Start Num: 37

Candidate Starts for ChocoMunchkin\_22:

(Start: 37 @19046 has 15 MA's), (47, 19127), (49, 19139), (52, 19151), (55, 19160), (69, 19223), (75, 19241), (78, 19271),

Gene: Chop\_31 Start: 26974, Stop: 27339, Start Num: 31

Candidate Starts for Chop\_31:

(8, 26299), (10, 26338), (11, 26353), (18, 26485), (22, 26710), (23, 26719), (28, 26854), (Start: 31 @26974 has 26 MA's), (52, 27097), (62, 27136), (64, 27148), (67, 27160), (75, 27187), (76, 27196), (86, 27259),

Gene: Cleo\_22 Start: 19671, Stop: 19958, Start Num: 32

Candidate Starts for Cleo\_22:

(Start: 32 @19671 has 26 MA's), (42, 19698), (47, 19758), (49, 19770), (57, 19800), (61, 19815), (64, 19833), (75, 19872), (76, 19881), (77, 19884), (80, 19917), (81, 19926), (84, 19938),

Gene: Commandaria\_50 Start: 39488, Stop: 39796, Start Num: 30

Candidate Starts for Commandaria\_50:

(Start: 30 @39488 has 41 MA's), (43, 39536), (47, 39590), (51, 39611), (58, 39635), (76, 39713), (87, 39776),

Gene: CosmicSans\_25 Start: 18437, Stop: 18763, Start Num: 33

Candidate Starts for CosmicSans\_25:

(Start: 33 @18437 has 36 MA's), (47, 18539), (61, 18596), (65, 18617), (67, 18626), (70, 18638), (75, 18653), (78, 18683), (79, 18695),

Gene: Cozz\_22 Start: 19363, Stop: 19659, Start Num: 31

Candidate Starts for Cozz\_22:

(Start: 31 @19363 has 26 MA's), (Start: 38 @19381 has 2 MA's), (47, 19459), (49, 19471), (51, 19480), (64, 19534),

Gene: Dalilpop\_54 Start: 40645, Stop: 40959, Start Num: 30

Candidate Starts for Dalilpop\_54:

(9, 40024), (12, 40090), (14, 40126), (17, 40165), (19, 40195), (Start: 30 @40645 has 41 MA's), (Start: 35 @40660 has 1 MA's), (50, 40765), (75, 40861), (76, 40870), (80, 40906), (83, 40921), (85, 40930),

Gene: DelRio\_32 Start: 27445, Stop: 27810, Start Num: 31

Candidate Starts for DelRio\_32:

(8, 26770), (10, 26809), (11, 26824), (18, 26956), (22, 27181), (23, 27190), (28, 27325), (Start: 31 @27445 has 26 MA's), (52, 27568), (62, 27607), (64, 27619), (67, 27631), (75, 27658), (76, 27667), (86, 27730),

Gene: Dinger\_25 Start: 18407, Stop: 18733, Start Num: 33

Candidate Starts for Dinger\_25:

(Start: 33 @18407 has 36 MA's), (47, 18509), (65, 18587), (67, 18596), (70, 18608), (75, 18623), (78, 18653), (79, 18665),

Gene: Dre3\_22 Start: 19597, Stop: 19884, Start Num: 32

Candidate Starts for Dre3\_22:

(Start: 32 @19597 has 26 MA's), (42, 19624), (47, 19684), (49, 19696), (61, 19741), (75, 19798), (80, 19843), (84, 19864),

Gene: Elliott\_22 Start: 19362, Stop: 19658, Start Num: 31

Candidate Starts for Elliott\_22:

(Start: 31 @19362 has 26 MA's), (Start: 38 @19380 has 2 MA's), (47, 19458), (49, 19470), (51, 19479), (64, 19533),

Gene: Emalyn\_21 Start: 18672, Stop: 18953, Start Num: 37

Candidate Starts for Emalyn\_21:

(Start: 37 @18672 has 15 MA's), (47, 18753), (49, 18765), (58, 18798), (64, 18828), (75, 18867), (78, 18897),

Gene: Emianna\_49 Start: 39364, Stop: 39675, Start Num: 30

Candidate Starts for Emianna\_49:

(1, 38308), (2, 38476), (4, 38515), (5, 38668), (6, 38671), (9, 38743), (12, 38809), (14, 38845), (15, 38857), (Start: 30 @39364 has 41 MA's), (61, 39523), (72, 39571), (75, 39580), (89, 39655),

Gene: Ennea\_56 Start: 40367, Stop: 40681, Start Num: 30

Candidate Starts for Ennea\_56:

(14, 39848), (Start: 30 @40367 has 41 MA's), (61, 40526), (64, 40544), (76, 40592), (80, 40628),

Gene: Erik\_25 Start: 18436, Stop: 18762, Start Num: 33

Candidate Starts for Erik\_25:

(Start: 33 @18436 has 36 MA's), (47, 18538), (61, 18595), (65, 18616), (67, 18625), (75, 18652), (78, 18682), (79, 18694),

Gene: Espica\_25 Start: 18437, Stop: 18763, Start Num: 33

Candidate Starts for Espica\_25:

(Start: 33 @18437 has 36 MA's), (47, 18539), (61, 18596), (65, 18617), (67, 18626), (75, 18653), (78, 18683), (79, 18695),

Gene: Eudoria\_23 Start: 21208, Stop: 21498, Start Num: 32

Candidate Starts for Eudoria\_23:

(18, 20716), (20, 20827), (21, 20845), (Start: 32 @21208 has 26 MA's), (51, 21319), (55, 21331), (58, 21343), (75, 21412), (76, 21421), (80, 21457),

Gene: Flapper\_54 Start: 40076, Stop: 40390, Start Num: 30

Candidate Starts for Flapper\_54:

(17, 39596), (19, 39626), (Start: 30 @40076 has 41 MA's), (Start: 35 @40091 has 1 MA's), (53, 40205), (57, 40220), (72, 40283), (76, 40301), (80, 40337),

Gene: Float294\_52 Start: 39809, Stop: 40123, Start Num: 30

Candidate Starts for Float294\_52:

(14, 39290), (Start: 30 @39809 has 41 MA's), (61, 39968), (64, 39986), (76, 40034), (80, 40070),

Gene: Foxboro\_50 Start: 39870, Stop: 40181, Start Num: 30

Candidate Starts for Foxboro\_50:

(5, 39174), (6, 39177), (9, 39249), (12, 39315), (14, 39351), (15, 39363), (Start: 30 @39870 has 41 MA's), (61, 40029), (72, 40077), (75, 40086), (89, 40161),

Gene: Francois\_31 Start: 26463, Stop: 26828, Start Num: 31

Candidate Starts for Francois\_31:

(8, 25788), (10, 25827), (11, 25842), (18, 25974), (22, 26199), (23, 26208), (28, 26343), (Start: 31 @26463 has 26 MA's), (52, 26586), (62, 26625), (64, 26637), (67, 26649), (75, 26676), (76, 26685), (86, 26748),

Gene: Fribs8\_23 Start: 20181, Stop: 20468, Start Num: 35

Candidate Starts for Fribs8\_23:

(26, 20001), (Start: 35 @20181 has 1 MA's), (42, 20208), (49, 20280), (61, 20325), (67, 20355),

Gene: Fury\_57 Start: 38531, Stop: 38845, Start Num: 30

Candidate Starts for Fury\_57:

(Start: 30 @38531 has 41 MA's), (Start: 38 @38555 has 2 MA's), (47, 38633), (50, 38651), (56, 38672), (75, 38747), (76, 38756),

Gene: GRU1\_39 Start: 31623, Stop: 31937, Start Num: 30

Candidate Starts for GRU1\_39:

(Start: 30 @31623 has 41 MA's), (Start: 35 @31638 has 1 MA's), (50, 31743), (75, 31839), (76, 31848), (80, 31884), (85, 31908),

Gene: GTE5\_41 Start: 32933, Stop: 33247, Start Num: 30

Candidate Starts for GTE5\_41:

(Start: 30 @32933 has 41 MA's), (Start: 35 @32948 has 1 MA's), (50, 33053), (72, 33140), (75, 33149), (76, 33158), (80, 33194),

Gene: GTE8\_38 Start: 32622, Stop: 32933, Start Num: 30

Candidate Starts for GTE8\_38:

(Start: 30 @32622 has 41 MA's), (69, 32820), (72, 32829),

Gene: Gibbous\_22 Start: 19597, Stop: 19884, Start Num: 32

Candidate Starts for Gibbous\_22:

(Start: 32 @19597 has 26 MA's), (42, 19624), (47, 19684), (49, 19696), (61, 19741), (75, 19798), (80, 19843), (84, 19864),

Gene: GoldHunter\_23 Start: 19363, Stop: 19659, Start Num: 31

Candidate Starts for GoldHunter\_23:

(Start: 31 @19363 has 26 MA's), (Start: 38 @19381 has 2 MA's), (47, 19459), (49, 19471), (51, 19480), (64, 19534),

Gene: Gollum\_25 Start: 18437, Stop: 18763, Start Num: 33

Candidate Starts for Gollum\_25:

(Start: 33 @18437 has 36 MA's), (47, 18539), (61, 18596), (65, 18617), (67, 18626), (70, 18638), (75, 18653), (78, 18683), (79, 18695),

Gene: GrandSlam\_31 Start: 26974, Stop: 27339, Start Num: 31

Candidate Starts for GrandSlam\_31:

(8, 26299), (10, 26338), (11, 26353), (18, 26485), (22, 26710), (23, 26719), (28, 26854), (Start: 31 @26974 has 26 MA's), (52, 27097), (62, 27136), (64, 27148), (67, 27160), (75, 27187), (76, 27196), (86, 27259),

Gene: GrootJr\_51 Start: 38746, Stop: 39057, Start Num: 30

Candidate Starts for GrootJr\_51:

(5, 38050), (6, 38053), (9, 38125), (12, 38191), (14, 38227), (15, 38239), (Start: 30 @38746 has 41 MA's), (61, 38905), (72, 38953), (75, 38962), (89, 39037),

Gene: Hamood\_31 Start: 26974, Stop: 27339, Start Num: 31

Candidate Starts for Hamood\_31:

(8, 26299), (10, 26338), (11, 26353), (18, 26485), (22, 26710), (23, 26719), (28, 26854), (Start: 31 @26974 has 26 MA's), (52, 27097), (62, 27136), (64, 27148), (67, 27160), (75, 27187), (76, 27196), (86, 27259),

Gene: Harlequin\_25 Start: 18387, Stop: 18713, Start Num: 33

Candidate Starts for Harlequin\_25:

(Start: 33 @18387 has 36 MA's), (47, 18489), (51, 18510), (65, 18567), (67, 18576), (70, 18588), (75, 18603), (78, 18633), (79, 18645),

Gene: HippoPololi\_24 Start: 20249, Stop: 20536, Start Num: 32

Candidate Starts for HippoPololi\_24:

(Start: 32 @20249 has 26 MA's), (42, 20276), (47, 20336), (49, 20348), (61, 20393), (64, 20411), (80, 20495), (84, 20516),

Gene: Hiro\_25 Start: 18693, Stop: 19019, Start Num: 33

Candidate Starts for Hiro\_25:

(Start: 33 @18693 has 36 MA's), (47, 18795), (65, 18873), (67, 18882), (72, 18900), (75, 18909), (78, 18939), (79, 18951),

Gene: HomeFry\_54 Start: 37184, Stop: 37498, Start Num: 30

Candidate Starts for HomeFry\_54:

(13, 36638), (24, 36944), (27, 37028), (Start: 30 @37184 has 41 MA's), (Start: 35 @37199 has 1 MA's), (47, 37286), (50, 37304), (56, 37325), (73, 37394), (75, 37400), (76, 37409), (78, 37430),

Gene: Horseradish\_23 Start: 18932, Stop: 19213, Start Num: 37

Candidate Starts for Horseradish\_23:

(Start: 37 @18932 has 15 MA's), (39, 18944), (44, 18962), (47, 19013), (49, 19025), (55, 19046), (58, 19058), (64, 19088), (78, 19157), (90, 19208),

Gene: HubbaBubba\_46 Start: 34896, Stop: 35213, Start Num: 30

Candidate Starts for HubbaBubba\_46:

(Start: 30 @34896 has 41 MA's), (47, 35007),

Gene: IDyn\_50 Start: 36322, Stop: 36642, Start Num: 30

Candidate Starts for IDyn\_50:

(Start: 30 @36322 has 41 MA's), (47, 36436),

Gene: Jester\_25 Start: 18381, Stop: 18707, Start Num: 33

Candidate Starts for Jester\_25:

(Start: 33 @18381 has 36 MA's), (47, 18483), (65, 18561), (67, 18570), (72, 18588), (75, 18597), (78, 18627), (79, 18639),

Gene: Jifall16\_48 Start: 39018, Stop: 39329, Start Num: 30

Candidate Starts for Jifall16\_48:

(1, 37962), (2, 38130), (4, 38169), (5, 38322), (6, 38325), (9, 38397), (12, 38463), (14, 38499), (15, 38511), (Start: 30 @39018 has 41 MA's), (61, 39177), (72, 39225), (75, 39234), (89, 39309),

Gene: Kabluna\_53 Start: 38440, Stop: 38748, Start Num: 30

Candidate Starts for Kabluna\_53:

(9, 37819), (12, 37885), (14, 37921), (17, 37960), (19, 37990), (Start: 30 @38440 has 41 MA's), (47, 38542), (71, 38644), (81, 38710),

Gene: KidneyBean\_49 Start: 39142, Stop: 39453, Start Num: 30

Candidate Starts for KidneyBean\_49:

(5, 38446), (6, 38449), (9, 38521), (12, 38587), (14, 38623), (15, 38635), (Start: 30 @39142 has 41 MA's), (61, 39301), (72, 39349), (75, 39358), (89, 39433),

Gene: Kita\_23 Start: 21208, Stop: 21498, Start Num: 32

Candidate Starts for Kita\_23:

(18, 20716), (20, 20827), (21, 20845), (Start: 32 @21208 has 26 MA's), (51, 21319), (55, 21331), (58, 21343), (75, 21412), (76, 21421), (80, 21457),

Gene: Krishelle\_25 Start: 18708, Stop: 19034, Start Num: 33

Candidate Starts for Krishelle\_25:

(Start: 33 @18708 has 36 MA's), (47, 18810), (65, 18888), (67, 18897), (72, 18915), (75, 18924), (78, 18954), (79, 18966),

Gene: Kurt\_49 Start: 39379, Stop: 39690, Start Num: 30

Candidate Starts for Kurt\_49:

(1, 38323), (2, 38491), (4, 38530), (5, 38683), (6, 38686), (9, 38758), (12, 38824), (14, 38860), (15, 38872), (Start: 30 @39379 has 41 MA's), (61, 39538), (72, 39586), (75, 39595), (89, 39670),

Gene: Lillie\_25 Start: 18437, Stop: 18763, Start Num: 33

Candidate Starts for Lillie\_25:

(Start: 33 @18437 has 36 MA's), (47, 18539), (61, 18596), (65, 18617), (67, 18626), (70, 18638), (75, 18653), (78, 18683), (79, 18695),

Gene: Lollipop1437\_55 Start: 40355, Stop: 40669, Start Num: 30

Candidate Starts for Lollipop1437\_55:

(14, 39836), (Start: 30 @40355 has 41 MA's), (61, 40514), (64, 40532), (76, 40580), (80, 40616),

Gene: MScarn\_24 Start: 19021, Stop: 19302, Start Num: 37

Candidate Starts for MScarn\_24:

(Start: 37 @19021 has 15 MA's), (39, 19033), (44, 19051), (47, 19102), (49, 19114), (55, 19135), (58, 19147), (64, 19177), (78, 19246), (90, 19297),

Gene: MaVan\_24 Start: 20334, Stop: 20621, Start Num: 32

Candidate Starts for MaVan\_24:

(Start: 32 @20334 has 26 MA's), (47, 20421), (60, 20472), (64, 20496), (67, 20508),

Gene: Malvina\_24 Start: 20252, Stop: 20539, Start Num: 32

Candidate Starts for Malvina\_24:

(Start: 32 @20252 has 26 MA's), (42, 20279), (47, 20339), (49, 20351), (61, 20396), (64, 20414), (80, 20498), (84, 20519),

Gene: Manasvini\_23 Start: 21208, Stop: 21498, Start Num: 32

Candidate Starts for Manasvini\_23:

(18, 20716), (20, 20827), (21, 20845), (Start: 32 @21208 has 26 MA's), (51, 21319), (55, 21331), (58, 21343), (75, 21412), (76, 21421), (80, 21457),

Gene: Maridalia\_22 Start: 21208, Stop: 21498, Start Num: 32

Candidate Starts for Maridalia\_22:

(18, 20716), (20, 20827), (21, 20845), (Start: 32 @21208 has 26 MA's), (51, 21319), (55, 21331), (58, 21343), (75, 21412), (76, 21421), (80, 21457),

Gene: Marietta\_51 Start: 36216, Stop: 36536, Start Num: 30

Candidate Starts for Marietta\_51:

(Start: 30 @36216 has 41 MA's), (47, 36330),

Gene: MerCougar\_51 Start: 39642, Stop: 39950, Start Num: 30

Candidate Starts for MerCougar\_51:

(9, 39021), (12, 39087), (14, 39123), (16, 39156), (17, 39162), (19, 39192), (Start: 30 @39642 has 41 MA's), (47, 39744), (50, 39762), (63, 39813), (72, 39849), (74, 39855), (81, 39912),

Gene: Mulch\_31 Start: 26437, Stop: 26802, Start Num: 31

Candidate Starts for Mulch\_31:

(Start: 31 @26437 has 26 MA's), (52, 26560), (62, 26599), (64, 26611), (67, 26623), (75, 26650), (76, 26659), (86, 26722),

Gene: MunkgeeRoachy\_22 Start: 19410, Stop: 19706, Start Num: 31  
Candidate Starts for MunkgeeRoachy\_22:  
(Start: 31 @19410 has 26 MA's), (Start: 38 @19428 has 2 MA's), (47, 19506), (49, 19518), (51, 19527), (64, 19581),

Gene: Nadeem\_31 Start: 26437, Stop: 26802, Start Num: 31  
Candidate Starts for Nadeem\_31:  
(Start: 31 @26437 has 26 MA's), (52, 26560), (62, 26599), (64, 26611), (67, 26623), (75, 26650), (76, 26659), (86, 26722),

Gene: NadineRae\_49 Start: 35463, Stop: 35783, Start Num: 30  
Candidate Starts for NadineRae\_49:  
(Start: 30 @35463 has 41 MA's), (47, 35577), (72, 35682),

Gene: Naiad\_25 Start: 18437, Stop: 18763, Start Num: 33  
Candidate Starts for Naiad\_25:  
(Start: 33 @18437 has 36 MA's), (47, 18539), (61, 18596), (65, 18617), (67, 18626), (70, 18638), (75, 18653), (78, 18683), (79, 18695),

Gene: Nancinator\_25 Start: 18437, Stop: 18763, Start Num: 33  
Candidate Starts for Nancinator\_25:  
(Start: 33 @18437 has 36 MA's), (47, 18539), (61, 18596), (65, 18617), (67, 18626), (75, 18653), (78, 18683), (79, 18695),

Gene: NancyRae\_31 Start: 26446, Stop: 26811, Start Num: 31  
Candidate Starts for NancyRae\_31:  
(8, 25771), (10, 25810), (11, 25825), (18, 25957), (22, 26182), (23, 26191), (28, 26326), (Start: 31 @26446 has 26 MA's), (52, 26569), (62, 26608), (64, 26620), (67, 26632), (75, 26659), (76, 26668), (86, 26731),

Gene: NatB6\_49 Start: 38436, Stop: 38747, Start Num: 30  
Candidate Starts for NatB6\_49:  
(Start: 30 @38436 has 41 MA's), (61, 38595), (72, 38643), (75, 38652), (89, 38727),

Gene: Natosaleda\_25 Start: 18437, Stop: 18763, Start Num: 33  
Candidate Starts for Natosaleda\_25:  
(Start: 33 @18437 has 36 MA's), (47, 18539), (61, 18596), (65, 18617), (67, 18626), (75, 18653), (78, 18683), (79, 18695),

Gene: Neobush\_23 Start: 21208, Stop: 21498, Start Num: 32  
Candidate Starts for Neobush\_23:  
(18, 20716), (20, 20827), (21, 20845), (Start: 32 @21208 has 26 MA's), (51, 21319), (55, 21331), (58, 21343), (75, 21412), (76, 21421), (80, 21457),

Gene: Nibbles\_24 Start: 20334, Stop: 20621, Start Num: 32  
Candidate Starts for Nibbles\_24:  
(Start: 32 @20334 has 26 MA's), (47, 20421), (60, 20472), (64, 20496), (67, 20508),

Gene: Nina\_23 Start: 20404, Stop: 20700, Start Num: 31  
Candidate Starts for Nina\_23:  
(Start: 31 @20404 has 26 MA's), (Start: 38 @20422 has 2 MA's), (47, 20500), (49, 20512), (51, 20521), (52, 20524), (64, 20575),

Gene: NosilaM\_53 Start: 39337, Stop: 39645, Start Num: 30  
Candidate Starts for NosilaM\_53:  
(9, 38716), (12, 38782), (14, 38818), (17, 38857), (19, 38887), (25, 39130), (Start: 30 @39337 has 41 MA's), (47, 39439), (71, 39541), (81, 39607),

Gene: NovumRegina\_49 Start: 38745, Stop: 39056, Start Num: 30  
Candidate Starts for NovumRegina\_49:  
(5, 38049), (6, 38052), (9, 38124), (12, 38190), (14, 38226), (15, 38238), (Start: 30 @38745 has 41 MA's), (61, 38904), (72, 38952), (75, 38961), (89, 39036),

Gene: Outis\_51 Start: 39336, Stop: 39644, Start Num: 30  
Candidate Starts for Outis\_51:  
(Start: 30 @39336 has 41 MA's), (47, 39438), (50, 39456), (63, 39507), (72, 39543), (74, 39549), (81, 39606),

Gene: PantheRoc\_22 Start: 20406, Stop: 20696, Start Num: 32  
Candidate Starts for PantheRoc\_22:  
(18, 19914), (20, 20025), (21, 20043), (Start: 32 @20406 has 26 MA's), (51, 20517), (55, 20529), (58, 20541), (75, 20610), (76, 20619), (80, 20655),

Gene: Parada\_31 Start: 26437, Stop: 26802, Start Num: 31  
Candidate Starts for Parada\_31:  
(Start: 31 @26437 has 26 MA's), (52, 26560), (62, 26599), (64, 26611), (67, 26623), (75, 26650), (76, 26659), (86, 26722),

Gene: Partridge\_25 Start: 18470, Stop: 18796, Start Num: 33  
Candidate Starts for Partridge\_25:  
(Start: 33 @18470 has 36 MA's), (47, 18572), (65, 18650), (67, 18659), (70, 18671), (75, 18686), (78, 18716), (79, 18728),

Gene: Patio\_53 Start: 39591, Stop: 39905, Start Num: 30  
Candidate Starts for Patio\_53:  
(14, 39072), (Start: 30 @39591 has 41 MA's), (61, 39750), (64, 39768), (76, 39816), (80, 39852),

Gene: Pemberton\_52 Start: 36195, Stop: 36515, Start Num: 30  
Candidate Starts for Pemberton\_52:  
(Start: 30 @36195 has 41 MA's), (47, 36309), (72, 36414),

Gene: PhailMary\_24 Start: 18759, Stop: 19085, Start Num: 33  
Candidate Starts for PhailMary\_24:  
(Start: 33 @18759 has 36 MA's), (47, 18861), (65, 18939), (67, 18948), (72, 18966), (75, 18975), (78, 19005), (79, 19017),

Gene: Phomeo\_48 Start: 39014, Stop: 39325, Start Num: 30  
Candidate Starts for Phomeo\_48:  
(1, 37958), (2, 38126), (4, 38165), (5, 38318), (6, 38321), (9, 38393), (12, 38459), (14, 38495), (15, 38507), (Start: 30 @39014 has 41 MA's), (61, 39173), (72, 39221), (75, 39230), (89, 39305),

Gene: Phrankenstein\_25 Start: 18437, Stop: 18763, Start Num: 33  
Candidate Starts for Phrankenstein\_25:  
(Start: 33 @18437 has 36 MA's), (47, 18539), (61, 18596), (65, 18617), (67, 18626), (75, 18653), (78, 18683), (79, 18695),

Gene: Pimento\_31 Start: 25915, Stop: 26280, Start Num: 31

Candidate Starts for Pimento\_31:

(8, 25240), (10, 25279), (11, 25294), (18, 25426), (22, 25651), (23, 25660), (28, 25795), (Start: 31 @25915 has 26 MA's), (52, 26038), (62, 26077), (64, 26089), (67, 26101), (75, 26128), (76, 26137), (86, 26200),

Gene: Pleakley\_57 Start: 38532, Stop: 38846, Start Num: 30

Candidate Starts for Pleakley\_57:

(Start: 30 @38532 has 41 MA's), (Start: 38 @38556 has 2 MA's), (47, 38634), (50, 38652), (56, 38673), (75, 38748), (76, 38757),

Gene: PsychoKiller\_22 Start: 19362, Stop: 19658, Start Num: 31

Candidate Starts for PsychoKiller\_22:

(Start: 31 @19362 has 26 MA's), (Start: 38 @19380 has 2 MA's), (47, 19458), (49, 19470), (51, 19479), (64, 19533),

Gene: Puppies\_22 Start: 18597, Stop: 18908, Start Num: 29

Candidate Starts for Puppies\_22:

(Start: 29 @18597 has 2 MA's), (36, 18627), (41, 18648), (45, 18672), (72, 18816),

Gene: Quasar\_22 Start: 19971, Stop: 20267, Start Num: 31

Candidate Starts for Quasar\_22:

(Start: 31 @19971 has 26 MA's), (Start: 38 @19989 has 2 MA's), (47, 20067), (49, 20079), (51, 20088), (64, 20142), (72, 20172),

Gene: RADical\_23 Start: 19363, Stop: 19659, Start Num: 31

Candidate Starts for RADical\_23:

(Start: 31 @19363 has 26 MA's), (Start: 38 @19381 has 2 MA's), (47, 19459), (49, 19471), (51, 19480), (64, 19534),

Gene: REQ2\_23 Start: 21745, Stop: 22032, Start Num: 38

Candidate Starts for REQ2\_23:

(Start: 37 @21742 has 15 MA's), (Start: 38 @21745 has 2 MA's), (43, 21769), (45, 21784), (46, 21802), (49, 21835), (52, 21847), (54, 21853), (57, 21865), (61, 21880), (65, 21901), (66, 21904), (68, 21916), (76, 21946), (78, 21967),

Gene: RER2\_18 Start: 15309, Stop: 15635, Start Num: 33

Candidate Starts for RER2\_18:

(Start: 33 @15309 has 36 MA's), (47, 15411), (61, 15468), (65, 15489), (67, 15498), (75, 15525), (78, 15555), (79, 15567),

Gene: RGL3\_18 Start: 15469, Stop: 15783, Start Num: 34

Candidate Starts for RGL3\_18:

(34, 15469), (47, 15571), (51, 15592), (61, 15628), (65, 15649), (67, 15658), (70, 15670), (72, 15676), (76, 15694), (82, 15742),

Gene: RSchmailzl\_23 Start: 19506, Stop: 19802, Start Num: 31

Candidate Starts for RSchmailzl\_23:

(Start: 31 @19506 has 26 MA's), (Start: 38 @19524 has 2 MA's), (47, 19602), (49, 19614), (51, 19623), (64, 19677),

Gene: Rasputin\_25 Start: 18405, Stop: 18731, Start Num: 33

Candidate Starts for Rasputin\_25:

(Start: 33 @18405 has 36 MA's), (47, 18507), (51, 18528), (65, 18585), (67, 18594), (70, 18606), (75, 18621), (78, 18651), (79, 18663),

Gene: RedBaron\_24 Start: 19406, Stop: 19702, Start Num: 31

Candidate Starts for RedBaron\_24:

(Start: 31 @19406 has 26 MA's), (Start: 38 @19424 has 2 MA's), (47, 19502), (49, 19514), (51, 19523), (64, 19577),

Gene: RedRaider\_57 Start: 41613, Stop: 41927, Start Num: 30

Candidate Starts for RedRaider\_57:

(Start: 30 @41613 has 41 MA's), (40, 41649), (61, 41772), (64, 41790), (80, 41874),

Gene: RexFury\_25 Start: 18468, Stop: 18794, Start Num: 33

Candidate Starts for RexFury\_25:

(Start: 33 @18468 has 36 MA's), (47, 18570), (61, 18627), (65, 18648), (67, 18657), (75, 18684), (78, 18714), (79, 18726),

Gene: Rhodalysa\_25 Start: 18437, Stop: 18763, Start Num: 33

Candidate Starts for Rhodalysa\_25:

(Start: 33 @18437 has 36 MA's), (47, 18539), (61, 18596), (65, 18617), (67, 18626), (70, 18638), (75, 18653), (78, 18683), (79, 18695),

Gene: Scuba\_57 Start: 38606, Stop: 38920, Start Num: 30

Candidate Starts for Scuba\_57:

(3, 37739), (13, 38057), (24, 38369), (27, 38453), (Start: 30 @38606 has 41 MA's), (Start: 38 @38630 has 2 MA's), (47, 38708), (54, 38738), (76, 38831),

Gene: Shuman\_25 Start: 18437, Stop: 18763, Start Num: 33

Candidate Starts for Shuman\_25:

(Start: 33 @18437 has 36 MA's), (47, 18539), (65, 18617), (67, 18626), (70, 18638), (75, 18653), (78, 18683), (79, 18695),

Gene: SketchMex\_21 Start: 19036, Stop: 19317, Start Num: 37

Candidate Starts for SketchMex\_21:

(Start: 37 @19036 has 15 MA's), (39, 19048), (44, 19066), (47, 19117), (49, 19129), (55, 19150), (58, 19162), (64, 19192), (78, 19261), (90, 19312),

Gene: Skysand\_52 Start: 39811, Stop: 40125, Start Num: 30

Candidate Starts for Skysand\_52:

(14, 39292), (Start: 30 @39811 has 41 MA's), (61, 39970), (64, 39988), (76, 40036), (80, 40072),

Gene: Socotra\_23 Start: 19362, Stop: 19658, Start Num: 31

Candidate Starts for Socotra\_23:

(Start: 31 @19362 has 26 MA's), (Start: 38 @19380 has 2 MA's), (47, 19458), (49, 19470), (51, 19479), (59, 19509), (64, 19533),

Gene: Sopespian\_22 Start: 19363, Stop: 19659, Start Num: 31

Candidate Starts for Sopespian\_22:

(Start: 31 @19363 has 26 MA's), (Start: 38 @19381 has 2 MA's), (47, 19459), (49, 19471), (51, 19480), (64, 19534),

Gene: StCroix\_25 Start: 18437, Stop: 18763, Start Num: 33

Candidate Starts for StCroix\_25:

(Start: 33 @18437 has 36 MA's), (47, 18539), (61, 18596), (65, 18617), (67, 18626), (70, 18638), (75, 18653), (78, 18683), (79, 18695),

Gene: StarStruck\_51 Start: 39336, Stop: 39644, Start Num: 30

Candidate Starts for StarStruck\_51:

(Start: 30 @39336 has 41 MA's), (47, 39438), (50, 39456), (63, 39507), (72, 39543), (74, 39549), (81, 39606),

Gene: Starburst\_23 Start: 19362, Stop: 19658, Start Num: 31

Candidate Starts for Starburst\_23:

(Start: 31 @19362 has 26 MA's), (Start: 38 @19380 has 2 MA's), (47, 19458), (49, 19470), (51, 19479), (64, 19533),

Gene: SteamedHams\_24 Start: 19046, Stop: 19327, Start Num: 37

Candidate Starts for SteamedHams\_24:

(Start: 37 @19046 has 15 MA's), (47, 19127), (49, 19139), (52, 19151), (55, 19160), (69, 19223), (75, 19241), (78, 19271),

Gene: Sukkupi\_50 Start: 37769, Stop: 38089, Start Num: 30

Candidate Starts for Sukkupi\_50:

(Start: 30 @37769 has 41 MA's), (47, 37883), (72, 37988),

Gene: SuperSulley\_51 Start: 39504, Stop: 39812, Start Num: 30

Candidate Starts for SuperSulley\_51:

(9, 38883), (12, 38949), (14, 38985), (17, 39024), (19, 39054), (Start: 30 @39504 has 41 MA's), (47, 39606), (71, 39708), (81, 39774),

Gene: Survivors\_24 Start: 20183, Stop: 20470, Start Num: 32

Candidate Starts for Survivors\_24:

(Start: 32 @20183 has 26 MA's), (45, 20231), (47, 20270), (60, 20321), (64, 20345), (67, 20357),

Gene: Suscepit\_23 Start: 21208, Stop: 21498, Start Num: 32

Candidate Starts for Suscepit\_23:

(18, 20716), (20, 20827), (21, 20845), (Start: 32 @21208 has 26 MA's), (51, 21319), (55, 21331), (58, 21343), (75, 21412), (76, 21421), (80, 21457),

Gene: Swann\_25 Start: 18437, Stop: 18763, Start Num: 33

Candidate Starts for Swann\_25:

(Start: 33 @18437 has 36 MA's), (47, 18539), (61, 18596), (65, 18617), (67, 18626), (75, 18653), (78, 18683), (79, 18695),

Gene: SweatNTears\_24 Start: 19547, Stop: 19828, Start Num: 37

Candidate Starts for SweatNTears\_24:

(Start: 37 @19547 has 15 MA's), (44, 19577), (47, 19628), (49, 19640), (55, 19661), (58, 19673), (78, 19772), (90, 19823),

Gene: TWAMP\_25 Start: 18437, Stop: 18763, Start Num: 33

Candidate Starts for TWAMP\_25:

(Start: 33 @18437 has 36 MA's), (47, 18539), (61, 18596), (65, 18617), (67, 18626), (70, 18638), (75, 18653), (78, 18683), (79, 18695),

Gene: Tailonex\_6 Start: 5606, Stop: 5941, Start Num: 31

Candidate Starts for Tailonex\_6:

(Start: 30 @5600 has 41 MA's), (Start: 31 @5606 has 26 MA's), (48, 5714), (51, 5726), (64, 5780), (75, 5819),

Gene: Takoda\_25 Start: 18397, Stop: 18723, Start Num: 33

Candidate Starts for Takoda\_25:

(Start: 33 @18397 has 36 MA's), (47, 18499), (65, 18577), (67, 18586), (70, 18598), (75, 18613), (78, 18643), (79, 18655),

Gene: Tayonia\_23 Start: 21208, Stop: 21498, Start Num: 32

Candidate Starts for Tayonia\_23:

(18, 20716), (20, 20827), (21, 20845), (Start: 32 @21208 has 26 MA's), (51, 21319), (55, 21331), (58, 21343), (75, 21412), (76, 21421), (80, 21457),

Gene: Tolls\_24 Start: 19049, Stop: 19330, Start Num: 37

Candidate Starts for Tolls\_24:

(Start: 37 @19049 has 15 MA's), (47, 19130), (49, 19142), (52, 19154), (55, 19163), (69, 19226), (75, 19244), (78, 19274),

Gene: Tracker\_49 Start: 38163, Stop: 38474, Start Num: 30

Candidate Starts for Tracker\_49:

(1, 37107), (2, 37275), (4, 37314), (5, 37467), (6, 37470), (9, 37542), (12, 37608), (14, 37644), (15, 37656), (Start: 30 @38163 has 41 MA's), (61, 38322), (72, 38370), (75, 38379), (89, 38454),

Gene: Troje\_22 Start: 19018, Stop: 19299, Start Num: 37

Candidate Starts for Troje\_22:

(Start: 37 @19018 has 15 MA's), (39, 19030), (44, 19048), (47, 19099), (49, 19111), (55, 19132), (58, 19144), (64, 19174), (78, 19243), (90, 19294),

Gene: Trumpet\_23 Start: 21208, Stop: 21498, Start Num: 32

Candidate Starts for Trumpet\_23:

(18, 20716), (20, 20827), (21, 20845), (Start: 32 @21208 has 26 MA's), (51, 21319), (55, 21331), (58, 21343), (75, 21412), (76, 21421), (80, 21457),

Gene: Turuncu\_54 Start: 39738, Stop: 40052, Start Num: 30

Candidate Starts for Turuncu\_54:

(9, 39117), (12, 39183), (14, 39219), (17, 39258), (19, 39288), (Start: 30 @39738 has 41 MA's), (Start: 35 @39753 has 1 MA's), (50, 39858), (72, 39945), (75, 39954), (76, 39963), (80, 39999),

Gene: Typhonomachy\_22 Start: 19362, Stop: 19658, Start Num: 31

Candidate Starts for Typhonomachy\_22:

(Start: 31 @19362 has 26 MA's), (Start: 38 @19380 has 2 MA's), (47, 19458), (49, 19470), (51, 19479), (64, 19533),

Gene: UhSalsa\_25 Start: 18437, Stop: 18763, Start Num: 33

Candidate Starts for UhSalsa\_25:

(Start: 33 @18437 has 36 MA's), (47, 18539), (61, 18596), (65, 18617), (67, 18626), (75, 18653), (78, 18683), (79, 18695),

Gene: Wallaby\_26 Start: 20327, Stop: 20614, Start Num: 32

Candidate Starts for Wallaby\_26:

(Start: 32 @20327 has 26 MA's), (45, 20375), (47, 20414), (60, 20465), (64, 20489), (67, 20501),

Gene: WheatThin\_31 Start: 26437, Stop: 26802, Start Num: 31

Candidate Starts for WheatThin\_31:

(Start: 31 @26437 has 26 MA's), (52, 26560), (62, 26599), (64, 26611), (67, 26623), (75, 26650), (76, 26659), (86, 26722),

Gene: Wheezy\_49 Start: 38368, Stop: 38679, Start Num: 30

Candidate Starts for Wheezy\_49:

(Start: 30 @38368 has 41 MA's), (61, 38527), (72, 38575), (75, 38584), (89, 38659),

Gene: WhoseManz\_50 Start: 35829, Stop: 36149, Start Num: 30

Candidate Starts for WhoseManz\_50:

(Start: 30 @35829 has 41 MA's), (47, 35943),

Gene: Widow\_22 Start: 18588, Stop: 18899, Start Num: 29

Candidate Starts for Widow\_22:

(Start: 29 @18588 has 2 MA's), (41, 18639), (45, 18663), (72, 18807),

Gene: Wolfwood\_24 Start: 20327, Stop: 20614, Start Num: 32

Candidate Starts for Wolfwood\_24:

(Start: 32 @20327 has 26 MA's), (45, 20375), (47, 20414), (60, 20465), (64, 20489), (67, 20501),

Gene: Yarn\_21 Start: 19039, Stop: 19320, Start Num: 37

Candidate Starts for Yarn\_21:

(Start: 37 @19039 has 15 MA's), (47, 19120), (49, 19132), (52, 19144), (55, 19153), (69, 19216), (75, 19234), (78, 19264),

Gene: Yeezy\_23 Start: 20430, Stop: 20720, Start Num: 32

Candidate Starts for Yeezy\_23:

(14, 19881), (18, 19938), (20, 20049), (21, 20067), (Start: 32 @20430 has 26 MA's), (51, 20541), (55, 20553), (58, 20565), (75, 20634), (76, 20643), (80, 20679),

Gene: Yndexa\_50 Start: 37769, Stop: 38089, Start Num: 30

Candidate Starts for Yndexa\_50:

(Start: 30 @37769 has 41 MA's), (47, 37883), (72, 37988),

Gene: Yogi\_25 Start: 18411, Stop: 18737, Start Num: 33

Candidate Starts for Yogi\_25:

(Start: 33 @18411 has 36 MA's), (47, 18513), (51, 18534), (65, 18591), (67, 18600), (70, 18612), (75, 18627), (78, 18657), (79, 18669),

Gene: Yoncess\_25 Start: 18411, Stop: 18737, Start Num: 33

Candidate Starts for Yoncess\_25:

(Start: 33 @18411 has 36 MA's), (47, 18513), (51, 18534), (65, 18591), (67, 18600), (70, 18612), (75, 18627), (78, 18657), (79, 18669),

Gene: Yummy\_23 Start: 18932, Stop: 19213, Start Num: 37

Candidate Starts for Yummy\_23:

(Start: 37 @18932 has 15 MA's), (39, 18944), (44, 18962), (47, 19013), (49, 19025), (55, 19046), (58, 19058), (64, 19088), (78, 19157), (90, 19208),

Gene: Zameen\_23 Start: 21208, Stop: 21498, Start Num: 32

Candidate Starts for Zameen\_23:

(18, 20716), (20, 20827), (21, 20845), (Start: 32 @21208 has 26 MA's), (51, 21319), (55, 21331), (58, 21343), (75, 21412), (76, 21421), (80, 21457),

Gene: Zareef\_24 Start: 20335, Stop: 20622, Start Num: 32

Candidate Starts for Zareef\_24:

(Start: 32 @20335 has 26 MA's), (45, 20383), (47, 20422), (60, 20473), (64, 20497), (67, 20509), (80, 20581),