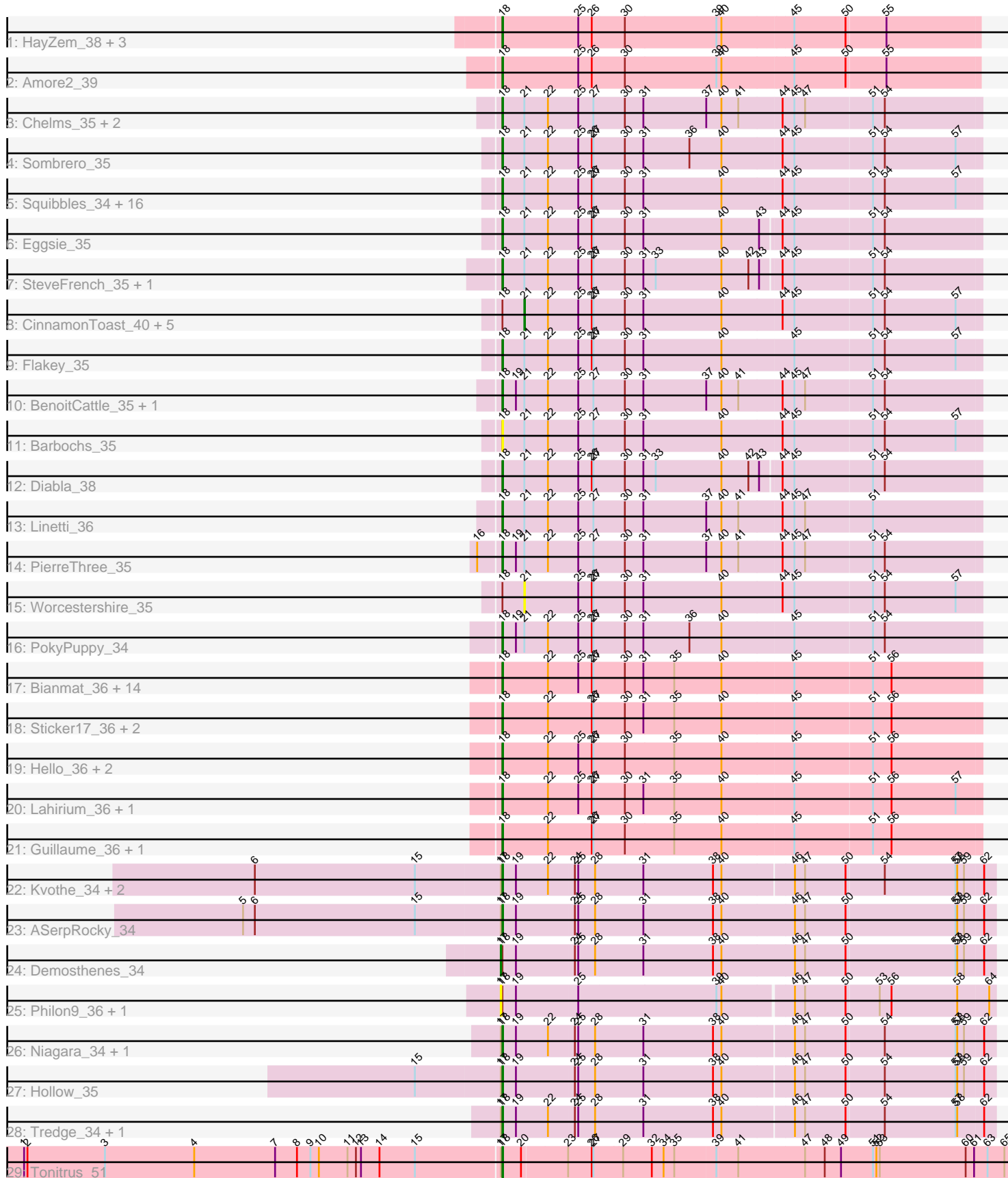


Pham 208574



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 208574 Report

This analysis was run 02/22/25 on database version 588.

Pham number 208574 has 82 members, 12 are drafts.

Phages represented in each track:

- Track 1 : HayZem\_38, GMA7\_29, Austin\_39, GTE7\_29
- Track 2 : Amore2\_39
- Track 3 : Chelms\_35, BigShaq\_35, Dakiti\_35
- Track 4 : Sombrero\_35
- Track 5 : Squibbles\_34, Adgers\_36, Boneham\_39, CathyBurgh\_34, RemRem\_36, Sam12\_35, Breezic\_35, FelixAlejandro\_40, John316\_39, Gorko\_35, Ekhein\_35, Poland\_40, BirksAndSocks\_39, Lizzo\_35, GourdThymes\_35, Hotorobo\_35, Beaver\_39
- Track 6 : Eggsie\_35
- Track 7 : SteveFrench\_35, RoyalG\_36
- Track 8 : CinnamonToast\_40, Exiguo\_35, Butterball\_39, Msay19\_40, Jellybones\_39, Monty\_34
- Track 9 : Flakey\_35
- Track 10 : BenoitCattle\_35, Crete\_36
- Track 11 : Barbochs\_35
- Track 12 : Diabla\_38
- Track 13 : Linetti\_36
- Track 14 : PierreThree\_35
- Track 15 : Worcestershire\_35
- Track 16 : PokyPuppy\_34
- Track 17 : Bianmat\_36, Shelley\_36, Luker\_37, Charianelly\_36, MrWormie\_36, GalacticEye\_36, Anamika\_36, Jams\_36, Hail2Pitt\_36, Berries\_36, Newt\_37, Woes\_36, Lidong\_36, Minos\_37, Kaseim\_37
- Track 18 : Sticker17\_36, Damp\_36, Nimi13\_36
- Track 19 : Hello\_36, Neoevie\_36, Teal\_36
- Track 20 : Lahirium\_36, Harambe\_36
- Track 21 : Guillaume\_36, Jormungandr\_36
- Track 22 : Kvothe\_34, Benczkowski14\_34, Katyusha\_34
- Track 23 : ASerpRocky\_34
- Track 24 : Demosthenes\_34
- Track 25 : Philon9\_36, Vitaenoi\_36
- Track 26 : Niagara\_34, Teech\_34
- Track 27 : Hollow\_35
- Track 28 : Tredge\_34, Teatealatte\_34
- Track 29 : Tonitrus\_51

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

The start number called the most often in the published annotations is 18, it was called in 64 of the 70 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- ASerpRocky\_34, Adgers\_36, Amore2\_39, Anamika\_36, Austin\_39, Barbochs\_35, Beaver\_39, Benczkowski14\_34, BenoitCattle\_35, Berries\_36, Bianmat\_36, BigShaq\_35, BirksAndSocks\_39, Boneham\_39, Breezic\_35, CathyBurgh\_34, Charianelly\_36, Chelms\_35, Crete\_36, Dakiti\_35, Damp\_36, Diabla\_38, Eggsie\_35, Ekhein\_35, FelixAlejandro\_40, Flakey\_35, GMA7\_29, GTE7\_29, GalacticEye\_36, Gorko\_35, GourdThymes\_35, Guillaume\_36, Hail2Pitt\_36, Harambe\_36, HayZem\_38, Hello\_36, Hollow\_35, Hotorobo\_35, Jams\_36, John316\_39, Jormungandr\_36, Kaseim\_37, Katyusha\_34, Kvothe\_34, Lahirium\_36, Lidong\_36, Linetti\_36, Lizzo\_35, Luker\_37, Minos\_37, MrWormie\_36, Neoevie\_36, Newt\_37, Niagara\_34, Nimi13\_36, PierreThree\_35, PokyPuppy\_34, Poland\_40, RemRem\_36, RoyalG\_36, Sam12\_35, Shelley\_36, Sombrero\_35, Squibbles\_34, SteveFrench\_35, Sticker17\_36, Teal\_36, Teatealatte\_34, Teech\_34, Tonitrus\_51, Tredge\_34, Woes\_36,

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

- Butterball\_39, CinnamonToast\_40, Demosthenes\_34, Exiguo\_35, Jellybones\_39, Monty\_34, Msay19\_40, Philon9\_36, Vitaenoi\_36, Worcestershire\_35,

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

- 

## **Summary by start number:**

Start 17:

- Found in 13 of 82 ( 15.9% ) of genes in pham
- Manual Annotations of this start: 1 of 70
- Called 23.1% of time when present
- Phage (with cluster) where this start called: Demosthenes\_34 (CS4), Philon9\_36 (CS4), Vitaenoi\_36 (CS4),

Start 18:

- Found in 82 of 82 ( 100.0% ) of genes in pham
- Manual Annotations of this start: 64 of 70
- Called 87.8% of time when present
- Phage (with cluster) where this start called: ASerpRocky\_34 (CS4), Adgers\_36 (CS2), Amore2\_39 (CS1), Anamika\_36 (CS3), Austin\_39 (CS1), Barbochs\_35 (CS2), Beaver\_39 (CS2), Benczkowski14\_34 (CS4), BenoitCattle\_35 (CS2), Berries\_36 (CS3), Bianmat\_36 (CS3), BigShaq\_35 (CS2), BirksAndSocks\_39 (CS2), Boneham\_39 (CS2), Breezic\_35 (CS2), CathyBurgh\_34 (CS2), Charianelly\_36 (CS3), Chelms\_35 (CS2), Crete\_36 (CS2), Dakiti\_35 (CS2), Damp\_36 (CS3), Diabla\_38 (CS2), Eggsie\_35 (CS2), Ekhein\_35 (CS2), FelixAlejandro\_40 (CS2), Flakey\_35 (CS2), GMA7\_29 (CS1), GTE7\_29 (CS1), GalacticEye\_36 (CS3), Gorko\_35 (CS2), GourdThymes\_35 (CS2), Guillaume\_36 (CS3), Hail2Pitt\_36 (CS3), Harambe\_36 (CS3), HayZem\_38 (CS1), Hello\_36 (CS3), Hollow\_35 (CS4), Hotorobo\_35 (CS2), Jams\_36 (CS3), John316\_39 (CS2), Jormungandr\_36 (CS3), Kaseim\_37 (CS3), Katyusha\_34 (CS4), Kvothe\_34 (CS4), Lahirium\_36 (CS3), Lidong\_36 (CS3),

Linetti\_36 (CS2), Lizzo\_35 (CS2), Luker\_37 (CS3), Minos\_37 (CS3), MrWormie\_36 (CS3), Neoevie\_36 (CS3), Newt\_37 (CS3), Niagara\_34 (CS4), Nimi13\_36 (CS3), PierreThree\_35 (CS2), PokyPuppy\_34 (CS2), Poland\_40 (CS2), RemRem\_36 (CS2), RoyalG\_36 (CS2), Sam12\_35 (CS2), Shelley\_36 (CS3), Sombrero\_35 (CS2), Squibbles\_34 (CS2), SteveFrench\_35 (CS2), Sticker17\_36 (CS3), Teal\_36 (CS3), Teatealatte\_34 (CS4), Teech\_34 (CS4), Tonitrus\_51 (singleton), Tredge\_34 (CS4), Woes\_36 (CS3),

Start 21:

- Found in 39 of 82 ( 47.6% ) of genes in pham
- Manual Annotations of this start: 5 of 70
- Called 17.9% of time when present
- Phage (with cluster) where this start called: Butterball\_39 (CS2), CinnamonToast\_40 (CS2), Exiguo\_35 (CS2), Jellybones\_39 (CS2), Monty\_34 (CS2), Msay19\_40 (CS2), Worcestershire\_35 (CS2),

### **Summary by clusters:**

There are 5 clusters represented in this pham: CS4, singleton, CS1, CS3, CS2,

Info for manual annotations of cluster CS1:

- Start number 18 was manually annotated 3 times for cluster CS1.

Info for manual annotations of cluster CS2:

- Start number 18 was manually annotated 28 times for cluster CS2.
- Start number 21 was manually annotated 5 times for cluster CS2.

Info for manual annotations of cluster CS3:

- Start number 18 was manually annotated 24 times for cluster CS3.

Info for manual annotations of cluster CS4:

- Start number 17 was manually annotated 1 time for cluster CS4.
- Start number 18 was manually annotated 8 times for cluster CS4.

### **Gene Information:**

Gene: ASerpRocky\_34 Start: 40526, Stop: 41386, Start Num: 18

Candidate Starts for ASerpRocky\_34:

(5, 40067), (6, 40088), (15, 40373), (Start: 17 @40523 has 1 MA's), (Start: 18 @40526 has 64 MA's), (19, 40547), (24, 40649), (25, 40655), (28, 40685), (31, 40769), (38, 40892), (40, 40907), (46, 41036), (47, 41054), (50, 41126), (57, 41318), (58, 41321), (59, 41333), (62, 41366),

Gene: Adgers\_36 Start: 39056, Stop: 39892, Start Num: 18

Candidate Starts for Adgers\_36:

(Start: 18 @39056 has 64 MA's), (Start: 21 @39092 has 5 MA's), (22, 39134), (25, 39188), (26, 39212), (27, 39215), (30, 39269), (31, 39302), (40, 39440), (44, 39545), (45, 39566), (51, 39701), (54, 39722), (57, 39848),

Gene: Amore2\_39 Start: 39586, Stop: 40413, Start Num: 18

Candidate Starts for Amore2\_39:

(Start: 18 @39586 has 64 MA's), (25, 39718), (26, 39742), (30, 39799), (39, 39961), (40, 39970), (45, 40090), (50, 40180), (55, 40249),

Gene: Anamika\_36 Start: 41432, Stop: 42265, Start Num: 18

Candidate Starts for Anamika\_36:

(Start: 18 @41432 has 64 MA's), (22, 41510), (25, 41564), (26, 41588), (27, 41591), (30, 41645), (31, 41678), (35, 41732), (40, 41816), (45, 41939), (51, 42074), (56, 42107),

Gene: Austin\_39 Start: 39586, Stop: 40413, Start Num: 18

Candidate Starts for Austin\_39:

(Start: 18 @39586 has 64 MA's), (25, 39718), (26, 39742), (30, 39799), (39, 39961), (40, 39970), (45, 40090), (50, 40180), (55, 40249),

Gene: Barbochs\_35 Start: 38895, Stop: 39731, Start Num: 18

Candidate Starts for Barbochs\_35:

(Start: 18 @38895 has 64 MA's), (Start: 21 @38931 has 5 MA's), (22, 38973), (25, 39027), (27, 39054), (30, 39108), (31, 39141), (40, 39279), (44, 39384), (45, 39405), (51, 39540), (54, 39561), (57, 39687),

Gene: Beaver\_39 Start: 40942, Stop: 41778, Start Num: 18

Candidate Starts for Beaver\_39:

(Start: 18 @40942 has 64 MA's), (Start: 21 @40978 has 5 MA's), (22, 41020), (25, 41074), (26, 41098), (27, 41101), (30, 41155), (31, 41188), (40, 41326), (44, 41431), (45, 41452), (51, 41587), (54, 41608), (57, 41734),

Gene: Benczkowski14\_34 Start: 40565, Stop: 41419, Start Num: 18

Candidate Starts for Benczkowski14\_34:

(6, 40127), (15, 40412), (Start: 17 @40562 has 1 MA's), (Start: 18 @40565 has 64 MA's), (19, 40586), (22, 40643), (24, 40688), (25, 40694), (28, 40724), (31, 40808), (38, 40931), (40, 40946), (46, 41069), (47, 41087), (50, 41159), (54, 41225), (57, 41351), (58, 41354), (59, 41366), (62, 41399),

Gene: BenoitCattle\_35 Start: 39000, Stop: 39836, Start Num: 18

Candidate Starts for BenoitCattle\_35:

(Start: 18 @39000 has 64 MA's), (19, 39021), (Start: 21 @39036 has 5 MA's), (22, 39078), (25, 39132), (27, 39159), (30, 39213), (31, 39246), (37, 39357), (40, 39384), (41, 39414), (44, 39489), (45, 39510), (47, 39528), (51, 39645), (54, 39666),

Gene: Berries\_36 Start: 41403, Stop: 42236, Start Num: 18

Candidate Starts for Berries\_36:

(Start: 18 @41403 has 64 MA's), (22, 41481), (25, 41535), (26, 41559), (27, 41562), (30, 41616), (31, 41649), (35, 41703), (40, 41787), (45, 41910), (51, 42045), (56, 42078),

Gene: Bianmat\_36 Start: 41443, Stop: 42276, Start Num: 18

Candidate Starts for Bianmat\_36:

(Start: 18 @41443 has 64 MA's), (22, 41521), (25, 41575), (26, 41599), (27, 41602), (30, 41656), (31, 41689), (35, 41743), (40, 41827), (45, 41950), (51, 42085), (56, 42118),

Gene: BigShaq\_35 Start: 39005, Stop: 39841, Start Num: 18

Candidate Starts for BigShaq\_35:

(Start: 18 @39005 has 64 MA's), (Start: 21 @39041 has 5 MA's), (22, 39083), (25, 39137), (27, 39164), (30, 39218), (31, 39251), (37, 39362), (40, 39389), (41, 39419), (44, 39494), (45, 39515), (47, 39533), (51, 39650), (54, 39671),

Gene: BirksAndSocks\_39 Start: 40920, Stop: 41756, Start Num: 18

Candidate Starts for BirksAndSocks\_39:

(Start: 18 @40920 has 64 MA's), (Start: 21 @40956 has 5 MA's), (22, 40998), (25, 41052), (26, 41076), (27, 41079), (30, 41133), (31, 41166), (40, 41304), (44, 41409), (45, 41430), (51, 41565), (54, 41586), (57, 41712),

Gene: Boneham\_39 Start: 40919, Stop: 41755, Start Num: 18

Candidate Starts for Boneham\_39:

(Start: 18 @40919 has 64 MA's), (Start: 21 @40955 has 5 MA's), (22, 40997), (25, 41051), (26, 41075), (27, 41078), (30, 41132), (31, 41165), (40, 41303), (44, 41408), (45, 41429), (51, 41564), (54, 41585), (57, 41711),

Gene: Breezic\_35 Start: 38908, Stop: 39744, Start Num: 18

Candidate Starts for Breezic\_35:

(Start: 18 @38908 has 64 MA's), (Start: 21 @38944 has 5 MA's), (22, 38986), (25, 39040), (26, 39064), (27, 39067), (30, 39121), (31, 39154), (40, 39292), (44, 39397), (45, 39418), (51, 39553), (54, 39574), (57, 39700),

Gene: Butterball\_39 Start: 40955, Stop: 41755, Start Num: 21

Candidate Starts for Butterball\_39:

(Start: 18 @40919 has 64 MA's), (Start: 21 @40955 has 5 MA's), (22, 40997), (25, 41051), (26, 41075), (27, 41078), (30, 41132), (31, 41165), (40, 41303), (44, 41408), (45, 41429), (51, 41564), (54, 41585), (57, 41711),

Gene: CathyBurgh\_34 Start: 39762, Stop: 40598, Start Num: 18

Candidate Starts for CathyBurgh\_34:

(Start: 18 @39762 has 64 MA's), (Start: 21 @39798 has 5 MA's), (22, 39840), (25, 39894), (26, 39918), (27, 39921), (30, 39975), (31, 40008), (40, 40146), (44, 40251), (45, 40272), (51, 40407), (54, 40428), (57, 40554),

Gene: Charianelly\_36 Start: 41153, Stop: 41986, Start Num: 18

Candidate Starts for Charianelly\_36:

(Start: 18 @41153 has 64 MA's), (22, 41231), (25, 41285), (26, 41309), (27, 41312), (30, 41366), (31, 41399), (35, 41453), (40, 41537), (45, 41660), (51, 41795), (56, 41828),

Gene: Chelms\_35 Start: 39008, Stop: 39844, Start Num: 18

Candidate Starts for Chelms\_35:

(Start: 18 @39008 has 64 MA's), (Start: 21 @39044 has 5 MA's), (22, 39086), (25, 39140), (27, 39167), (30, 39221), (31, 39254), (37, 39365), (40, 39392), (41, 39422), (44, 39497), (45, 39518), (47, 39536), (51, 39653), (54, 39674),

Gene: CinnamonToast\_40 Start: 41009, Stop: 41809, Start Num: 21

Candidate Starts for CinnamonToast\_40:

(Start: 18 @40973 has 64 MA's), (Start: 21 @41009 has 5 MA's), (22, 41051), (25, 41105), (26, 41129), (27, 41132), (30, 41186), (31, 41219), (40, 41357), (44, 41462), (45, 41483), (51, 41618), (54, 41639), (57, 41765),

Gene: Crete\_36 Start: 39271, Stop: 40107, Start Num: 18

Candidate Starts for Crete\_36:

(Start: 18 @39271 has 64 MA's), (19, 39292), (Start: 21 @39307 has 5 MA's), (22, 39349), (25, 39403), (27, 39430), (30, 39484), (31, 39517), (37, 39628), (40, 39655), (41, 39685), (44, 39760), (45, 39781), (47, 39799), (51, 39916), (54, 39937),

Gene: Dakiti\_35 Start: 39876, Stop: 40712, Start Num: 18

Candidate Starts for Dakiti\_35:

(Start: 18 @39876 has 64 MA's), (Start: 21 @39912 has 5 MA's), (22, 39954), (25, 40008), (27, 40035), (30, 40089), (31, 40122), (37, 40233), (40, 40260), (41, 40290), (44, 40365), (45, 40386), (47, 40404), (51, 40521), (54, 40542),

Gene: Damp\_36 Start: 40317, Stop: 41150, Start Num: 18

Candidate Starts for Damp\_36:

(Start: 18 @40317 has 64 MA's), (22, 40395), (26, 40473), (27, 40476), (30, 40530), (31, 40563), (35, 40617), (40, 40701), (45, 40824), (51, 40959), (56, 40992),

Gene: Demosthenes\_34 Start: 40496, Stop: 41359, Start Num: 17

Candidate Starts for Demosthenes\_34:

(Start: 17 @40496 has 1 MA's), (Start: 18 @40499 has 64 MA's), (19, 40520), (24, 40622), (25, 40628), (28, 40658), (31, 40742), (38, 40865), (40, 40880), (46, 41009), (47, 41027), (50, 41099), (57, 41291), (58, 41294), (59, 41306), (62, 41339),

Gene: Diabla\_38 Start: 40763, Stop: 41593, Start Num: 18

Candidate Starts for Diabla\_38:

(Start: 18 @40763 has 64 MA's), (Start: 21 @40799 has 5 MA's), (22, 40841), (25, 40895), (26, 40919), (27, 40922), (30, 40976), (31, 41009), (33, 41030), (40, 41147), (42, 41195), (43, 41213), (44, 41246), (45, 41267), (51, 41402), (54, 41423),

Gene: Eggsie\_35 Start: 39032, Stop: 39862, Start Num: 18

Candidate Starts for Eggsie\_35:

(Start: 18 @39032 has 64 MA's), (Start: 21 @39068 has 5 MA's), (22, 39110), (25, 39164), (26, 39188), (27, 39191), (30, 39245), (31, 39278), (40, 39416), (43, 39482), (44, 39515), (45, 39536), (51, 39671), (54, 39692),

Gene: Ekhein\_35 Start: 38890, Stop: 39726, Start Num: 18

Candidate Starts for Ekhein\_35:

(Start: 18 @38890 has 64 MA's), (Start: 21 @38926 has 5 MA's), (22, 38968), (25, 39022), (26, 39046), (27, 39049), (30, 39103), (31, 39136), (40, 39274), (44, 39379), (45, 39400), (51, 39535), (54, 39556), (57, 39682),

Gene: Exiguo\_35 Start: 38938, Stop: 39738, Start Num: 21

Candidate Starts for Exiguo\_35:

(Start: 18 @38902 has 64 MA's), (Start: 21 @38938 has 5 MA's), (22, 38980), (25, 39034), (26, 39058), (27, 39061), (30, 39115), (31, 39148), (40, 39286), (44, 39391), (45, 39412), (51, 39547), (54, 39568), (57, 39694),

Gene: FelixAlejandro\_40 Start: 41117, Stop: 41953, Start Num: 18

Candidate Starts for FelixAlejandro\_40:

(Start: 18 @41117 has 64 MA's), (Start: 21 @41153 has 5 MA's), (22, 41195), (25, 41249), (26, 41273), (27, 41276), (30, 41330), (31, 41363), (40, 41501), (44, 41606), (45, 41627), (51, 41762), (54, 41783), (57, 41909),

Gene: Flakey\_35 Start: 39766, Stop: 40602, Start Num: 18

Candidate Starts for Flakey\_35:

(Start: 18 @39766 has 64 MA's), (Start: 21 @39802 has 5 MA's), (22, 39844), (25, 39898), (26, 39922), (27, 39925), (30, 39979), (31, 40012), (40, 40150), (45, 40276), (51, 40411), (54, 40432), (57, 40558),

Gene: GMA7\_29 Start: 33800, Stop: 34627, Start Num: 18

Candidate Starts for GMA7\_29:

(Start: 18 @33800 has 64 MA's), (25, 33932), (26, 33956), (30, 34013), (39, 34175), (40, 34184), (45, 34304), (50, 34394), (55, 34463),

Gene: GTE7\_29 Start: 33831, Stop: 34658, Start Num: 18

Candidate Starts for GTE7\_29:

(Start: 18 @33831 has 64 MA's), (25, 33963), (26, 33987), (30, 34044), (39, 34206), (40, 34215), (45, 34335), (50, 34425), (55, 34494),

Gene: GalacticEye\_36 Start: 41115, Stop: 41948, Start Num: 18

Candidate Starts for GalacticEye\_36:

(Start: 18 @41115 has 64 MA's), (22, 41193), (25, 41247), (26, 41271), (27, 41274), (30, 41328), (31, 41361), (35, 41415), (40, 41499), (45, 41622), (51, 41757), (56, 41790),

Gene: Gorko\_35 Start: 38894, Stop: 39730, Start Num: 18

Candidate Starts for Gorko\_35:

(Start: 18 @38894 has 64 MA's), (Start: 21 @38930 has 5 MA's), (22, 38972), (25, 39026), (26, 39050), (27, 39053), (30, 39107), (31, 39140), (40, 39278), (44, 39383), (45, 39404), (51, 39539), (54, 39560), (57, 39686),

Gene: GourdThymes\_35 Start: 39768, Stop: 40604, Start Num: 18

Candidate Starts for GourdThymes\_35:

(Start: 18 @39768 has 64 MA's), (Start: 21 @39804 has 5 MA's), (22, 39846), (25, 39900), (26, 39924), (27, 39927), (30, 39981), (31, 40014), (40, 40152), (44, 40257), (45, 40278), (51, 40413), (54, 40434), (57, 40560),

Gene: Guillaume\_36 Start: 41165, Stop: 41998, Start Num: 18

Candidate Starts for Guillaume\_36:

(Start: 18 @41165 has 64 MA's), (22, 41243), (26, 41321), (27, 41324), (30, 41378), (35, 41465), (40, 41549), (45, 41672), (51, 41807), (56, 41840),

Gene: Hail2Pitt\_36 Start: 41641, Stop: 42474, Start Num: 18

Candidate Starts for Hail2Pitt\_36:

(Start: 18 @41641 has 64 MA's), (22, 41719), (25, 41773), (26, 41797), (27, 41800), (30, 41854), (31, 41887), (35, 41941), (40, 42025), (45, 42148), (51, 42283), (56, 42316),

Gene: Harambe\_36 Start: 41432, Stop: 42265, Start Num: 18

Candidate Starts for Harambe\_36:

(Start: 18 @41432 has 64 MA's), (22, 41510), (25, 41564), (26, 41588), (27, 41591), (30, 41645), (31, 41678), (35, 41732), (40, 41816), (45, 41939), (51, 42074), (56, 42107), (57, 42221),

Gene: HayZem\_38 Start: 39583, Stop: 40410, Start Num: 18

Candidate Starts for HayZem\_38:

(Start: 18 @39583 has 64 MA's), (25, 39715), (26, 39739), (30, 39796), (39, 39958), (40, 39967), (45, 40087), (50, 40177), (55, 40246),

Gene: Hello\_36 Start: 41394, Stop: 42227, Start Num: 18

Candidate Starts for Hello\_36:

(Start: 18 @41394 has 64 MA's), (22, 41472), (25, 41526), (26, 41550), (27, 41553), (30, 41607), (35, 41694), (40, 41778), (45, 41901), (51, 42036), (56, 42069),

Gene: Hollow\_35 Start: 40911, Stop: 41765, Start Num: 18

Candidate Starts for Hollow\_35:



(15, 40758), (Start: 17 @40908 has 1 MA's), (Start: 18 @40911 has 64 MA's), (19, 40932), (24, 41034), (25, 41040), (28, 41070), (31, 41154), (38, 41277), (40, 41292), (46, 41415), (47, 41433), (50, 41505), (54, 41571), (57, 41697), (58, 41700), (59, 41712), (62, 41745),

Gene: Hotorobo\_35 Start: 39773, Stop: 40609, Start Num: 18

Candidate Starts for Hotorobo\_35:

(Start: 18 @39773 has 64 MA's), (Start: 21 @39809 has 5 MA's), (22, 39851), (25, 39905), (26, 39929), (27, 39932), (30, 39986), (31, 40019), (40, 40157), (44, 40262), (45, 40283), (51, 40418), (54, 40439), (57, 40565),

Gene: Jams\_36 Start: 40603, Stop: 41436, Start Num: 18

Candidate Starts for Jams\_36:

(Start: 18 @40603 has 64 MA's), (22, 40681), (25, 40735), (26, 40759), (27, 40762), (30, 40816), (31, 40849), (35, 40903), (40, 40987), (45, 41110), (51, 41245), (56, 41278),

Gene: Jellybones\_39 Start: 41014, Stop: 41814, Start Num: 21

Candidate Starts for Jellybones\_39:

(Start: 18 @40978 has 64 MA's), (Start: 21 @41014 has 5 MA's), (22, 41056), (25, 41110), (26, 41134), (27, 41137), (30, 41191), (31, 41224), (40, 41362), (44, 41467), (45, 41488), (51, 41623), (54, 41644), (57, 41770),

Gene: John316\_39 Start: 40931, Stop: 41767, Start Num: 18

Candidate Starts for John316\_39:

(Start: 18 @40931 has 64 MA's), (Start: 21 @40967 has 5 MA's), (22, 41009), (25, 41063), (26, 41087), (27, 41090), (30, 41144), (31, 41177), (40, 41315), (44, 41420), (45, 41441), (51, 41576), (54, 41597), (57, 41723),

Gene: Jormungandr\_36 Start: 41147, Stop: 41980, Start Num: 18

Candidate Starts for Jormungandr\_36:

(Start: 18 @41147 has 64 MA's), (22, 41225), (26, 41303), (27, 41306), (30, 41360), (35, 41447), (40, 41531), (45, 41654), (51, 41789), (56, 41822),

Gene: Kaseim\_37 Start: 40588, Stop: 41421, Start Num: 18

Candidate Starts for Kaseim\_37:

(Start: 18 @40588 has 64 MA's), (22, 40666), (25, 40720), (26, 40744), (27, 40747), (30, 40801), (31, 40834), (35, 40888), (40, 40972), (45, 41095), (51, 41230), (56, 41263),

Gene: Katyusha\_34 Start: 40565, Stop: 41419, Start Num: 18

Candidate Starts for Katyusha\_34:

(6, 40127), (15, 40412), (Start: 17 @40562 has 1 MA's), (Start: 18 @40565 has 64 MA's), (19, 40586), (22, 40643), (24, 40688), (25, 40694), (28, 40724), (31, 40808), (38, 40931), (40, 40946), (46, 41069), (47, 41087), (50, 41159), (54, 41225), (57, 41351), (58, 41354), (59, 41366), (62, 41399),

Gene: Kvothe\_34 Start: 40464, Stop: 41318, Start Num: 18

Candidate Starts for Kvothe\_34:

(6, 40026), (15, 40311), (Start: 17 @40461 has 1 MA's), (Start: 18 @40464 has 64 MA's), (19, 40485), (22, 40542), (24, 40587), (25, 40593), (28, 40623), (31, 40707), (38, 40830), (40, 40845), (46, 40968), (47, 40986), (50, 41058), (54, 41124), (57, 41250), (58, 41253), (59, 41265), (62, 41298),

Gene: Lahirium\_36 Start: 41669, Stop: 42502, Start Num: 18

Candidate Starts for Lahirium\_36:

(Start: 18 @41669 has 64 MA's), (22, 41747), (25, 41801), (26, 41825), (27, 41828), (30, 41882), (31, 41915), (35, 41969), (40, 42053), (45, 42176), (51, 42311), (56, 42344), (57, 42458),

Gene: Lidong\_36 Start: 41403, Stop: 42236, Start Num: 18

Candidate Starts for Lidong\_36:

(Start: 18 @41403 has 64 MA's), (22, 41481), (25, 41535), (26, 41559), (27, 41562), (30, 41616), (31, 41649), (35, 41703), (40, 41787), (45, 41910), (51, 42045), (56, 42078),

Gene: Linetti\_36 Start: 40002, Stop: 40838, Start Num: 18

Candidate Starts for Linetti\_36:

(Start: 18 @40002 has 64 MA's), (Start: 21 @40038 has 5 MA's), (22, 40080), (25, 40134), (27, 40161), (30, 40215), (31, 40248), (37, 40359), (40, 40386), (41, 40416), (44, 40491), (45, 40512), (47, 40530), (51, 40647),

Gene: Lizzo\_35 Start: 39762, Stop: 40598, Start Num: 18

Candidate Starts for Lizzo\_35:

(Start: 18 @39762 has 64 MA's), (Start: 21 @39798 has 5 MA's), (22, 39840), (25, 39894), (26, 39918), (27, 39921), (30, 39975), (31, 40008), (40, 40146), (44, 40251), (45, 40272), (51, 40407), (54, 40428), (57, 40554),

Gene: Luker\_37 Start: 41622, Stop: 42455, Start Num: 18

Candidate Starts for Luker\_37:

(Start: 18 @41622 has 64 MA's), (22, 41700), (25, 41754), (26, 41778), (27, 41781), (30, 41835), (31, 41868), (35, 41922), (40, 42006), (45, 42129), (51, 42264), (56, 42297),

Gene: Minos\_37 Start: 41145, Stop: 41978, Start Num: 18

Candidate Starts for Minos\_37:

(Start: 18 @41145 has 64 MA's), (22, 41223), (25, 41277), (26, 41301), (27, 41304), (30, 41358), (31, 41391), (35, 41445), (40, 41529), (45, 41652), (51, 41787), (56, 41820),

Gene: Monty\_34 Start: 38948, Stop: 39748, Start Num: 21

Candidate Starts for Monty\_34:

(Start: 18 @38912 has 64 MA's), (Start: 21 @38948 has 5 MA's), (22, 38990), (25, 39044), (26, 39068), (27, 39071), (30, 39125), (31, 39158), (40, 39296), (44, 39401), (45, 39422), (51, 39557), (54, 39578), (57, 39704),

Gene: MrWormie\_36 Start: 40306, Stop: 41139, Start Num: 18

Candidate Starts for MrWormie\_36:

(Start: 18 @40306 has 64 MA's), (22, 40384), (25, 40438), (26, 40462), (27, 40465), (30, 40519), (31, 40552), (35, 40606), (40, 40690), (45, 40813), (51, 40948), (56, 40981),

Gene: Msay19\_40 Start: 41144, Stop: 41944, Start Num: 21

Candidate Starts for Msay19\_40:

(Start: 18 @41108 has 64 MA's), (Start: 21 @41144 has 5 MA's), (22, 41186), (25, 41240), (26, 41264), (27, 41267), (30, 41321), (31, 41354), (40, 41492), (44, 41597), (45, 41618), (51, 41753), (54, 41774), (57, 41900),

Gene: Neevie\_36 Start: 41408, Stop: 42241, Start Num: 18

Candidate Starts for Neevie\_36:

(Start: 18 @41408 has 64 MA's), (22, 41486), (25, 41540), (26, 41564), (27, 41567), (30, 41621), (35, 41708), (40, 41792), (45, 41915), (51, 42050), (56, 42083),

Gene: Newt\_37 Start: 41636, Stop: 42469, Start Num: 18

Candidate Starts for Newt\_37:

(Start: 18 @41636 has 64 MA's), (22, 41714), (25, 41768), (26, 41792), (27, 41795), (30, 41849), (31, 41882), (35, 41936), (40, 42020), (45, 42143), (51, 42278), (56, 42311),

Gene: Niagara\_34 Start: 40522, Stop: 41376, Start Num: 18

Candidate Starts for Niagara\_34:

(Start: 17 @40519 has 1 MA's), (Start: 18 @40522 has 64 MA's), (19, 40543), (22, 40600), (24, 40645), (25, 40651), (28, 40681), (31, 40765), (38, 40888), (40, 40903), (46, 41026), (47, 41044), (50, 41116), (54, 41182), (57, 41308), (58, 41311), (59, 41323), (62, 41356),

Gene: Nimi13\_36 Start: 41154, Stop: 41987, Start Num: 18

Candidate Starts for Nimi13\_36:

(Start: 18 @41154 has 64 MA's), (22, 41232), (26, 41310), (27, 41313), (30, 41367), (31, 41400), (35, 41454), (40, 41538), (45, 41661), (51, 41796), (56, 41829),

Gene: Philon9\_36 Start: 41732, Stop: 42586, Start Num: 17

Candidate Starts for Philon9\_36:

(Start: 17 @41732 has 1 MA's), (Start: 18 @41735 has 64 MA's), (19, 41756), (25, 41864), (39, 42107), (40, 42116), (46, 42236), (47, 42254), (50, 42326), (53, 42383), (56, 42404), (58, 42521), (64, 42575),

Gene: PierreThree\_35 Start: 39873, Stop: 40709, Start Num: 18

Candidate Starts for PierreThree\_35:

(16, 39834), (Start: 18 @39873 has 64 MA's), (19, 39894), (Start: 21 @39909 has 5 MA's), (22, 39951), (25, 40005), (27, 40032), (30, 40086), (31, 40119), (37, 40230), (40, 40257), (41, 40287), (44, 40362), (45, 40383), (47, 40401), (51, 40518), (54, 40539),

Gene: PokyPuppy\_34 Start: 39816, Stop: 40652, Start Num: 18

Candidate Starts for PokyPuppy\_34:

(Start: 18 @39816 has 64 MA's), (19, 39837), (Start: 21 @39852 has 5 MA's), (22, 39894), (25, 39948), (26, 39972), (27, 39975), (30, 40029), (31, 40062), (36, 40143), (40, 40200), (45, 40326), (51, 40461), (54, 40482),

Gene: Poland\_40 Start: 41087, Stop: 41923, Start Num: 18

Candidate Starts for Poland\_40:

(Start: 18 @41087 has 64 MA's), (Start: 21 @41123 has 5 MA's), (22, 41165), (25, 41219), (26, 41243), (27, 41246), (30, 41300), (31, 41333), (40, 41471), (44, 41576), (45, 41597), (51, 41732), (54, 41753), (57, 41879),

Gene: RemRem\_36 Start: 38902, Stop: 39738, Start Num: 18

Candidate Starts for RemRem\_36:

(Start: 18 @38902 has 64 MA's), (Start: 21 @38938 has 5 MA's), (22, 38980), (25, 39034), (26, 39058), (27, 39061), (30, 39115), (31, 39148), (40, 39286), (44, 39391), (45, 39412), (51, 39547), (54, 39568), (57, 39694),

Gene: RoyalG\_36 Start: 39375, Stop: 40205, Start Num: 18

Candidate Starts for RoyalG\_36:

(Start: 18 @39375 has 64 MA's), (Start: 21 @39411 has 5 MA's), (22, 39453), (25, 39507), (26, 39531), (27, 39534), (30, 39588), (31, 39621), (33, 39642), (40, 39759), (42, 39807), (43, 39825), (44, 39858), (45, 39879), (51, 40014), (54, 40035),

Gene: Sam12\_35 Start: 38902, Stop: 39738, Start Num: 18

Candidate Starts for Sam12\_35:

(Start: 18 @38902 has 64 MA's), (Start: 21 @38938 has 5 MA's), (22, 38980), (25, 39034), (26, 39058), (27, 39061), (30, 39115), (31, 39148), (40, 39286), (44, 39391), (45, 39412), (51, 39547), (54, 39568),

(57, 39694),

Gene: Shelley\_36 Start: 40630, Stop: 41463, Start Num: 18

Candidate Starts for Shelley\_36:

(Start: 18 @40630 has 64 MA's), (22, 40708), (25, 40762), (26, 40786), (27, 40789), (30, 40843), (31, 40876), (35, 40930), (40, 41014), (45, 41137), (51, 41272), (56, 41305),

Gene: Sombrero\_35 Start: 38904, Stop: 39740, Start Num: 18

Candidate Starts for Sombrero\_35:

(Start: 18 @38904 has 64 MA's), (Start: 21 @38940 has 5 MA's), (22, 38982), (25, 39036), (26, 39060), (27, 39063), (30, 39117), (31, 39150), (36, 39231), (40, 39288), (44, 39393), (45, 39414), (51, 39549), (54, 39570), (57, 39696),

Gene: Squibbles\_34 Start: 39765, Stop: 40601, Start Num: 18

Candidate Starts for Squibbles\_34:

(Start: 18 @39765 has 64 MA's), (Start: 21 @39801 has 5 MA's), (22, 39843), (25, 39897), (26, 39921), (27, 39924), (30, 39978), (31, 40011), (40, 40149), (44, 40254), (45, 40275), (51, 40410), (54, 40431), (57, 40557),

Gene: SteveFrench\_35 Start: 39615, Stop: 40445, Start Num: 18

Candidate Starts for SteveFrench\_35:

(Start: 18 @39615 has 64 MA's), (Start: 21 @39651 has 5 MA's), (22, 39693), (25, 39747), (26, 39771), (27, 39774), (30, 39828), (31, 39861), (33, 39882), (40, 39999), (42, 40047), (43, 40065), (44, 40098), (45, 40119), (51, 40254), (54, 40275),

Gene: Sticker17\_36 Start: 41145, Stop: 41978, Start Num: 18

Candidate Starts for Sticker17\_36:

(Start: 18 @41145 has 64 MA's), (22, 41223), (26, 41301), (27, 41304), (30, 41358), (31, 41391), (35, 41445), (40, 41529), (45, 41652), (51, 41787), (56, 41820),

Gene: Teal\_36 Start: 41613, Stop: 42446, Start Num: 18

Candidate Starts for Teal\_36:

(Start: 18 @41613 has 64 MA's), (22, 41691), (25, 41745), (26, 41769), (27, 41772), (30, 41826), (35, 41913), (40, 41997), (45, 42120), (51, 42255), (56, 42288),

Gene: Teatealatte\_34 Start: 40467, Stop: 41321, Start Num: 18

Candidate Starts for Teatealatte\_34:

(Start: 17 @40464 has 1 MA's), (Start: 18 @40467 has 64 MA's), (19, 40488), (22, 40545), (24, 40590), (25, 40596), (28, 40626), (31, 40710), (38, 40833), (40, 40848), (46, 40971), (47, 40989), (50, 41061), (54, 41127), (57, 41253), (58, 41256), (62, 41301),

Gene: Teech\_34 Start: 40268, Stop: 41122, Start Num: 18

Candidate Starts for Teech\_34:

(Start: 17 @40265 has 1 MA's), (Start: 18 @40268 has 64 MA's), (19, 40289), (22, 40346), (24, 40391), (25, 40397), (28, 40427), (31, 40511), (38, 40634), (40, 40649), (46, 40772), (47, 40790), (50, 40862), (54, 40928), (57, 41054), (58, 41057), (59, 41069), (62, 41102),

Gene: Tonitrus\_51 Start: 39078, Stop: 39962, Start Num: 18

Candidate Starts for Tonitrus\_51:

(1, 38232), (2, 38238), (3, 38376), (4, 38535), (7, 38679), (8, 38718), (9, 38742), (10, 38757), (11, 38808), (12, 38823), (13, 38832), (14, 38865), (15, 38928), (Start: 17 @39075 has 1 MA's), (Start: 18 @39078 has 64 MA's), (20, 39111), (23, 39189), (26, 39231), (27, 39234), (29, 39285), (32, 39336), (34, 39357), (35, 39375), (39, 39447), (41, 39483), (47, 39600), (48, 39633), (49, 39660), (51, 39717),

(52, 39723), (53, 39729), (60, 39882), (61, 39897), (63, 39921), (65, 39951),

Gene: Tredge\_34 Start: 40467, Stop: 41321, Start Num: 18

Candidate Starts for Tredge\_34:

(Start: 17 @40464 has 1 MA's), (Start: 18 @40467 has 64 MA's), (19, 40488), (22, 40545), (24, 40590), (25, 40596), (28, 40626), (31, 40710), (38, 40833), (40, 40848), (46, 40971), (47, 40989), (50, 41061), (54, 41127), (57, 41253), (58, 41256), (62, 41301),

Gene: Vitaenoi\_36 Start: 41731, Stop: 42585, Start Num: 17

Candidate Starts for Vitaenoi\_36:

(Start: 17 @41731 has 1 MA's), (Start: 18 @41734 has 64 MA's), (19, 41755), (25, 41863), (39, 42106), (40, 42115), (46, 42235), (47, 42253), (50, 42325), (53, 42382), (56, 42403), (58, 42520), (64, 42574),

Gene: Woes\_36 Start: 41664, Stop: 42497, Start Num: 18

Candidate Starts for Woes\_36:

(Start: 18 @41664 has 64 MA's), (22, 41742), (25, 41796), (26, 41820), (27, 41823), (30, 41877), (31, 41910), (35, 41964), (40, 42048), (45, 42171), (51, 42306), (56, 42339),

Gene: Worcestershire\_35 Start: 38940, Stop: 39740, Start Num: 21

Candidate Starts for Worcestershire\_35:

(Start: 18 @38904 has 64 MA's), (Start: 21 @38940 has 5 MA's), (25, 39036), (26, 39060), (27, 39063), (30, 39117), (31, 39150), (40, 39288), (44, 39393), (45, 39414), (51, 39549), (54, 39570), (57, 39696),