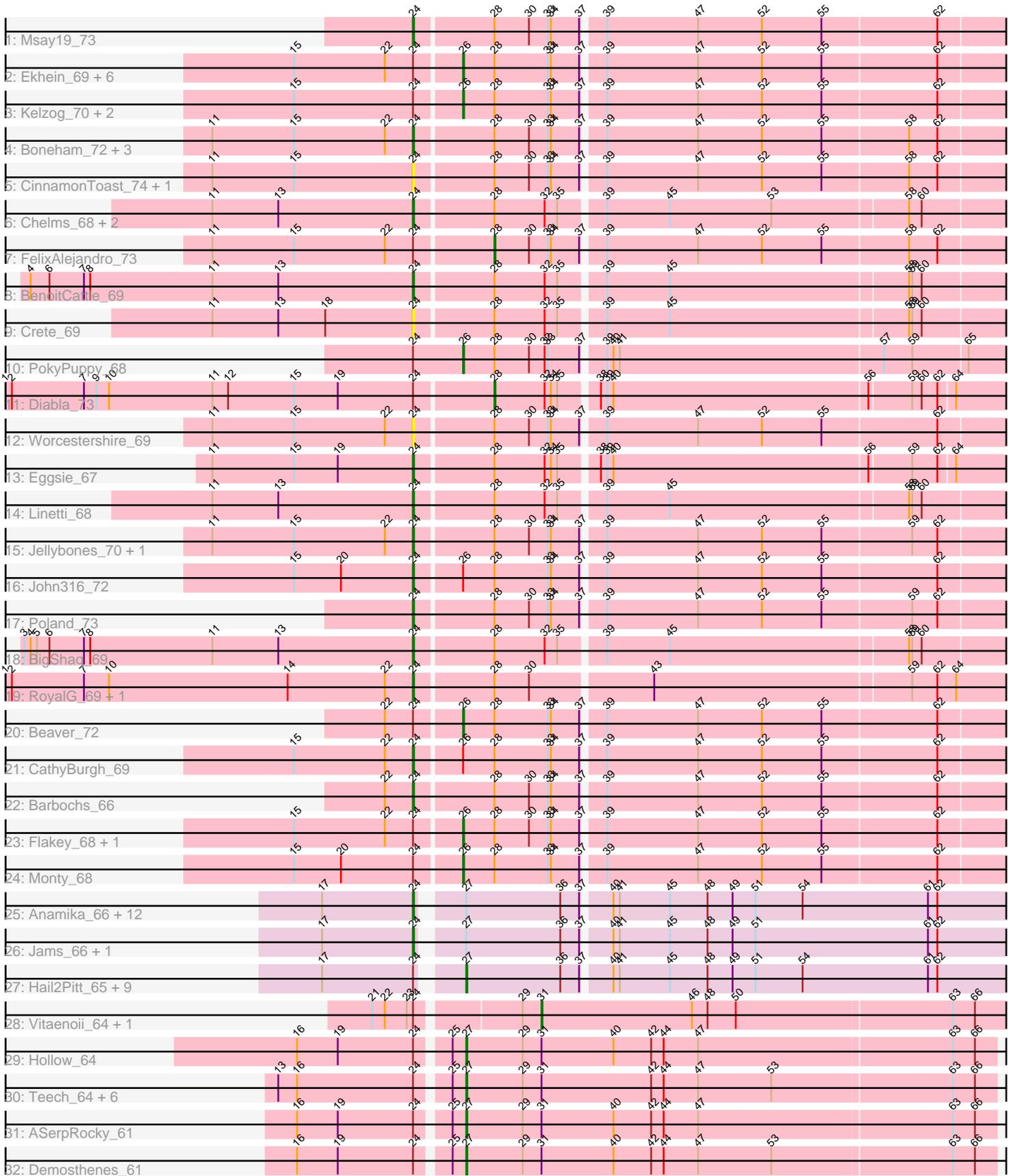


# Pham 283733



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 283733 Report

This analysis was run 02/23/26 on database version 636.

Pham number 283733 has 78 members, 5 are drafts.

Phages represented in each track:

- Track 1 : Msay19\_73
- Track 2 : Ekhein\_69, Gorko\_68, Lizzo\_69, Hotorobo\_69, Exiguo\_68, Breezic\_69, Sam12\_68
- Track 3 : Kelzog\_70, GourdThymes\_69, Squibbles\_68
- Track 4 : Boneham\_72, Adgers\_72, Sombrero\_70, Butterball\_71
- Track 5 : CinnamonToast\_74, BillyBobJr\_74
- Track 6 : Chelms\_68, Dakiti\_69, PierreThree\_67
- Track 7 : FelixAlejandro\_73
- Track 8 : BenoitCattle\_69
- Track 9 : Crete\_69
- Track 10 : PokyPuppy\_68
- Track 11 : Diabla\_73
- Track 12 : Worcestershire\_69
- Track 13 : Eggsie\_67
- Track 14 : Linetti\_68
- Track 15 : Jellybones\_70, BirksAndSocks\_73
- Track 16 : John316\_72
- Track 17 : Poland\_73
- Track 18 : BigShaq\_69
- Track 19 : RoyalG\_69, SteveFrench\_68
- Track 20 : Beaver\_72
- Track 21 : CathyBurgh\_69
- Track 22 : Barbochs\_66
- Track 23 : Flakey\_68, RemRem\_70
- Track 24 : Monty\_68
- Track 25 : Anamika\_66, Luker\_67, Lahirium\_66, Kaseim\_66, Neoevie\_66, Nimi13\_66, Damp\_66, Guillaume\_66, GalacticEye\_66, Teal\_66, Minos\_67, Hello\_66, Jormungandr\_66
- Track 26 : Jams\_66, Harambe\_66
- Track 27 : Hail2Pitt\_65, Woes\_66, Charianelly\_66, Newt\_67, Sticker17\_66, Bianmat\_66, Lidong\_66, Shelley\_66, Berries\_66, MrWormie\_66
- Track 28 : Vitaenoi\_64, Philon9\_64
- Track 29 : Hollow\_64
- Track 30 : Teech\_64, Katyusha\_63, Kvothe\_62, Teatealatte\_64, Tredge\_63, Benczkowski14\_63, Niagara\_63
- Track 31 : ASerpRocky\_61
- Track 32 : Demosthenes\_61

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

The start number called the most often in the published annotations is 24, it was called in 35 of the 73 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Adgers\_72, Anamika\_66, Barbochs\_66, BenoitCattle\_69, BigShaq\_69, BillyBobJr\_74, BirksAndSocks\_73, Boneham\_72, Butterball\_71, CathyBurgh\_69, Chelms\_68, CinnamonToast\_74, Crete\_69, Dakiti\_69, Damp\_66, Eggsie\_67, GalacticEye\_66, Guillaume\_66, Harambe\_66, Hello\_66, Jams\_66, Jellybones\_70, John316\_72, Jormungandr\_66, Kaseim\_66, Lahirium\_66, Linetti\_68, Luker\_67, Minos\_67, Msay19\_73, Neoevie\_66, Nimi13\_66, PierreThree\_67, Poland\_73, RoyalG\_69, Sombrero\_70, SteveFrench\_68, Teal\_66, Worcestershire\_69,

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

- ASerpRocky\_61, Beaver\_72, Benczkowski14\_63, Berries\_66, Bianmat\_66, Breezic\_69, Charianelly\_66, Demosthenes\_61, Diabla\_73, Ekhein\_69, Exiguo\_68, FelixAlejandro\_73, Flakey\_68, Gorko\_68, GourdThymes\_69, Hail2Pitt\_65, Hollow\_64, Hotorobo\_69, Katyusha\_63, Kelzog\_70, Kvothe\_62, Lidong\_66, Lizzo\_69, Monty\_68, MrWormie\_66, Newt\_67, Niagara\_63, Philon9\_64, PokyPuppy\_68, RemRem\_70, Sam12\_68, Shelley\_66, Squibbles\_68, Sticker17\_66, Teatealatte\_64, Teech\_64, Tredge\_63, Vitaenoi\_64, Woes\_66,

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

- 

### **Summary by start number:**

Start 24:

- Found in 78 of 78 ( 100.0% ) of genes in pham
- Manual Annotations of this start: 35 of 73
- Called 50.0% of time when present
- Phage (with cluster) where this start called: Adgers\_72 (CS2), Anamika\_66 (CS3), Barbochs\_66 (CS2), BenoitCattle\_69 (CS2), BigShaq\_69 (CS2), BillyBobJr\_74 (CS2), BirksAndSocks\_73 (CS2), Boneham\_72 (CS2), Butterball\_71 (CS2), CathyBurgh\_69 (CS2), Chelms\_68 (CS2), CinnamonToast\_74 (CS2), Crete\_69 (CS2), Dakiti\_69 (CS2), Damp\_66 (CS3), Eggsie\_67 (CS2), GalacticEye\_66 (CS3), Guillaume\_66 (CS3), Harambe\_66 (CS3), Hello\_66 (CS3), Jams\_66 (CS3), Jellybones\_70 (CS2), John316\_72 (CS2), Jormungandr\_66 (CS3), Kaseim\_66 (CS3), Lahirium\_66 (CS3), Linetti\_68 (CS2), Luker\_67 (CS3), Minos\_67 (CS3), Msay19\_73 (CS2), Neoevie\_66 (CS3), Nimi13\_66 (CS3), PierreThree\_67 (CS2), Poland\_73 (CS2), RoyalG\_69 (CS2), Sombrero\_70 (CS2), SteveFrench\_68 (CS2), Teal\_66 (CS3), Worcestershire\_69 (CS2),

Start 26:

- Found in 17 of 78 ( 21.8% ) of genes in pham
- Manual Annotations of this start: 14 of 73
- Called 88.2% of time when present

- Phage (with cluster) where this start called: Beaver\_72 (CS2), Breezic\_69 (CS2), Ekhein\_69 (CS2), Exiguo\_68 (CS2), Flakey\_68 (CS2), Gorko\_68 (CS2), GourdThymes\_69 (CS2), Hotorobo\_69 (CS2), Kelzog\_70 (CS2), Lizzo\_69 (CS2), Monty\_68 (CS2), PokyPuppy\_68 (CS2), RemRem\_70 (CS2), Sam12\_68 (CS2), Squibbles\_68 (CS2),

Start 27:

- Found in 35 of 78 ( 44.9% ) of genes in pham
- Manual Annotations of this start: 20 of 73
- Called 57.1% of time when present
- Phage (with cluster) where this start called: ASerpRocky\_61 (CS4), Benczkowski14\_63 (CS4), Berries\_66 (CS3), Bianmat\_66 (CS3), Charianelly\_66 (CS3), Demosthenes\_61 (CS4), Hail2Pitt\_65 (CS3), Hollow\_64 (CS4), Katyusha\_63 (CS4), Kvothe\_62 (CS4), Lidong\_66 (CS3), MrWormie\_66 (CS3), Newt\_67 (CS3), Niagara\_63 (CS4), Shelley\_66 (CS3), Sticker17\_66 (CS3), Teatealatte\_64 (CS4), Teech\_64 (CS4), Tredge\_63 (CS4), Woes\_66 (CS3),

Start 28:

- Found in 41 of 78 ( 52.6% ) of genes in pham
- Manual Annotations of this start: 2 of 73
- Called 4.9% of time when present
- Phage (with cluster) where this start called: Diabla\_73 (CS2), FelixAlejandro\_73 (CS2),

Start 31:

- Found in 12 of 78 ( 15.4% ) of genes in pham
- Manual Annotations of this start: 2 of 73
- Called 16.7% of time when present
- Phage (with cluster) where this start called: Philon9\_64 (CS4), Vitaenoi\_64 (CS4),

### **Summary by clusters:**

There are 3 clusters represented in this pham: CS4, CS3, CS2,

Info for manual annotations of cluster CS2:

- Start number 24 was manually annotated 20 times for cluster CS2.
- Start number 26 was manually annotated 14 times for cluster CS2.
- Start number 28 was manually annotated 2 times for cluster CS2.

Info for manual annotations of cluster CS3:

- Start number 24 was manually annotated 15 times for cluster CS3.
- Start number 27 was manually annotated 10 times for cluster CS3.

Info for manual annotations of cluster CS4:

- Start number 27 was manually annotated 10 times for cluster CS4.
- Start number 31 was manually annotated 2 times for cluster CS4.

### **Gene Information:**

Gene: ASerpRocky\_61 Start: 56398, Stop: 55874, Start Num: 27

Candidate Starts for ASerpRocky\_61:

(16, 56548), (19, 56509), (Start: 24 @56437 has 35 MA's), (25, 56410), (Start: 27 @56398 has 20 MA's), (29, 56344), (Start: 31 @56326 has 2 MA's), (40, 56257), (42, 56221), (44, 56209), (47, 56176), (63, 55939), (66, 55918),

Gene: Adgers\_72 Start: 56930, Stop: 56373, Start Num: 24

Candidate Starts for Adgers\_72:

(11, 57122), (15, 57044), (22, 56957), (Start: 24 @56930 has 35 MA's), (Start: 28 @56858 has 2 MA's), (30, 56825), (33, 56807), (34, 56804), (37, 56777), (39, 56759), (47, 56672), (52, 56612), (55, 56555), (58, 56474), (62, 56447),

Gene: Anamika\_66 Start: 57104, Stop: 56556, Start Num: 24

Candidate Starts for Anamika\_66:

(17, 57191), (Start: 24 @57104 has 35 MA's), (Start: 27 @57071 has 20 MA's), (36, 56981), (37, 56963), (40, 56939), (41, 56933), (45, 56885), (48, 56849), (49, 56825), (51, 56804), (54, 56759), (61, 56639), (62, 56630),

Gene: Barbochs\_66 Start: 56304, Stop: 55747, Start Num: 24

Candidate Starts for Barbochs\_66:

(22, 56331), (Start: 24 @56304 has 35 MA's), (Start: 28 @56232 has 2 MA's), (30, 56199), (33, 56181), (34, 56178), (37, 56151), (39, 56133), (47, 56046), (52, 55986), (55, 55929), (62, 55821),

Gene: Beaver\_72 Start: 58206, Stop: 57691, Start Num: 26

Candidate Starts for Beaver\_72:

(22, 58275), (Start: 24 @58248 has 35 MA's), (Start: 26 @58206 has 14 MA's), (Start: 28 @58176 has 2 MA's), (33, 58125), (34, 58122), (37, 58095), (39, 58077), (47, 57990), (52, 57930), (55, 57873), (62, 57765),

Gene: Benczkowski14\_63 Start: 56922, Stop: 56398, Start Num: 27

Candidate Starts for Benczkowski14\_63:

(13, 57090), (16, 57072), (Start: 24 @56961 has 35 MA's), (25, 56934), (Start: 27 @56922 has 20 MA's), (29, 56868), (Start: 31 @56850 has 2 MA's), (42, 56745), (44, 56733), (47, 56700), (53, 56631), (63, 56463), (66, 56442),

Gene: BenoitCattle\_69 Start: 56881, Stop: 56330, Start Num: 24

Candidate Starts for BenoitCattle\_69:

(4, 57247), (6, 57229), (7, 57196), (8, 57190), (11, 57073), (13, 57010), (Start: 24 @56881 has 35 MA's), (Start: 28 @56809 has 2 MA's), (32, 56761), (35, 56749), (39, 56710), (45, 56650), (58, 56428), (59, 56425), (60, 56416),

Gene: Berries\_66 Start: 57043, Stop: 56528, Start Num: 27

Candidate Starts for Berries\_66:

(17, 57163), (Start: 24 @57076 has 35 MA's), (Start: 27 @57043 has 20 MA's), (36, 56953), (37, 56935), (40, 56911), (41, 56905), (45, 56857), (48, 56821), (49, 56797), (51, 56776), (54, 56731), (61, 56611), (62, 56602),

Gene: Bianmat\_66 Start: 57083, Stop: 56568, Start Num: 27

Candidate Starts for Bianmat\_66:

(17, 57203), (Start: 24 @57116 has 35 MA's), (Start: 27 @57083 has 20 MA's), (36, 56993), (37, 56975), (40, 56951), (41, 56945), (45, 56897), (48, 56861), (49, 56837), (51, 56816), (54, 56771), (61, 56651), (62, 56642),

Gene: BigShaq\_69 Start: 56886, Stop: 56335, Start Num: 24

Candidate Starts for BigShaq\_69:

(3, 57258), (4, 57252), (5, 57246), (6, 57234), (7, 57201), (8, 57195), (11, 57078), (13, 57015), (Start: 24 @56886 has 35 MA's), (Start: 28 @56814 has 2 MA's), (32, 56766), (35, 56754), (39, 56715), (45, 56655), (58, 56433), (59, 56430), (60, 56421),

Gene: BillyBobJr\_74 Start: 58384, Stop: 57827, Start Num: 24

Candidate Starts for BillyBobJr\_74:

(11, 58576), (15, 58498), (Start: 24 @58384 has 35 MA's), (Start: 28 @58312 has 2 MA's), (30, 58279), (33, 58261), (34, 58258), (37, 58231), (39, 58213), (47, 58126), (52, 58066), (55, 58009), (58, 57928), (62, 57901),

Gene: BirksAndSocks\_73 Start: 58388, Stop: 57831, Start Num: 24

Candidate Starts for BirksAndSocks\_73:

(11, 58580), (15, 58502), (22, 58415), (Start: 24 @58388 has 35 MA's), (Start: 28 @58316 has 2 MA's), (30, 58283), (33, 58265), (34, 58262), (37, 58235), (39, 58217), (47, 58130), (52, 58070), (55, 58013), (59, 57929), (62, 57905),

Gene: Boneham\_72 Start: 58313, Stop: 57756, Start Num: 24

Candidate Starts for Boneham\_72:

(11, 58505), (15, 58427), (22, 58340), (Start: 24 @58313 has 35 MA's), (Start: 28 @58241 has 2 MA's), (30, 58208), (33, 58190), (34, 58187), (37, 58160), (39, 58142), (47, 58055), (52, 57995), (55, 57938), (58, 57857), (62, 57830),

Gene: Breezic\_69 Start: 56443, Stop: 55928, Start Num: 26

Candidate Starts for Breezic\_69:

(15, 56599), (22, 56512), (Start: 24 @56485 has 35 MA's), (Start: 26 @56443 has 14 MA's), (Start: 28 @56413 has 2 MA's), (33, 56362), (34, 56359), (37, 56332), (39, 56314), (47, 56227), (52, 56167), (55, 56110), (62, 56002),

Gene: Butterball\_71 Start: 58318, Stop: 57761, Start Num: 24

Candidate Starts for Butterball\_71:

(11, 58510), (15, 58432), (22, 58345), (Start: 24 @58318 has 35 MA's), (Start: 28 @58246 has 2 MA's), (30, 58213), (33, 58195), (34, 58192), (37, 58165), (39, 58147), (47, 58060), (52, 58000), (55, 57943), (58, 57862), (62, 57835),

Gene: CathyBurgh\_69 Start: 56999, Stop: 56442, Start Num: 24

Candidate Starts for CathyBurgh\_69:

(15, 57113), (22, 57026), (Start: 24 @56999 has 35 MA's), (Start: 26 @56957 has 14 MA's), (Start: 28 @56927 has 2 MA's), (33, 56876), (34, 56873), (37, 56846), (39, 56828), (47, 56741), (52, 56681), (55, 56624), (62, 56516),

Gene: Charianelly\_66 Start: 56793, Stop: 56278, Start Num: 27

Candidate Starts for Charianelly\_66:

(17, 56913), (Start: 24 @56826 has 35 MA's), (Start: 27 @56793 has 20 MA's), (36, 56703), (37, 56685), (40, 56661), (41, 56655), (45, 56607), (48, 56571), (49, 56547), (51, 56526), (54, 56481), (61, 56361), (62, 56352),

Gene: Chelms\_68 Start: 56825, Stop: 56274, Start Num: 24

Candidate Starts for Chelms\_68:

(11, 57017), (13, 56954), (Start: 24 @56825 has 35 MA's), (Start: 28 @56753 has 2 MA's), (32, 56705), (35, 56693), (39, 56654), (45, 56594), (53, 56498), (58, 56372), (60, 56360),

Gene: CinnamonToast\_74 Start: 58384, Stop: 57827, Start Num: 24

Candidate Starts for CinnamonToast\_74:

(11, 58576), (15, 58498), (Start: 24 @58384 has 35 MA's), (Start: 28 @58312 has 2 MA's), (30, 58279), (33, 58261), (34, 58258), (37, 58231), (39, 58213), (47, 58126), (52, 58066), (55, 58009), (58, 57928), (62, 57901),

Gene: Crete\_69 Start: 56944, Stop: 56393, Start Num: 24

Candidate Starts for Crete\_69:

(11, 57136), (13, 57073), (18, 57028), (Start: 24 @56944 has 35 MA's), (Start: 28 @56872 has 2 MA's), (32, 56824), (35, 56812), (39, 56773), (45, 56713), (58, 56491), (59, 56488), (60, 56479),

Gene: Dakiti\_69 Start: 57693, Stop: 57142, Start Num: 24

Candidate Starts for Dakiti\_69:

(11, 57885), (13, 57822), (Start: 24 @57693 has 35 MA's), (Start: 28 @57621 has 2 MA's), (32, 57573), (35, 57561), (39, 57522), (45, 57462), (53, 57366), (58, 57240), (60, 57228),

Gene: Damp\_66 Start: 55990, Stop: 55442, Start Num: 24

Candidate Starts for Damp\_66:

(17, 56077), (Start: 24 @55990 has 35 MA's), (Start: 27 @55957 has 20 MA's), (36, 55867), (37, 55849), (40, 55825), (41, 55819), (45, 55771), (48, 55735), (49, 55711), (51, 55690), (54, 55645), (61, 55525), (62, 55516),

Gene: Demosthenes\_61 Start: 56374, Stop: 55850, Start Num: 27

Candidate Starts for Demosthenes\_61:

(16, 56524), (19, 56485), (Start: 24 @56413 has 35 MA's), (25, 56386), (Start: 27 @56374 has 20 MA's), (29, 56320), (Start: 31 @56302 has 2 MA's), (40, 56233), (42, 56197), (44, 56185), (47, 56152), (53, 56083), (63, 55915), (66, 55894),

Gene: Diabla\_73 Start: 58325, Stop: 57840, Start Num: 28

Candidate Starts for Diabla\_73:

(1, 58787), (2, 58781), (7, 58712), (9, 58700), (10, 58688), (11, 58589), (12, 58574), (15, 58511), (19, 58469), (Start: 24 @58397 has 35 MA's), (Start: 28 @58325 has 2 MA's), (32, 58277), (34, 58271), (35, 58265), (38, 58232), (39, 58226), (40, 58220), (56, 57980), (59, 57941), (60, 57932), (62, 57917), (64, 57902),

Gene: Eggsie\_67 Start: 56201, Stop: 55644, Start Num: 24

Candidate Starts for Eggsie\_67:

(11, 56393), (15, 56315), (19, 56273), (Start: 24 @56201 has 35 MA's), (Start: 28 @56129 has 2 MA's), (32, 56081), (34, 56075), (35, 56069), (38, 56036), (39, 56030), (40, 56024), (56, 55784), (59, 55745), (62, 55721), (64, 55706),

Gene: Ekhein\_69 Start: 56148, Stop: 55633, Start Num: 26

Candidate Starts for Ekhein\_69:

(15, 56304), (22, 56217), (Start: 24 @56190 has 35 MA's), (Start: 26 @56148 has 14 MA's), (Start: 28 @56118 has 2 MA's), (33, 56067), (34, 56064), (37, 56037), (39, 56019), (47, 55932), (52, 55872), (55, 55815), (62, 55707),

Gene: Exiguo\_68 Start: 56184, Stop: 55669, Start Num: 26

Candidate Starts for Exiguo\_68:

(15, 56340), (22, 56253), (Start: 24 @56226 has 35 MA's), (Start: 26 @56184 has 14 MA's), (Start: 28 @56154 has 2 MA's), (33, 56103), (34, 56100), (37, 56073), (39, 56055), (47, 55968), (52, 55908), (55, 55851), (62, 55743),

Gene: FelixAlejandro\_73 Start: 58644, Stop: 58159, Start Num: 28

Candidate Starts for FelixAlejandro\_73:

(11, 58908), (15, 58830), (22, 58743), (Start: 24 @58716 has 35 MA's), (Start: 28 @58644 has 2 MA's), (30, 58611), (33, 58593), (34, 58590), (37, 58563), (39, 58545), (47, 58458), (52, 58398), (55, 58341), (58, 58260), (62, 58233),

Gene: Flakey\_68 Start: 56943, Stop: 56428, Start Num: 26

Candidate Starts for Flakey\_68:

(15, 57099), (22, 57012), (Start: 24 @56985 has 35 MA's), (Start: 26 @56943 has 14 MA's), (Start: 28 @56913 has 2 MA's), (30, 56880), (33, 56862), (34, 56859), (37, 56832), (39, 56814), (47, 56727), (52, 56667), (55, 56610), (62, 56502),

Gene: GalacticEye\_66 Start: 56787, Stop: 56239, Start Num: 24

Candidate Starts for GalacticEye\_66:

(17, 56874), (Start: 24 @56787 has 35 MA's), (Start: 27 @56754 has 20 MA's), (36, 56664), (37, 56646), (40, 56622), (41, 56616), (45, 56568), (48, 56532), (49, 56508), (51, 56487), (54, 56442), (61, 56322), (62, 56313),

Gene: Gorko\_68 Start: 56089, Stop: 55574, Start Num: 26

Candidate Starts for Gorko\_68:

(15, 56245), (22, 56158), (Start: 24 @56131 has 35 MA's), (Start: 26 @56089 has 14 MA's), (Start: 28 @56059 has 2 MA's), (33, 56008), (34, 56005), (37, 55978), (39, 55960), (47, 55873), (52, 55813), (55, 55756), (62, 55648),

Gene: GourdThymes\_69 Start: 57044, Stop: 56529, Start Num: 26

Candidate Starts for GourdThymes\_69:

(15, 57200), (Start: 24 @57086 has 35 MA's), (Start: 26 @57044 has 14 MA's), (Start: 28 @57014 has 2 MA's), (33, 56963), (34, 56960), (37, 56933), (39, 56915), (47, 56828), (52, 56768), (55, 56711), (62, 56603),

Gene: Guillaume\_66 Start: 56837, Stop: 56289, Start Num: 24

Candidate Starts for Guillaume\_66:

(17, 56924), (Start: 24 @56837 has 35 MA's), (Start: 27 @56804 has 20 MA's), (36, 56714), (37, 56696), (40, 56672), (41, 56666), (45, 56618), (48, 56582), (49, 56558), (51, 56537), (54, 56492), (61, 56372), (62, 56363),

Gene: Hail2Pitt\_65 Start: 57280, Stop: 56765, Start Num: 27

Candidate Starts for Hail2Pitt\_65:

(17, 57400), (Start: 24 @57313 has 35 MA's), (Start: 27 @57280 has 20 MA's), (36, 57190), (37, 57172), (40, 57148), (41, 57142), (45, 57094), (48, 57058), (49, 57034), (51, 57013), (54, 56968), (61, 56848), (62, 56839),

Gene: Harambe\_66 Start: 57104, Stop: 56556, Start Num: 24

Candidate Starts for Harambe\_66:

(17, 57191), (Start: 24 @57104 has 35 MA's), (Start: 27 @57071 has 20 MA's), (36, 56981), (37, 56963), (40, 56939), (41, 56933), (45, 56885), (48, 56849), (49, 56825), (51, 56804), (61, 56639), (62, 56630),

Gene: Hello\_66 Start: 57066, Stop: 56518, Start Num: 24

Candidate Starts for Hello\_66:

(17, 57153), (Start: 24 @57066 has 35 MA's), (Start: 27 @57033 has 20 MA's), (36, 56943), (37, 56925), (40, 56901), (41, 56895), (45, 56847), (48, 56811), (49, 56787), (51, 56766), (54, 56721), (61, 56601), (62, 56592),

Gene: Hollow\_64 Start: 57103, Stop: 56579, Start Num: 27

Candidate Starts for Hollow\_64:

(16, 57253), (19, 57214), (Start: 24 @57142 has 35 MA's), (25, 57115), (Start: 27 @57103 has 20 MA's), (29, 57049), (Start: 31 @57031 has 2 MA's), (40, 56962), (42, 56926), (44, 56914), (47, 56881), (63, 56644), (66, 56623),

Gene: Hotorobo\_69 Start: 57031, Stop: 56516, Start Num: 26

Candidate Starts for Hotorobo\_69:

(15, 57187), (22, 57100), (Start: 24 @57073 has 35 MA's), (Start: 26 @57031 has 14 MA's), (Start: 28 @57001 has 2 MA's), (33, 56950), (34, 56947), (37, 56920), (39, 56902), (47, 56815), (52, 56755), (55, 56698), (62, 56590),

Gene: Jams\_66 Start: 56276, Stop: 55728, Start Num: 24

Candidate Starts for Jams\_66:

(17, 56363), (Start: 24 @56276 has 35 MA's), (Start: 27 @56243 has 20 MA's), (36, 56153), (37, 56135), (40, 56111), (41, 56105), (45, 56057), (48, 56021), (49, 55997), (51, 55976), (61, 55811), (62, 55802),

Gene: Jellybones\_70 Start: 58001, Stop: 57444, Start Num: 24

Candidate Starts for Jellybones\_70:

(11, 58193), (15, 58115), (22, 58028), (Start: 24 @58001 has 35 MA's), (Start: 28 @57929 has 2 MA's), (30, 57896), (33, 57878), (34, 57875), (37, 57848), (39, 57830), (47, 57743), (52, 57683), (55, 57626), (59, 57542), (62, 57518),

Gene: John316\_72 Start: 58150, Stop: 57593, Start Num: 24

Candidate Starts for John316\_72:

(15, 58264), (20, 58219), (Start: 24 @58150 has 35 MA's), (Start: 26 @58108 has 14 MA's), (Start: 28 @58078 has 2 MA's), (33, 58027), (34, 58024), (37, 57997), (39, 57979), (47, 57892), (52, 57832), (55, 57775), (62, 57667),

Gene: Jormungandr\_66 Start: 56819, Stop: 56271, Start Num: 24

Candidate Starts for Jormungandr\_66:

(17, 56906), (Start: 24 @56819 has 35 MA's), (Start: 27 @56786 has 20 MA's), (36, 56696), (37, 56678), (40, 56654), (41, 56648), (45, 56600), (48, 56564), (49, 56540), (51, 56519), (54, 56474), (61, 56354), (62, 56345),

Gene: Kaseim\_66 Start: 56261, Stop: 55713, Start Num: 24

Candidate Starts for Kaseim\_66:

(17, 56348), (Start: 24 @56261 has 35 MA's), (Start: 27 @56228 has 20 MA's), (36, 56138), (37, 56120), (40, 56096), (41, 56090), (45, 56042), (48, 56006), (49, 55982), (51, 55961), (54, 55916), (61, 55796), (62, 55787),

Gene: Katyusha\_63 Start: 56922, Stop: 56398, Start Num: 27

Candidate Starts for Katyusha\_63:

(13, 57090), (16, 57072), (Start: 24 @56961 has 35 MA's), (25, 56934), (Start: 27 @56922 has 20 MA's), (29, 56868), (Start: 31 @56850 has 2 MA's), (42, 56745), (44, 56733), (47, 56700), (53, 56631), (63, 56463), (66, 56442),

Gene: Kelzog\_70 Start: 56920, Stop: 56405, Start Num: 26

Candidate Starts for Kelzog\_70:

(15, 57076), (Start: 24 @56962 has 35 MA's), (Start: 26 @56920 has 14 MA's), (Start: 28 @56890 has 2 MA's), (33, 56839), (34, 56836), (37, 56809), (39, 56791), (47, 56704), (52, 56644), (55, 56587), (62, 56479),

Gene: Kvothe\_62 Start: 56824, Stop: 56300, Start Num: 27

Candidate Starts for Kvothe\_62:

(13, 56992), (16, 56974), (Start: 24 @56863 has 35 MA's), (25, 56836), (Start: 27 @56824 has 20 MA's), (29, 56770), (Start: 31 @56752 has 2 MA's), (42, 56647), (44, 56635), (47, 56602), (53, 56533), (63, 56365), (66, 56344),

Gene: Lahirium\_66 Start: 57341, Stop: 56793, Start Num: 24

Candidate Starts for Lahirium\_66:

(17, 57428), (Start: 24 @57341 has 35 MA's), (Start: 27 @57308 has 20 MA's), (36, 57218), (37, 57200), (40, 57176), (41, 57170), (45, 57122), (48, 57086), (49, 57062), (51, 57041), (54, 56996), (61, 56876), (62, 56867),

Gene: Lidong\_66 Start: 57043, Stop: 56528, Start Num: 27

Candidate Starts for Lidong\_66:

(17, 57163), (Start: 24 @57076 has 35 MA's), (Start: 27 @57043 has 20 MA's), (36, 56953), (37, 56935), (40, 56911), (41, 56905), (45, 56857), (48, 56821), (49, 56797), (51, 56776), (54, 56731), (61, 56611), (62, 56602),

Gene: Linetti\_68 Start: 57847, Stop: 57296, Start Num: 24

Candidate Starts for Linetti\_68:

(11, 58039), (13, 57976), (Start: 24 @57847 has 35 MA's), (Start: 28 @57775 has 2 MA's), (32, 57727), (35, 57715), (39, 57676), (45, 57616), (58, 57394), (59, 57391), (60, 57382),

Gene: Lizzo\_69 Start: 56957, Stop: 56442, Start Num: 26

Candidate Starts for Lizzo\_69:

(15, 57113), (22, 57026), (Start: 24 @56999 has 35 MA's), (Start: 26 @56957 has 14 MA's), (Start: 28 @56927 has 2 MA's), (33, 56876), (34, 56873), (37, 56846), (39, 56828), (47, 56741), (52, 56681), (55, 56624), (62, 56516),

Gene: Luker\_67 Start: 57294, Stop: 56746, Start Num: 24

Candidate Starts for Luker\_67:

(17, 57381), (Start: 24 @57294 has 35 MA's), (Start: 27 @57261 has 20 MA's), (36, 57171), (37, 57153), (40, 57129), (41, 57123), (45, 57075), (48, 57039), (49, 57015), (51, 56994), (54, 56949), (61, 56829), (62, 56820),

Gene: Minos\_67 Start: 56818, Stop: 56270, Start Num: 24

Candidate Starts for Minos\_67:

(17, 56905), (Start: 24 @56818 has 35 MA's), (Start: 27 @56785 has 20 MA's), (36, 56695), (37, 56677), (40, 56653), (41, 56647), (45, 56599), (48, 56563), (49, 56539), (51, 56518), (54, 56473), (61, 56353), (62, 56344),

Gene: Monty\_68 Start: 56170, Stop: 55655, Start Num: 26

Candidate Starts for Monty\_68:

(15, 56326), (20, 56281), (Start: 24 @56212 has 35 MA's), (Start: 26 @56170 has 14 MA's), (Start: 28 @56140 has 2 MA's), (33, 56089), (34, 56086), (37, 56059), (39, 56041), (47, 55954), (52, 55894), (55, 55837), (62, 55729),

Gene: MrWormie\_66 Start: 55946, Stop: 55431, Start Num: 27

Candidate Starts for MrWormie\_66:

(17, 56066), (Start: 24 @55979 has 35 MA's), (Start: 27 @55946 has 20 MA's), (36, 55856), (37, 55838), (40, 55814), (41, 55808), (45, 55760), (48, 55724), (49, 55700), (51, 55679), (54, 55634), (61, 55514), (62, 55505),

Gene: Msay19\_73 Start: 58602, Stop: 58045, Start Num: 24

Candidate Starts for Msay19\_73:

(Start: 24 @58602 has 35 MA's), (Start: 28 @58530 has 2 MA's), (30, 58497), (33, 58479), (34, 58476), (37, 58449), (39, 58431), (47, 58344), (52, 58284), (55, 58227), (62, 58119),

Gene: Neoevie\_66 Start: 57080, Stop: 56532, Start Num: 24

Candidate Starts for Neoevie\_66:

(17, 57167), (Start: 24 @57080 has 35 MA's), (Start: 27 @57047 has 20 MA's), (36, 56957), (37, 56939), (40, 56915), (41, 56909), (45, 56861), (48, 56825), (49, 56801), (51, 56780), (54, 56735), (61, 56615), (62, 56606),

Gene: Newt\_67 Start: 57275, Stop: 56760, Start Num: 27

Candidate Starts for Newt\_67:

(17, 57395), (Start: 24 @57308 has 35 MA's), (Start: 27 @57275 has 20 MA's), (36, 57185), (37, 57167), (40, 57143), (41, 57137), (45, 57089), (48, 57053), (49, 57029), (51, 57008), (54, 56963), (61, 56843), (62, 56834),

Gene: Niagara\_63 Start: 56915, Stop: 56391, Start Num: 27

Candidate Starts for Niagara\_63:

(13, 57083), (16, 57065), (Start: 24 @56954 has 35 MA's), (25, 56927), (Start: 27 @56915 has 20 MA's), (29, 56861), (Start: 31 @56843 has 2 MA's), (42, 56738), (44, 56726), (47, 56693), (53, 56624), (63, 56456), (66, 56435),

Gene: Nimi13\_66 Start: 56827, Stop: 56279, Start Num: 24

Candidate Starts for Nimi13\_66:

(17, 56914), (Start: 24 @56827 has 35 MA's), (Start: 27 @56794 has 20 MA's), (36, 56704), (37, 56686), (40, 56662), (41, 56656), (45, 56608), (48, 56572), (49, 56548), (51, 56527), (54, 56482), (61, 56362), (62, 56353),

Gene: Philon9\_64 Start: 57975, Stop: 57511, Start Num: 31

Candidate Starts for Philon9\_64:

(21, 58122), (22, 58110), (23, 58089), (Start: 24 @58083 has 35 MA's), (29, 57993), (Start: 31 @57975 has 2 MA's), (46, 57831), (48, 57816), (50, 57789), (63, 57588), (66, 57567),

Gene: PierreThree\_67 Start: 57324, Stop: 56773, Start Num: 24

Candidate Starts for PierreThree\_67:

(11, 57516), (13, 57453), (Start: 24 @57324 has 35 MA's), (Start: 28 @57252 has 2 MA's), (32, 57204), (35, 57192), (39, 57153), (45, 57093), (53, 56997), (58, 56871), (60, 56859),

Gene: PokyPuppy\_68 Start: 57314, Stop: 56799, Start Num: 26

Candidate Starts for PokyPuppy\_68:

(Start: 24 @57362 has 35 MA's), (Start: 26 @57314 has 14 MA's), (Start: 28 @57284 has 2 MA's), (30, 57251), (32, 57236), (33, 57233), (37, 57203), (39, 57185), (40, 57179), (41, 57173), (57, 56924), (59, 56897), (65, 56846),

Gene: Poland\_73 Start: 58581, Stop: 58024, Start Num: 24

Candidate Starts for Poland\_73:

(Start: 24 @58581 has 35 MA's), (Start: 28 @58509 has 2 MA's), (30, 58476), (33, 58458), (34, 58455), (37, 58428), (39, 58410), (47, 58323), (52, 58263), (55, 58206), (59, 58122), (62, 58098),

Gene: RemRem\_70 Start: 56160, Stop: 55645, Start Num: 26

Candidate Starts for RemRem\_70:

(15, 56316), (22, 56229), (Start: 24 @56202 has 35 MA's), (Start: 26 @56160 has 14 MA's), (Start: 28 @56130 has 2 MA's), (30, 56097), (33, 56079), (34, 56076), (37, 56049), (39, 56031), (47, 55944), (52, 55884), (55, 55827), (62, 55719),

Gene: RoyalG\_69 Start: 56834, Stop: 56274, Start Num: 24

Candidate Starts for RoyalG\_69:

(1, 57224), (2, 57218), (7, 57149), (10, 57125), (14, 56954), (22, 56861), (Start: 24 @56834 has 35 MA's), (Start: 28 @56762 has 2 MA's), (30, 56729), (43, 56618), (59, 56378), (62, 56354), (64, 56336),

Gene: Sam12\_68 Start: 56184, Stop: 55669, Start Num: 26

Candidate Starts for Sam12\_68:

(15, 56340), (22, 56253), (Start: 24 @56226 has 35 MA's), (Start: 26 @56184 has 14 MA's), (Start: 28 @56154 has 2 MA's), (33, 56103), (34, 56100), (37, 56073), (39, 56055), (47, 55968), (52, 55908), (55, 55851), (62, 55743),

Gene: Shelley\_66 Start: 56270, Stop: 55755, Start Num: 27

Candidate Starts for Shelley\_66:

(17, 56390), (Start: 24 @56303 has 35 MA's), (Start: 27 @56270 has 20 MA's), (36, 56180), (37, 56162), (40, 56138), (41, 56132), (45, 56084), (48, 56048), (49, 56024), (51, 56003), (54, 55958), (61, 55838), (62, 55829),

Gene: Sombrero\_70 Start: 56793, Stop: 56236, Start Num: 24

Candidate Starts for Sombrero\_70:

(11, 56985), (15, 56907), (22, 56820), (Start: 24 @56793 has 35 MA's), (Start: 28 @56721 has 2 MA's), (30, 56688), (33, 56670), (34, 56667), (37, 56640), (39, 56622), (47, 56535), (52, 56475), (55, 56418), (58, 56337), (62, 56310),

Gene: Squibbles\_68 Start: 57023, Stop: 56508, Start Num: 26

Candidate Starts for Squibbles\_68:

(15, 57179), (Start: 24 @57065 has 35 MA's), (Start: 26 @57023 has 14 MA's), (Start: 28 @56993 has 2 MA's), (33, 56942), (34, 56939), (37, 56912), (39, 56894), (47, 56807), (52, 56747), (55, 56690), (62, 56582),

Gene: SteveFrench\_68 Start: 57074, Stop: 56514, Start Num: 24

Candidate Starts for SteveFrench\_68:

(1, 57464), (2, 57458), (7, 57389), (10, 57365), (14, 57194), (22, 57101), (Start: 24 @57074 has 35 MA's), (Start: 28 @57002 has 2 MA's), (30, 56969), (43, 56858), (59, 56618), (62, 56594), (64, 56576),

Gene: Sticker17\_66 Start: 56758, Stop: 56243, Start Num: 27

Candidate Starts for Sticker17\_66:

(17, 56878), (Start: 24 @56791 has 35 MA's), (Start: 27 @56758 has 20 MA's), (36, 56668), (37, 56650), (40, 56626), (41, 56620), (45, 56572), (48, 56536), (49, 56512), (51, 56491), (54, 56446), (61, 56326), (62, 56317),

Gene: Teal\_66 Start: 57285, Stop: 56737, Start Num: 24

Candidate Starts for Teal\_66:

(17, 57372), (Start: 24 @57285 has 35 MA's), (Start: 27 @57252 has 20 MA's), (36, 57162), (37, 57144), (40, 57120), (41, 57114), (45, 57066), (48, 57030), (49, 57006), (51, 56985), (54, 56940), (61, 56820), (62, 56811),

Gene: Teatealatte\_64 Start: 56812, Stop: 56288, Start Num: 27

Candidate Starts for Teatealatte\_64:

(13, 56980), (16, 56962), (Start: 24 @56851 has 35 MA's), (25, 56824), (Start: 27 @56812 has 20 MA's), (29, 56758), (Start: 31 @56740 has 2 MA's), (42, 56635), (44, 56623), (47, 56590), (53, 56521), (63, 56353), (66, 56332),

Gene: Teech\_64 Start: 56628, Stop: 56104, Start Num: 27

Candidate Starts for Teech\_64:

(13, 56796), (16, 56778), (Start: 24 @56667 has 35 MA's), (25, 56640), (Start: 27 @56628 has 20 MA's), (29, 56574), (Start: 31 @56556 has 2 MA's), (42, 56451), (44, 56439), (47, 56406), (53, 56337), (63, 56169), (66, 56148),

Gene: Tredge\_63 Start: 56812, Stop: 56288, Start Num: 27

Candidate Starts for Tredge\_63:

(13, 56980), (16, 56962), (Start: 24 @56851 has 35 MA's), (25, 56824), (Start: 27 @56812 has 20 MA's), (29, 56758), (Start: 31 @56740 has 2 MA's), (42, 56635), (44, 56623), (47, 56590), (53, 56521), (63, 56353), (66, 56332),

Gene: Vitaenoi\_64 Start: 57959, Stop: 57495, Start Num: 31

Candidate Starts for Vitaenoi\_64:

(21, 58106), (22, 58094), (23, 58073), (Start: 24 @58067 has 35 MA's), (29, 57977), (Start: 31 @57959 has 2 MA's), (46, 57815), (48, 57800), (50, 57773), (63, 57572), (66, 57551),

Gene: Woes\_66 Start: 57303, Stop: 56788, Start Num: 27

Candidate Starts for Woes\_66:

(17, 57423), (Start: 24 @57336 has 35 MA's), (Start: 27 @57303 has 20 MA's), (36, 57213), (37, 57195), (40, 57171), (41, 57165), (45, 57117), (48, 57081), (49, 57057), (51, 57036), (54, 56991), (61, 56871), (62, 56862),

Gene: Worcestershire\_69 Start: 56204, Stop: 55647, Start Num: 24

Candidate Starts for Worcestershire\_69:

(11, 56396), (15, 56318), (22, 56231), (Start: 24 @56204 has 35 MA's), (Start: 28 @56132 has 2 MA's), (30, 56099), (33, 56081), (34, 56078), (37, 56051), (39, 56033), (47, 55946), (52, 55886), (55, 55829), (62, 55721),