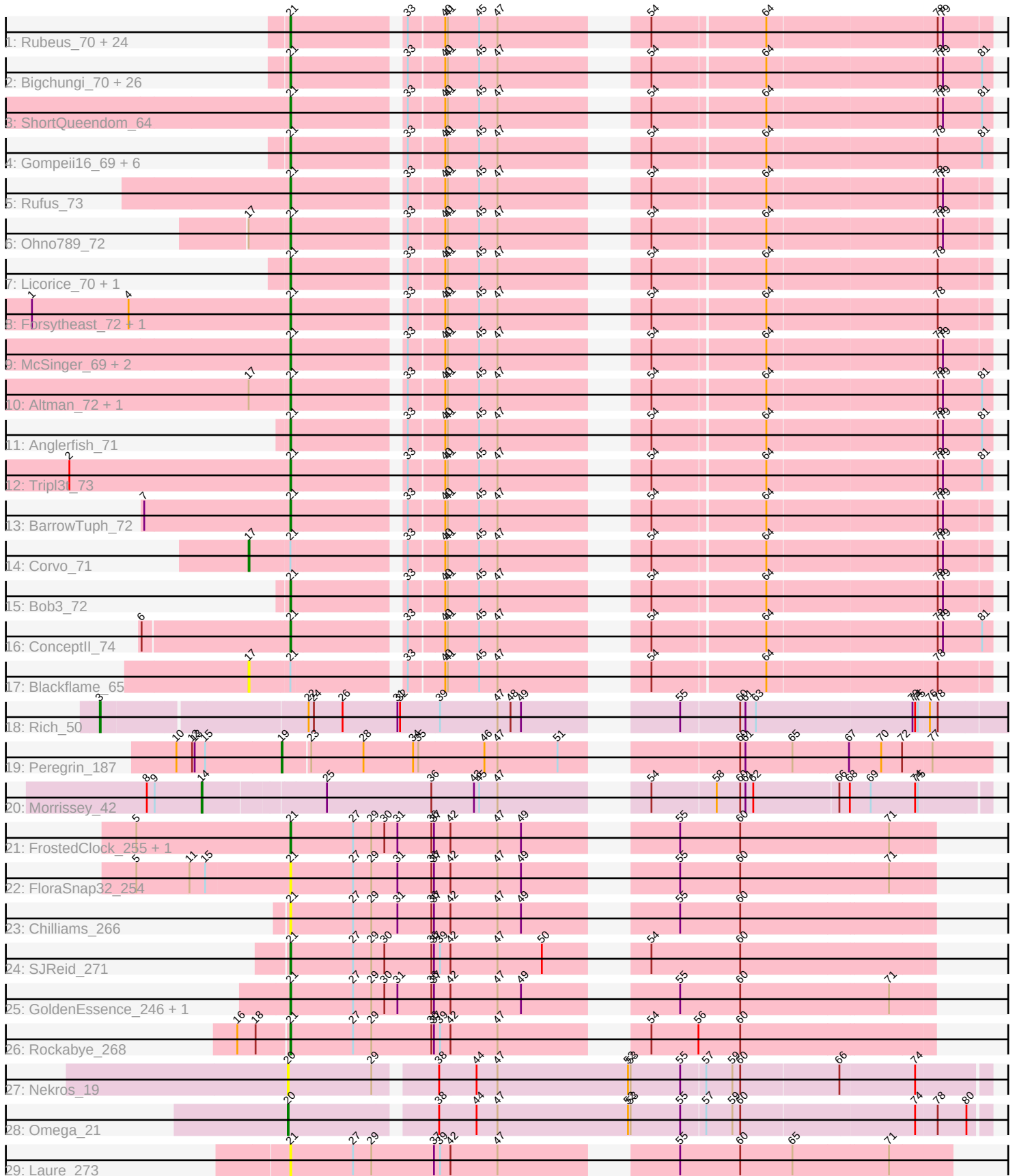


# Pham 326907



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 326907 Report

This analysis was run 09/05/26 on database version 662.

Pham number 326907 has 92 members, 9 are drafts.

Phages represented in each track:

- Track 1 : Rubeus\_70, Acme\_73, Lamina13\_73, Dulcie\_70, Zephyr\_72, Arlo\_69, HarryOW\_70, HermioneGrange\_73, Fajezeel\_72, KyMonks1A\_75, BigMau\_73, GageAP\_72, Thor\_72, Greg\_72, Parliament\_70, Froghopper\_68, Jerm2\_72, SarFire\_72, GrecoEtereo\_73, Watermelon\_72, MPlant7149\_71, Atkinbua\_75, BPBiebs31\_74, Rohr\_72, Carlyle\_70
- Track 2 : Bigchung\_70, Buttons\_66, Sumter\_66, Dexes\_70, Rhynn\_66, Pari\_74, Smeagol\_71, Maroc7\_70, Burton\_71, AFIS\_67, Phlippers\_67, Fascinus\_66, Jorgensen\_75, Bigfoot\_64, Pelly\_72, Sandaddy\_67, Rajelicia\_71, Marsha\_69, Sorpresa\_68, StewieG\_63, CactusRose\_72, Pinto\_70, Snazzy\_69, Pippin\_70, Scowl\_70, Arcanine\_73, Barriga\_72
- Track 3 : ShortQueendom\_64
- Track 4 : Gompeii16\_69, PacerPaul\_70, Bircsak\_69, BigPaolini\_67, Francis47\_69, Agaliana\_65, Chanagan\_64
- Track 5 : Rufus\_73
- Track 6 : Ohno789\_72
- Track 7 : Licorice\_70, EnzoK\_70
- Track 8 : Forsytheast\_72, Moose\_72
- Track 9 : McSinger\_69, Euphoria\_70, Bethlehem\_72
- Track 10 : Altman\_72, Kanely\_71
- Track 11 : Anglerfish\_71
- Track 12 : Tripl3t\_73
- Track 13 : BarrowTuph\_72
- Track 14 : Corvo\_71
- Track 15 : Bob3\_72
- Track 16 : ConceptII\_74
- Track 17 : Blackflame\_65
- Track 18 : Rich\_50
- Track 19 : Peregrin\_187
- Track 20 : Morrissey\_42
- Track 21 : FrostedClock\_255, Talia1610\_255
- Track 22 : FloraSnap32\_254
- Track 23 : Chilliams\_266
- Track 24 : SJReid\_271
- Track 25 : GoldenEssence\_246, Patbob\_253
- Track 26 : Rockabye\_268
- Track 27 : Nekros\_19
- Track 28 : Omega\_21

- Track 29 : Laure\_273

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

The start number called the most often in the published annotations is 21, it was called in 78 of the 83 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- AFIS\_67, Acme\_73, Agaliana\_65, Altman\_72, Anglerfish\_71, Arcanine\_73, Arlo\_69, Atkinbua\_75, BPBiebs31\_74, Barriga\_72, BarrowTuph\_72, Bethlehem\_72, BigMau\_73, BigPaolini\_67, Bigchungl\_70, Bigfoot\_64, Bircsak\_69, Bob3\_72, Burton\_71, Buttons\_66, CactusRose\_72, Carlyle\_70, Chanagan\_64, Chilliams\_266, ConceptII\_74, Dexes\_70, Dulcie\_70, EnzoK\_70, Euphoria\_70, Fajezeel\_72, Fascinus\_66, FloraSnap32\_254, Forsytheast\_72, Francis47\_69, Froghopper\_68, FrostedClock\_255, GageAP\_72, GoldenEssence\_246, Gompeii16\_69, GrecoEtereo\_73, Greg\_72, HarryOW\_70, HermioneGrange\_73, Jerm2\_72, Jorgensen\_75, Kanely\_71, KyMonks1A\_75, Lamina13\_73, Laure\_273, Licorice\_70, MPlant7149\_71, Maroc7\_70, Marsha\_69, McSinger\_69, Moose\_72, Ohno789\_72, PacerPaul\_70, Pari\_74, Parliament\_70, Patbob\_253, Pelly\_72, Phlippers\_67, Pinto\_70, Pippin\_70, Rajelicia\_71, Rhynn\_66, Rockabye\_268, Rohr\_72, Rubeus\_70, Rufus\_73, SJReid\_271, Sandaddy\_67, SarFire\_72, Scowl\_70, ShortQueendom\_64, Smeagol\_71, Snazzy\_69, Sorpresa\_68, StewieG\_63, Sumter\_66, Talia1610\_255, Thor\_72, Tripl3t\_73, Watermelon\_72, Zephyr\_72,

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

- Blackflame\_65, Corvo\_71,

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

- Morrissey\_42, Nekros\_19, Omega\_21, Peregrin\_187, Rich\_50,

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

Start 3:

- Found in 1 of 92 ( 1.1% ) of genes in pham
- Manual Annotations of this start: 1 of 83
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Rich\_50 (B5),

Start 14:

- Found in 1 of 92 ( 1.1% ) of genes in pham
- Manual Annotations of this start: 1 of 83
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Morrissey\_42 (CD),

Start 17:

- Found in 5 of 92 ( 5.4% ) of genes in pham
- Manual Annotations of this start: 1 of 83
- Called 40.0% of time when present
- Phage (with cluster) where this start called: Blackflame\_65 (A1), Corvo\_71 (A1),

Start 19:

- Found in 1 of 92 ( 1.1% ) of genes in pham
- Manual Annotations of this start: 1 of 83
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Peregrin\_187 (CB),

Start 20:

- Found in 2 of 92 ( 2.2% ) of genes in pham
- Manual Annotations of this start: 1 of 83
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Nekros\_19 (J), Omega\_21 (J),

Start 21:

- Found in 87 of 92 ( 94.6% ) of genes in pham
- Manual Annotations of this start: 78 of 83
- Called 97.7% of time when present
- Phage (with cluster) where this start called: AFIS\_67 (A1), Acme\_73 (A1), Agaliana\_65 (A1), Altman\_72 (A1), Anglerfish\_71 (A1), Arcanine\_73 (A1), Arlo\_69 (A1), Atkinbua\_75 (A1), BPBiebs31\_74 (A1), Barriga\_72 (A1), BarrowTuph\_72 (A1), Bethlehem\_72 (A1), BigMau\_73 (A1), BigPaolini\_67 (A1), Bigchungi\_70 (A1), Bigfoot\_64 (A1), Bircsak\_69 (A1), Bob3\_72 (A1), Burton\_71 (A1), Buttons\_66 (A1), CactusRose\_72 (A1), Carlyle\_70 (A1), Chanagan\_64 (A1), Chilliams\_266 (FC), ConceptII\_74 (A1), Dexes\_70 (A1), Dulcie\_70 (A1), EnzoK\_70 (A1), Euphoria\_70 (A1), Fajezeel\_72 (A1), Fascinus\_66 (A1), FloraSnap32\_254 (FC), Forsytheast\_72 (A1), Francis47\_69 (A1), Frogghopper\_68 (A1), FrostedClock\_255 (FC), GageAP\_72 (A1), GoldenEssence\_246 (FC), Gompeii16\_69 (A1), GrecoEtereo\_73 (A1), Greg\_72 (A1), HarryOW\_70 (A1), HermioneGrange\_73 (A1), Jerm2\_72 (A1), Jorgensen\_75 (A1), Kanely\_71 (A1), KyMonks1A\_75 (A1), Lamina13\_73 (A1), Laure\_273 (UNK), Licorice\_70 (A1), MPlant7149\_71 (A1), Maroc7\_70 (A1), Marsha\_69 (A1), McSinger\_69 (A1), Moose\_72 (A1), Ohno789\_72 (A1), PacerPaul\_70 (A1), Pari\_74 (A1), Parliament\_70 (A1), Patbob\_253 (FC), Pelly\_72 (A1), Phlippers\_67 (A1), Pinto\_70 (A1), Pippin\_70 (A1), Rajelicia\_71 (A1), Rhynn\_66 (A1), Rockabye\_268 (FC), Rohr\_72 (A1), Rubeus\_70 (A1), Rufus\_73 (A1), SJReid\_271 (FC), Sandaddy\_67 (A1), SarFire\_72 (A1), Scowl\_70 (A1), ShortQueendom\_64 (A1), Smeagol\_71 (A1), Snazzy\_69 (A1), Sorpresa\_68 (A1), StewieG\_63 (A1), Sumter\_66 (A1), Talia1610\_255 (FC), Thor\_72 (A1), Tripl3t\_73 (A1), Watermelon\_72 (A1), Zephyr\_72 (A1),

**Summary by clusters:**

There are 7 clusters represented in this pham: CB, J, CD, A1, B5, FC, UNK,

Info for manual annotations of cluster A1:

- Start number 17 was manually annotated 1 time for cluster A1.
- Start number 21 was manually annotated 73 times for cluster A1.

Info for manual annotations of cluster B5:

- Start number 3 was manually annotated 1 time for cluster B5.

Info for manual annotations of cluster CB:

- Start number 19 was manually annotated 1 time for cluster CB.

Info for manual annotations of cluster CD:

- Start number 14 was manually annotated 1 time for cluster CD.

Info for manual annotations of cluster FC:

- Start number 21 was manually annotated 5 times for cluster FC.

Info for manual annotations of cluster J:

- Start number 20 was manually annotated 1 time for cluster J.

### **Gene Information:**

Gene: AFIS\_67 Start: 44623, Stop: 43913, Start Num: 21

Candidate Starts for AFIS\_67:

(Start: 21 @44623 has 78 MA's), (33, 44509), (40, 44473), (41, 44470), (45, 44434), (47, 44413), (54, 44287), (64, 44164), (78, 43975), (79, 43969), (81, 43924),

Gene: Acme\_73 Start: 45963, Stop: 45256, Start Num: 21

Candidate Starts for Acme\_73:

(Start: 21 @45963 has 78 MA's), (33, 45849), (40, 45813), (41, 45810), (45, 45774), (47, 45753), (54, 45627), (64, 45504), (78, 45315), (79, 45309),

Gene: Agaliana\_65 Start: 42001, Stop: 41291, Start Num: 21

Candidate Starts for Agaliana\_65:

(Start: 21 @42001 has 78 MA's), (33, 41887), (40, 41851), (41, 41848), (45, 41812), (47, 41791), (54, 41665), (64, 41542), (78, 41353), (81, 41302),

Gene: Altman\_72 Start: 44843, Stop: 44133, Start Num: 21

Candidate Starts for Altman\_72:

(Start: 17 @44888 has 1 MA's), (Start: 21 @44843 has 78 MA's), (33, 44729), (40, 44693), (41, 44690), (45, 44654), (47, 44633), (54, 44507), (64, 44384), (78, 44195), (79, 44189), (81, 44144),

Gene: Anglerfish\_71 Start: 45173, Stop: 44463, Start Num: 21

Candidate Starts for Anglerfish\_71:

(Start: 21 @45173 has 78 MA's), (33, 45059), (40, 45023), (41, 45020), (45, 44984), (47, 44963), (54, 44837), (64, 44714), (78, 44525), (79, 44519), (81, 44474),

Gene: Arcanine\_73 Start: 45897, Stop: 45187, Start Num: 21

Candidate Starts for Arcanine\_73:

(Start: 21 @45897 has 78 MA's), (33, 45783), (40, 45747), (41, 45744), (45, 45708), (47, 45687), (54, 45561), (64, 45438), (78, 45249), (79, 45243), (81, 45198),

Gene: Arlo\_69 Start: 44678, Stop: 43971, Start Num: 21

Candidate Starts for Arlo\_69:

(Start: 21 @44678 has 78 MA's), (33, 44564), (40, 44528), (41, 44525), (45, 44489), (47, 44468), (54, 44342), (64, 44219), (78, 44030), (79, 44024),

Gene: Atkinbua\_75 Start: 45196, Stop: 44489, Start Num: 21

Candidate Starts for Atkinbua\_75:

(Start: 21 @45196 has 78 MA's), (33, 45082), (40, 45046), (41, 45043), (45, 45007), (47, 44986), (54, 44860), (64, 44737), (78, 44548), (79, 44542),

Gene: BPBiebs31\_74 Start: 45784, Stop: 45077, Start Num: 21

Candidate Starts for BPBiebs31\_74:

(Start: 21 @45784 has 78 MA's), (33, 45670), (40, 45634), (41, 45631), (45, 45595), (47, 45574), (54, 45448), (64, 45325), (78, 45136), (79, 45130),

Gene: Barriga\_72 Start: 43491, Stop: 42781, Start Num: 21

Candidate Starts for Barriga\_72:

(Start: 21 @43491 has 78 MA's), (33, 43377), (40, 43341), (41, 43338), (45, 43302), (47, 43281), (54, 43155), (64, 43032), (78, 42843), (79, 42837), (81, 42792),

Gene: BarrowTuph\_72 Start: 44862, Stop: 44155, Start Num: 21

Candidate Starts for BarrowTuph\_72:

(7, 45027), (Start: 21 @44862 has 78 MA's), (33, 44748), (40, 44712), (41, 44709), (45, 44673), (47, 44652), (54, 44526), (64, 44403), (78, 44214), (79, 44208),

Gene: Bethlehem\_72 Start: 46702, Stop: 45995, Start Num: 21

Candidate Starts for Bethlehem\_72:

(Start: 21 @46702 has 78 MA's), (33, 46588), (40, 46552), (41, 46549), (45, 46513), (47, 46492), (54, 46366), (64, 46243), (78, 46054), (79, 46048),

Gene: BigMau\_73 Start: 45592, Stop: 44885, Start Num: 21

Candidate Starts for BigMau\_73:

(Start: 21 @45592 has 78 MA's), (33, 45478), (40, 45442), (41, 45439), (45, 45403), (47, 45382), (54, 45256), (64, 45133), (78, 44944), (79, 44938),

Gene: BigPaolini\_67 Start: 42940, Stop: 42230, Start Num: 21

Candidate Starts for BigPaolini\_67:

(Start: 21 @42940 has 78 MA's), (33, 42826), (40, 42790), (41, 42787), (45, 42751), (47, 42730), (54, 42604), (64, 42481), (78, 42292), (81, 42241),

Gene: Bigchungi\_70 Start: 45376, Stop: 44666, Start Num: 21

Candidate Starts for Bigchungi\_70:

(Start: 21 @45376 has 78 MA's), (33, 45262), (40, 45226), (41, 45223), (45, 45187), (47, 45166), (54, 45040), (64, 44917), (78, 44728), (79, 44722), (81, 44677),

Gene: Bigfoot\_64 Start: 44023, Stop: 43313, Start Num: 21

Candidate Starts for Bigfoot\_64:

(Start: 21 @44023 has 78 MA's), (33, 43909), (40, 43873), (41, 43870), (45, 43834), (47, 43813), (54, 43687), (64, 43564), (78, 43375), (79, 43369), (81, 43324),

Gene: Bircsak\_69 Start: 46296, Stop: 45586, Start Num: 21

Candidate Starts for Bircsak\_69:

(Start: 21 @46296 has 78 MA's), (33, 46182), (40, 46146), (41, 46143), (45, 46107), (47, 46086), (54, 45960), (64, 45837), (78, 45648), (81, 45597),

Gene: Blackflame\_65 Start: 44075, Stop: 43323, Start Num: 17

Candidate Starts for Blackflame\_65:

(Start: 17 @44075 has 1 MA's), (Start: 21 @44030 has 78 MA's), (33, 43916), (40, 43880), (41, 43877), (45, 43841), (47, 43820), (54, 43694), (64, 43571), (78, 43382),

Gene: Bob3\_72 Start: 44862, Stop: 44155, Start Num: 21

Candidate Starts for Bob3\_72:

(Start: 21 @44862 has 78 MA's), (33, 44748), (40, 44712), (41, 44709), (45, 44673), (47, 44652), (54, 44526), (64, 44403), (78, 44214), (79, 44208),

Gene: Burton\_71 Start: 46277, Stop: 45567, Start Num: 21

Candidate Starts for Burton\_71:

(Start: 21 @46277 has 78 MA's), (33, 46163), (40, 46127), (41, 46124), (45, 46088), (47, 46067), (54, 45941), (64, 45818), (78, 45629), (79, 45623), (81, 45578),

Gene: Buttons\_66 Start: 41990, Stop: 41280, Start Num: 21

Candidate Starts for Buttons\_66:

(Start: 21 @41990 has 78 MA's), (33, 41876), (40, 41840), (41, 41837), (45, 41801), (47, 41780), (54, 41654), (64, 41531), (78, 41342), (79, 41336), (81, 41291),

Gene: CactusRose\_72 Start: 45043, Stop: 44333, Start Num: 21

Candidate Starts for CactusRose\_72:

(Start: 21 @45043 has 78 MA's), (33, 44929), (40, 44893), (41, 44890), (45, 44854), (47, 44833), (54, 44707), (64, 44584), (78, 44395), (79, 44389), (81, 44344),

Gene: Carlyle\_70 Start: 43385, Stop: 42678, Start Num: 21

Candidate Starts for Carlyle\_70:

(Start: 21 @43385 has 78 MA's), (33, 43271), (40, 43235), (41, 43232), (45, 43196), (47, 43175), (54, 43049), (64, 42926), (78, 42737), (79, 42731),

Gene: Chanagan\_64 Start: 42260, Stop: 41550, Start Num: 21

Candidate Starts for Chanagan\_64:

(Start: 21 @42260 has 78 MA's), (33, 42146), (40, 42110), (41, 42107), (45, 42071), (47, 42050), (54, 41924), (64, 41801), (78, 41612), (81, 41561),

Gene: Chilliams\_266 Start: 161365, Stop: 162048, Start Num: 21

Candidate Starts for Chilliams\_266:

(Start: 21 @161365 has 78 MA's), (27, 161437), (29, 161458), (31, 161488), (36, 161527), (37, 161530), (42, 161548), (47, 161602), (49, 161629), (55, 161761), (60, 161830),

Gene: ConceptII\_74 Start: 46071, Stop: 45361, Start Num: 21

Candidate Starts for ConceptII\_74:

(6, 46236), (Start: 21 @46071 has 78 MA's), (33, 45957), (40, 45921), (41, 45918), (45, 45882), (47, 45861), (54, 45735), (64, 45612), (78, 45423), (79, 45417), (81, 45372),

Gene: Corvo\_71 Start: 45749, Stop: 44997, Start Num: 17

Candidate Starts for Corvo\_71:

(Start: 17 @45749 has 1 MA's), (Start: 21 @45704 has 78 MA's), (33, 45590), (40, 45554), (41, 45551), (45, 45515), (47, 45494), (54, 45368), (64, 45245), (78, 45056), (79, 45050),

Gene: Dexes\_70 Start: 46320, Stop: 45610, Start Num: 21

Candidate Starts for Dexes\_70:

(Start: 21 @46320 has 78 MA's), (33, 46206), (40, 46170), (41, 46167), (45, 46131), (47, 46110), (54, 45984), (64, 45861), (78, 45672), (79, 45666), (81, 45621),

Gene: Dulcie\_70 Start: 46210, Stop: 45503, Start Num: 21

Candidate Starts for Dulcie\_70:

(Start: 21 @46210 has 78 MA's), (33, 46096), (40, 46060), (41, 46057), (45, 46021), (47, 46000), (54, 45874), (64, 45751), (78, 45562), (79, 45556),

Gene: EnzoK\_70 Start: 42239, Stop: 41532, Start Num: 21

Candidate Starts for EnzoK\_70:

(Start: 21 @42239 has 78 MA's), (33, 42125), (40, 42089), (41, 42086), (45, 42050), (47, 42029), (54, 41903), (64, 41780), (78, 41591),

Gene: Euphoria\_70 Start: 44720, Stop: 44013, Start Num: 21

Candidate Starts for Euphoria\_70:

(Start: 21 @44720 has 78 MA's), (33, 44606), (40, 44570), (41, 44567), (45, 44531), (47, 44510), (54, 44384), (64, 44261), (78, 44072), (79, 44066),

Gene: Fajezeel\_72 Start: 45253, Stop: 44546, Start Num: 21

Candidate Starts for Fajezeel\_72:

(Start: 21 @45253 has 78 MA's), (33, 45139), (40, 45103), (41, 45100), (45, 45064), (47, 45043), (54, 44917), (64, 44794), (78, 44605), (79, 44599),

Gene: Fascinus\_66 Start: 44537, Stop: 43827, Start Num: 21

Candidate Starts for Fascinus\_66:

(Start: 21 @44537 has 78 MA's), (33, 44423), (40, 44387), (41, 44384), (45, 44348), (47, 44327), (54, 44201), (64, 44078), (78, 43889), (79, 43883), (81, 43838),

Gene: FloraSnap32\_254 Start: 161719, Stop: 162402, Start Num: 21

Candidate Starts for FloraSnap32\_254:

(5, 161545), (11, 161605), (15, 161623), (Start: 21 @161719 has 78 MA's), (27, 161791), (29, 161812), (31, 161842), (36, 161881), (37, 161884), (42, 161902), (47, 161956), (49, 161983), (55, 162115), (60, 162184), (71, 162352),

Gene: Forsytheast\_72 Start: 44800, Stop: 44093, Start Num: 21

Candidate Starts for Forsytheast\_72:

(1, 45094), (4, 44983), (Start: 21 @44800 has 78 MA's), (33, 44686), (40, 44650), (41, 44647), (45, 44611), (47, 44590), (54, 44464), (64, 44341), (78, 44152),

Gene: Francis47\_69 Start: 45845, Stop: 45135, Start Num: 21

Candidate Starts for Francis47\_69:

(Start: 21 @45845 has 78 MA's), (33, 45731), (40, 45695), (41, 45692), (45, 45656), (47, 45635), (54, 45509), (64, 45386), (78, 45197), (81, 45146),

Gene: Froghopper\_68 Start: 43859, Stop: 43152, Start Num: 21

Candidate Starts for Froghopper\_68:

(Start: 21 @43859 has 78 MA's), (33, 43745), (40, 43709), (41, 43706), (45, 43670), (47, 43649), (54, 43523), (64, 43400), (78, 43211), (79, 43205),

Gene: FrostedClock\_255 Start: 161678, Stop: 162361, Start Num: 21

Candidate Starts for FrostedClock\_255:

(5, 161501), (Start: 21 @161678 has 78 MA's), (27, 161750), (29, 161771), (30, 161786), (31, 161801), (36, 161840), (37, 161843), (42, 161861), (47, 161915), (49, 161942), (55, 162074), (60, 162143), (71, 162311),

Gene: GageAP\_72 Start: 46033, Stop: 45326, Start Num: 21

Candidate Starts for GageAP\_72:

(Start: 21 @46033 has 78 MA's), (33, 45919), (40, 45883), (41, 45880), (45, 45844), (47, 45823), (54, 45697), (64, 45574), (78, 45385), (79, 45379),

Gene: GoldenEssence\_246 Start: 156953, Stop: 157636, Start Num: 21



Candidate Starts for GoldenEssence\_246:

(Start: 21 @156953 has 78 MA's), (27, 157025), (29, 157046), (30, 157061), (31, 157076), (36, 157115), (37, 157118), (42, 157136), (47, 157190), (49, 157217), (55, 157349), (60, 157418), (71, 157586),

Gene: Gompeii16\_69 Start: 46297, Stop: 45587, Start Num: 21

Candidate Starts for Gompeii16\_69:

(Start: 21 @46297 has 78 MA's), (33, 46183), (40, 46147), (41, 46144), (45, 46108), (47, 46087), (54, 45961), (64, 45838), (78, 45649), (81, 45598),

Gene: GrecoEtereo\_73 Start: 45729, Stop: 45022, Start Num: 21

Candidate Starts for GrecoEtereo\_73:

(Start: 21 @45729 has 78 MA's), (33, 45615), (40, 45579), (41, 45576), (45, 45540), (47, 45519), (54, 45393), (64, 45270), (78, 45081), (79, 45075),

Gene: Greg\_72 Start: 45253, Stop: 44546, Start Num: 21

Candidate Starts for Greg\_72:

(Start: 21 @45253 has 78 MA's), (33, 45139), (40, 45103), (41, 45100), (45, 45064), (47, 45043), (54, 44917), (64, 44794), (78, 44605), (79, 44599),

Gene: HarryOW\_70 Start: 45658, Stop: 44951, Start Num: 21

Candidate Starts for HarryOW\_70:

(Start: 21 @45658 has 78 MA's), (33, 45544), (40, 45508), (41, 45505), (45, 45469), (47, 45448), (54, 45322), (64, 45199), (78, 45010), (79, 45004),

Gene: HermioneGrange\_73 Start: 46086, Stop: 45379, Start Num: 21

Candidate Starts for HermioneGrange\_73:

(Start: 21 @46086 has 78 MA's), (33, 45972), (40, 45936), (41, 45933), (45, 45897), (47, 45876), (54, 45750), (64, 45627), (78, 45438), (79, 45432),

Gene: Jerm2\_72 Start: 46156, Stop: 45449, Start Num: 21

Candidate Starts for Jerm2\_72:

(Start: 21 @46156 has 78 MA's), (33, 46042), (40, 46006), (41, 46003), (45, 45967), (47, 45946), (54, 45820), (64, 45697), (78, 45508), (79, 45502),

Gene: Jorgensen\_75 Start: 45374, Stop: 44664, Start Num: 21

Candidate Starts for Jorgensen\_75:

(Start: 21 @45374 has 78 MA's), (33, 45260), (40, 45224), (41, 45221), (45, 45185), (47, 45164), (54, 45038), (64, 44915), (78, 44726), (79, 44720), (81, 44675),

Gene: Kanely\_71 Start: 44620, Stop: 43910, Start Num: 21

Candidate Starts for Kanely\_71:

(Start: 17 @44665 has 1 MA's), (Start: 21 @44620 has 78 MA's), (33, 44506), (40, 44470), (41, 44467), (45, 44431), (47, 44410), (54, 44284), (64, 44161), (78, 43972), (79, 43966), (81, 43921),

Gene: KyMonks1A\_75 Start: 45252, Stop: 44545, Start Num: 21

Candidate Starts for KyMonks1A\_75:

(Start: 21 @45252 has 78 MA's), (33, 45138), (40, 45102), (41, 45099), (45, 45063), (47, 45042), (54, 44916), (64, 44793), (78, 44604), (79, 44598),

Gene: Lamina13\_73 Start: 46395, Stop: 45688, Start Num: 21

Candidate Starts for Lamina13\_73:

(Start: 21 @46395 has 78 MA's), (33, 46281), (40, 46245), (41, 46242), (45, 46206), (47, 46185), (54, 46059), (64, 45936), (78, 45747), (79, 45741),

Gene: Laure\_273 Start: 151899, Stop: 152603, Start Num: 21

Candidate Starts for Laure\_273:

(Start: 21 @151899 has 78 MA's), (27, 151971), (29, 151992), (37, 152064), (39, 152070), (42, 152082), (47, 152136), (55, 152295), (60, 152364), (65, 152424), (71, 152532),

Gene: Licorice\_70 Start: 45944, Stop: 45237, Start Num: 21

Candidate Starts for Licorice\_70:

(Start: 21 @45944 has 78 MA's), (33, 45830), (40, 45794), (41, 45791), (45, 45755), (47, 45734), (54, 45608), (64, 45485), (78, 45296),

Gene: MPlant7149\_71 Start: 43974, Stop: 43267, Start Num: 21

Candidate Starts for MPlant7149\_71:

(Start: 21 @43974 has 78 MA's), (33, 43860), (40, 43824), (41, 43821), (45, 43785), (47, 43764), (54, 43638), (64, 43515), (78, 43326), (79, 43320),

Gene: Maroc7\_70 Start: 45527, Stop: 44817, Start Num: 21

Candidate Starts for Maroc7\_70:

(Start: 21 @45527 has 78 MA's), (33, 45413), (40, 45377), (41, 45374), (45, 45338), (47, 45317), (54, 45191), (64, 45068), (78, 44879), (79, 44873), (81, 44828),

Gene: Marsha\_69 Start: 45612, Stop: 44902, Start Num: 21

Candidate Starts for Marsha\_69:

(Start: 21 @45612 has 78 MA's), (33, 45498), (40, 45462), (41, 45459), (45, 45423), (47, 45402), (54, 45276), (64, 45153), (78, 44964), (79, 44958), (81, 44913),

Gene: McSinger\_69 Start: 44338, Stop: 43631, Start Num: 21

Candidate Starts for McSinger\_69:

(Start: 21 @44338 has 78 MA's), (33, 44224), (40, 44188), (41, 44185), (45, 44149), (47, 44128), (54, 44002), (64, 43879), (78, 43690), (79, 43684),

Gene: Moose\_72 Start: 44800, Stop: 44093, Start Num: 21

Candidate Starts for Moose\_72:

(1, 45094), (4, 44983), (Start: 21 @44800 has 78 MA's), (33, 44686), (40, 44650), (41, 44647), (45, 44611), (47, 44590), (54, 44464), (64, 44341), (78, 44152),

Gene: Morrissey\_42 Start: 33249, Stop: 32419, Start Num: 14

Candidate Starts for Morrissey\_42:

(8, 33312), (9, 33303), (Start: 14 @33249 has 1 MA's), (25, 33117), (36, 32997), (43, 32949), (45, 32943), (47, 32922), (54, 32796), (58, 32724), (60, 32697), (61, 32691), (62, 32682), (66, 32586), (68, 32574), (69, 32550), (74, 32499), (75, 32496),

Gene: Nekros\_19 Start: 13875, Stop: 13102, Start Num: 20

Candidate Starts for Nekros\_19:

(Start: 20 @13875 has 1 MA's), (29, 13779), (38, 13719), (44, 13677), (47, 13653), (52, 13503), (53, 13500), (55, 13443), (57, 13416), (59, 13386), (60, 13377), (66, 13266), (74, 13182),

Gene: Ohno789\_72 Start: 45661, Stop: 44954, Start Num: 21

Candidate Starts for Ohno789\_72:

(Start: 17 @45706 has 1 MA's), (Start: 21 @45661 has 78 MA's), (33, 45547), (40, 45511), (41, 45508), (45, 45472), (47, 45451), (54, 45325), (64, 45202), (78, 45013), (79, 45007),

Gene: Omega\_21 Start: 15554, Stop: 14781, Start Num: 20

Candidate Starts for Omega\_21:

(Start: 20 @15554 has 1 MA's), (38, 15398), (44, 15356), (47, 15332), (52, 15182), (53, 15179), (55, 15122), (57, 15095), (59, 15065), (60, 15056), (74, 14861), (78, 14837), (80, 14804),

Gene: PacerPaul\_70 Start: 45212, Stop: 44502, Start Num: 21

Candidate Starts for PacerPaul\_70:

(Start: 21 @45212 has 78 MA's), (33, 45098), (40, 45062), (41, 45059), (45, 45023), (47, 45002), (54, 44876), (64, 44753), (78, 44564), (81, 44513),

Gene: Pari\_74 Start: 44407, Stop: 43697, Start Num: 21

Candidate Starts for Pari\_74:

(Start: 21 @44407 has 78 MA's), (33, 44293), (40, 44257), (41, 44254), (45, 44218), (47, 44197), (54, 44071), (64, 43948), (78, 43759), (79, 43753), (81, 43708),

Gene: Parliament\_70 Start: 46702, Stop: 45995, Start Num: 21

Candidate Starts for Parliament\_70:

(Start: 21 @46702 has 78 MA's), (33, 46588), (40, 46552), (41, 46549), (45, 46513), (47, 46492), (54, 46366), (64, 46243), (78, 46054), (79, 46048),

Gene: Patbob\_253 Start: 162530, Stop: 163213, Start Num: 21

Candidate Starts for Patbob\_253:

(Start: 21 @162530 has 78 MA's), (27, 162602), (29, 162623), (30, 162638), (31, 162653), (36, 162692), (37, 162695), (42, 162713), (47, 162767), (49, 162794), (55, 162926), (60, 162995), (71, 163163),

Gene: Pelly\_72 Start: 46865, Stop: 46155, Start Num: 21

Candidate Starts for Pelly\_72:

(Start: 21 @46865 has 78 MA's), (33, 46751), (40, 46715), (41, 46712), (45, 46676), (47, 46655), (54, 46529), (64, 46406), (78, 46217), (79, 46211), (81, 46166),

Gene: Peregrin\_187 Start: 99174, Stop: 99926, Start Num: 19

Candidate Starts for Peregrin\_187:

(10, 99054), (12, 99072), (13, 99075), (15, 99087), (Start: 19 @99174 has 1 MA's), (23, 99204), (28, 99264), (34, 99321), (35, 99327), (46, 99402), (47, 99417), (51, 99486), (60, 99642), (61, 99648), (65, 99702), (67, 99765), (70, 99801), (72, 99825), (77, 99858),

Gene: Phlippers\_67 Start: 45431, Stop: 44721, Start Num: 21

Candidate Starts for Phlippers\_67:

(Start: 21 @45431 has 78 MA's), (33, 45317), (40, 45281), (41, 45278), (45, 45242), (47, 45221), (54, 45095), (64, 44972), (78, 44783), (79, 44777), (81, 44732),

Gene: Pinto\_70 Start: 44629, Stop: 43919, Start Num: 21

Candidate Starts for Pinto\_70:

(Start: 21 @44629 has 78 MA's), (33, 44515), (40, 44479), (41, 44476), (45, 44440), (47, 44419), (54, 44293), (64, 44170), (78, 43981), (79, 43975), (81, 43930),

Gene: Pippin\_70 Start: 44002, Stop: 43292, Start Num: 21

Candidate Starts for Pippin\_70:

(Start: 21 @44002 has 78 MA's), (33, 43888), (40, 43852), (41, 43849), (45, 43813), (47, 43792), (54, 43666), (64, 43543), (78, 43354), (79, 43348), (81, 43303),

Gene: Rajelicia\_71 Start: 46405, Stop: 45695, Start Num: 21

Candidate Starts for Rajelicia\_71:

(Start: 21 @46405 has 78 MA's), (33, 46291), (40, 46255), (41, 46252), (45, 46216), (47, 46195), (54, 46069), (64, 45946), (78, 45757), (79, 45751), (81, 45706),

Gene: Rhynn\_66 Start: 43990, Stop: 43280, Start Num: 21

Candidate Starts for Rhynn\_66:

(Start: 21 @43990 has 78 MA's), (33, 43876), (40, 43840), (41, 43837), (45, 43801), (47, 43780), (54, 43654), (64, 43531), (78, 43342), (79, 43336), (81, 43291),

Gene: Rich\_50 Start: 47033, Stop: 46050, Start Num: 3

Candidate Starts for Rich\_50:

(Start: 3 @47033 has 1 MA's), (22, 46808), (24, 46802), (26, 46769), (31, 46706), (32, 46703), (39, 46658), (47, 46592), (48, 46577), (49, 46565), (55, 46433), (60, 46367), (61, 46361), (63, 46349), (73, 46172), (74, 46169), (75, 46166), (76, 46154), (78, 46145),

Gene: Rockabye\_268 Start: 161200, Stop: 161883, Start Num: 21

Candidate Starts for Rockabye\_268:

(16, 161143), (18, 161164), (Start: 21 @161200 has 78 MA's), (27, 161272), (29, 161293), (36, 161362), (37, 161365), (39, 161371), (42, 161383), (47, 161437), (54, 161563), (56, 161617), (60, 161665),

Gene: Rohr\_72 Start: 46232, Stop: 45525, Start Num: 21

Candidate Starts for Rohr\_72:

(Start: 21 @46232 has 78 MA's), (33, 46118), (40, 46082), (41, 46079), (45, 46043), (47, 46022), (54, 45896), (64, 45773), (78, 45584), (79, 45578),

Gene: Rubeus\_70 Start: 42734, Stop: 42027, Start Num: 21

Candidate Starts for Rubeus\_70:

(Start: 21 @42734 has 78 MA's), (33, 42620), (40, 42584), (41, 42581), (45, 42545), (47, 42524), (54, 42398), (64, 42275), (78, 42086), (79, 42080),

Gene: Rufus\_73 Start: 45418, Stop: 44711, Start Num: 21

Candidate Starts for Rufus\_73:

(Start: 21 @45418 has 78 MA's), (33, 45304), (40, 45268), (41, 45265), (45, 45229), (47, 45208), (54, 45082), (64, 44959), (78, 44770), (79, 44764),

Gene: SJReid\_271 Start: 158434, Stop: 159117, Start Num: 21

Candidate Starts for SJReid\_271:

(Start: 21 @158434 has 78 MA's), (27, 158506), (29, 158527), (30, 158542), (36, 158596), (37, 158599), (39, 158605), (42, 158617), (47, 158671), (50, 158722), (54, 158797), (60, 158899),

Gene: Sandaddy\_67 Start: 44367, Stop: 43657, Start Num: 21

Candidate Starts for Sandaddy\_67:

(Start: 21 @44367 has 78 MA's), (33, 44253), (40, 44217), (41, 44214), (45, 44178), (47, 44157), (54, 44031), (64, 43908), (78, 43719), (79, 43713), (81, 43668),

Gene: SarFire\_72 Start: 45694, Stop: 44987, Start Num: 21

Candidate Starts for SarFire\_72:

(Start: 21 @45694 has 78 MA's), (33, 45580), (40, 45544), (41, 45541), (45, 45505), (47, 45484), (54, 45358), (64, 45235), (78, 45046), (79, 45040),

Gene: Scowl\_70 Start: 44222, Stop: 43512, Start Num: 21

Candidate Starts for Scowl\_70:

(Start: 21 @44222 has 78 MA's), (33, 44108), (40, 44072), (41, 44069), (45, 44033), (47, 44012), (54, 43886), (64, 43763), (78, 43574), (79, 43568), (81, 43523),

Gene: ShortQueendom\_64 Start: 42111, Stop: 41401, Start Num: 21

Candidate Starts for ShortQueendom\_64:

(Start: 21 @42111 has 78 MA's), (33, 41997), (40, 41961), (41, 41958), (45, 41922), (47, 41901), (54, 41775), (64, 41652), (78, 41463), (79, 41457), (81, 41412),

Gene: Smeagol\_71 Start: 46076, Stop: 45366, Start Num: 21

Candidate Starts for Smeagol\_71:

(Start: 21 @46076 has 78 MA's), (33, 45962), (40, 45926), (41, 45923), (45, 45887), (47, 45866), (54, 45740), (64, 45617), (78, 45428), (79, 45422), (81, 45377),

Gene: Snazzy\_69 Start: 44638, Stop: 43928, Start Num: 21

Candidate Starts for Snazzy\_69:

(Start: 21 @44638 has 78 MA's), (33, 44524), (40, 44488), (41, 44485), (45, 44449), (47, 44428), (54, 44302), (64, 44179), (78, 43990), (79, 43984), (81, 43939),

Gene: Sorpresa\_68 Start: 44369, Stop: 43659, Start Num: 21

Candidate Starts for Sorpresa\_68:

(Start: 21 @44369 has 78 MA's), (33, 44255), (40, 44219), (41, 44216), (45, 44180), (47, 44159), (54, 44033), (64, 43910), (78, 43721), (79, 43715), (81, 43670),

Gene: StewieG\_63 Start: 41127, Stop: 40417, Start Num: 21

Candidate Starts for StewieG\_63:

(Start: 21 @41127 has 78 MA's), (33, 41013), (40, 40977), (41, 40974), (45, 40938), (47, 40917), (54, 40791), (64, 40668), (78, 40479), (79, 40473), (81, 40428),

Gene: Sumter\_66 Start: 44733, Stop: 44023, Start Num: 21

Candidate Starts for Sumter\_66:

(Start: 21 @44733 has 78 MA's), (33, 44619), (40, 44583), (41, 44580), (45, 44544), (47, 44523), (54, 44397), (64, 44274), (78, 44085), (79, 44079), (81, 44034),

Gene: Talia1610\_255 Start: 162657, Stop: 163340, Start Num: 21

Candidate Starts for Talia1610\_255:

(5, 162480), (Start: 21 @162657 has 78 MA's), (27, 162729), (29, 162750), (30, 162765), (31, 162780), (36, 162819), (37, 162822), (42, 162840), (47, 162894), (49, 162921), (55, 163053), (60, 163122), (71, 163290),

Gene: Thor\_72 Start: 45052, Stop: 44345, Start Num: 21

Candidate Starts for Thor\_72:

(Start: 21 @45052 has 78 MA's), (33, 44938), (40, 44902), (41, 44899), (45, 44863), (47, 44842), (54, 44716), (64, 44593), (78, 44404), (79, 44398),

Gene: Tripl3t\_73 Start: 47002, Stop: 46292, Start Num: 21

Candidate Starts for Tripl3t\_73:

(2, 47254), (Start: 21 @47002 has 78 MA's), (33, 46888), (40, 46852), (41, 46849), (45, 46813), (47, 46792), (54, 46666), (64, 46543), (78, 46354), (79, 46348), (81, 46303),

Gene: Watermelon\_72 Start: 45356, Stop: 44649, Start Num: 21

Candidate Starts for Watermelon\_72:

(Start: 21 @45356 has 78 MA's), (33, 45242), (40, 45206), (41, 45203), (45, 45167), (47, 45146), (54, 45020), (64, 44897), (78, 44708), (79, 44702),

Gene: Zephyr\_72 Start: 44616, Stop: 43909, Start Num: 21

Candidate Starts for Zephyr\_72:

(Start: 21 @44616 has 78 MA's), (33, 44502), (40, 44466), (41, 44463), (45, 44427), (47, 44406), (54, 44280), (64, 44157), (78, 43968), (79, 43962),