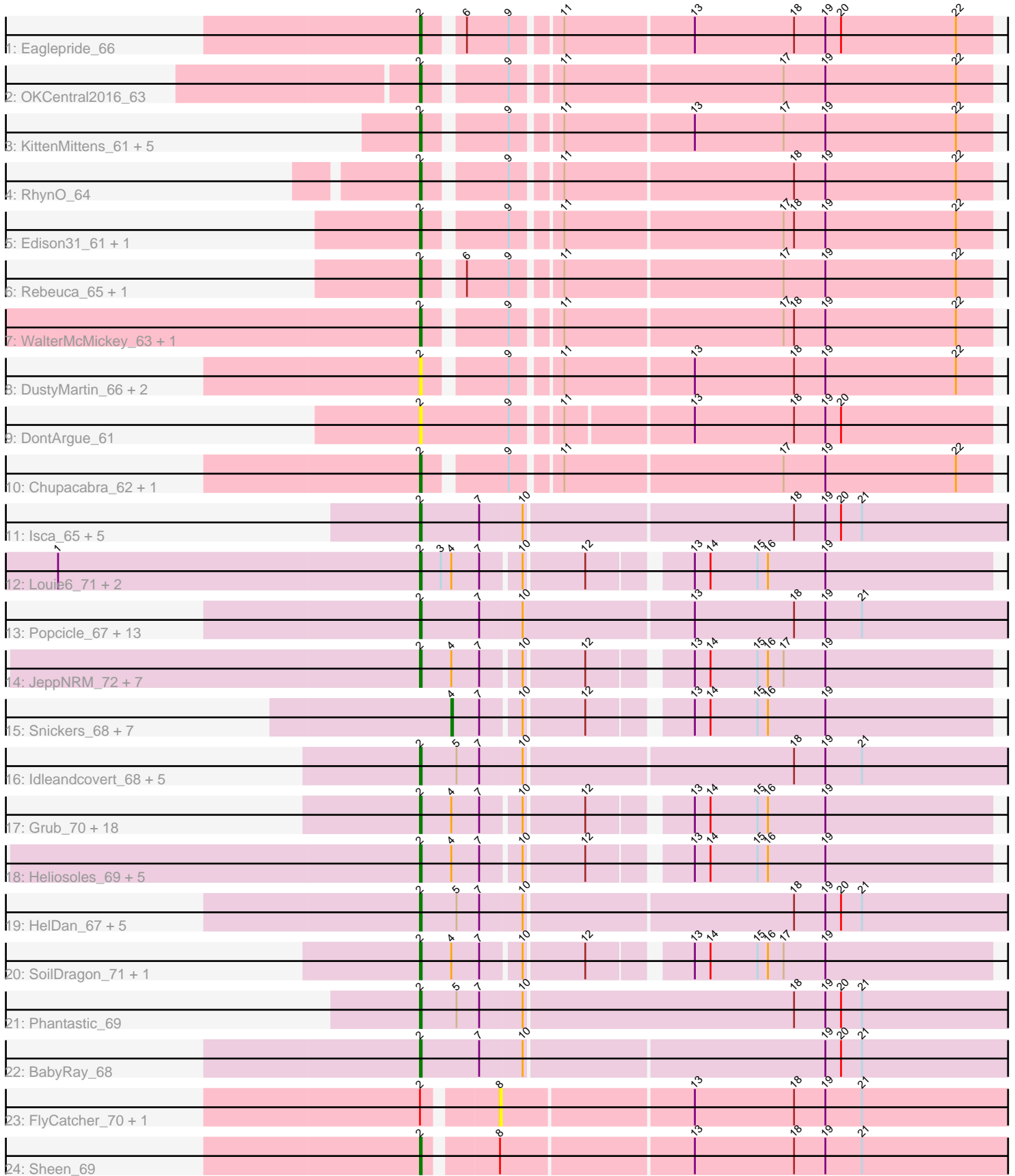


# Pham 216019



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 216019 Report

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

Pham number 216019 has 104 members, 12 are drafts.

Phages represented in each track:

- Track 1 : Eaglepride\_66
- Track 2 : OKCentral2016\_63
- Track 3 : KittenMittens\_61, Poompha\_61, Severus\_62, Drake94\_62, PeaceMeal1\_62, Trike\_61
- Track 4 : RhynO\_64
- Track 5 : Edison31\_61, Topanga\_61
- Track 6 : Rebeuca\_65, Kristoff\_63
- Track 7 : WalterMcMickey\_63, Twister\_63
- Track 8 : DustyMartin\_66, Rowdy\_66, Shapes\_66
- Track 9 : DontArgue\_61
- Track 10 : Chupacabra\_62, Goose\_65
- Track 11 : Isca\_65, JF4\_65, Rockstar\_66, MK4\_67, MA5\_67, JF2\_65
- Track 12 : Louie6\_71, KADY\_69, Misomonster\_73
- Track 13 : Popcicle\_67, Caviar\_67, Todacoro\_67, Pocahontas\_66, Veracruz\_64, Panamaxus\_65, Texage\_65, Lambert1\_67, Noella\_67, Norbert\_63, ResDef\_65, QuinnKiro\_66, Margo\_67, Hookmount\_67
- Track 14 : JeppNRM\_72, HaveUMetTed\_72, PhishRPhriends\_68, Gemma\_69, Kalb97\_72, OlanP\_70, Manu\_71, ACFishhook\_69
- Track 15 : Snickers\_68, Mainiac\_71, Daishi\_71, Sabia\_70, MadMarie\_70, Dieselweasel\_72, JHC117\_68, Tiffany\_71
- Track 16 : Idleandcovert\_68, SaturnRing\_67, BlueBird\_70, Bugatti\_67, Pistachio\_67, Giroux\_66
- Track 17 : Grub\_70, BreSam8\_72, Methuselah\_65, Soshari\_74, Pembroke\_72, Microwolf\_68, Watson\_71, DaHudson\_71, AgronaGT15\_69, Farber\_72, PGHhamlin\_74, Vix\_68, MuchMore\_75, Malinsilva\_74, MarQuardt\_72, Aglet\_73, Wooldri\_74, Lilith\_70, AugsMagnumOpus\_75
- Track 18 : Heliosoles\_69, Groupthink\_72, Kalnoky\_72, Marius\_72, PurpleHaze\_71, Zetzy\_69
- Track 19 : HelDan\_67, DropBear\_65, Scout\_66, Kachowdy\_65, Fred313\_65, Heathen\_67
- Track 20 : SoilDragon\_71, Jobu08\_68
- Track 21 : Phantastic\_69
- Track 22 : BabyRay\_68
- Track 23 : FlyCatcher\_70, Toro\_68
- Track 24 : Sheen\_69

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

The start number called the most often in the published annotations is 2, it was called in 85 of the 92 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- ACFishhook\_69, Aglet\_73, AgronaGT15\_69, AugsMagnumOpus\_75, BabyRay\_68, BlueBird\_70, BreSam8\_72, Bugatti\_67, Caviar\_67, Chupacabra\_62, DaHudson\_71, DontArgue\_61, Drake94\_62, DropBear\_65, DustyMartin\_66, Eaglepride\_66, Edison31\_61, Farber\_72, Fred313\_65, Gemma\_69, Giroux\_66, Goose\_65, Grouphink\_72, Grub\_70, HaveUMetTed\_72, Heathen\_67, HelDan\_67, Heliosoles\_69, Hookmount\_67, Idleandcovert\_68, Isca\_65, JF2\_65, JF4\_65, JeppNRM\_72, Jobu08\_68, KADY\_69, Kachowdy\_65, Kalb97\_72, Kalnoky\_72, KittenMittens\_61, Kristoff\_63, Lambert1\_67, Lilith\_70, Louie6\_71, MA5\_67, MK4\_67, Malinsilva\_74, Manu\_71, MarQuardt\_72, Margo\_67, Marius\_72, Methuselah\_65, Microwolf\_68, Misomonster\_73, MuchMore\_75, Noella\_67, Norbert\_63, OKCentral2016\_63, OlanP\_70, PGHhamlin\_74, Panamaxus\_65, PeaceMeal1\_62, Pembroke\_72, Phantastic\_69, PhishRPhriends\_68, Pistachio\_67, Pocahontas\_66, Poompha\_61, Popcicle\_67, PurpleHaze\_71, QuinnKiro\_66, Rebeuca\_65, ResDef\_65, RhynO\_64, Rockstar\_66, Rowdy\_66, SaturnRing\_67, Scout\_66, Severus\_62, Shapes\_66, Sheen\_69, SoilDragon\_71, Soshari\_74, Texage\_65, Todacoro\_67, Topanga\_61, Trike\_61, Twister\_63, Veracruz\_64, Vix\_68, WalterMcMickey\_63, Watson\_71, Wooldri\_74, Zetzy\_69,

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

- FlyCatcher\_70, Toro\_68,

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

- Daishi\_71, Dieselweasel\_72, JHC117\_68, MadMarie\_70, Mainiac\_71, Sabia\_70, Snickers\_68, Tiffany\_71,

## **Summary by start number:**

Start 2:

- Found in 96 of 104 ( 92.3% ) of genes in pham
- Manual Annotations of this start: 85 of 92
- Called 97.9% of time when present
- Phage (with cluster) where this start called: ACFishhook\_69 (A3), Aglet\_73 (A3), AgronaGT15\_69 (A3), AugsMagnumOpus\_75 (A3), BabyRay\_68 (A3), BlueBird\_70 (A3), BreSam8\_72 (A3), Bugatti\_67 (A3), Caviar\_67 (A3), Chupacabra\_62 (A10), DaHudson\_71 (A3), DontArgue\_61 (A10), Drake94\_62 (A10), DropBear\_65 (A3), DustyMartin\_66 (A10), Eaglepride\_66 (A10), Edison31\_61 (A10), Farber\_72 (A3), Fred313\_65 (A3), Gemma\_69 (A3), Giroux\_66 (A3), Goose\_65 (A10), Grouphink\_72 (A3), Grub\_70 (A3), HaveUMetTed\_72 (A3), Heathen\_67 (A3), HelDan\_67 (A3), Heliosoles\_69 (A3), Hookmount\_67 (A3), Idleandcovert\_68 (A3), Isca\_65 (A3), JF2\_65 (A3), JF4\_65 (A3), JeppNRM\_72 (A3), Jobu08\_68 (A3), KADY\_69 (A3), Kachowdy\_65 (A3), Kalb97\_72 (A3), Kalnoky\_72 (A3), KittenMittens\_61 (A10), Kristoff\_63 (A10), Lambert1\_67 (A3), Lilith\_70 (A3), Louie6\_71 (A3), MA5\_67 (A3), MK4\_67 (A3), Malinsilva\_74 (A3), Manu\_71 (A3), MarQuardt\_72 (A3), Margo\_67 (A3), Marius\_72 (A3), Methuselah\_65 (A3), Microwolf\_68 (A3), Misomonster\_73 (A3), MuchMore\_75 (A3), Noella\_67 (A3), Norbert\_63 (A3), OKCentral2016\_63 (A10), OlanP\_70 (A3), PGHhamlin\_74 (A3), Panamaxus\_65 (A3), PeaceMeal1\_62 (A10),

Pembroke\_72 (A3), Phantastic\_69 (A3), PhishRPhriends\_68 (A3), Pistachio\_67 (A3), Pocahontas\_66 (A3), Poompha\_61 (A10), Popcicle\_67 (A3), PurpleHaze\_71 (A3), QuinnKiro\_66 (A3), Rebeuca\_65 (A10), ResDef\_65 (A3), RhynO\_64 (A10), Rockstar\_66 (A3), Rowdy\_66 (A10), SaturnRing\_67 (A3), Scout\_66 (A3), Severus\_62 (A10), Shapes\_66 (A10), Sheen\_69 (A7), SoilDragon\_71 (A3), Soshari\_74 (A3), Texage\_65 (A3), Todacoro\_67 (A3), Topanga\_61 (A10), Trike\_61 (A10), Twister\_63 (A10), Veracruz\_64 (A3), Vix\_68 (A3), WalterMcMickey\_63 (A10), Watson\_71 (A3), Wooldri\_74 (A3), Zetzy\_69 (A3),

#### Start 4:

- Found in 46 of 104 ( 44.2% ) of genes in pham
- Manual Annotations of this start: 7 of 92
- Called 17.4% of time when present
- Phage (with cluster) where this start called: Daishi\_71 (A3), Dieselweasel\_72 (A3), JHC117\_68 (A3), MadMarie\_70 (A3), Mainiac\_71 (A3), Sabia\_70 (A3), Snickers\_68 (A3), Tiffany\_71 (A3),

#### Start 8:

- Found in 3 of 104 ( 2.9% ) of genes in pham
- No Manual Annotations of this start.
- Called 66.7% of time when present
- Phage (with cluster) where this start called: FlyCatcher\_70 (A7), Toro\_68 (A7),

### Summary by clusters:

There are 3 clusters represented in this pham: A3, A10, A7,

Info for manual annotations of cluster A10:

- Start number 2 was manually annotated 17 times for cluster A10.

Info for manual annotations of cluster A3:

- Start number 2 was manually annotated 67 times for cluster A3.
- Start number 4 was manually annotated 7 times for cluster A3.

Info for manual annotations of cluster A7:

- Start number 2 was manually annotated 1 time for cluster A7.

### Gene Information:

Gene: ACFishhook\_69 Start: 42330, Stop: 42022, Start Num: 2

Candidate Starts for ACFishhook\_69:

(Start: 2 @42330 has 85 MA's), (Start: 4 @42312 has 7 MA's), (7, 42297), (10, 42276), (12, 42243), (13, 42192), (14, 42183), (15, 42156), (16, 42150), (17, 42141), (19, 42117),

Gene: Aglet\_73 Start: 42442, Stop: 42134, Start Num: 2

Candidate Starts for Aglet\_73:

(Start: 2 @42442 has 85 MA's), (Start: 4 @42424 has 7 MA's), (7, 42409), (10, 42388), (12, 42355), (13, 42304), (14, 42295), (15, 42268), (16, 42262), (19, 42229),

Gene: AgronaGT15\_69 Start: 42290, Stop: 41982, Start Num: 2

Candidate Starts for AgronaGT15\_69:

(Start: 2 @42290 has 85 MA's), (Start: 4 @42272 has 7 MA's), (7, 42257), (10, 42236), (12, 42203), (13, 42152), (14, 42143), (15, 42116), (16, 42110), (19, 42077),

Gene: AugsMagnumOpus\_75 Start: 42433, Stop: 42125, Start Num: 2

Candidate Starts for AugsMagnumOpus\_75:

(Start: 2 @42433 has 85 MA's), (Start: 4 @42415 has 7 MA's), (7, 42400), (10, 42379), (12, 42346), (13, 42295), (14, 42286), (15, 42259), (16, 42253), (19, 42220),

Gene: BabyRay\_68 Start: 42157, Stop: 41789, Start Num: 2

Candidate Starts for BabyRay\_68:

(Start: 2 @42157 has 85 MA's), (7, 42124), (10, 42100), (19, 41932), (20, 41923), (21, 41911),

Gene: BlueBird\_70 Start: 42204, Stop: 41836, Start Num: 2

Candidate Starts for BlueBird\_70:

(Start: 2 @42204 has 85 MA's), (5, 42183), (7, 42171), (10, 42147), (18, 41997), (19, 41979), (21, 41958),

Gene: BreSam8\_72 Start: 42435, Stop: 42127, Start Num: 2

Candidate Starts for BreSam8\_72:

(Start: 2 @42435 has 85 MA's), (Start: 4 @42417 has 7 MA's), (7, 42402), (10, 42381), (12, 42348), (13, 42297), (14, 42288), (15, 42261), (16, 42255), (19, 42222),

Gene: Bugatti\_67 Start: 42204, Stop: 41836, Start Num: 2

Candidate Starts for Bugatti\_67:

(Start: 2 @42204 has 85 MA's), (5, 42183), (7, 42171), (10, 42147), (18, 41997), (19, 41979), (21, 41958),

Gene: Caviar\_67 Start: 42160, Stop: 41789, Start Num: 2

Candidate Starts for Caviar\_67:

(Start: 2 @42160 has 85 MA's), (7, 42127), (10, 42103), (13, 42007), (18, 41950), (19, 41932), (21, 41911),

Gene: Chupacabra\_62 Start: 41312, Stop: 41004, Start Num: 2

Candidate Starts for Chupacabra\_62:

(Start: 2 @41312 has 85 MA's), (9, 41270), (11, 41246), (17, 41123), (19, 41099), (22, 41024),

Gene: DaHudson\_71 Start: 42434, Stop: 42126, Start Num: 2

Candidate Starts for DaHudson\_71:

(Start: 2 @42434 has 85 MA's), (Start: 4 @42416 has 7 MA's), (7, 42401), (10, 42380), (12, 42347), (13, 42296), (14, 42287), (15, 42260), (16, 42254), (19, 42221),

Gene: Daishi\_71 Start: 41292, Stop: 41002, Start Num: 4

Candidate Starts for Daishi\_71:

(Start: 4 @41292 has 7 MA's), (7, 41277), (10, 41256), (12, 41223), (13, 41172), (14, 41163), (15, 41136), (16, 41130), (19, 41097),

Gene: Dieselweasel\_72 Start: 42426, Stop: 42136, Start Num: 4

Candidate Starts for Dieselweasel\_72:

(Start: 4 @42426 has 7 MA's), (7, 42411), (10, 42390), (12, 42357), (13, 42306), (14, 42297), (15, 42270), (16, 42264), (19, 42231),

Gene: DontArgue\_61 Start: 40445, Stop: 40131, Start Num: 2

Candidate Starts for DontArgue\_61:

(Start: 2 @40445 has 85 MA's), (9, 40394), (11, 40370), (13, 40301), (18, 40244), (19, 40226), (20, 40217),

Gene: Drake94\_62 Start: 40387, Stop: 40079, Start Num: 2

Candidate Starts for Drake94\_62:

(Start: 2 @40387 has 85 MA's), (9, 40345), (11, 40321), (13, 40249), (17, 40198), (19, 40174), (22, 40099),

Gene: DropBear\_65 Start: 42103, Stop: 41738, Start Num: 2

Candidate Starts for DropBear\_65:

(Start: 2 @42103 has 85 MA's), (5, 42082), (7, 42070), (10, 42046), (18, 41896), (19, 41878), (20, 41869), (21, 41857),

Gene: DustyMartin\_66 Start: 41423, Stop: 41115, Start Num: 2

Candidate Starts for DustyMartin\_66:

(Start: 2 @41423 has 85 MA's), (9, 41381), (11, 41357), (13, 41285), (18, 41228), (19, 41210), (22, 41135),

Gene: Eaglepride\_66 Start: 41419, Stop: 41111, Start Num: 2

Candidate Starts for Eaglepride\_66:

(Start: 2 @41419 has 85 MA's), (6, 41401), (9, 41377), (11, 41353), (13, 41281), (18, 41224), (19, 41206), (20, 41197), (22, 41131),

Gene: Edison31\_61 Start: 41187, Stop: 40879, Start Num: 2

Candidate Starts for Edison31\_61:

(Start: 2 @41187 has 85 MA's), (9, 41145), (11, 41121), (17, 40998), (18, 40992), (19, 40974), (22, 40899),

Gene: Farber\_72 Start: 42431, Stop: 42123, Start Num: 2

Candidate Starts for Farber\_72:

(Start: 2 @42431 has 85 MA's), (Start: 4 @42413 has 7 MA's), (7, 42398), (10, 42377), (12, 42344), (13, 42293), (14, 42284), (15, 42257), (16, 42251), (19, 42218),

Gene: FlyCatcher\_70 Start: 45930, Stop: 45607, Start Num: 8

Candidate Starts for FlyCatcher\_70:

(Start: 2 @45966 has 85 MA's), (8, 45930), (13, 45825), (18, 45768), (19, 45750), (21, 45729),

Gene: Fred313\_65 Start: 41797, Stop: 41432, Start Num: 2

Candidate Starts for Fred313\_65:

(Start: 2 @41797 has 85 MA's), (5, 41776), (7, 41764), (10, 41740), (18, 41590), (19, 41572), (20, 41563), (21, 41551),

Gene: Gemma\_69 Start: 42254, Stop: 41946, Start Num: 2

Candidate Starts for Gemma\_69:

(Start: 2 @42254 has 85 MA's), (Start: 4 @42236 has 7 MA's), (7, 42221), (10, 42200), (12, 42167), (13, 42116), (14, 42107), (15, 42080), (16, 42074), (17, 42065), (19, 42041),

Gene: Giroux\_66 Start: 42203, Stop: 41835, Start Num: 2

Candidate Starts for Giroux\_66:

(Start: 2 @42203 has 85 MA's), (5, 42182), (7, 42170), (10, 42146), (18, 41996), (19, 41978), (21, 41957),

Gene: Goose\_65 Start: 41128, Stop: 40820, Start Num: 2

Candidate Starts for Goose\_65:

(Start: 2 @41128 has 85 MA's), (9, 41086), (11, 41062), (17, 40939), (19, 40915), (22, 40840),

Gene: Groupthink\_72 Start: 42258, Stop: 41950, Start Num: 2

Candidate Starts for Groupthink\_72:

(Start: 2 @42258 has 85 MA's), (Start: 4 @42240 has 7 MA's), (7, 42225), (10, 42204), (12, 42171), (13, 42120), (14, 42111), (15, 42084), (16, 42078), (19, 42045),

Gene: Grub\_70 Start: 42433, Stop: 42125, Start Num: 2

Candidate Starts for Grub\_70:

(Start: 2 @42433 has 85 MA's), (Start: 4 @42415 has 7 MA's), (7, 42400), (10, 42379), (12, 42346), (13, 42295), (14, 42286), (15, 42259), (16, 42253), (19, 42220),

Gene: HaveUMetTed\_72 Start: 42243, Stop: 41935, Start Num: 2

Candidate Starts for HaveUMetTed\_72:

(Start: 2 @42243 has 85 MA's), (Start: 4 @42225 has 7 MA's), (7, 42210), (10, 42189), (12, 42156), (13, 42105), (14, 42096), (15, 42069), (16, 42063), (17, 42054), (19, 42030),

Gene: Heathen\_67 Start: 41892, Stop: 41527, Start Num: 2

Candidate Starts for Heathen\_67:

(Start: 2 @41892 has 85 MA's), (5, 41871), (7, 41859), (10, 41835), (18, 41685), (19, 41667), (20, 41658), (21, 41646),

Gene: HelDan\_67 Start: 42108, Stop: 41743, Start Num: 2

Candidate Starts for HelDan\_67:

(Start: 2 @42108 has 85 MA's), (5, 42087), (7, 42075), (10, 42051), (18, 41901), (19, 41883), (20, 41874), (21, 41862),

Gene: Heliosoles\_69 Start: 42261, Stop: 41953, Start Num: 2

Candidate Starts for Heliosoles\_69:

(Start: 2 @42261 has 85 MA's), (Start: 4 @42243 has 7 MA's), (7, 42228), (10, 42207), (12, 42174), (13, 42123), (14, 42114), (15, 42087), (16, 42081), (19, 42048),

Gene: Hookmount\_67 Start: 42161, Stop: 41790, Start Num: 2

Candidate Starts for Hookmount\_67:

(Start: 2 @42161 has 85 MA's), (7, 42128), (10, 42104), (13, 42008), (18, 41951), (19, 41933), (21, 41912),

Gene: Idleandcovert\_68 Start: 42204, Stop: 41836, Start Num: 2

Candidate Starts for Idleandcovert\_68:

(Start: 2 @42204 has 85 MA's), (5, 42183), (7, 42171), (10, 42147), (18, 41997), (19, 41979), (21, 41958),

Gene: Isca\_65 Start: 41657, Stop: 41289, Start Num: 2

Candidate Starts for Isca\_65:

(Start: 2 @41657 has 85 MA's), (7, 41624), (10, 41600), (18, 41450), (19, 41432), (20, 41423), (21, 41411),

Gene: JF2\_65 Start: 40352, Stop: 39984, Start Num: 2

Candidate Starts for JF2\_65:

(Start: 2 @40352 has 85 MA's), (7, 40319), (10, 40295), (18, 40145), (19, 40127), (20, 40118), (21, 40106),

Gene: JF4\_65 Start: 40352, Stop: 39984, Start Num: 2

Candidate Starts for JF4\_65:

(Start: 2 @40352 has 85 MA's), (7, 40319), (10, 40295), (18, 40145), (19, 40127), (20, 40118), (21, 40106),

Gene: JHC117\_68 Start: 42422, Stop: 42132, Start Num: 4

Candidate Starts for JHC117\_68:

(Start: 4 @42422 has 7 MA's), (7, 42407), (10, 42386), (12, 42353), (13, 42302), (14, 42293), (15, 42266), (16, 42260), (19, 42227),

Gene: JeppNRM\_72 Start: 42259, Stop: 41951, Start Num: 2

Candidate Starts for JeppNRM\_72:

(Start: 2 @42259 has 85 MA's), (Start: 4 @42241 has 7 MA's), (7, 42226), (10, 42205), (12, 42172), (13, 42121), (14, 42112), (15, 42085), (16, 42079), (17, 42070), (19, 42046),

Gene: Jobu08\_68 Start: 42273, Stop: 41965, Start Num: 2

Candidate Starts for Jobu08\_68:

(Start: 2 @42273 has 85 MA's), (Start: 4 @42255 has 7 MA's), (7, 42240), (10, 42219), (12, 42186), (13, 42135), (14, 42126), (15, 42099), (16, 42093), (17, 42084), (19, 42060),

Gene: KADY\_69 Start: 42469, Stop: 42161, Start Num: 2

Candidate Starts for KADY\_69:

(1, 42676), (Start: 2 @42469 has 85 MA's), (3, 42457), (Start: 4 @42451 has 7 MA's), (7, 42436), (10, 42415), (12, 42382), (13, 42331), (14, 42322), (15, 42295), (16, 42289), (19, 42256),

Gene: Kachowdy\_65 Start: 42144, Stop: 41779, Start Num: 2

Candidate Starts for Kachowdy\_65:

(Start: 2 @42144 has 85 MA's), (5, 42123), (7, 42111), (10, 42087), (18, 41937), (19, 41919), (20, 41910), (21, 41898),

Gene: Kalb97\_72 Start: 42257, Stop: 41949, Start Num: 2

Candidate Starts for Kalb97\_72:

(Start: 2 @42257 has 85 MA's), (Start: 4 @42239 has 7 MA's), (7, 42224), (10, 42203), (12, 42170), (13, 42119), (14, 42110), (15, 42083), (16, 42077), (17, 42068), (19, 42044),

Gene: Kalnoky\_72 Start: 42255, Stop: 41947, Start Num: 2

Candidate Starts for Kalnoky\_72:

(Start: 2 @42255 has 85 MA's), (Start: 4 @42237 has 7 MA's), (7, 42222), (10, 42201), (12, 42168), (13, 42117), (14, 42108), (15, 42081), (16, 42075), (19, 42042),

Gene: KittenMittens\_61 Start: 40395, Stop: 40087, Start Num: 2

Candidate Starts for KittenMittens\_61:

(Start: 2 @40395 has 85 MA's), (9, 40353), (11, 40329), (13, 40257), (17, 40206), (19, 40182), (22, 40107),

Gene: Kristoff\_63 Start: 41709, Stop: 41401, Start Num: 2

Candidate Starts for Kristoff\_63:

(Start: 2 @41709 has 85 MA's), (6, 41691), (9, 41667), (11, 41643), (17, 41520), (19, 41496), (22, 41421),

Gene: Lambert1\_67 Start: 42160, Stop: 41789, Start Num: 2

Candidate Starts for Lambert1\_67:



(Start: 2 @42160 has 85 MA's), (7, 42127), (10, 42103), (13, 42007), (18, 41950), (19, 41932), (21, 41911),

Gene: Lilith\_70 Start: 42434, Stop: 42126, Start Num: 2

Candidate Starts for Lilith\_70:

(Start: 2 @42434 has 85 MA's), (Start: 4 @42416 has 7 MA's), (7, 42401), (10, 42380), (12, 42347), (13, 42296), (14, 42287), (15, 42260), (16, 42254), (19, 42221),

Gene: Louie6\_71 Start: 42471, Stop: 42163, Start Num: 2

Candidate Starts for Louie6\_71:

(1, 42678), (Start: 2 @42471 has 85 MA's), (3, 42459), (Start: 4 @42453 has 7 MA's), (7, 42438), (10, 42417), (12, 42384), (13, 42333), (14, 42324), (15, 42297), (16, 42291), (19, 42258),

Gene: MA5\_67 Start: 41561, Stop: 41193, Start Num: 2

Candidate Starts for MA5\_67:

(Start: 2 @41561 has 85 MA's), (7, 41528), (10, 41504), (18, 41354), (19, 41336), (20, 41327), (21, 41315),

Gene: MK4\_67 Start: 41636, Stop: 41268, Start Num: 2

Candidate Starts for MK4\_67:

(Start: 2 @41636 has 85 MA's), (7, 41603), (10, 41579), (18, 41429), (19, 41411), (20, 41402), (21, 41390),

Gene: MadMarie\_70 Start: 42425, Stop: 42135, Start Num: 4

Candidate Starts for MadMarie\_70:

(Start: 4 @42425 has 7 MA's), (7, 42410), (10, 42389), (12, 42356), (13, 42305), (14, 42296), (15, 42269), (16, 42263), (19, 42230),

Gene: Mainiac\_71 Start: 42417, Stop: 42127, Start Num: 4

Candidate Starts for Mainiac\_71:

(Start: 4 @42417 has 7 MA's), (7, 42402), (10, 42381), (12, 42348), (13, 42297), (14, 42288), (15, 42261), (16, 42255), (19, 42222),

Gene: Malinsilva\_74 Start: 42433, Stop: 42125, Start Num: 2

Candidate Starts for Malinsilva\_74:

(Start: 2 @42433 has 85 MA's), (Start: 4 @42415 has 7 MA's), (7, 42400), (10, 42379), (12, 42346), (13, 42295), (14, 42286), (15, 42259), (16, 42253), (19, 42220),

Gene: Manu\_71 Start: 42258, Stop: 41950, Start Num: 2

Candidate Starts for Manu\_71:

(Start: 2 @42258 has 85 MA's), (Start: 4 @42240 has 7 MA's), (7, 42225), (10, 42204), (12, 42171), (13, 42120), (14, 42111), (15, 42084), (16, 42078), (17, 42069), (19, 42045),

Gene: MarQuardt\_72 Start: 42443, Stop: 42135, Start Num: 2

Candidate Starts for MarQuardt\_72:

(Start: 2 @42443 has 85 MA's), (Start: 4 @42425 has 7 MA's), (7, 42410), (10, 42389), (12, 42356), (13, 42305), (14, 42296), (15, 42269), (16, 42263), (19, 42230),

Gene: Margo\_67 Start: 42186, Stop: 41815, Start Num: 2

Candidate Starts for Margo\_67:

(Start: 2 @42186 has 85 MA's), (7, 42153), (10, 42129), (13, 42033), (18, 41976), (19, 41958), (21, 41937),

Gene: Marius\_72 Start: 42255, Stop: 41947, Start Num: 2

Candidate Starts for Marius\_72:

(Start: 2 @42255 has 85 MA's), (Start: 4 @42237 has 7 MA's), (7, 42222), (10, 42201), (12, 42168), (13, 42117), (14, 42108), (15, 42081), (16, 42075), (19, 42042),

Gene: Methuselah\_65 Start: 42465, Stop: 42157, Start Num: 2

Candidate Starts for Methuselah\_65:

(Start: 2 @42465 has 85 MA's), (Start: 4 @42447 has 7 MA's), (7, 42432), (10, 42411), (12, 42378), (13, 42327), (14, 42318), (15, 42291), (16, 42285), (19, 42252),

Gene: Microwolf\_68 Start: 42457, Stop: 42149, Start Num: 2

Candidate Starts for Microwolf\_68:

(Start: 2 @42457 has 85 MA's), (Start: 4 @42439 has 7 MA's), (7, 42424), (10, 42403), (12, 42370), (13, 42319), (14, 42310), (15, 42283), (16, 42277), (19, 42244),

Gene: Misomonster\_73 Start: 42468, Stop: 42160, Start Num: 2

Candidate Starts for Misomonster\_73:

(1, 42675), (Start: 2 @42468 has 85 MA's), (3, 42456), (Start: 4 @42450 has 7 MA's), (7, 42435), (10, 42414), (12, 42381), (13, 42330), (14, 42321), (15, 42294), (16, 42288), (19, 42255),

Gene: MuchMore\_75 Start: 42433, Stop: 42125, Start Num: 2

Candidate Starts for MuchMore\_75:

(Start: 2 @42433 has 85 MA's), (Start: 4 @42415 has 7 MA's), (7, 42400), (10, 42379), (12, 42346), (13, 42295), (14, 42286), (15, 42259), (16, 42253), (19, 42220),

Gene: Noella\_67 Start: 42161, Stop: 41790, Start Num: 2

Candidate Starts for Noella\_67:

(Start: 2 @42161 has 85 MA's), (7, 42128), (10, 42104), (13, 42008), (18, 41951), (19, 41933), (21, 41912),

Gene: Norbert\_63 Start: 42160, Stop: 41789, Start Num: 2

Candidate Starts for Norbert\_63:

(Start: 2 @42160 has 85 MA's), (7, 42127), (10, 42103), (13, 42007), (18, 41950), (19, 41932), (21, 41911),

Gene: OKCentral2016\_63 Start: 40871, Stop: 40563, Start Num: 2

Candidate Starts for OKCentral2016\_63:

(Start: 2 @40871 has 85 MA's), (9, 40829), (11, 40805), (17, 40682), (19, 40658), (22, 40583),

Gene: OlanP\_70 Start: 42431, Stop: 42123, Start Num: 2

Candidate Starts for OlanP\_70:

(Start: 2 @42431 has 85 MA's), (Start: 4 @42413 has 7 MA's), (7, 42398), (10, 42377), (12, 42344), (13, 42293), (14, 42284), (15, 42257), (16, 42251), (17, 42242), (19, 42218),

Gene: PGHhamlin\_74 Start: 42433, Stop: 42125, Start Num: 2

Candidate Starts for PGHhamlin\_74:

(Start: 2 @42433 has 85 MA's), (Start: 4 @42415 has 7 MA's), (7, 42400), (10, 42379), (12, 42346), (13, 42295), (14, 42286), (15, 42259), (16, 42253), (19, 42220),

Gene: Panamaxus\_65 Start: 42160, Stop: 41789, Start Num: 2

Candidate Starts for Panamaxus\_65:

(Start: 2 @42160 has 85 MA's), (7, 42127), (10, 42103), (13, 42007), (18, 41950), (19, 41932), (21, 41911),

Gene: PeaceMeal1\_62 Start: 40396, Stop: 40088, Start Num: 2

Candidate Starts for PeaceMeal1\_62:

(Start: 2 @40396 has 85 MA's), (9, 40354), (11, 40330), (13, 40258), (17, 40207), (19, 40183), (22, 40108),

Gene: Pembroke\_72 Start: 42442, Stop: 42134, Start Num: 2

Candidate Starts for Pembroke\_72:

(Start: 2 @42442 has 85 MA's), (Start: 4 @42424 has 7 MA's), (7, 42409), (10, 42388), (12, 42355), (13, 42304), (14, 42295), (15, 42268), (16, 42262), (19, 42229),

Gene: Phantastic\_69 Start: 41822, Stop: 41451, Start Num: 2

Candidate Starts for Phantastic\_69:

(Start: 2 @41822 has 85 MA's), (5, 41801), (7, 41789), (10, 41765), (18, 41612), (19, 41594), (20, 41585), (21, 41573),

Gene: PhishRPhriends\_68 Start: 41439, Stop: 41131, Start Num: 2

Candidate Starts for PhishRPhriends\_68:

(Start: 2 @41439 has 85 MA's), (Start: 4 @41421 has 7 MA's), (7, 41406), (10, 41385), (12, 41352), (13, 41301), (14, 41292), (15, 41265), (16, 41259), (17, 41250), (19, 41226),

Gene: Pistachio\_67 Start: 41751, Stop: 41383, Start Num: 2

Candidate Starts for Pistachio\_67:

(Start: 2 @41751 has 85 MA's), (5, 41730), (7, 41718), (10, 41694), (18, 41544), (19, 41526), (21, 41505),

Gene: Pocahontas\_66 Start: 42157, Stop: 41786, Start Num: 2

Candidate Starts for Pocahontas\_66:

(Start: 2 @42157 has 85 MA's), (7, 42124), (10, 42100), (13, 42004), (18, 41947), (19, 41929), (21, 41908),

Gene: Poompha\_61 Start: 40394, Stop: 40086, Start Num: 2

Candidate Starts for Poompha\_61:

(Start: 2 @40394 has 85 MA's), (9, 40352), (11, 40328), (13, 40256), (17, 40205), (19, 40181), (22, 40106),

Gene: Popcicle\_67 Start: 42157, Stop: 41786, Start Num: 2

Candidate Starts for Popcicle\_67:

(Start: 2 @42157 has 85 MA's), (7, 42124), (10, 42100), (13, 42004), (18, 41947), (19, 41929), (21, 41908),

Gene: PurpleHaze\_71 Start: 42257, Stop: 41949, Start Num: 2

Candidate Starts for PurpleHaze\_71:

(Start: 2 @42257 has 85 MA's), (Start: 4 @42239 has 7 MA's), (7, 42224), (10, 42203), (12, 42170), (13, 42119), (14, 42110), (15, 42083), (16, 42077), (19, 42044),

Gene: QuinnKiro\_66 Start: 42160, Stop: 41789, Start Num: 2

Candidate Starts for QuinnKiro\_66:

(Start: 2 @42160 has 85 MA's), (7, 42127), (10, 42103), (13, 42007), (18, 41950), (19, 41932), (21, 41911),

Gene: Rebeuca\_65 Start: 41710, Stop: 41402, Start Num: 2

Candidate Starts for Rebeuca\_65:

(Start: 2 @41710 has 85 MA's), (6, 41692), (9, 41668), (11, 41644), (17, 41521), (19, 41497), (22, 41422),

Gene: ResDef\_65 Start: 42160, Stop: 41789, Start Num: 2

Candidate Starts for ResDef\_65:

(Start: 2 @42160 has 85 MA's), (7, 42127), (10, 42103), (13, 42007), (18, 41950), (19, 41932), (21, 41911),

Gene: RhynO\_64 Start: 41351, Stop: 41043, Start Num: 2

Candidate Starts for RhynO\_64:

(Start: 2 @41351 has 85 MA's), (9, 41309), (11, 41285), (18, 41156), (19, 41138), (22, 41063),

Gene: Rockstar\_66 Start: 41645, Stop: 41277, Start Num: 2

Candidate Starts for Rockstar\_66:

(Start: 2 @41645 has 85 MA's), (7, 41612), (10, 41588), (18, 41438), (19, 41420), (20, 41411), (21, 41399),

Gene: Rowdy\_66 Start: 41423, Stop: 41115, Start Num: 2

Candidate Starts for Rowdy\_66:

(Start: 2 @41423 has 85 MA's), (9, 41381), (11, 41357), (13, 41285), (18, 41228), (19, 41210), (22, 41135),

Gene: Sabia\_70 Start: 42432, Stop: 42142, Start Num: 4

Candidate Starts for Sabia\_70:

(Start: 4 @42432 has 7 MA's), (7, 42417), (10, 42396), (12, 42363), (13, 42312), (14, 42303), (15, 42276), (16, 42270), (19, 42237),

Gene: SaturnRing\_67 Start: 42204, Stop: 41836, Start Num: 2

Candidate Starts for SaturnRing\_67:

(Start: 2 @42204 has 85 MA's), (5, 42183), (7, 42171), (10, 42147), (18, 41997), (19, 41979), (21, 41958),

Gene: Scout\_66 Start: 41355, Stop: 40990, Start Num: 2

Candidate Starts for Scout\_66:

(Start: 2 @41355 has 85 MA's), (5, 41334), (7, 41322), (10, 41298), (18, 41148), (19, 41130), (20, 41121), (21, 41109),

Gene: Severus\_62 Start: 40394, Stop: 40086, Start Num: 2

Candidate Starts for Severus\_62:

(Start: 2 @40394 has 85 MA's), (9, 40352), (11, 40328), (13, 40256), (17, 40205), (19, 40181), (22, 40106),

Gene: Shapes\_66 Start: 41423, Stop: 41115, Start Num: 2

Candidate Starts for Shapes\_66:

(Start: 2 @41423 has 85 MA's), (9, 41381), (11, 41357), (13, 41285), (18, 41228), (19, 41210), (22, 41135),

Gene: Sheen\_69 Start: 45854, Stop: 45495, Start Num: 2

Candidate Starts for Sheen\_69:

(Start: 2 @45854 has 85 MA's), (8, 45818), (13, 45713), (18, 45656), (19, 45638), (21, 45617),

Gene: Snickers\_68 Start: 42397, Stop: 42107, Start Num: 4

Candidate Starts for Snickers\_68:

(Start: 4 @42397 has 7 MA's), (7, 42382), (10, 42361), (12, 42328), (13, 42277), (14, 42268), (15, 42241), (16, 42235), (19, 42202),

Gene: SoilDragon\_71 Start: 41889, Stop: 41581, Start Num: 2

Candidate Starts for SoilDragon\_71:

(Start: 2 @41889 has 85 MA's), (Start: 4 @41871 has 7 MA's), (7, 41856), (10, 41835), (12, 41802), (13, 41751), (14, 41742), (15, 41715), (16, 41709), (17, 41700), (19, 41676),

Gene: Soshari\_74 Start: 42465, Stop: 42157, Start Num: 2

Candidate Starts for Soshari\_74:

(Start: 2 @42465 has 85 MA's), (Start: 4 @42447 has 7 MA's), (7, 42432), (10, 42411), (12, 42378), (13, 42327), (14, 42318), (15, 42291), (16, 42285), (19, 42252),

Gene: Texage\_65 Start: 42161, Stop: 41790, Start Num: 2

Candidate Starts for Texage\_65:

(Start: 2 @42161 has 85 MA's), (7, 42128), (10, 42104), (13, 42008), (18, 41951), (19, 41933), (21, 41912),

Gene: Tiffany\_71 Start: 42309, Stop: 42019, Start Num: 4

Candidate Starts for Tiffany\_71:

(Start: 4 @42309 has 7 MA's), (7, 42294), (10, 42273), (12, 42240), (13, 42189), (14, 42180), (15, 42153), (16, 42147), (19, 42114),

Gene: Todacoro\_67 Start: 42160, Stop: 41789, Start Num: 2

Candidate Starts for Todacoro\_67:

(Start: 2 @42160 has 85 MA's), (7, 42127), (10, 42103), (13, 42007), (18, 41950), (19, 41932), (21, 41911),

Gene: Topanga\_61 Start: 41190, Stop: 40882, Start Num: 2

Candidate Starts for Topanga\_61:

(Start: 2 @41190 has 85 MA's), (9, 41148), (11, 41124), (17, 41001), (18, 40995), (19, 40977), (22, 40902),

Gene: Toro\_68 Start: 45930, Stop: 45607, Start Num: 8

Candidate Starts for Toro\_68:

(Start: 2 @45966 has 85 MA's), (8, 45930), (13, 45825), (18, 45768), (19, 45750), (21, 45729),

Gene: Trike\_61 Start: 40401, Stop: 40093, Start Num: 2

Candidate Starts for Trike\_61:

(Start: 2 @40401 has 85 MA's), (9, 40359), (11, 40335), (13, 40263), (17, 40212), (19, 40188), (22, 40113),

Gene: Twister\_63 Start: 41311, Stop: 41003, Start Num: 2

Candidate Starts for Twister\_63:

(Start: 2 @41311 has 85 MA's), (9, 41269), (11, 41245), (17, 41122), (18, 41116), (19, 41098), (22, 41023),

Gene: Veracruz\_64 Start: 42160, Stop: 41789, Start Num: 2

Candidate Starts for Veracruz\_64:

(Start: 2 @42160 has 85 MA's), (7, 42127), (10, 42103), (13, 42007), (18, 41950), (19, 41932), (21, 41911),

Gene: Vix\_68 Start: 42524, Stop: 42216, Start Num: 2

Candidate Starts for Vix\_68:

(Start: 2 @42524 has 85 MA's), (Start: 4 @42506 has 7 MA's), (7, 42491), (10, 42470), (12, 42437), (13, 42386), (14, 42377), (15, 42350), (16, 42344), (19, 42311),

Gene: WalterMcMickey\_63 Start: 41311, Stop: 41003, Start Num: 2

Candidate Starts for WalterMcMickey\_63:

(Start: 2 @41311 has 85 MA's), (9, 41269), (11, 41245), (17, 41122), (18, 41116), (19, 41098), (22, 41023),

Gene: Watson\_71 Start: 42433, Stop: 42125, Start Num: 2

Candidate Starts for Watson\_71:

(Start: 2 @42433 has 85 MA's), (Start: 4 @42415 has 7 MA's), (7, 42400), (10, 42379), (12, 42346), (13, 42295), (14, 42286), (15, 42259), (16, 42253), (19, 42220),

Gene: Wooldri\_74 Start: 42353, Stop: 42045, Start Num: 2

Candidate Starts for Wooldri\_74:

(Start: 2 @42353 has 85 MA's), (Start: 4 @42335 has 7 MA's), (7, 42320), (10, 42299), (12, 42266), (13, 42215), (14, 42206), (15, 42179), (16, 42173), (19, 42140),

Gene: Zetzy\_69 Start: 42004, Stop: 41696, Start Num: 2

Candidate Starts for Zetzy\_69:

(Start: 2 @42004 has 85 MA's), (Start: 4 @41986 has 7 MA's), (7, 41971), (10, 41950), (12, 41917), (13, 41866), (14, 41857), (15, 41830), (16, 41824), (19, 41791),