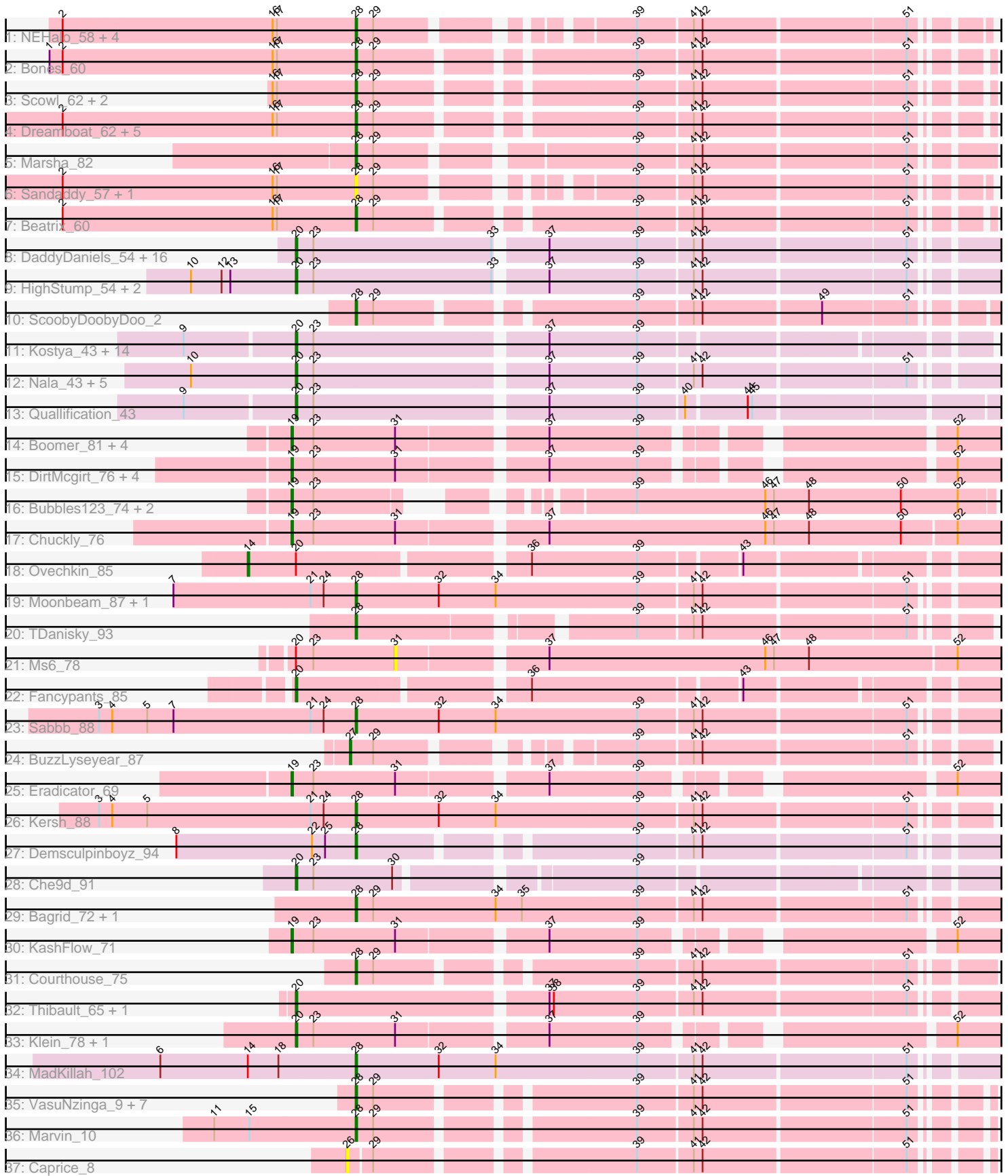


Pham 171334



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 171334 Report

This analysis was run 07/10/24 on database version 566.

Pham number 171334 has 107 members, 14 are drafts.

Phages represented in each track:

- Track 1 : NEHalo\_58, AFIS\_57, SpikeBT\_59, GageAP\_62, Makemake\_63
- Track 2 : Bones\_60
- Track 3 : Scowl\_62, StrongArm\_59, Bexan\_58
- Track 4 : Dreamboat\_62, Cueyllys\_61, Ohno789\_61, Graduation\_65, PherrisBueller\_60, Jasper\_61
- Track 5 : Marsha\_82
- Track 6 : Sandaddy\_57, Sorpresa\_56
- Track 7 : Beatrix\_60
- Track 8 : DaddyDaniels\_54, Kronus\_50, Childish\_52, MmasiCarm\_51, Obutu\_51, Soile\_53, Phayeta\_52, Mortcellus\_50, Brilliant\_54, Kahve\_52, Casbah\_50, Ben11\_50, Gervas\_51, HenryJackson\_52, Rita1961\_51, Craff\_55, SlippinJimmy\_52
- Track 9 : HighStump\_54, Longacauda\_53, Legolas\_54
- Track 10 : ScoobyDoobyDoo\_2
- Track 11 : Kostya\_43, PhatBacter\_45, xkcd\_46, Nimrod\_45, Phaux\_44, Murica\_44, Palpatine\_45, BigBubba\_43, FireRed\_45, Terminus\_44, Petra64142\_47, HufflyPuff\_44, Misfit\_44, Policronamos\_47, BugsBunny\_43
- Track 12 : Nala\_43, Rimmer\_43, MPhalcon\_42, MISSy\_42, Buck\_43, Youngblood\_44
- Track 13 : Qualification\_43
- Track 14 : Boomer\_81, Llij\_73, Rockne\_78, Phatniss\_74, PMC\_74
- Track 15 : DirtMcgirt\_76, UncleRicky\_76, Drago\_74, Enby\_78, Lorde\_77
- Track 16 : Bubbles123\_74, IrishSherpFalk\_79, WillSterrel\_78
- Track 17 : Chuckly\_76
- Track 18 : Ovechkin\_85
- Track 19 : Moonbeam\_87, Rialto\_90
- Track 20 : TDanisky\_93
- Track 21 : Ms6\_78
- Track 22 : Fancypants\_85
- Track 23 : Sabbb\_88
- Track 24 : BuzzLyseyear\_87
- Track 25 : Eradicator\_69
- Track 26 : Kersh\_88
- Track 27 : Demsculpinboyz\_94
- Track 28 : Che9d\_91
- Track 29 : Bagrid\_72, EricMillard\_72
- Track 30 : KashFlow\_71
- Track 31 : Courthouse\_75

- Track 32 : Thibault\_65, Constella\_64
- Track 33 : Klein\_78, Wanda\_82
- Track 34 : MadKillah\_102
- Track 35 : VasuNzinga\_9, Latretium\_78, MrPhizzler\_53, RedRaider77\_10, Rimu\_56, Fringe\_56, Gwilliam\_54, Lumine\_53
- Track 36 : Marvin\_10
- Track 37 : Caprice\_8

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

The start number called the most often in the published annotations is 20, it was called in 42 of the 93 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Ben11\_50, BigBubba\_43, Brilliant\_54, Buck\_43, BugsBunny\_43, Casbah\_50, Che9d\_91, Childish\_52, Constella\_64, Craff\_55, DaddyDaniels\_54, Fancypants\_85, FireRed\_45, Gervas\_51, HenryJackson\_52, HighStump\_54, HufflyPuff\_44, Kahve\_52, Klein\_78, Kostya\_43, Kronus\_50, Legolas\_54, Longacauda\_53, MISSy\_42, MPhalcon\_42, Misfit\_44, MmasiCarm\_51, Mortcellus\_50, Murica\_44, Nala\_43, Nimrod\_45, Obutu\_51, Palpatine\_45, Petra64142\_47, PhatBacter\_45, Phaux\_44, Phayeta\_52, Policronamos\_47, Quallification\_43, Rimmer\_43, Rita1961\_51, SlippinJimmy\_52, Soile\_53, Terminus\_44, Thibault\_65, Wanda\_82, Youngblood\_44, xkcd\_46,

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

- Ms6\_78, Ovechkin\_85,

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

- AFIS\_57, Bagrid\_72, Beatrix\_60, Bexan\_58, Bones\_60, Boomer\_81, Bubbles123\_74, BuzzLyseyear\_87, Caprice\_8, Chuckly\_76, Courthouse\_75, Cueyllyss\_61, Demsculpinboyz\_94, DirtMcgirt\_76, Drago\_74, Dreamboat\_62, Enby\_78, Eradicator\_69, EricMillard\_72, Fringe\_56, GageAP\_62, Graduation\_65, Gwilliam\_54, IrishSherpFalk\_79, Jasper\_61, KashFlow\_71, Kersh\_88, Latretium\_78, Llij\_73, Lorde\_77, Lumine\_53, MadKillah\_102, Makemake\_63, Marsha\_82, Marvin\_10, Moonbeam\_87, MrPhizzler\_53, NEHalo\_58, Ohno789\_61, PMC\_74, Phatniss\_74, PherrisBueller\_60, RedRaider77\_10, Rialto\_90, Rimu\_56, Rockne\_78, Sabbb\_88, Sandaddy\_57, ScoobyDoobyDoo\_2, Scowl\_62, Sorpresa\_56, SpikeBT\_59, StrongArm\_59, TDanisky\_93, UncleRicky\_76, VasuNzinga\_9, WillSterrel\_78,

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

Start 14:

- Found in 2 of 107 ( 1.9% ) of genes in pham
- Manual Annotations of this start: 1 of 93
- Called 50.0% of time when present
- Phage (with cluster) where this start called: Ovechkin\_85 (F1),

Start 19:

- Found in 16 of 107 ( 15.0% ) of genes in pham

- Manual Annotations of this start: 16 of 93
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Boomer\_81 (F1), Bubbles123\_74 (F1), Chuckly\_76 (F1), DirtMcgirt\_76 (F1), Drago\_74 (F1), Enby\_78 (F1), Eradicator\_69 (F1), IrishSherpFalk\_79 (F1), KashFlow\_71 (J), Llij\_73 (F1), Lorde\_77 (F1), PMC\_74 (F1), Phatniss\_74 (F1), Rockne\_78 (F1), UncleRicky\_76 (F1), WillSterrel\_78 (F1),

#### Start 20:

- Found in 50 of 107 ( 46.7% ) of genes in pham
- Manual Annotations of this start: 42 of 93
- Called 96.0% of time when present
- Phage (with cluster) where this start called: Ben11\_50 (B3), BigBubba\_43 (E), Brilliant\_54 (B1), Buck\_43 (E), BugsBunny\_43 (E), Casbah\_50 (B3), Che9d\_91 (F2), Childish\_52 (B1), Constella\_64 (J), Craff\_55 (B1), DaddyDaniels\_54 (B1), Fancypants\_85 (F1), FireRed\_45 (E), Gervas\_51 (B3), HenryJackson\_52 (B1), HighStump\_54 (B1), HufflyPuff\_44 (E), Kahve\_52 (B1), Klein\_78 (J), Kostya\_43 (E), Kronus\_50 (B3), Legolas\_54 (B1), Longacauda\_53 (B1), MISSy\_42 (E), MPhalcon\_42 (E), Misfit\_44 (E), MmasiCarm\_51 (B3), Mortcellus\_50 (B3), Murica\_44 (E), Nala\_43 (E), Nimrod\_45 (E), Obutu\_51 (B3), Palpatine\_45 (E), Petra64142\_47 (E), PhatBacter\_45 (E), Phaux\_44 (E), Phayeta\_52 (B3), Policronamos\_47 (E), Quallification\_43 (E), Rimmer\_43 (E), Rita1961\_51 (B3), SlippinJimmy\_52 (B3), Soile\_53 (B1), Terminus\_44 (E), Thibault\_65 (J), Wanda\_82 (J), Youngblood\_44 (E), xkcd\_46 (E),

#### Start 26:

- Found in 1 of 107 ( 0.9% ) of genes in pham
- No Manual Annotations of this start.
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Caprice\_8 (S),

#### Start 27:

- Found in 1 of 107 ( 0.9% ) of genes in pham
- Manual Annotations of this start: 1 of 93
- Called 100.0% of time when present
- Phage (with cluster) where this start called: BuzzLyseyear\_87 (F1),

#### Start 28:

- Found in 39 of 107 ( 36.4% ) of genes in pham
- Manual Annotations of this start: 33 of 93
- Called 100.0% of time when present
- Phage (with cluster) where this start called: AFIS\_57 (A1), Bagrid\_72 (J), Beatrix\_60 (A1), Bexan\_58 (A1), Bones\_60 (A1), Courthouse\_75 (J), Cueylyss\_61 (A1), Demsculpinboyz\_94 (F2), Dreamboat\_62 (A1), EricMillard\_72 (J), Fringe\_56 (B1), GageAP\_62 (A1), Graduation\_65 (A1), Gwilliam\_54 (B1), Jasper\_61 (A1), Kersh\_88 (F1), Latretium\_78 (F1), Lumine\_53 (B1), MadKillah\_102 (O), Makemake\_63 (A1), Marsha\_82 (A1), Marvin\_10 (S), Moonbeam\_87 (F1), MrPhizzler\_53 (B1), NEHalo\_58 (A1), Ohno789\_61 (A1), PherrisBueller\_60 (A1), RedRaider77\_10 (S), Rialto\_90 (F1), Rimu\_56 (B1), Sabbb\_88 (F1), Sandaddy\_57 (A1), ScoobyDoobyDoo\_2 (C2), Scowl\_62 (A1), Sorpresa\_56 (A1), SpikeBT\_59 (A1), StrongArm\_59 (A1), TDanisky\_93 (F1), VasuNzinga\_9 (S),

#### Start 31:

- Found in 16 of 107 ( 15.0% ) of genes in pham

- No Manual Annotations of this start.
- Called 6.2% of time when present
- Phage (with cluster) where this start called: Ms6\_78 (F1),

### **Summary by clusters:**

There are 10 clusters represented in this pham: F1, F2, E, J, O, A1, S, B1, B3, C2,

Info for manual annotations of cluster A1:

- Start number 28 was manually annotated 17 times for cluster A1.

Info for manual annotations of cluster B1:

- Start number 20 was manually annotated 10 times for cluster B1.
- Start number 28 was manually annotated 2 times for cluster B1.

Info for manual annotations of cluster B3:

- Start number 20 was manually annotated 8 times for cluster B3.

Info for manual annotations of cluster C2:

- Start number 28 was manually annotated 1 time for cluster C2.

Info for manual annotations of cluster E:

- Start number 20 was manually annotated 18 times for cluster E.

Info for manual annotations of cluster F1:

- Start number 14 was manually annotated 1 time for cluster F1.
- Start number 19 was manually annotated 15 times for cluster F1.
- Start number 20 was manually annotated 1 time for cluster F1.
- Start number 27 was manually annotated 1 time for cluster F1.
- Start number 28 was manually annotated 6 times for cluster F1.

Info for manual annotations of cluster F2:

- Start number 20 was manually annotated 1 time for cluster F2.
- Start number 28 was manually annotated 1 time for cluster F2.

Info for manual annotations of cluster J:

- Start number 19 was manually annotated 1 time for cluster J.
- Start number 20 was manually annotated 4 times for cluster J.
- Start number 28 was manually annotated 2 times for cluster J.

Info for manual annotations of cluster O:

- Start number 28 was manually annotated 1 time for cluster O.

Info for manual annotations of cluster S:

- Start number 28 was manually annotated 3 times for cluster S.

### **Gene Information:**

Gene: AFIS\_57 Start: 39716, Stop: 39357, Start Num: 28

Candidate Starts for AFIS\_57:

(2, 39917), (16, 39773), (17, 39770), (Start: 28 @39716 has 33 MA's), (29, 39704), (39, 39569), (41, 39533), (42, 39527), (51, 39395),

Gene: Bagrid\_72 Start: 50124, Stop: 49711, Start Num: 28

Candidate Starts for Bagrid\_72:

(Start: 28 @50124 has 33 MA's), (29, 50112), (34, 50028), (35, 50010), (39, 49932), (41, 49896), (42, 49890), (51, 49758),

Gene: Beatrix\_60 Start: 41870, Stop: 41490, Start Num: 28

Candidate Starts for Beatrix\_60:

(2, 42071), (16, 41927), (17, 41924), (Start: 28 @41870 has 33 MA's), (29, 41858), (39, 41702), (41, 41666), (42, 41660), (51, 41528),

Gene: Ben11\_50 Start: 45429, Stop: 44986, Start Num: 20

Candidate Starts for Ben11\_50:

(Start: 20 @45429 has 42 MA's), (23, 45417), (33, 45297), (37, 45267), (39, 45207), (41, 45171), (42, 45165), (51, 45033),

Gene: Bexan\_58 Start: 41649, Stop: 41269, Start Num: 28

Candidate Starts for Bexan\_58:

(16, 41706), (17, 41703), (Start: 28 @41649 has 33 MA's), (29, 41637), (39, 41481), (41, 41445), (42, 41439), (51, 41307),

Gene: BigBubba\_43 Start: 35101, Stop: 34667, Start Num: 20

Candidate Starts for BigBubba\_43:

(9, 35173), (Start: 20 @35101 has 42 MA's), (23, 35089), (37, 34939), (39, 34879),

Gene: Bones\_60 Start: 41965, Stop: 41585, Start Num: 28

Candidate Starts for Bones\_60:

(1, 42175), (2, 42166), (16, 42022), (17, 42019), (Start: 28 @41965 has 33 MA's), (29, 41953), (39, 41797), (41, 41761), (42, 41755), (51, 41623),

Gene: Boomer\_81 Start: 48708, Stop: 49136, Start Num: 19

Candidate Starts for Boomer\_81:

(Start: 19 @48708 has 16 MA's), (23, 48723), (31, 48777), (37, 48870), (39, 48930), (52, 49107),

Gene: Brilliant\_54 Start: 47338, Stop: 46895, Start Num: 20

Candidate Starts for Brilliant\_54:

(Start: 20 @47338 has 42 MA's), (23, 47326), (33, 47206), (37, 47176), (39, 47116), (41, 47080), (42, 47074), (51, 46942),

Gene: Bubbles123\_74 Start: 48058, Stop: 48471, Start Num: 19

Candidate Starts for Bubbles123\_74:

(Start: 19 @48058 has 16 MA's), (23, 48073), (39, 48229), (46, 48316), (47, 48322), (48, 48346), (50, 48409), (52, 48448),

Gene: Buck\_43 Start: 35755, Stop: 35318, Start Num: 20

Candidate Starts for Buck\_43:

(10, 35827), (Start: 20 @35755 has 42 MA's), (23, 35743), (37, 35593), (39, 35533), (41, 35497), (42, 35491), (51, 35359),

Gene: BugsBunny\_43 Start: 35586, Stop: 35152, Start Num: 20

Candidate Starts for BugsBunny\_43:

(9, 35658), (Start: 20 @35586 has 42 MA's), (23, 35574), (37, 35424), (39, 35364),

Gene: BuzzLyseyear\_87 Start: 51492, Stop: 51857, Start Num: 27

Candidate Starts for BuzzLyseyear\_87:

(Start: 27 @51492 has 1 MA's), (29, 51507), (39, 51642), (41, 51678), (42, 51684), (51, 51816),

Gene: Caprice\_8 Start: 2539, Stop: 2922, Start Num: 26

Candidate Starts for Caprice\_8:

(26, 2539), (29, 2554), (39, 2710), (41, 2746), (42, 2752), (51, 2884),

Gene: Casbah\_50 Start: 45459, Stop: 45016, Start Num: 20

Candidate Starts for Casbah\_50:

(Start: 20 @45459 has 42 MA's), (23, 45447), (33, 45327), (37, 45297), (39, 45237), (41, 45201), (42, 45195), (51, 45063),

Gene: Che9d\_91 Start: 48600, Stop: 49028, Start Num: 20

Candidate Starts for Che9d\_91:

(Start: 20 @48600 has 42 MA's), (23, 48612), (30, 48666), (39, 48810),

Gene: Childish\_52 Start: 47365, Stop: 46922, Start Num: 20

Candidate Starts for Childish\_52:

(Start: 20 @47365 has 42 MA's), (23, 47353), (33, 47233), (37, 47203), (39, 47143), (41, 47107), (42, 47101), (51, 46969),

Gene: Chuckly\_76 Start: 45511, Stop: 45978, Start Num: 19

Candidate Starts for Chuckly\_76:

(Start: 19 @45511 has 16 MA's), (23, 45526), (31, 45580), (37, 45673), (46, 45820), (47, 45826), (48, 45850), (50, 45913), (52, 45949),

Gene: Constella\_64 Start: 46367, Stop: 45930, Start Num: 20

Candidate Starts for Constella\_64:

(Start: 20 @46367 has 42 MA's), (37, 46205), (38, 46202), (39, 46145), (41, 46109), (42, 46103), (51, 45971),

Gene: Courthouse\_75 Start: 48166, Stop: 47780, Start Num: 28

Candidate Starts for Courthouse\_75:

(Start: 28 @48166 has 33 MA's), (29, 48154), (39, 47998), (41, 47962), (42, 47956), (51, 47824),

Gene: Craff\_55 Start: 47790, Stop: 47347, Start Num: 20

Candidate Starts for Craff\_55:

(Start: 20 @47790 has 42 MA's), (23, 47778), (33, 47658), (37, 47628), (39, 47568), (41, 47532), (42, 47526), (51, 47394),

Gene: Cueyllyss\_61 Start: 42165, Stop: 41785, Start Num: 28

Candidate Starts for Cueyllyss\_61:

(2, 42366), (16, 42222), (17, 42219), (Start: 28 @42165 has 33 MA's), (29, 42153), (39, 41997), (41, 41961), (42, 41955), (51, 41823),

Gene: DaddyDaniels\_54 Start: 47322, Stop: 46879, Start Num: 20

Candidate Starts for DaddyDaniels\_54:

(Start: 20 @47322 has 42 MA's), (23, 47310), (33, 47190), (37, 47160), (39, 47100), (41, 47064), (42, 47058), (51, 46926),

Gene: Demsculpinboyz\_94 Start: 48157, Stop: 48546, Start Num: 28  
Candidate Starts for Demsculpinboyz\_94:  
(8, 48034), (22, 48127), (25, 48136), (Start: 28 @48157 has 33 MA's), (39, 48325), (41, 48361), (42, 48367), (51, 48499),

Gene: DirtMcgirt\_76 Start: 45318, Stop: 45746, Start Num: 19  
Candidate Starts for DirtMcgirt\_76:  
(Start: 19 @45318 has 16 MA's), (23, 45333), (31, 45387), (37, 45480), (39, 45540), (52, 45717),

Gene: Drago\_74 Start: 45321, Stop: 45749, Start Num: 19  
Candidate Starts for Drago\_74:  
(Start: 19 @45321 has 16 MA's), (23, 45336), (31, 45390), (37, 45483), (39, 45543), (52, 45720),

Gene: Dreamboat\_62 Start: 40065, Stop: 39685, Start Num: 28  
Candidate Starts for Dreamboat\_62:  
(2, 40266), (16, 40122), (17, 40119), (Start: 28 @40065 has 33 MA's), (29, 40053), (39, 39897), (41, 39861), (42, 39855), (51, 39723),

Gene: Enby\_78 Start: 45597, Stop: 46025, Start Num: 19  
Candidate Starts for Enby\_78:  
(Start: 19 @45597 has 16 MA's), (23, 45612), (31, 45666), (37, 45759), (39, 45819), (52, 45996),

Gene: Eradicator\_69 Start: 46041, Stop: 46469, Start Num: 19  
Candidate Starts for Eradicator\_69:  
(Start: 19 @46041 has 16 MA's), (23, 46056), (31, 46110), (37, 46203), (39, 46263), (52, 46440),

Gene: EricMillard\_72 Start: 50977, Stop: 50564, Start Num: 28  
Candidate Starts for EricMillard\_72:  
(Start: 28 @50977 has 33 MA's), (29, 50965), (34, 50881), (35, 50863), (39, 50785), (41, 50749), (42, 50743), (51, 50611),

Gene: Fancypants\_85 Start: 50404, Stop: 50835, Start Num: 20  
Candidate Starts for Fancypants\_85:  
(Start: 20 @50404 has 42 MA's), (36, 50548), (43, 50683),

Gene: FireRed\_45 Start: 36025, Stop: 35591, Start Num: 20  
Candidate Starts for FireRed\_45:  
(9, 36097), (Start: 20 @36025 has 42 MA's), (23, 36013), (37, 35863), (39, 35803),

Gene: Fringe\_56 Start: 48267, Stop: 47878, Start Num: 28  
Candidate Starts for Fringe\_56:  
(Start: 28 @48267 has 33 MA's), (29, 48255), (39, 48099), (41, 48063), (42, 48057), (51, 47925),

Gene: GageAP\_62 Start: 41383, Stop: 41024, Start Num: 28  
Candidate Starts for GageAP\_62:  
(2, 41584), (16, 41440), (17, 41437), (Start: 28 @41383 has 33 MA's), (29, 41371), (39, 41236), (41, 41200), (42, 41194), (51, 41062),

Gene: Gervas\_51 Start: 45588, Stop: 45145, Start Num: 20  
Candidate Starts for Gervas\_51:  
(Start: 20 @45588 has 42 MA's), (23, 45576), (33, 45456), (37, 45426), (39, 45366), (41, 45330), (42, 45324), (51, 45192),



Gene: Graduation\_65 Start: 42237, Stop: 41857, Start Num: 28  
Candidate Starts for Graduation\_65:  
(2, 42438), (16, 42294), (17, 42291), (Start: 28 @42237 has 33 MA's), (29, 42225), (39, 42069), (41, 42033), (42, 42027), (51, 41895),

Gene: Gwilliam\_54 Start: 47683, Stop: 47303, Start Num: 28  
Candidate Starts for Gwilliam\_54:  
(Start: 28 @47683 has 33 MA's), (29, 47671), (39, 47515), (41, 47479), (42, 47473), (51, 47341),

Gene: HenryJackson\_52 Start: 47354, Stop: 46911, Start Num: 20  
Candidate Starts for HenryJackson\_52:  
(Start: 20 @47354 has 42 MA's), (23, 47342), (33, 47222), (37, 47192), (39, 47132), (41, 47096), (42, 47090), (51, 46958),

Gene: HighStump\_54 Start: 47890, Stop: 47447, Start Num: 20  
Candidate Starts for HighStump\_54:  
(10, 47962), (12, 47941), (13, 47935), (Start: 20 @47890 has 42 MA's), (23, 47878), (33, 47758), (37, 47728), (39, 47668), (41, 47632), (42, 47626), (51, 47494),

Gene: HufflyPuff\_44 Start: 35981, Stop: 35547, Start Num: 20  
Candidate Starts for HufflyPuff\_44:  
(9, 36053), (Start: 20 @35981 has 42 MA's), (23, 35969), (37, 35819), (39, 35759),

Gene: IrishSherpFalk\_79 Start: 48781, Stop: 49194, Start Num: 19  
Candidate Starts for IrishSherpFalk\_79:  
(Start: 19 @48781 has 16 MA's), (23, 48796), (39, 48952), (46, 49039), (47, 49045), (48, 49069), (50, 49132), (52, 49171),

Gene: Jasper\_61 Start: 39951, Stop: 39571, Start Num: 28  
Candidate Starts for Jasper\_61:  
(2, 40152), (16, 40008), (17, 40005), (Start: 28 @39951 has 33 MA's), (29, 39939), (39, 39783), (41, 39747), (42, 39741), (51, 39609),

Gene: Kahve\_52 Start: 47351, Stop: 46908, Start Num: 20  
Candidate Starts for Kahve\_52:  
(Start: 20 @47351 has 42 MA's), (23, 47339), (33, 47219), (37, 47189), (39, 47129), (41, 47093), (42, 47087), (51, 46955),

Gene: KashFlow\_71 Start: 46755, Stop: 46327, Start Num: 19  
Candidate Starts for KashFlow\_71:  
(Start: 19 @46755 has 16 MA's), (23, 46740), (31, 46686), (37, 46593), (39, 46533), (52, 46356),

Gene: Kersh\_88 Start: 52115, Stop: 52522, Start Num: 28  
Candidate Starts for Kersh\_88:  
(3, 51941), (4, 51950), (5, 51974), (21, 52085), (24, 52094), (Start: 28 @52115 has 33 MA's), (32, 52172), (34, 52211), (39, 52307), (41, 52343), (42, 52349), (51, 52481),

Gene: Klein\_78 Start: 51350, Stop: 50925, Start Num: 20  
Candidate Starts for Klein\_78:  
(Start: 20 @51350 has 42 MA's), (23, 51338), (31, 51284), (37, 51191), (39, 51131), (52, 50954),

Gene: Kostya\_43 Start: 35472, Stop: 35038, Start Num: 20  
Candidate Starts for Kostya\_43:

(9, 35544), (Start: 20 @35472 has 42 MA's), (23, 35460), (37, 35310), (39, 35250),

Gene: Kronus\_50 Start: 46191, Stop: 45748, Start Num: 20

Candidate Starts for Kronus\_50:

(Start: 20 @46191 has 42 MA's), (23, 46179), (33, 46059), (37, 46029), (39, 45969), (41, 45933), (42, 45927), (51, 45795),

Gene: Latretium\_78 Start: 47174, Stop: 47560, Start Num: 28

Candidate Starts for Latretium\_78:

(Start: 28 @47174 has 33 MA's), (29, 47186), (39, 47342), (41, 47378), (42, 47384), (51, 47516),

Gene: Legolas\_54 Start: 47787, Stop: 47344, Start Num: 20

Candidate Starts for Legolas\_54:

(10, 47859), (12, 47838), (13, 47832), (Start: 20 @47787 has 42 MA's), (23, 47775), (33, 47655), (37, 47625), (39, 47565), (41, 47529), (42, 47523), (51, 47391),

Gene: Llij\_73 Start: 45475, Stop: 45903, Start Num: 19

Candidate Starts for Llij\_73:

(Start: 19 @45475 has 16 MA's), (23, 45490), (31, 45544), (37, 45637), (39, 45697), (52, 45874),

Gene: Longacauda\_53 Start: 47750, Stop: 47307, Start Num: 20

Candidate Starts for Longacauda\_53:

(10, 47822), (12, 47801), (13, 47795), (Start: 20 @47750 has 42 MA's), (23, 47738), (33, 47618), (37, 47588), (39, 47528), (41, 47492), (42, 47486), (51, 47354),

Gene: Lorde\_77 Start: 44762, Stop: 45190, Start Num: 19

Candidate Starts for Lorde\_77:

(Start: 19 @44762 has 16 MA's), (23, 44777), (31, 44831), (37, 44924), (39, 44984), (52, 45161),

Gene: Lumine\_53 Start: 47538, Stop: 47155, Start Num: 28

Candidate Starts for Lumine\_53:

(Start: 28 @47538 has 33 MA's), (29, 47526), (39, 47370), (41, 47334), (42, 47328), (51, 47196),

Gene: MISSy\_42 Start: 35034, Stop: 34591, Start Num: 20

Candidate Starts for MISSy\_42:

(10, 35106), (Start: 20 @35034 has 42 MA's), (23, 35022), (37, 34872), (39, 34812), (41, 34776), (42, 34770), (51, 34638),

Gene: MPhalcon\_42 Start: 35027, Stop: 34584, Start Num: 20

Candidate Starts for MPhalcon\_42:

(10, 35099), (Start: 20 @35027 has 42 MA's), (23, 35015), (37, 34865), (39, 34805), (41, 34769), (42, 34763), (51, 34631),

Gene: MadKillah\_102 Start: 61818, Stop: 61405, Start Num: 28

Candidate Starts for MadKillah\_102:

(6, 61950), (Start: 14 @61890 has 1 MA's), (18, 61869), (Start: 28 @61818 has 33 MA's), (32, 61761), (34, 61722), (39, 61626), (41, 61590), (42, 61584), (51, 61452),

Gene: Makemake\_63 Start: 42339, Stop: 41959, Start Num: 28

Candidate Starts for Makemake\_63:

(2, 42540), (16, 42396), (17, 42393), (Start: 28 @42339 has 33 MA's), (29, 42327), (39, 42171), (41, 42135), (42, 42129), (51, 41997),

Gene: Marsha\_82 Start: 50494, Stop: 50108, Start Num: 28

Candidate Starts for Marsha\_82:

(Start: 28 @50494 has 33 MA's), (29, 50482), (39, 50326), (41, 50290), (42, 50284), (51, 50152),

Gene: Marvin\_10 Start: 3597, Stop: 3977, Start Num: 28

Candidate Starts for Marvin\_10:

(11, 3501), (15, 3525), (Start: 28 @3597 has 33 MA's), (29, 3609), (39, 3765), (41, 3801), (42, 3807), (51, 3939),

Gene: Misfit\_44 Start: 36046, Stop: 35612, Start Num: 20

Candidate Starts for Misfit\_44:

(9, 36118), (Start: 20 @36046 has 42 MA's), (23, 36034), (37, 35884), (39, 35824),

Gene: MmasiCarm\_51 Start: 45638, Stop: 45195, Start Num: 20

Candidate Starts for MmasiCarm\_51:

(Start: 20 @45638 has 42 MA's), (23, 45626), (33, 45506), (37, 45476), (39, 45416), (41, 45380), (42, 45374), (51, 45242),

Gene: Moonbeam\_87 Start: 50558, Stop: 50971, Start Num: 28

Candidate Starts for Moonbeam\_87:

(7, 50435), (21, 50528), (24, 50537), (Start: 28 @50558 has 33 MA's), (32, 50615), (34, 50654), (39, 50750), (41, 50786), (42, 50792), (51, 50924),

Gene: Mortcellus\_50 Start: 46245, Stop: 45802, Start Num: 20

Candidate Starts for Mortcellus\_50:

(Start: 20 @46245 has 42 MA's), (23, 46233), (33, 46113), (37, 46083), (39, 46023), (41, 45987), (42, 45981), (51, 45849),

Gene: MrPhizzler\_53 Start: 47284, Stop: 46895, Start Num: 28

Candidate Starts for MrPhizzler\_53:

(Start: 28 @47284 has 33 MA's), (29, 47272), (39, 47116), (41, 47080), (42, 47074), (51, 46942),

Gene: Ms6\_78 Start: 44647, Stop: 45045, Start Num: 31

Candidate Starts for Ms6\_78:

(Start: 20 @44581 has 42 MA's), (23, 44593), (31, 44647), (37, 44740), (46, 44887), (47, 44893), (48, 44917), (52, 45016),

Gene: Murica\_44 Start: 35981, Stop: 35547, Start Num: 20

Candidate Starts for Murica\_44:

(9, 36053), (Start: 20 @35981 has 42 MA's), (23, 35969), (37, 35819), (39, 35759),

Gene: NEHalo\_58 Start: 40784, Stop: 40425, Start Num: 28

Candidate Starts for NEHalo\_58:

(2, 40985), (16, 40841), (17, 40838), (Start: 28 @40784 has 33 MA's), (29, 40772), (39, 40637), (41, 40601), (42, 40595), (51, 40463),

Gene: Nala\_43 Start: 35539, Stop: 35096, Start Num: 20

Candidate Starts for Nala\_43:

(10, 35611), (Start: 20 @35539 has 42 MA's), (23, 35527), (37, 35377), (39, 35317), (41, 35281), (42, 35275), (51, 35143),

Gene: Nimrod\_45 Start: 36239, Stop: 35805, Start Num: 20

Candidate Starts for Nimrod\_45:

(9, 36311), (Start: 20 @36239 has 42 MA's), (23, 36227), (37, 36077), (39, 36017),

Gene: Obutu\_51 Start: 45593, Stop: 45150, Start Num: 20

Candidate Starts for Obutu\_51:

(Start: 20 @45593 has 42 MA's), (23, 45581), (33, 45461), (37, 45431), (39, 45371), (41, 45335), (42, 45329), (51, 45197),

Gene: Ohno789\_61 Start: 41528, Stop: 41148, Start Num: 28

Candidate Starts for Ohno789\_61:

(2, 41729), (16, 41585), (17, 41582), (Start: 28 @41528 has 33 MA's), (29, 41516), (39, 41360), (41, 41324), (42, 41318), (51, 41186),

Gene: Ovechkin\_85 Start: 49845, Stop: 50309, Start Num: 14

Candidate Starts for Ovechkin\_85:

(Start: 14 @49845 has 1 MA's), (Start: 20 @49878 has 42 MA's), (36, 50022), (39, 50094), (43, 50157),

Gene: PMC\_74 Start: 46932, Stop: 47360, Start Num: 19

Candidate Starts for PMC\_74:

(Start: 19 @46932 has 16 MA's), (23, 46947), (31, 47001), (37, 47094), (39, 47154), (52, 47331),

Gene: Palpatine\_45 Start: 36011, Stop: 35577, Start Num: 20

Candidate Starts for Palpatine\_45:

(9, 36083), (Start: 20 @36011 has 42 MA's), (23, 35999), (37, 35849), (39, 35789),

Gene: Petra64142\_47 Start: 36475, Stop: 36041, Start Num: 20

Candidate Starts for Petra64142\_47:

(9, 36547), (Start: 20 @36475 has 42 MA's), (23, 36463), (37, 36313), (39, 36253),

Gene: PhatBacter\_45 Start: 36025, Stop: 35591, Start Num: 20

Candidate Starts for PhatBacter\_45:

(9, 36097), (Start: 20 @36025 has 42 MA's), (23, 36013), (37, 35863), (39, 35803),

Gene: Phatniss\_74 Start: 46570, Stop: 46998, Start Num: 19

Candidate Starts for Phatniss\_74:

(Start: 19 @46570 has 16 MA's), (23, 46585), (31, 46639), (37, 46732), (39, 46792), (52, 46969),

Gene: Phaux\_44 Start: 36023, Stop: 35589, Start Num: 20

Candidate Starts for Phaux\_44:

(9, 36095), (Start: 20 @36023 has 42 MA's), (23, 36011), (37, 35861), (39, 35801),

Gene: Phayeta\_52 Start: 45475, Stop: 45032, Start Num: 20

Candidate Starts for Phayeta\_52:

(Start: 20 @45475 has 42 MA's), (23, 45463), (33, 45343), (37, 45313), (39, 45253), (41, 45217), (42, 45211), (51, 45079),

Gene: PherrisBueller\_60 Start: 39602, Stop: 39222, Start Num: 28

Candidate Starts for PherrisBueller\_60:

(2, 39803), (16, 39659), (17, 39656), (Start: 28 @39602 has 33 MA's), (29, 39590), (39, 39434), (41, 39398), (42, 39392), (51, 39260),

Gene: Policronamos\_47 Start: 36023, Stop: 35589, Start Num: 20

Candidate Starts for Policronamos\_47:

(9, 36095), (Start: 20 @36023 has 42 MA's), (23, 36011), (37, 35861), (39, 35801),

Gene: Quallification\_43 Start: 35661, Stop: 35215, Start Num: 20

Candidate Starts for Quallification\_43:

(9, 35733), (Start: 20 @35661 has 42 MA's), (23, 35649), (37, 35499), (39, 35439), (40, 35409), (44, 35370), (45, 35367),

Gene: RedRaider77\_10 Start: 3149, Stop: 3538, Start Num: 28

Candidate Starts for RedRaider77\_10:

(Start: 28 @3149 has 33 MA's), (29, 3161), (39, 3317), (41, 3353), (42, 3359), (51, 3491),

Gene: Rialto\_90 Start: 50654, Stop: 51067, Start Num: 28

Candidate Starts for Rialto\_90:

(7, 50531), (21, 50624), (24, 50633), (Start: 28 @50654 has 33 MA's), (32, 50711), (34, 50750), (39, 50846), (41, 50882), (42, 50888), (51, 51020),

Gene: Rimmer\_43 Start: 35365, Stop: 34928, Start Num: 20

Candidate Starts for Rimmer\_43:

(10, 35437), (Start: 20 @35365 has 42 MA's), (23, 35353), (37, 35203), (39, 35143), (41, 35107), (42, 35101), (51, 34969),

Gene: Rimu\_56 Start: 47304, Stop: 46915, Start Num: 28

Candidate Starts for Rimu\_56:

(Start: 28 @47304 has 33 MA's), (29, 47292), (39, 47136), (41, 47100), (42, 47094), (51, 46962),

Gene: Rita1961\_51 Start: 45594, Stop: 45151, Start Num: 20

Candidate Starts for Rita1961\_51:

(Start: 20 @45594 has 42 MA's), (23, 45582), (33, 45462), (37, 45432), (39, 45372), (41, 45336), (42, 45330), (51, 45198),

Gene: Rockne\_78 Start: 46944, Stop: 47372, Start Num: 19

Candidate Starts for Rockne\_78:

(Start: 19 @46944 has 16 MA's), (23, 46959), (31, 47013), (37, 47106), (39, 47166), (52, 47343),

Gene: Sabbb\_88 Start: 48209, Stop: 48622, Start Num: 28

Candidate Starts for Sabbb\_88:

(3, 48035), (4, 48044), (5, 48068), (7, 48086), (21, 48179), (24, 48188), (Start: 28 @48209 has 33 MA's), (32, 48266), (34, 48305), (39, 48401), (41, 48437), (42, 48443), (51, 48575),

Gene: Sandaddy\_57 Start: 40445, Stop: 40086, Start Num: 28

Candidate Starts for Sandaddy\_57:

(2, 40646), (16, 40502), (17, 40499), (Start: 28 @40445 has 33 MA's), (29, 40433), (39, 40298), (41, 40262), (42, 40256), (51, 40124),

Gene: ScoobyDoobyDoo\_2 Start: 227, Stop: 613, Start Num: 28

Candidate Starts for ScoobyDoobyDoo\_2:

(Start: 28 @227 has 33 MA's), (29, 239), (39, 395), (41, 431), (42, 437), (49, 515), (51, 569),

Gene: Scowl\_62 Start: 40833, Stop: 40453, Start Num: 28

Candidate Starts for Scowl\_62:

(16, 40890), (17, 40887), (Start: 28 @40833 has 33 MA's), (29, 40821), (39, 40665), (41, 40629), (42, 40623), (51, 40491),

Gene: SlippinJimmy\_52 Start: 46376, Stop: 45933, Start Num: 20  
Candidate Starts for SlippinJimmy\_52:  
(Start: 20 @46376 has 42 MA's), (23, 46364), (33, 46244), (37, 46214), (39, 46154), (41, 46118), (42, 46112), (51, 45980),

Gene: Soile\_53 Start: 47351, Stop: 46908, Start Num: 20  
Candidate Starts for Soile\_53:  
(Start: 20 @47351 has 42 MA's), (23, 47339), (33, 47219), (37, 47189), (39, 47129), (41, 47093), (42, 47087), (51, 46955),

Gene: Sorpresa\_56 Start: 40447, Stop: 40088, Start Num: 28  
Candidate Starts for Sorpresa\_56:  
(2, 40648), (16, 40504), (17, 40501), (Start: 28 @40447 has 33 MA's), (29, 40435), (39, 40300), (41, 40264), (42, 40258), (51, 40126),

Gene: SpikeBT\_59 Start: 40641, Stop: 40282, Start Num: 28  
Candidate Starts for SpikeBT\_59:  
(2, 40842), (16, 40698), (17, 40695), (Start: 28 @40641 has 33 MA's), (29, 40629), (39, 40494), (41, 40458), (42, 40452), (51, 40320),

Gene: StrongArm\_59 Start: 41777, Stop: 41397, Start Num: 28  
Candidate Starts for StrongArm\_59:  
(16, 41834), (17, 41831), (Start: 28 @41777 has 33 MA's), (29, 41765), (39, 41609), (41, 41573), (42, 41567), (51, 41435),

Gene: TDanisky\_93 Start: 48927, Stop: 49307, Start Num: 28  
Candidate Starts for TDanisky\_93:  
(Start: 28 @48927 has 33 MA's), (39, 49092), (41, 49128), (42, 49134), (51, 49266),

Gene: Terminus\_44 Start: 36046, Stop: 35612, Start Num: 20  
Candidate Starts for Terminus\_44:  
(9, 36118), (Start: 20 @36046 has 42 MA's), (23, 36034), (37, 35884), (39, 35824),

Gene: Thibault\_65 Start: 47312, Stop: 46869, Start Num: 20  
Candidate Starts for Thibault\_65:  
(Start: 20 @47312 has 42 MA's), (37, 47150), (38, 47147), (39, 47090), (41, 47054), (42, 47048), (51, 46916),

Gene: UncleRicky\_76 Start: 46818, Stop: 47246, Start Num: 19  
Candidate Starts for UncleRicky\_76:  
(Start: 19 @46818 has 16 MA's), (23, 46833), (31, 46887), (37, 46980), (39, 47040), (52, 47217),

Gene: VasuNzinga\_9 Start: 2804, Stop: 3184, Start Num: 28  
Candidate Starts for VasuNzinga\_9:  
(Start: 28 @2804 has 33 MA's), (29, 2816), (39, 2972), (41, 3008), (42, 3014), (51, 3146),

Gene: Wanda\_82 Start: 51659, Stop: 51234, Start Num: 20  
Candidate Starts for Wanda\_82:  
(Start: 20 @51659 has 42 MA's), (23, 51647), (31, 51593), (37, 51500), (39, 51440), (52, 51263),

Gene: WillSterrel\_78 Start: 48814, Stop: 49227, Start Num: 19  
Candidate Starts for WillSterrel\_78:

(Start: 19 @48814 has 16 MA's), (23, 48829), (39, 48985), (46, 49072), (47, 49078), (48, 49102), (50, 49165), (52, 49204),

Gene: Youngblood\_44 Start: 35976, Stop: 35539, Start Num: 20

Candidate Starts for Youngblood\_44:

(10, 36048), (Start: 20 @35976 has 42 MA's), (23, 35964), (37, 35814), (39, 35754), (41, 35718), (42, 35712), (51, 35580),

Gene: xkcd\_46 Start: 36166, Stop: 35732, Start Num: 20

Candidate Starts for xkcd\_46:

(9, 36238), (Start: 20 @36166 has 42 MA's), (23, 36154), (37, 36004), (39, 35944),