



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 224445 Report

This analysis was run 03/28/25 on database version 593.

Pham number 224445 has 105 members, 22 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, Cueyllyss\_61, Ohno789\_61, Graduation\_65, PherrisBueller\_60, Jasper\_61
- Track 5 : Marsha\_82
- Track 6 : Sandaddy\_57, Sorpresa\_58
- Track 7 : Beatrix\_60
- Track 8 : HighStump\_54, Iridessa\_54, Longacauda\_53, Legolas\_54, Orwigg\_52
- Track 9 : Nicole21\_53
- Track 10 : SwainyDoc\_51, DaddyDaniels\_54, Chentzyk\_51, 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, Marlia\_51, Rita1961\_51, Craff\_55, TinyTerror\_51, SlippinJimmy\_52
- Track 11 : DeejaClivia\_12
- Track 12 : JigglyPuff\_6
- Track 13 : ScoobyDoobyDoo\_2
- Track 14 : MPhalcon\_42, StormChicken\_44, Nala\_43, MISSy\_42, Rimmer\_43, Becksu\_43, Buck\_43, Youngblood\_44
- Track 15 : FairyPath\_42, Quallification\_43
- Track 16 : Chuckly\_76
- Track 17 : Harley\_78
- Track 18 : Slim\_86, Emmaloid\_86, Sabbb\_88
- Track 19 : Ovechkin\_85
- Track 20 : Moonbeam\_87, Rialto\_90
- Track 21 : TDanisky\_93
- Track 22 : Fancypants\_85
- Track 23 : Kersh\_88
- Track 24 : Demsculpinboyz\_94
- Track 25 : Che9d\_91
- Track 26 : Superphikiman\_71, Kalah2\_68, Redno2\_70, Ejimix\_73, Squint\_74, Beem\_73, JuicyJay\_72, NihilNomen\_74, Phoebus\_76, DmpstrDiver\_73, Odette\_72, HokkenD\_66, Porcelain\_73, MiaZeal\_74, Halley\_75, Dallas\_72, Ariel\_73
- Track 27 : Bagrid\_72, EricMillard\_72
- Track 28 : Thibault\_65
- Track 29 : Shaboozey\_74
- Track 30 : MadKillah\_102

- Track 31 : VasuNzinga\_9, Latretium\_78, MrPhizzler\_53, RedRaider77\_10, Rimu\_56, Fringe\_56, Lumine\_53, Khan1\_53, Gwilliam\_53
- Track 32 : Marvin\_10
- Track 33 : 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 22, it was called in 46 of the 83 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Ariel\_73, Becksu\_43, Beem\_73, Ben11\_50, Brilliant\_54, Buck\_43, Casbah\_50, Che9d\_91, Chentzyk\_51, Childish\_52, Craff\_55, DaddyDaniels\_54, Dallas\_72, DmpstrDiver\_73, Ejimix\_73, FairyPath\_42, Fancypants\_85, Gervas\_51, Halley\_75, HenryJackson\_52, HighStump\_54, HokkenD\_66, Iridessa\_54, JuicyJay\_72, Kahve\_52, Kalah2\_68, Kronus\_50, Legolas\_54, Longacauda\_53, MISSy\_42, MPhalcon\_42, Marlia\_51, MiaZeal\_74, MmasiCarm\_51, Mortcellus\_50, Nala\_43, Nicole21\_53, NihilNomen\_74, Obutu\_51, Odette\_72, Orwigg\_52, Phayeta\_52, Phoebus\_76, Porcelain\_73, Quallification\_43, Redno2\_70, Rimmer\_43, Rita1961\_51, SlippinJimmy\_52, Soile\_53, Squint\_74, StormChicken\_44, Superphikiman\_71, SwainyDoc\_51, Thibault\_65, TinyTerror\_51, Youngblood\_44,

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

- Ovechkin\_85,

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

- AFIS\_57, Bagrid\_72, Beatrix\_60, Bexan\_58, Bones\_60, Caprice\_8, Chuckly\_76, Cueyllyss\_61, DeejaClivia\_12, Demsculpinboyz\_94, Dreamboat\_62, Emmaloid\_86, EricMillard\_72, Fringe\_56, GageAP\_62, Graduation\_65, Gwilliam\_53, Harley\_78, Jasper\_61, JigglyPuff\_6, Kersh\_88, Khan1\_53, Latretium\_78, Lumine\_53, MadKillah\_102, Makemake\_63, Marsha\_82, Marvin\_10, Moonbeam\_87, MrPhizzler\_53, NEHalo\_58, Ohno789\_61, PherrisBueller\_60, RedRaider77\_10, Rialto\_90, Rimu\_56, Sabbb\_88, Sandaddy\_57, ScoobyDoobyDoo\_2, Scowl\_62, Shaboozey\_74, Slim\_86, Sorpresa\_58, SpikeBT\_59, StrongArm\_59, TDanisky\_93, VasuNzinga\_9,

**Summary by start number:**

Start 14:

- Found in 2 of 105 ( 1.9% ) of genes in pham
- Manual Annotations of this start: 1 of 83
- Called 50.0% of time when present
- Phage (with cluster) where this start called: Ovechkin\_85 (F1),

Start 20:

- Found in 2 of 105 ( 1.9% ) of genes in pham
- Manual Annotations of this start: 2 of 83
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Chuckly\_76 (F1), Harley\_78 (F1),

Start 21:

- Found in 1 of 105 ( 1.0% ) of genes in pham
- No Manual Annotations of this start.
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Shaboozey\_74 (J),

Start 22:

- Found in 58 of 105 ( 55.2% ) of genes in pham
- Manual Annotations of this start: 46 of 83
- Called 98.3% of time when present
- Phage (with cluster) where this start called: Ariel\_73 (J), Becksu\_43 (E), Beem\_73 (J), Ben11\_50 (B3), Brilliant\_54 (B1), Buck\_43 (E), Casbah\_50 (B3), Che9d\_91 (F2), Chentzyk\_51 (B3), Childish\_52 (B1), Craff\_55 (B1), DaddyDaniels\_54 (B1), Dallas\_72 (J), DmpstrDiver\_73 (J), Ejimix\_73 (J), FairyPath\_42 (E), Fancypants\_85 (F1), Gervas\_51 (B3), Halley\_75 (J), HenryJackson\_52 (B1), HighStump\_54 (B1), HokkenD\_66 (J), Iridessa\_54 (B1), JuicyJay\_72 (J), Kahve\_52 (B1), Kalah2\_68 (J), Kronus\_50 (B3), Legolas\_54 (B1), Longacauda\_53 (B1), MISSy\_42 (E), MPhalcon\_42 (E), Marlia\_51 (B3), MiaZeal\_74 (J), MmasiCarm\_51 (B3), Mortcellus\_50 (B3), Nala\_43 (E), Nicole21\_53 (B1), NihilNomen\_74 (J), Obutu\_51 (B3), Odette\_72 (J), Orwigg\_52 (B1), Phayeta\_52 (B3), Phoebus\_76 (J), Porcelain\_73 (J), Quallification\_43 (E), Redno2\_70 (J), Rimmer\_43 (E), Rita1961\_51 (B3), SlippinJimmy\_52 (B3), Soile\_53 (B1), Squint\_74 (J), StormChicken\_44 (E), Superphikiman\_71 (J), SwainyDoc\_51 (B3), Thibault\_65 (J), TinyTerror\_51 (B3), Youngblood\_44 (E),

Start 28:

- Found in 1 of 105 ( 1.0% ) 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 29:

- Found in 1 of 105 ( 1.0% ) of genes in pham
- No Manual Annotations of this start.
- Called 100.0% of time when present
- Phage (with cluster) where this start called: DeejaClivia\_12 (C1),

Start 30:

- Found in 42 of 105 ( 40.0% ) of genes in pham
- Manual Annotations of this start: 34 of 83
- 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), Cueylyss\_61 (A1), Demsculpinboyz\_94 (F2), Dreamboat\_62 (A1), Emmaloid\_86 (F1), EricMillard\_72 (J), Fringe\_56 (B1), GageAP\_62 (A1), Graduation\_65 (A1), Gwilliam\_53 (B1), Jasper\_61 (A1), JigglyPuff\_6 (C1), Kersh\_88 (F1), Khan1\_53 (B1), 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), Slim\_86 (F1), Sorpresa\_58 (A1), SpikeBT\_59 (A1), StrongArm\_59 (A1), TDanisky\_93 (F1), VasuNzinga\_9 (S),

## Summary by clusters:

There are 11 clusters represented in this pham: F1, F2, E, J, O, A1, S, B1, B3, C2, C1,

Info for manual annotations of cluster A1:

- Start number 30 was manually annotated 18 times for cluster A1.

Info for manual annotations of cluster B1:

- Start number 22 was manually annotated 12 times for cluster B1.
- Start number 30 was manually annotated 3 times for cluster B1.

Info for manual annotations of cluster B3:

- Start number 22 was manually annotated 8 times for cluster B3.

Info for manual annotations of cluster C2:

- Start number 30 was manually annotated 1 time for cluster C2.

Info for manual annotations of cluster E:

- Start number 22 was manually annotated 7 times for cluster E.

Info for manual annotations of cluster F1:

- Start number 14 was manually annotated 1 time for cluster F1.
- Start number 20 was manually annotated 2 times for cluster F1.
- Start number 22 was manually annotated 1 time for cluster F1.
- Start number 30 was manually annotated 6 times for cluster F1.

Info for manual annotations of cluster F2:

- Start number 22 was manually annotated 1 time for cluster F2.
- Start number 30 was manually annotated 1 time for cluster F2.

Info for manual annotations of cluster J:

- Start number 22 was manually annotated 17 times for cluster J.
- Start number 30 was manually annotated 1 time for cluster J.

Info for manual annotations of cluster O:

- Start number 30 was manually annotated 1 time for cluster O.

Info for manual annotations of cluster S:

- Start number 30 was manually annotated 3 times for cluster S.

## Gene Information:

Gene: AFIS\_57 Start: 39716, Stop: 39357, Start Num: 30

Candidate Starts for AFIS\_57:

(2, 39917), (16, 39773), (17, 39770), (Start: 30 @39716 has 34 MA's), (31, 39704), (43, 39569), (45, 39533), (46, 39527), (58, 39395),

Gene: Ariel\_73 Start: 46707, Stop: 46291, Start Num: 22

Candidate Starts for Ariel\_73:

(Start: 22 @46707 has 46 MA's), (24, 46695), (35, 46611), (38, 46593), (43, 46515), (44, 46485), (48, 46446), (49, 46443),

Gene: Bagrid\_72 Start: 50124, Stop: 49711, Start Num: 30

Candidate Starts for Bagrid\_72:

(Start: 30 @50124 has 34 MA's), (31, 50112), (37, 50028), (40, 50010), (43, 49932), (45, 49896), (46, 49890), (58, 49758),

Gene: Beatrix\_60 Start: 41870, Stop: 41490, Start Num: 30

Candidate Starts for Beatrix\_60:

(2, 42071), (16, 41927), (17, 41924), (Start: 30 @41870 has 34 MA's), (31, 41858), (43, 41702), (45, 41666), (46, 41660), (58, 41528),

Gene: Becksu\_43 Start: 35704, Stop: 35261, Start Num: 22

Candidate Starts for Becksu\_43:

(10, 35776), (Start: 22 @35704 has 46 MA's), (24, 35692), (41, 35542), (43, 35482), (45, 35446), (46, 35440), (58, 35308),

Gene: Beem\_73 Start: 50984, Stop: 50568, Start Num: 22

Candidate Starts for Beem\_73:

(Start: 22 @50984 has 46 MA's), (24, 50972), (35, 50888), (38, 50870), (43, 50792), (44, 50762), (48, 50723), (49, 50720),

Gene: Ben11\_50 Start: 45429, Stop: 44986, Start Num: 22

Candidate Starts for Ben11\_50:

(Start: 22 @45429 has 46 MA's), (24, 45417), (36, 45297), (41, 45267), (43, 45207), (45, 45171), (46, 45165), (58, 45033),

Gene: Bexan\_58 Start: 41649, Stop: 41269, Start Num: 30

Candidate Starts for Bexan\_58:

(16, 41706), (17, 41703), (Start: 30 @41649 has 34 MA's), (31, 41637), (43, 41481), (45, 41445), (46, 41439), (58, 41307),

Gene: Bones\_60 Start: 41965, Stop: 41585, Start Num: 30

Candidate Starts for Bones\_60:

(1, 42175), (2, 42166), (16, 42022), (17, 42019), (Start: 30 @41965 has 34 MA's), (31, 41953), (43, 41797), (45, 41761), (46, 41755), (58, 41623),

Gene: Brilliant\_54 Start: 47338, Stop: 46895, Start Num: 22

Candidate Starts for Brilliant\_54:

(Start: 22 @47338 has 46 MA's), (24, 47326), (36, 47206), (41, 47176), (43, 47116), (45, 47080), (46, 47074), (58, 46942),

Gene: Buck\_43 Start: 35755, Stop: 35318, Start Num: 22

Candidate Starts for Buck\_43:

(10, 35827), (Start: 22 @35755 has 46 MA's), (24, 35743), (41, 35593), (43, 35533), (45, 35497), (46, 35491), (58, 35359),

Gene: Caprice\_8 Start: 2539, Stop: 2922, Start Num: 28

Candidate Starts for Caprice\_8:

(28, 2539), (31, 2554), (43, 2710), (45, 2746), (46, 2752), (58, 2884),

Gene: Casbah\_50 Start: 45459, Stop: 45016, Start Num: 22

Candidate Starts for Casbah\_50:

(Start: 22 @45459 has 46 MA's), (24, 45447), (36, 45327), (41, 45297), (43, 45237), (45, 45201), (46, 45195), (58, 45063),

Gene: Che9d\_91 Start: 48600, Stop: 49028, Start Num: 22

Candidate Starts for Che9d\_91:

(Start: 22 @48600 has 46 MA's), (24, 48612), (33, 48666), (43, 48810),

Gene: Chentzyk\_51 Start: 45971, Stop: 45528, Start Num: 22

Candidate Starts for Chentzyk\_51:

(Start: 22 @45971 has 46 MA's), (24, 45959), (36, 45839), (41, 45809), (43, 45749), (45, 45713), (46, 45707), (58, 45575),

Gene: Childish\_52 Start: 47365, Stop: 46922, Start Num: 22

Candidate Starts for Childish\_52:

(Start: 22 @47365 has 46 MA's), (24, 47353), (36, 47233), (41, 47203), (43, 47143), (45, 47107), (46, 47101), (58, 46969),

Gene: Chuckly\_76 Start: 45511, Stop: 45978, Start Num: 20

Candidate Starts for Chuckly\_76:

(Start: 20 @45511 has 2 MA's), (24, 45526), (32, 45580), (41, 45673), (50, 45820), (51, 45826), (55, 45850), (57, 45913), (59, 45949),

Gene: Craff\_55 Start: 47790, Stop: 47347, Start Num: 22

Candidate Starts for Craff\_55:

(Start: 22 @47790 has 46 MA's), (24, 47778), (36, 47658), (41, 47628), (43, 47568), (45, 47532), (46, 47526), (58, 47394),

Gene: Cueyllyss\_61 Start: 42165, Stop: 41785, Start Num: 30

Candidate Starts for Cueyllyss\_61:

(2, 42366), (16, 42222), (17, 42219), (Start: 30 @42165 has 34 MA's), (31, 42153), (43, 41997), (45, 41961), (46, 41955), (58, 41823),

Gene: DaddyDaniels\_54 Start: 47322, Stop: 46879, Start Num: 22

Candidate Starts for DaddyDaniels\_54:

(Start: 22 @47322 has 46 MA's), (24, 47310), (36, 47190), (41, 47160), (43, 47100), (45, 47064), (46, 47058), (58, 46926),

Gene: Dallas\_72 Start: 49905, Stop: 49489, Start Num: 22

Candidate Starts for Dallas\_72:

(Start: 22 @49905 has 46 MA's), (24, 49893), (35, 49809), (38, 49791), (43, 49713), (44, 49683), (48, 49644), (49, 49641),

Gene: DeejaClivia\_12 Start: 3961, Stop: 4326, Start Num: 29

Candidate Starts for DeejaClivia\_12:

(29, 3961), (31, 3976), (43, 4111), (45, 4147), (46, 4153), (58, 4285),

Gene: Demsculpinboyz\_94 Start: 48157, Stop: 48546, Start Num: 30

Candidate Starts for Demsculpinboyz\_94:

(5, 48034), (23, 48127), (26, 48136), (Start: 30 @48157 has 34 MA's), (43, 48325), (45, 48361), (46, 48367), (58, 48499),

Gene: DmpstrDiver\_73 Start: 50332, Stop: 49916, Start Num: 22

Candidate Starts for DmpstrDiver\_73:

(Start: 22 @50332 has 46 MA's), (24, 50320), (35, 50236), (38, 50218), (43, 50140), (44, 50110), (48, 50071), (49, 50068),

Gene: Dreamboat\_62 Start: 40065, Stop: 39685, Start Num: 30

Candidate Starts for Dreamboat\_62:

(2, 40266), (16, 40122), (17, 40119), (Start: 30 @40065 has 34 MA's), (31, 40053), (43, 39897), (45, 39861), (46, 39855), (58, 39723),

Gene: Ejimix\_73 Start: 51773, Stop: 51354, Start Num: 22

Candidate Starts for Ejimix\_73:

(Start: 22 @51773 has 46 MA's), (24, 51761), (35, 51677), (38, 51659), (43, 51581), (44, 51551), (48, 51512), (49, 51509),

Gene: Emmaloid\_86 Start: 50002, Stop: 50415, Start Num: 30

Candidate Starts for Emmaloid\_86:

(3, 49828), (4, 49837), (6, 49861), (8, 49879), (25, 49972), (27, 49981), (Start: 30 @50002 has 34 MA's), (34, 50059), (37, 50098), (43, 50194), (45, 50230), (46, 50236), (58, 50368),

Gene: EricMillard\_72 Start: 50977, Stop: 50564, Start Num: 30

Candidate Starts for EricMillard\_72:

(Start: 30 @50977 has 34 MA's), (31, 50965), (37, 50881), (40, 50863), (43, 50785), (45, 50749), (46, 50743), (58, 50611),

Gene: FairyPath\_42 Start: 35650, Stop: 35204, Start Num: 22

Candidate Starts for FairyPath\_42:

(9, 35722), (Start: 22 @35650 has 46 MA's), (24, 35638), (41, 35488), (43, 35428), (44, 35398), (48, 35359), (49, 35356),

Gene: Fancypants\_85 Start: 50404, Stop: 50835, Start Num: 22

Candidate Starts for Fancypants\_85:

(Start: 22 @50404 has 46 MA's), (39, 50548), (47, 50683),

Gene: Fringe\_56 Start: 48267, Stop: 47878, Start Num: 30

Candidate Starts for Fringe\_56:

(Start: 30 @48267 has 34 MA's), (31, 48255), (43, 48099), (45, 48063), (46, 48057), (58, 47925),

Gene: GageAP\_62 Start: 41383, Stop: 41024, Start Num: 30

Candidate Starts for GageAP\_62:

(2, 41584), (16, 41440), (17, 41437), (Start: 30 @41383 has 34 MA's), (31, 41371), (43, 41236), (45, 41200), (46, 41194), (58, 41062),

Gene: Gervas\_51 Start: 45588, Stop: 45145, Start Num: 22

Candidate Starts for Gervas\_51:

(Start: 22 @45588 has 46 MA's), (24, 45576), (36, 45456), (41, 45426), (43, 45366), (45, 45330), (46, 45324), (58, 45192),

Gene: Graduation\_65 Start: 42237, Stop: 41857, Start Num: 30

Candidate Starts for Graduation\_65:

(2, 42438), (16, 42294), (17, 42291), (Start: 30 @42237 has 34 MA's), (31, 42225), (43, 42069), (45, 42033), (46, 42027), (58, 41895),

Gene: Gwilliam\_53 Start: 47683, Stop: 47303, Start Num: 30



Candidate Starts for Gwilliam\_53:

(Start: 30 @47683 has 34 MA's), (31, 47671), (43, 47515), (45, 47479), (46, 47473), (58, 47341),

Gene: Halley\_75 Start: 50984, Stop: 50568, Start Num: 22

Candidate Starts for Halley\_75:

(Start: 22 @50984 has 46 MA's), (24, 50972), (35, 50888), (38, 50870), (43, 50792), (44, 50762), (48, 50723), (49, 50720),

Gene: Harley\_78 Start: 47547, Stop: 47975, Start Num: 20

Candidate Starts for Harley\_78:

(Start: 20 @47547 has 2 MA's), (39, 47694), (43, 47766), (52, 47844), (53, 47856), (54, 47859),

Gene: HenryJackson\_52 Start: 47354, Stop: 46911, Start Num: 22

Candidate Starts for HenryJackson\_52:

(Start: 22 @47354 has 46 MA's), (24, 47342), (36, 47222), (41, 47192), (43, 47132), (45, 47096), (46, 47090), (58, 46958),

Gene: HighStump\_54 Start: 47890, Stop: 47447, Start Num: 22

Candidate Starts for HighStump\_54:

(10, 47962), (12, 47941), (13, 47935), (Start: 22 @47890 has 46 MA's), (24, 47878), (36, 47758), (41, 47728), (43, 47668), (45, 47632), (46, 47626), (58, 47494),

Gene: HokkenD\_66 Start: 49253, Stop: 48837, Start Num: 22

Candidate Starts for HokkenD\_66:

(Start: 22 @49253 has 46 MA's), (24, 49241), (35, 49157), (38, 49139), (43, 49061), (44, 49031), (48, 48992), (49, 48989),

Gene: Iridessa\_54 Start: 47334, Stop: 46891, Start Num: 22

Candidate Starts for Iridessa\_54:

(10, 47406), (12, 47385), (13, 47379), (Start: 22 @47334 has 46 MA's), (24, 47322), (36, 47202), (41, 47172), (43, 47112), (45, 47076), (46, 47070), (58, 46938),

Gene: Jasper\_61 Start: 39951, Stop: 39571, Start Num: 30

Candidate Starts for Jasper\_61:

(2, 40152), (16, 40008), (17, 40005), (Start: 30 @39951 has 34 MA's), (31, 39939), (43, 39783), (45, 39747), (46, 39741), (58, 39609),

Gene: JigglyPuff\_6 Start: 1982, Stop: 2365, Start Num: 30

Candidate Starts for JigglyPuff\_6:

(19, 1931), (Start: 30 @1982 has 34 MA's), (31, 1994), (43, 2150), (45, 2186), (46, 2192), (56, 2270), (58, 2324),

Gene: JuicyJay\_72 Start: 52118, Stop: 51702, Start Num: 22

Candidate Starts for JuicyJay\_72:

(Start: 22 @52118 has 46 MA's), (24, 52106), (35, 52022), (38, 52004), (43, 51926), (44, 51896), (48, 51857), (49, 51854),

Gene: Kahve\_52 Start: 47351, Stop: 46908, Start Num: 22

Candidate Starts for Kahve\_52:

(Start: 22 @47351 has 46 MA's), (24, 47339), (36, 47219), (41, 47189), (43, 47129), (45, 47093), (46, 47087), (58, 46955),

Gene: Kalah2\_68 Start: 50277, Stop: 49861, Start Num: 22

Candidate Starts for Kalah2\_68:

(Start: 22 @50277 has 46 MA's), (24, 50265), (35, 50181), (38, 50163), (43, 50085), (44, 50055), (48, 50016), (49, 50013),

Gene: Kersh\_88 Start: 52115, Stop: 52522, Start Num: 30

Candidate Starts for Kersh\_88:

(3, 51941), (4, 51950), (6, 51974), (25, 52085), (27, 52094), (Start: 30 @52115 has 34 MA's), (34, 52172), (37, 52211), (43, 52307), (45, 52343), (46, 52349), (58, 52481),

Gene: Khan1\_53 Start: 47307, Stop: 46918, Start Num: 30

Candidate Starts for Khan1\_53:

(Start: 30 @47307 has 34 MA's), (31, 47295), (43, 47139), (45, 47103), (46, 47097), (58, 46965),

Gene: Kronus\_50 Start: 46191, Stop: 45748, Start Num: 22

Candidate Starts for Kronus\_50:

(Start: 22 @46191 has 46 MA's), (24, 46179), (36, 46059), (41, 46029), (43, 45969), (45, 45933), (46, 45927), (58, 45795),

Gene: Latretium\_78 Start: 47174, Stop: 47560, Start Num: 30

Candidate Starts for Latretium\_78:

(Start: 30 @47174 has 34 MA's), (31, 47186), (43, 47342), (45, 47378), (46, 47384), (58, 47516),

Gene: Legolas\_54 Start: 47787, Stop: 47344, Start Num: 22

Candidate Starts for Legolas\_54:

(10, 47859), (12, 47838), (13, 47832), (Start: 22 @47787 has 46 MA's), (24, 47775), (36, 47655), (41, 47625), (43, 47565), (45, 47529), (46, 47523), (58, 47391),

Gene: Longacauda\_53 Start: 47750, Stop: 47307, Start Num: 22

Candidate Starts for Longacauda\_53:

(10, 47822), (12, 47801), (13, 47795), (Start: 22 @47750 has 46 MA's), (24, 47738), (36, 47618), (41, 47588), (43, 47528), (45, 47492), (46, 47486), (58, 47354),

Gene: Lumine\_53 Start: 47538, Stop: 47155, Start Num: 30

Candidate Starts for Lumine\_53:

(Start: 30 @47538 has 34 MA's), (31, 47526), (43, 47370), (45, 47334), (46, 47328), (58, 47196),

Gene: MISSy\_42 Start: 35034, Stop: 34591, Start Num: 22

Candidate Starts for MISSy\_42:

(10, 35106), (Start: 22 @35034 has 46 MA's), (24, 35022), (41, 34872), (43, 34812), (45, 34776), (46, 34770), (58, 34638),

Gene: MPhalcon\_42 Start: 35027, Stop: 34584, Start Num: 22

Candidate Starts for MPhalcon\_42:

(10, 35099), (Start: 22 @35027 has 46 MA's), (24, 35015), (41, 34865), (43, 34805), (45, 34769), (46, 34763), (58, 34631),

Gene: MadKillah\_102 Start: 61818, Stop: 61405, Start Num: 30

Candidate Starts for MadKillah\_102:

(7, 61950), (15, 61890), (18, 61869), (Start: 30 @61818 has 34 MA's), (34, 61761), (37, 61722), (43, 61626), (45, 61590), (46, 61584), (58, 61452),

Gene: Makemake\_63 Start: 42339, Stop: 41959, Start Num: 30

Candidate Starts for Makemake\_63:

(2, 42540), (16, 42396), (17, 42393), (Start: 30 @42339 has 34 MA's), (31, 42327), (43, 42171), (45, 42135), (46, 42129), (58, 41997),

Gene: Marlia\_51 Start: 45592, Stop: 45149, Start Num: 22

Candidate Starts for Marlia\_51:

(Start: 22 @45592 has 46 MA's), (24, 45580), (36, 45460), (41, 45430), (43, 45370), (45, 45334), (46, 45328), (58, 45196),

Gene: Marsha\_82 Start: 50494, Stop: 50108, Start Num: 30

Candidate Starts for Marsha\_82:

(Start: 30 @50494 has 34 MA's), (31, 50482), (43, 50326), (45, 50290), (46, 50284), (58, 50152),

Gene: Marvin\_10 Start: 3597, Stop: 3977, Start Num: 30

Candidate Starts for Marvin\_10:

(11, 3501), (Start: 14 @3525 has 1 MA's), (Start: 30 @3597 has 34 MA's), (31, 3609), (43, 3765), (45, 3801), (46, 3807), (58, 3939),

Gene: MiaZeal\_74 Start: 47379, Stop: 46963, Start Num: 22

Candidate Starts for MiaZeal\_74:

(Start: 22 @47379 has 46 MA's), (24, 47367), (35, 47283), (38, 47265), (43, 47187), (44, 47157), (48, 47118), (49, 47115),

Gene: MmasiCarm\_51 Start: 45638, Stop: 45195, Start Num: 22

Candidate Starts for MmasiCarm\_51:

(Start: 22 @45638 has 46 MA's), (24, 45626), (36, 45506), (41, 45476), (43, 45416), (45, 45380), (46, 45374), (58, 45242),

Gene: Moonbeam\_87 Start: 50558, Stop: 50971, Start Num: 30

Candidate Starts for Moonbeam\_87:

(8, 50435), (25, 50528), (27, 50537), (Start: 30 @50558 has 34 MA's), (34, 50615), (37, 50654), (43, 50750), (45, 50786), (46, 50792), (58, 50924),

Gene: Mortcellus\_50 Start: 46245, Stop: 45802, Start Num: 22

Candidate Starts for Mortcellus\_50:

(Start: 22 @46245 has 46 MA's), (24, 46233), (36, 46113), (41, 46083), (43, 46023), (45, 45987), (46, 45981), (58, 45849),

Gene: MrPhizzler\_53 Start: 47284, Stop: 46895, Start Num: 30

Candidate Starts for MrPhizzler\_53:

(Start: 30 @47284 has 34 MA's), (31, 47272), (43, 47116), (45, 47080), (46, 47074), (58, 46942),

Gene: NEHalo\_58 Start: 40784, Stop: 40425, Start Num: 30

Candidate Starts for NEHalo\_58:

(2, 40985), (16, 40841), (17, 40838), (Start: 30 @40784 has 34 MA's), (31, 40772), (43, 40637), (45, 40601), (46, 40595), (58, 40463),

Gene: Nala\_43 Start: 35539, Stop: 35096, Start Num: 22

Candidate Starts for Nala\_43:

(10, 35611), (Start: 22 @35539 has 46 MA's), (24, 35527), (41, 35377), (43, 35317), (45, 35281), (46, 35275), (58, 35143),

Gene: Nicole21\_53 Start: 47623, Stop: 47051, Start Num: 22

Candidate Starts for Nicole21\_53:

(10, 47695), (12, 47674), (13, 47668), (Start: 22 @47623 has 46 MA's), (24, 47611), (36, 47491), (41, 47461), (43, 47401), (45, 47365), (46, 47359), (58, 47227), (60, 47185),

Gene: NihilNomen\_74 Start: 51071, Stop: 50655, Start Num: 22

Candidate Starts for NihilNomen\_74:

(Start: 22 @51071 has 46 MA's), (24, 51059), (35, 50975), (38, 50957), (43, 50879), (44, 50849), (48, 50810), (49, 50807),

Gene: Obutu\_51 Start: 45593, Stop: 45150, Start Num: 22

Candidate Starts for Obutu\_51:

(Start: 22 @45593 has 46 MA's), (24, 45581), (36, 45461), (41, 45431), (43, 45371), (45, 45335), (46, 45329), (58, 45197),

Gene: Odette\_72 Start: 50114, Stop: 49698, Start Num: 22

Candidate Starts for Odette\_72:

(Start: 22 @50114 has 46 MA's), (24, 50102), (35, 50018), (38, 50000), (43, 49922), (44, 49892), (48, 49853), (49, 49850),

Gene: Ohno789\_61 Start: 41528, Stop: 41148, Start Num: 30

Candidate Starts for Ohno789\_61:

(2, 41729), (16, 41585), (17, 41582), (Start: 30 @41528 has 34 MA's), (31, 41516), (43, 41360), (45, 41324), (46, 41318), (58, 41186),

Gene: Orwigg\_52 Start: 47308, Stop: 46766, Start Num: 22

Candidate Starts for Orwigg\_52:

(10, 47380), (12, 47359), (13, 47353), (Start: 22 @47308 has 46 MA's), (24, 47296), (36, 47176), (41, 47146), (43, 47086), (45, 47050), (46, 47044), (58, 46912),

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

Candidate Starts for Ovechkin\_85:

(Start: 14 @49845 has 1 MA's), (Start: 22 @49878 has 46 MA's), (39, 50022), (43, 50094), (47, 50157),

Gene: Phayeta\_52 Start: 45475, Stop: 45032, Start Num: 22

Candidate Starts for Phayeta\_52:

(Start: 22 @45475 has 46 MA's), (24, 45463), (36, 45343), (41, 45313), (43, 45253), (45, 45217), (46, 45211), (58, 45079),

Gene: PherrisBueller\_60 Start: 39602, Stop: 39222, Start Num: 30

Candidate Starts for PherrisBueller\_60:

(2, 39803), (16, 39659), (17, 39656), (Start: 30 @39602 has 34 MA's), (31, 39590), (43, 39434), (45, 39398), (46, 39392), (58, 39260),

Gene: Phoebus\_76 Start: 52253, Stop: 51837, Start Num: 22

Candidate Starts for Phoebus\_76:

(Start: 22 @52253 has 46 MA's), (24, 52241), (35, 52157), (38, 52139), (43, 52061), (44, 52031), (48, 51992), (49, 51989),

Gene: Porcelain\_73 Start: 47379, Stop: 46963, Start Num: 22

Candidate Starts for Porcelain\_73:

(Start: 22 @47379 has 46 MA's), (24, 47367), (35, 47283), (38, 47265), (43, 47187), (44, 47157), (48, 47118), (49, 47115),

Gene: Qualification\_43 Start: 35661, Stop: 35215, Start Num: 22

Candidate Starts for Quallification\_43:

(9, 35733), (Start: 22 @35661 has 46 MA's), (24, 35649), (41, 35499), (43, 35439), (44, 35409), (48, 35370), (49, 35367),

Gene: RedRaider77\_10 Start: 3149, Stop: 3538, Start Num: 30

Candidate Starts for RedRaider77\_10:

(Start: 30 @3149 has 34 MA's), (31, 3161), (43, 3317), (45, 3353), (46, 3359), (58, 3491),

Gene: Redno2\_70 Start: 47867, Stop: 47451, Start Num: 22

Candidate Starts for Redno2\_70:

(Start: 22 @47867 has 46 MA's), (24, 47855), (35, 47771), (38, 47753), (43, 47675), (44, 47645), (48, 47606), (49, 47603),

Gene: Rialto\_90 Start: 50654, Stop: 51067, Start Num: 30

Candidate Starts for Rialto\_90:

(8, 50531), (25, 50624), (27, 50633), (Start: 30 @50654 has 34 MA's), (34, 50711), (37, 50750), (43, 50846), (45, 50882), (46, 50888), (58, 51020),

Gene: Rimmer\_43 Start: 35365, Stop: 34928, Start Num: 22

Candidate Starts for Rimmer\_43:

(10, 35437), (Start: 22 @35365 has 46 MA's), (24, 35353), (41, 35203), (43, 35143), (45, 35107), (46, 35101), (58, 34969),

Gene: Rimu\_56 Start: 47304, Stop: 46915, Start Num: 30

Candidate Starts for Rimu\_56:

(Start: 30 @47304 has 34 MA's), (31, 47292), (43, 47136), (45, 47100), (46, 47094), (58, 46962),

Gene: Rita1961\_51 Start: 45594, Stop: 45151, Start Num: 22

Candidate Starts for Rita1961\_51:

(Start: 22 @45594 has 46 MA's), (24, 45582), (36, 45462), (41, 45432), (43, 45372), (45, 45336), (46, 45330), (58, 45198),

Gene: Sabbb\_88 Start: 48209, Stop: 48622, Start Num: 30

Candidate Starts for Sabbb\_88:

(3, 48035), (4, 48044), (6, 48068), (8, 48086), (25, 48179), (27, 48188), (Start: 30 @48209 has 34 MA's), (34, 48266), (37, 48305), (43, 48401), (45, 48437), (46, 48443), (58, 48575),

Gene: Sandaddy\_57 Start: 40445, Stop: 40086, Start Num: 30

Candidate Starts for Sandaddy\_57:

(2, 40646), (16, 40502), (17, 40499), (Start: 30 @40445 has 34 MA's), (31, 40433), (43, 40298), (45, 40262), (46, 40256), (58, 40124),

Gene: ScoobyDoobyDoo\_2 Start: 227, Stop: 613, Start Num: 30

Candidate Starts for ScoobyDoobyDoo\_2:

(Start: 30 @227 has 34 MA's), (31, 239), (43, 395), (45, 431), (46, 437), (56, 515), (58, 569),

Gene: Scowl\_62 Start: 40833, Stop: 40453, Start Num: 30

Candidate Starts for Scowl\_62:

(16, 40890), (17, 40887), (Start: 30 @40833 has 34 MA's), (31, 40821), (43, 40665), (45, 40629), (46, 40623), (58, 40491),

Gene: Shaboozey\_74 Start: 47299, Stop: 46889, Start Num: 21

Candidate Starts for Shaboozey\_74:

(21, 47299), (24, 47287), (43, 47107), (45, 47071), (46, 47065), (58, 46933),

Gene: Slim\_86 Start: 49993, Stop: 50406, Start Num: 30

Candidate Starts for Slim\_86:

(3, 49819), (4, 49828), (6, 49852), (8, 49870), (25, 49963), (27, 49972), (Start: 30 @49993 has 34 MA's), (34, 50050), (37, 50089), (43, 50185), (45, 50221), (46, 50227), (58, 50359),

Gene: SlippinJimmy\_52 Start: 46376, Stop: 45933, Start Num: 22

Candidate Starts for SlippinJimmy\_52:

(Start: 22 @46376 has 46 MA's), (24, 46364), (36, 46244), (41, 46214), (43, 46154), (45, 46118), (46, 46112), (58, 45980),

Gene: Soile\_53 Start: 47351, Stop: 46908, Start Num: 22

Candidate Starts for Soile\_53:

(Start: 22 @47351 has 46 MA's), (24, 47339), (36, 47219), (41, 47189), (43, 47129), (45, 47093), (46, 47087), (58, 46955),

Gene: Sorpresa\_58 Start: 40447, Stop: 40088, Start Num: 30

Candidate Starts for Sorpresa\_58:

(2, 40648), (16, 40504), (17, 40501), (Start: 30 @40447 has 34 MA's), (31, 40435), (43, 40300), (45, 40264), (46, 40258), (58, 40126),

Gene: SpikeBT\_59 Start: 40641, Stop: 40282, Start Num: 30

Candidate Starts for SpikeBT\_59:

(2, 40842), (16, 40698), (17, 40695), (Start: 30 @40641 has 34 MA's), (31, 40629), (43, 40494), (45, 40458), (46, 40452), (58, 40320),

Gene: Squint\_74 Start: 47498, Stop: 47082, Start Num: 22

Candidate Starts for Squint\_74:

(Start: 22 @47498 has 46 MA's), (24, 47486), (35, 47402), (38, 47384), (43, 47306), (44, 47276), (48, 47237), (49, 47234),

Gene: StormChicken\_44 Start: 35973, Stop: 35536, Start Num: 22

Candidate Starts for StormChicken\_44:

(10, 36045), (Start: 22 @35973 has 46 MA's), (24, 35961), (41, 35811), (43, 35751), (45, 35715), (46, 35709), (58, 35577),

Gene: StrongArm\_59 Start: 41777, Stop: 41397, Start Num: 30

Candidate Starts for StrongArm\_59:

(16, 41834), (17, 41831), (Start: 30 @41777 has 34 MA's), (31, 41765), (43, 41609), (45, 41573), (46, 41567), (58, 41435),

Gene: Superphikiman\_71 Start: 46589, Stop: 46173, Start Num: 22

Candidate Starts for Superphikiman\_71:

(Start: 22 @46589 has 46 MA's), (24, 46577), (35, 46493), (38, 46475), (43, 46397), (44, 46367), (48, 46328), (49, 46325),

Gene: SwainyDoc\_51 Start: 45606, Stop: 45163, Start Num: 22

Candidate Starts for SwainyDoc\_51:

(Start: 22 @45606 has 46 MA's), (24, 45594), (36, 45474), (41, 45444), (43, 45384), (45, 45348), (46, 45342), (58, 45210),

Gene: TDanisky\_93 Start: 48927, Stop: 49307, Start Num: 30

Candidate Starts for TDanisky\_93:

(Start: 30 @48927 has 34 MA's), (43, 49092), (45, 49128), (46, 49134), (58, 49266),

Gene: Thibault\_65 Start: 47312, Stop: 46869, Start Num: 22

Candidate Starts for Thibault\_65:

(Start: 22 @47312 has 46 MA's), (41, 47150), (42, 47147), (43, 47090), (45, 47054), (46, 47048), (58, 46916),

Gene: TinyTerror\_51 Start: 45641, Stop: 45198, Start Num: 22

Candidate Starts for TinyTerror\_51:

(Start: 22 @45641 has 46 MA's), (24, 45629), (36, 45509), (41, 45479), (43, 45419), (45, 45383), (46, 45377), (58, 45245),

Gene: VasuNzinga\_9 Start: 2804, Stop: 3184, Start Num: 30

Candidate Starts for VasuNzinga\_9:

(Start: 30 @2804 has 34 MA's), (31, 2816), (43, 2972), (45, 3008), (46, 3014), (58, 3146),

Gene: Youngblood\_44 Start: 35976, Stop: 35539, Start Num: 22

Candidate Starts for Youngblood\_44:

(10, 36048), (Start: 22 @35976 has 46 MA's), (24, 35964), (41, 35814), (43, 35754), (45, 35718), (46, 35712), (58, 35580),