



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 191219 Report

This analysis was run 11/02/24 on database version 579.

Pham number 191219 has 93 members, 1 are drafts.

Phages represented in each track:

- Track 1 : Tootsieroll\_87, MulchSalad\_95, Veteran\_84, Gorge\_90, Zizzle\_94, Radiance\_91, James\_95, Guppsters\_88, Zerg\_92, BlueCrab\_94, Mattes\_92, Doug\_90, Crumble\_86, Bubbles123\_87, MilanaBonita\_86, Cabrinians\_88, Philus\_93, Pollywog\_95, LilMoolah\_94, Job42\_93, Yorick\_87, Firehouse51\_88, Mantra\_91, Spoonbill\_91, DRBy19\_94, Melissauren88\_82, Brocalys\_83, Dante\_91, Mutaforma13\_94
- Track 2 : AlpineSix\_92
- Track 3 : Llama\_100, Seabastian\_101, Jinglebell\_100, OfUltron\_101, Ochi17\_99, Modragons\_98
- Track 4 : Flathead\_96, ShiLan\_94, Hlubikazi\_91, ShowerHandel\_91, Mandlovu\_91, Lizziana\_92, Akhila\_87, MadMen\_98, DillTech15\_99, Clifton\_83, Nivrat\_91, Pippy\_89, ByChance\_81, SiSi\_89, Saal\_89, Burwell21\_85, Jarcob\_94, OlympiaSaint\_95, LastJedi\_82, Maravista\_88, NormanBulbieJr\_89, Sandalphon\_91, Strokeseat\_91, Minnie\_85, FreddyB\_101, Martik\_89, TDanisky\_102, Whatsapiecost\_87, Kersh\_97, Koella\_84, Beakin\_84, SwagPiggett\_93, Whouxphf\_94, Latretium\_94, Demsculpinboyz\_106, Sabbb\_96, Mozy\_98, Blexus\_88, Batiatus\_91, Sparkdehlily\_101, Priscilla\_92
- Track 5 : Coco12\_92, Phanphagia\_96, Shauna1\_94
- Track 6 : Hegedechwinu\_93
- Track 7 : BobaPhett\_93
- Track 8 : EleanorGeorge\_98
- Track 9 : Pacc40\_89
- Track 10 : Kingsley\_100, Sarma624\_94, Cerasum\_90, Velveteen\_89
- Track 11 : SassyB\_84, PopTart\_84
- Track 12 : BigPhil\_88
- Track 13 : Mova\_95
- Track 14 : Frankie\_92

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

The start number called the most often in the published annotations is 10, it was called in 57 of the 92 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Akhila\_87, Batiatus\_91, Beakin\_84, Blexus\_88, Burwell21\_85, ByChance\_81, Cerasum\_90, Clifton\_83, Demsculpinboyz\_106, DillTech15\_99, EleanorGeorge\_98, Flathead\_96, Frankie\_92, FreddyB\_101, Hegedechwinu\_93, Hlubikazi\_91, Jarcob\_94, Jinglebell\_100, Kersh\_97, Kingsley\_100, Koella\_84, LastJedi\_82, Latretium\_94, Lizziana\_92, Llama\_100, MadMen\_98, Mandlovu\_91, Maravista\_88, Martik\_89, Minnie\_85, Modragons\_98, Mova\_95, Mozy\_98, Nivrat\_91, NormanBulbieJr\_89, Ochi17\_99, OfUltron\_101, OlympiaSaint\_95, Pippy\_89, PopTart\_84, Priscilla\_92, Saal\_89, Sabbb\_96, Sandalphon\_91, Sarma624\_94, SassyB\_84, Seabastian\_101, ShiLan\_94, ShowerHandel\_91, SiSi\_89, Sparkdehlily\_101, Strokeseat\_91, SwagPiggett\_93, TDanisky\_102, Velveteen\_89, Whatsapiecost\_87, Whouxphf\_94,

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

- AlpineSix\_92, BigPhil\_88, BlueCrab\_94, BobaPhett\_93, Brocalys\_83, Bubbles123\_87, Cabrinians\_88, Coco12\_92, Crumble\_86, DRBy19\_94, Dante\_91, Doug\_90, Firehouse51\_88, Gorge\_90, Guppsters\_88, James\_95, Job42\_93, LilMoolah\_94, Mantra\_91, Mattes\_92, Melissauren88\_82, MilanaBonita\_86, MulchSalad\_95, Mutaforma13\_94, Pacc40\_89, Phanphagia\_96, Philus\_93, Pollywog\_95, Radiance\_91, Shauna1\_94, Spoonbill\_91, Tootsieroll\_87, Veteran\_84, Yorick\_87, Zerg\_92, Zizzle\_94,

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

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### Summary by start number:

Start 8:

- Found in 8 of 93 ( 8.6% ) of genes in pham
- Manual Annotations of this start: 1 of 92
- Called 12.5% of time when present
- Phage (with cluster) where this start called: BigPhil\_88 (F1),

Start 10:

- Found in 93 of 93 ( 100.0% ) of genes in pham
- Manual Annotations of this start: 57 of 92
- Called 61.3% of time when present
- Phage (with cluster) where this start called: Akhila\_87 (F1), Batiatus\_91 (F1), Beakin\_84 (F1), Blexus\_88 (F1), Burwell21\_85 (F1), ByChance\_81 (F1), Cerasum\_90 (F1), Clifton\_83 (F1), Demsculpinboyz\_106 (F2), DillTech15\_99 (F1), EleanorGeorge\_98 (F1), Flathead\_96 (F1), Frankie\_92 (F1), FreddyB\_101 (F1), Hegedechwinu\_93 (F1), Hlubikazi\_91 (F1), Jarcob\_94 (F1), Jinglebell\_100 (F1), Kersh\_97 (F1), Kingsley\_100 (F1), Koella\_84 (F1), LastJedi\_82 (F1), Latretium\_94 (F1), Lizziana\_92 (F1), Llama\_100 (F1), MadMen\_98 (F1), Mandlovu\_91 (F1), Maravista\_88 (F1), Martik\_89 (F1), Minnie\_85 (F1), Modragons\_98 (F1), Mova\_95 (F1), Mozy\_98 (F1), Nivrat\_91 (F1), NormanBulbieJr\_89 (F1), Ochi17\_99 (F1), OfUltron\_101 (F1), OlympiaSaint\_95 (F1), Pippy\_89 (F1), PopTart\_84 (F1), Priscilla\_92 (F1), Saal\_89 (F1), Sabbb\_96 (F1), Sandalphon\_91 (F1), Sarma624\_94 (F1), SassyB\_84 (F1), Seabastian\_101 (F1), ShiLan\_94 (F1), ShowerHandel\_91 (F1), SiSi\_89 (F1), Sparkdehlily\_101 (F1), Strokeseat\_91 (F1), SwagPiggett\_93 (F1), TDanisky\_102 (F1), Velveteen\_89 (F1), Whatsapiecost\_87 (F1), Whouxphf\_94 (F1),

Start 12:

- Found in 93 of 93 ( 100.0% ) of genes in pham

- Manual Annotations of this start: 34 of 92
- Called 37.6% of time when present
- Phage (with cluster) where this start called: AlpineSix\_92 (F1), BlueCrab\_94 (F1), BobaPhett\_93 (F1), Brocalys\_83 (F1), Bubbles123\_87 (F1), Cabrinians\_88 (F1), Coco12\_92 (F1), Crumble\_86 (F1), DRBy19\_94 (F1), Dante\_91 (F1), Doug\_90 (F1), Firehouse51\_88 (F1), Gorge\_90 (F1), Guppsters\_88 (F1), James\_95 (F1), Job42\_93 (F1), LilMoolah\_94 (F1), Mantra\_91 (F1), Mattes\_92 (F1), Melissauren88\_82 (F1), MilanaBonita\_86 (F1), MulchSalad\_95 (F), Mutaforma13\_94 (F1), Pacc40\_89 (F1), Phanphagia\_96 (F1), Philus\_93 (F1), Pollywog\_95 (F1), Radiance\_91 (F1), Shauna1\_94 (F1), Spoonbill\_91 (F1), Tootsieroll\_87 (F1), Veteran\_84 (F1), Yorick\_87 (F1), Zerg\_92 (F1), Zizzle\_94 (F1),

### Summary by clusters:

There are 3 clusters represented in this pham: F1, F2, F,

Info for manual annotations of cluster F1:

- Start number 8 was manually annotated 1 time for cluster F1.
- Start number 10 was manually annotated 56 times for cluster F1.
- Start number 12 was manually annotated 34 times for cluster F1.

Info for manual annotations of cluster F2:

- Start number 10 was manually annotated 1 time for cluster F2.

### Gene Information:

Gene: Akhila\_87 Start: 50296, Stop: 50835, Start Num: 10

Candidate Starts for Akhila\_87:

(Start: 10 @50296 has 57 MA's), (11, 50302), (Start: 12 @50308 has 34 MA's), (13, 50452), (14, 50515), (15, 50671), (18, 50743), (20, 50773), (21, 50776), (22, 50794), (23, 50800),

Gene: AlpineSix\_92 Start: 51234, Stop: 51761, Start Num: 12

Candidate Starts for AlpineSix\_92:

(Start: 10 @51222 has 57 MA's), (11, 51228), (Start: 12 @51234 has 34 MA's), (13, 51378), (15, 51597), (18, 51669), (19, 51675), (20, 51699), (21, 51702), (22, 51720), (23, 51726),

Gene: Batiatus\_91 Start: 51505, Stop: 52044, Start Num: 10

Candidate Starts for Batiatus\_91:

(Start: 10 @51505 has 57 MA's), (11, 51511), (Start: 12 @51517 has 34 MA's), (13, 51661), (14, 51724), (15, 51880), (18, 51952), (20, 51982), (21, 51985), (22, 52003), (23, 52009),

Gene: Beakin\_84 Start: 48258, Stop: 48797, Start Num: 10

Candidate Starts for Beakin\_84:

(Start: 10 @48258 has 57 MA's), (11, 48264), (Start: 12 @48270 has 34 MA's), (13, 48414), (14, 48477), (15, 48633), (18, 48705), (20, 48735), (21, 48738), (22, 48756), (23, 48762),

Gene: BigPhil\_88 Start: 48225, Stop: 48836, Start Num: 8

Candidate Starts for BigPhil\_88:

(Start: 8 @48225 has 1 MA's), (Start: 10 @48297 has 57 MA's), (11, 48303), (Start: 12 @48309 has 34 MA's), (13, 48453), (14, 48516), (15, 48672), (18, 48744), (20, 48774), (21, 48777), (22, 48795),

(23, 48801),

Gene: Blexus\_88 Start: 51633, Stop: 52172, Start Num: 10

Candidate Starts for Blexus\_88:

(Start: 10 @51633 has 57 MA's), (11, 51639), (Start: 12 @51645 has 34 MA's), (13, 51789), (14, 51852), (15, 52008), (18, 52080), (20, 52110), (21, 52113), (22, 52131), (23, 52137),

Gene: BlueCrab\_94 Start: 52594, Stop: 53121, Start Num: 12

Candidate Starts for BlueCrab\_94:

(Start: 10 @52582 has 57 MA's), (11, 52588), (Start: 12 @52594 has 34 MA's), (13, 52738), (14, 52801), (15, 52957), (18, 53029), (20, 53059), (21, 53062), (22, 53080), (23, 53086),

Gene: BobaPhett\_93 Start: 53327, Stop: 53854, Start Num: 12

Candidate Starts for BobaPhett\_93:

(2, 53162), (4, 53174), (Start: 10 @53315 has 57 MA's), (11, 53321), (Start: 12 @53327 has 34 MA's), (13, 53471), (14, 53534), (15, 53690), (18, 53762), (20, 53792), (21, 53795), (22, 53813), (23, 53819),

Gene: Brocalys\_83 Start: 48806, Stop: 49333, Start Num: 12

Candidate Starts for Brocalys\_83:

(Start: 10 @48794 has 57 MA's), (11, 48800), (Start: 12 @48806 has 34 MA's), (13, 48950), (14, 49013), (15, 49169), (18, 49241), (20, 49271), (21, 49274), (22, 49292), (23, 49298),

Gene: Bubbles123\_87 Start: 51527, Stop: 52054, Start Num: 12

Candidate Starts for Bubbles123\_87:

(Start: 10 @51515 has 57 MA's), (11, 51521), (Start: 12 @51527 has 34 MA's), (13, 51671), (14, 51734), (15, 51890), (18, 51962), (20, 51992), (21, 51995), (22, 52013), (23, 52019),

Gene: Burwell21\_85 Start: 51080, Stop: 51619, Start Num: 10

Candidate Starts for Burwell21\_85:

(Start: 10 @51080 has 57 MA's), (11, 51086), (Start: 12 @51092 has 34 MA's), (13, 51236), (14, 51299), (15, 51455), (18, 51527), (20, 51557), (21, 51560), (22, 51578), (23, 51584),

Gene: ByChance\_81 Start: 46706, Stop: 47245, Start Num: 10

Candidate Starts for ByChance\_81:

(Start: 10 @46706 has 57 MA's), (11, 46712), (Start: 12 @46718 has 34 MA's), (13, 46862), (14, 46925), (15, 47081), (18, 47153), (20, 47183), (21, 47186), (22, 47204), (23, 47210),

Gene: Cabrinians\_88 Start: 50726, Stop: 51253, Start Num: 12

Candidate Starts for Cabrinians\_88:

(Start: 10 @50714 has 57 MA's), (11, 50720), (Start: 12 @50726 has 34 MA's), (13, 50870), (14, 50933), (15, 51089), (18, 51161), (20, 51191), (21, 51194), (22, 51212), (23, 51218),

Gene: Cerasum\_90 Start: 48315, Stop: 48854, Start Num: 10

Candidate Starts for Cerasum\_90:

(Start: 8 @48243 has 1 MA's), (Start: 10 @48315 has 57 MA's), (11, 48321), (Start: 12 @48327 has 34 MA's), (13, 48471), (14, 48534), (15, 48690), (18, 48762), (20, 48792), (21, 48795), (22, 48813), (23, 48819),

Gene: Clifton\_83 Start: 49769, Stop: 50308, Start Num: 10

Candidate Starts for Clifton\_83:

(Start: 10 @49769 has 57 MA's), (11, 49775), (Start: 12 @49781 has 34 MA's), (13, 49925), (14, 49988), (15, 50144), (18, 50216), (20, 50246), (21, 50249), (22, 50267), (23, 50273),

Gene: Coco12\_92 Start: 52384, Stop: 52911, Start Num: 12

Candidate Starts for Coco12\_92:

(Start: 8 @52300 has 1 MA's), (Start: 10 @52372 has 57 MA's), (11, 52378), (Start: 12 @52384 has 34 MA's), (13, 52528), (14, 52591), (15, 52747), (18, 52819), (20, 52849), (21, 52852), (22, 52870), (23, 52876),

Gene: Crumble\_86 Start: 47451, Stop: 47978, Start Num: 12

Candidate Starts for Crumble\_86:

(Start: 10 @47439 has 57 MA's), (11, 47445), (Start: 12 @47451 has 34 MA's), (13, 47595), (14, 47658), (15, 47814), (18, 47886), (20, 47916), (21, 47919), (22, 47937), (23, 47943),

Gene: DRBy19\_94 Start: 53090, Stop: 53617, Start Num: 12

Candidate Starts for DRBy19\_94:

(Start: 10 @53078 has 57 MA's), (11, 53084), (Start: 12 @53090 has 34 MA's), (13, 53234), (14, 53297), (15, 53453), (18, 53525), (20, 53555), (21, 53558), (22, 53576), (23, 53582),

Gene: Dante\_91 Start: 53012, Stop: 53539, Start Num: 12

Candidate Starts for Dante\_91:

(Start: 10 @53000 has 57 MA's), (11, 53006), (Start: 12 @53012 has 34 MA's), (13, 53156), (14, 53219), (15, 53375), (18, 53447), (20, 53477), (21, 53480), (22, 53498), (23, 53504),

Gene: Demsculpinboyz\_106 Start: 51661, Stop: 52200, Start Num: 10

Candidate Starts for Demsculpinboyz\_106:

(Start: 10 @51661 has 57 MA's), (11, 51667), (Start: 12 @51673 has 34 MA's), (13, 51817), (14, 51880), (15, 52036), (18, 52108), (20, 52138), (21, 52141), (22, 52159), (23, 52165),

Gene: DillTech15\_99 Start: 51826, Stop: 52365, Start Num: 10

Candidate Starts for DillTech15\_99:

(Start: 10 @51826 has 57 MA's), (11, 51832), (Start: 12 @51838 has 34 MA's), (13, 51982), (14, 52045), (15, 52201), (18, 52273), (20, 52303), (21, 52306), (22, 52324), (23, 52330),

Gene: Doug\_90 Start: 52926, Stop: 53453, Start Num: 12

Candidate Starts for Doug\_90:

(Start: 10 @52914 has 57 MA's), (11, 52920), (Start: 12 @52926 has 34 MA's), (13, 53070), (14, 53133), (15, 53289), (18, 53361), (20, 53391), (21, 53394), (22, 53412), (23, 53418),

Gene: EleanorGeorge\_98 Start: 54144, Stop: 54683, Start Num: 10

Candidate Starts for EleanorGeorge\_98:

(6, 54057), (Start: 10 @54144 has 57 MA's), (11, 54150), (Start: 12 @54156 has 34 MA's), (13, 54300), (14, 54363), (15, 54519), (18, 54591), (20, 54621), (21, 54624), (22, 54642), (23, 54648),

Gene: Firehouse51\_88 Start: 52378, Stop: 52905, Start Num: 12

Candidate Starts for Firehouse51\_88:

(Start: 10 @52366 has 57 MA's), (11, 52372), (Start: 12 @52378 has 34 MA's), (13, 52522), (14, 52585), (15, 52741), (18, 52813), (20, 52843), (21, 52846), (22, 52864), (23, 52870),

Gene: Flathead\_96 Start: 51870, Stop: 52409, Start Num: 10

Candidate Starts for Flathead\_96:

(Start: 10 @51870 has 57 MA's), (11, 51876), (Start: 12 @51882 has 34 MA's), (13, 52026), (14, 52089), (15, 52245), (18, 52317), (20, 52347), (21, 52350), (22, 52368), (23, 52374),

Gene: Frankie\_92 Start: 51409, Stop: 51855, Start Num: 10

Candidate Starts for Frankie\_92:

(9, 51361), (Start: 10 @51409 has 57 MA's), (11, 51415), (Start: 12 @51421 has 34 MA's), (13, 51565), (14, 51628), (15, 51784),

Gene: FreddyB\_101 Start: 52361, Stop: 52900, Start Num: 10

Candidate Starts for FreddyB\_101:

(Start: 10 @52361 has 57 MA's), (11, 52367), (Start: 12 @52373 has 34 MA's), (13, 52517), (14, 52580), (15, 52736), (18, 52808), (20, 52838), (21, 52841), (22, 52859), (23, 52865),

Gene: Gorge\_90 Start: 52000, Stop: 52527, Start Num: 12

Candidate Starts for Gorge\_90:

(Start: 10 @51988 has 57 MA's), (11, 51994), (Start: 12 @52000 has 34 MA's), (13, 52144), (14, 52207), (15, 52363), (18, 52435), (20, 52465), (21, 52468), (22, 52486), (23, 52492),

Gene: Guppsters\_88 Start: 49364, Stop: 49891, Start Num: 12

Candidate Starts for Guppsters\_88:

(Start: 10 @49352 has 57 MA's), (11, 49358), (Start: 12 @49364 has 34 MA's), (13, 49508), (14, 49571), (15, 49727), (18, 49799), (20, 49829), (21, 49832), (22, 49850), (23, 49856),

Gene: Hegedechwinu\_93 Start: 50606, Stop: 51121, Start Num: 10

Candidate Starts for Hegedechwinu\_93:

(Start: 10 @50606 has 57 MA's), (11, 50612), (Start: 12 @50618 has 34 MA's), (13, 50762), (14, 50825), (15, 50981), (16, 50993), (17, 51008), (20, 51086), (24, 51113),

Gene: Hlubikazi\_91 Start: 49975, Stop: 50514, Start Num: 10

Candidate Starts for Hlubikazi\_91:

(Start: 10 @49975 has 57 MA's), (11, 49981), (Start: 12 @49987 has 34 MA's), (13, 50131), (14, 50194), (15, 50350), (18, 50422), (20, 50452), (21, 50455), (22, 50473), (23, 50479),

Gene: James\_95 Start: 53382, Stop: 53909, Start Num: 12

Candidate Starts for James\_95:

(Start: 10 @53370 has 57 MA's), (11, 53376), (Start: 12 @53382 has 34 MA's), (13, 53526), (14, 53589), (15, 53745), (18, 53817), (20, 53847), (21, 53850), (22, 53868), (23, 53874),

Gene: Jarcob\_94 Start: 52969, Stop: 53508, Start Num: 10

Candidate Starts for Jarcob\_94:

(Start: 10 @52969 has 57 MA's), (11, 52975), (Start: 12 @52981 has 34 MA's), (13, 53125), (14, 53188), (15, 53344), (18, 53416), (20, 53446), (21, 53449), (22, 53467), (23, 53473),

Gene: Jinglebell\_100 Start: 53119, Stop: 53658, Start Num: 10

Candidate Starts for Jinglebell\_100:

(Start: 10 @53119 has 57 MA's), (11, 53125), (Start: 12 @53131 has 34 MA's), (13, 53275), (15, 53494), (18, 53566), (19, 53572), (20, 53596), (21, 53599), (22, 53617), (23, 53623),

Gene: Job42\_93 Start: 54041, Stop: 54568, Start Num: 12

Candidate Starts for Job42\_93:

(Start: 10 @54029 has 57 MA's), (11, 54035), (Start: 12 @54041 has 34 MA's), (13, 54185), (14, 54248), (15, 54404), (18, 54476), (20, 54506), (21, 54509), (22, 54527), (23, 54533),

Gene: Kersh\_97 Start: 54402, Stop: 54941, Start Num: 10

Candidate Starts for Kersh\_97:

(Start: 10 @54402 has 57 MA's), (11, 54408), (Start: 12 @54414 has 34 MA's), (13, 54558), (14, 54621), (15, 54777), (18, 54849), (20, 54879), (21, 54882), (22, 54900), (23, 54906),

Gene: Kingsley\_100 Start: 54979, Stop: 55518, Start Num: 10

Candidate Starts for Kingsley\_100:

(Start: 8 @54907 has 1 MA's), (Start: 10 @54979 has 57 MA's), (11, 54985), (Start: 12 @54991 has 34 MA's), (13, 55135), (14, 55198), (15, 55354), (18, 55426), (20, 55456), (21, 55459), (22, 55477), (23, 55483),

Gene: Koella\_84 Start: 48132, Stop: 48671, Start Num: 10

Candidate Starts for Koella\_84:

(Start: 10 @48132 has 57 MA's), (11, 48138), (Start: 12 @48144 has 34 MA's), (13, 48288), (14, 48351), (15, 48507), (18, 48579), (20, 48609), (21, 48612), (22, 48630), (23, 48636),

Gene: LastJedi\_82 Start: 49188, Stop: 49727, Start Num: 10

Candidate Starts for LastJedi\_82:

(Start: 10 @49188 has 57 MA's), (11, 49194), (Start: 12 @49200 has 34 MA's), (13, 49344), (14, 49407), (15, 49563), (18, 49635), (20, 49665), (21, 49668), (22, 49686), (23, 49692),

Gene: Latretium\_94 Start: 52235, Stop: 52774, Start Num: 10

Candidate Starts for Latretium\_94:

(Start: 10 @52235 has 57 MA's), (11, 52241), (Start: 12 @52247 has 34 MA's), (13, 52391), (14, 52454), (15, 52610), (18, 52682), (20, 52712), (21, 52715), (22, 52733), (23, 52739),

Gene: LilMoolah\_94 Start: 52181, Stop: 52708, Start Num: 12

Candidate Starts for LilMoolah\_94:

(Start: 10 @52169 has 57 MA's), (11, 52175), (Start: 12 @52181 has 34 MA's), (13, 52325), (14, 52388), (15, 52544), (18, 52616), (20, 52646), (21, 52649), (22, 52667), (23, 52673),

Gene: Lizziana\_92 Start: 52437, Stop: 52976, Start Num: 10

Candidate Starts for Lizziana\_92:

(Start: 10 @52437 has 57 MA's), (11, 52443), (Start: 12 @52449 has 34 MA's), (13, 52593), (14, 52656), (15, 52812), (18, 52884), (20, 52914), (21, 52917), (22, 52935), (23, 52941),

Gene: Llama\_100 Start: 52975, Stop: 53514, Start Num: 10

Candidate Starts for Llama\_100:

(Start: 10 @52975 has 57 MA's), (11, 52981), (Start: 12 @52987 has 34 MA's), (13, 53131), (15, 53350), (18, 53422), (19, 53428), (20, 53452), (21, 53455), (22, 53473), (23, 53479),

Gene: MadMen\_98 Start: 52283, Stop: 52822, Start Num: 10

Candidate Starts for MadMen\_98:

(Start: 10 @52283 has 57 MA's), (11, 52289), (Start: 12 @52295 has 34 MA's), (13, 52439), (14, 52502), (15, 52658), (18, 52730), (20, 52760), (21, 52763), (22, 52781), (23, 52787),

Gene: Mandlovu\_91 Start: 49917, Stop: 50456, Start Num: 10

Candidate Starts for Mandlovu\_91:

(Start: 10 @49917 has 57 MA's), (11, 49923), (Start: 12 @49929 has 34 MA's), (13, 50073), (14, 50136), (15, 50292), (18, 50364), (20, 50394), (21, 50397), (22, 50415), (23, 50421),

Gene: Mantra\_91 Start: 51360, Stop: 51887, Start Num: 12

Candidate Starts for Mantra\_91:

(Start: 10 @51348 has 57 MA's), (11, 51354), (Start: 12 @51360 has 34 MA's), (13, 51504), (14, 51567), (15, 51723), (18, 51795), (20, 51825), (21, 51828), (22, 51846), (23, 51852),

Gene: Maravista\_88 Start: 53097, Stop: 53636, Start Num: 10

Candidate Starts for Maravista\_88:



(Start: 10 @53097 has 57 MA's), (11, 53103), (Start: 12 @53109 has 34 MA's), (13, 53253), (14, 53316), (15, 53472), (18, 53544), (20, 53574), (21, 53577), (22, 53595), (23, 53601),

Gene: Martik\_89 Start: 52454, Stop: 52993, Start Num: 10

Candidate Starts for Martik\_89:

(Start: 10 @52454 has 57 MA's), (11, 52460), (Start: 12 @52466 has 34 MA's), (13, 52610), (14, 52673), (15, 52829), (18, 52901), (20, 52931), (21, 52934), (22, 52952), (23, 52958),

Gene: Mattes\_92 Start: 52118, Stop: 52645, Start Num: 12

Candidate Starts for Mattes\_92:

(Start: 10 @52106 has 57 MA's), (11, 52112), (Start: 12 @52118 has 34 MA's), (13, 52262), (14, 52325), (15, 52481), (18, 52553), (20, 52583), (21, 52586), (22, 52604), (23, 52610),

Gene: Melissauren88\_82 Start: 47962, Stop: 48489, Start Num: 12

Candidate Starts for Melissauren88\_82:

(Start: 10 @47950 has 57 MA's), (11, 47956), (Start: 12 @47962 has 34 MA's), (13, 48106), (14, 48169), (15, 48325), (18, 48397), (20, 48427), (21, 48430), (22, 48448), (23, 48454),

Gene: MilanaBonita\_86 Start: 50308, Stop: 50835, Start Num: 12

Candidate Starts for MilanaBonita\_86:

(Start: 10 @50296 has 57 MA's), (11, 50302), (Start: 12 @50308 has 34 MA's), (13, 50452), (14, 50515), (15, 50671), (18, 50743), (20, 50773), (21, 50776), (22, 50794), (23, 50800),

Gene: Minnie\_85 Start: 52072, Stop: 52611, Start Num: 10

Candidate Starts for Minnie\_85:

(Start: 10 @52072 has 57 MA's), (11, 52078), (Start: 12 @52084 has 34 MA's), (13, 52228), (14, 52291), (15, 52447), (18, 52519), (20, 52549), (21, 52552), (22, 52570), (23, 52576),

Gene: Modragons\_98 Start: 52963, Stop: 53502, Start Num: 10

Candidate Starts for Modragons\_98:

(Start: 10 @52963 has 57 MA's), (11, 52969), (Start: 12 @52975 has 34 MA's), (13, 53119), (15, 53338), (18, 53410), (19, 53416), (20, 53440), (21, 53443), (22, 53461), (23, 53467),

Gene: Mova\_95 Start: 52107, Stop: 52646, Start Num: 10

Candidate Starts for Mova\_95:

(5, 52011), (7, 52026), (Start: 10 @52107 has 57 MA's), (11, 52113), (Start: 12 @52119 has 34 MA's), (13, 52263), (15, 52482), (18, 52554), (19, 52560), (20, 52584), (21, 52587), (22, 52605), (23, 52611),

Gene: Mozy\_98 Start: 51874, Stop: 52413, Start Num: 10

Candidate Starts for Mozy\_98:

(Start: 10 @51874 has 57 MA's), (11, 51880), (Start: 12 @51886 has 34 MA's), (13, 52030), (14, 52093), (15, 52249), (18, 52321), (20, 52351), (21, 52354), (22, 52372), (23, 52378),

Gene: MulchSalad\_95 Start: 52947, Stop: 53474, Start Num: 12

Candidate Starts for MulchSalad\_95:

(Start: 10 @52935 has 57 MA's), (11, 52941), (Start: 12 @52947 has 34 MA's), (13, 53091), (14, 53154), (15, 53310), (18, 53382), (20, 53412), (21, 53415), (22, 53433), (23, 53439),

Gene: Mutaforma13\_94 Start: 51220, Stop: 51747, Start Num: 12

Candidate Starts for Mutaforma13\_94:

(Start: 10 @51208 has 57 MA's), (11, 51214), (Start: 12 @51220 has 34 MA's), (13, 51364), (14, 51427), (15, 51583), (18, 51655), (20, 51685), (21, 51688), (22, 51706), (23, 51712),

Gene: Nivrat\_91 Start: 52042, Stop: 52581, Start Num: 10

Candidate Starts for Nivrat\_91:

(Start: 10 @52042 has 57 MA's), (11, 52048), (Start: 12 @52054 has 34 MA's), (13, 52198), (14, 52261), (15, 52417), (18, 52489), (20, 52519), (21, 52522), (22, 52540), (23, 52546),

Gene: NormanBulbieJr\_89 Start: 52146, Stop: 52685, Start Num: 10

Candidate Starts for NormanBulbieJr\_89:

(Start: 10 @52146 has 57 MA's), (11, 52152), (Start: 12 @52158 has 34 MA's), (13, 52302), (14, 52365), (15, 52521), (18, 52593), (20, 52623), (21, 52626), (22, 52644), (23, 52650),

Gene: Ochi17\_99 Start: 52570, Stop: 53109, Start Num: 10

Candidate Starts for Ochi17\_99:

(Start: 10 @52570 has 57 MA's), (11, 52576), (Start: 12 @52582 has 34 MA's), (13, 52726), (15, 52945), (18, 53017), (19, 53023), (20, 53047), (21, 53050), (22, 53068), (23, 53074),

Gene: OfUltron\_101 Start: 53119, Stop: 53658, Start Num: 10

Candidate Starts for OfUltron\_101:

(Start: 10 @53119 has 57 MA's), (11, 53125), (Start: 12 @53131 has 34 MA's), (13, 53275), (15, 53494), (18, 53566), (19, 53572), (20, 53596), (21, 53599), (22, 53617), (23, 53623),

Gene: OlympiaSaint\_95 Start: 52312, Stop: 52851, Start Num: 10

Candidate Starts for OlympiaSaint\_95:

(Start: 10 @52312 has 57 MA's), (11, 52318), (Start: 12 @52324 has 34 MA's), (13, 52468), (14, 52531), (15, 52687), (18, 52759), (20, 52789), (21, 52792), (22, 52810), (23, 52816),

Gene: Pacc40\_89 Start: 52550, Stop: 53077, Start Num: 12

Candidate Starts for Pacc40\_89:

(1, 52388), (3, 52400), (Start: 10 @52538 has 57 MA's), (11, 52544), (Start: 12 @52550 has 34 MA's), (13, 52694), (14, 52757), (15, 52913), (18, 52985), (20, 53015), (21, 53018), (22, 53036), (23, 53042),

Gene: Phanphagia\_96 Start: 53230, Stop: 53757, Start Num: 12

Candidate Starts for Phanphagia\_96:

(Start: 8 @53146 has 1 MA's), (Start: 10 @53218 has 57 MA's), (11, 53224), (Start: 12 @53230 has 34 MA's), (13, 53374), (14, 53437), (15, 53593), (18, 53665), (20, 53695), (21, 53698), (22, 53716), (23, 53722),

Gene: Philus\_93 Start: 53066, Stop: 53593, Start Num: 12

Candidate Starts for Philus\_93:

(Start: 10 @53054 has 57 MA's), (11, 53060), (Start: 12 @53066 has 34 MA's), (13, 53210), (14, 53273), (15, 53429), (18, 53501), (20, 53531), (21, 53534), (22, 53552), (23, 53558),

Gene: Pippy\_89 Start: 50417, Stop: 50956, Start Num: 10

Candidate Starts for Pippy\_89:

(Start: 10 @50417 has 57 MA's), (11, 50423), (Start: 12 @50429 has 34 MA's), (13, 50573), (14, 50636), (15, 50792), (18, 50864), (20, 50894), (21, 50897), (22, 50915), (23, 50921),

Gene: Pollywog\_95 Start: 53379, Stop: 53906, Start Num: 12

Candidate Starts for Pollywog\_95:

(Start: 10 @53367 has 57 MA's), (11, 53373), (Start: 12 @53379 has 34 MA's), (13, 53523), (14, 53586), (15, 53742), (18, 53814), (20, 53844), (21, 53847), (22, 53865), (23, 53871),

Gene: PopTart\_84 Start: 49091, Stop: 49630, Start Num: 10

Candidate Starts for PopTart\_84:

(Start: 10 @49091 has 57 MA's), (11, 49097), (Start: 12 @49103 has 34 MA's), (13, 49247), (15, 49466), (18, 49538), (19, 49544), (20, 49568), (21, 49571), (22, 49589), (23, 49595),

Gene: Priscilla\_92 Start: 52244, Stop: 52783, Start Num: 10

Candidate Starts for Priscilla\_92:

(Start: 10 @52244 has 57 MA's), (11, 52250), (Start: 12 @52256 has 34 MA's), (13, 52400), (14, 52463), (15, 52619), (18, 52691), (20, 52721), (21, 52724), (22, 52742), (23, 52748),

Gene: Radiance\_91 Start: 51665, Stop: 52192, Start Num: 12

Candidate Starts for Radiance\_91:

(Start: 10 @51653 has 57 MA's), (11, 51659), (Start: 12 @51665 has 34 MA's), (13, 51809), (14, 51872), (15, 52028), (18, 52100), (20, 52130), (21, 52133), (22, 52151), (23, 52157),

Gene: Saal\_89 Start: 51808, Stop: 52347, Start Num: 10

Candidate Starts for Saal\_89:

(Start: 10 @51808 has 57 MA's), (11, 51814), (Start: 12 @51820 has 34 MA's), (13, 51964), (14, 52027), (15, 52183), (18, 52255), (20, 52285), (21, 52288), (22, 52306), (23, 52312),

Gene: Sabbb\_96 Start: 50248, Stop: 50787, Start Num: 10

Candidate Starts for Sabbb\_96:

(Start: 10 @50248 has 57 MA's), (11, 50254), (Start: 12 @50260 has 34 MA's), (13, 50404), (14, 50467), (15, 50623), (18, 50695), (20, 50725), (21, 50728), (22, 50746), (23, 50752),

Gene: Sandalphon\_91 Start: 52800, Stop: 53339, Start Num: 10

Candidate Starts for Sandalphon\_91:

(Start: 10 @52800 has 57 MA's), (11, 52806), (Start: 12 @52812 has 34 MA's), (13, 52956), (14, 53019), (15, 53175), (18, 53247), (20, 53277), (21, 53280), (22, 53298), (23, 53304),

Gene: Sarma624\_94 Start: 48991, Stop: 49530, Start Num: 10

Candidate Starts for Sarma624\_94:

(Start: 8 @48919 has 1 MA's), (Start: 10 @48991 has 57 MA's), (11, 48997), (Start: 12 @49003 has 34 MA's), (13, 49147), (14, 49210), (15, 49366), (18, 49438), (20, 49468), (21, 49471), (22, 49489), (23, 49495),

Gene: SassyB\_84 Start: 49091, Stop: 49630, Start Num: 10

Candidate Starts for SassyB\_84:

(Start: 10 @49091 has 57 MA's), (11, 49097), (Start: 12 @49103 has 34 MA's), (13, 49247), (15, 49466), (18, 49538), (19, 49544), (20, 49568), (21, 49571), (22, 49589), (23, 49595),

Gene: Seabastian\_101 Start: 53120, Stop: 53659, Start Num: 10

Candidate Starts for Seabastian\_101:

(Start: 10 @53120 has 57 MA's), (11, 53126), (Start: 12 @53132 has 34 MA's), (13, 53276), (15, 53495), (18, 53567), (19, 53573), (20, 53597), (21, 53600), (22, 53618), (23, 53624),

Gene: Shauna1\_94 Start: 52846, Stop: 53373, Start Num: 12

Candidate Starts for Shauna1\_94:

(Start: 8 @52762 has 1 MA's), (Start: 10 @52834 has 57 MA's), (11, 52840), (Start: 12 @52846 has 34 MA's), (13, 52990), (14, 53053), (15, 53209), (18, 53281), (20, 53311), (21, 53314), (22, 53332), (23, 53338),

Gene: ShiLan\_94 Start: 53825, Stop: 54364, Start Num: 10

Candidate Starts for ShiLan\_94:

(Start: 10 @53825 has 57 MA's), (11, 53831), (Start: 12 @53837 has 34 MA's), (13, 53981), (14, 54044), (15, 54200), (18, 54272), (20, 54302), (21, 54305), (22, 54323), (23, 54329),

Gene: ShowerHandel\_91 Start: 50644, Stop: 51183, Start Num: 10

Candidate Starts for ShowerHandel\_91:

(Start: 10 @50644 has 57 MA's), (11, 50650), (Start: 12 @50656 has 34 MA's), (13, 50800), (14, 50863), (15, 51019), (18, 51091), (20, 51121), (21, 51124), (22, 51142), (23, 51148),

Gene: SiSi\_89 Start: 50873, Stop: 51412, Start Num: 10

Candidate Starts for SiSi\_89:

(Start: 10 @50873 has 57 MA's), (11, 50879), (Start: 12 @50885 has 34 MA's), (13, 51029), (14, 51092), (15, 51248), (18, 51320), (20, 51350), (21, 51353), (22, 51371), (23, 51377),

Gene: Sparkdehlily\_101 Start: 50985, Stop: 51524, Start Num: 10

Candidate Starts for Sparkdehlily\_101:

(Start: 10 @50985 has 57 MA's), (11, 50991), (Start: 12 @50997 has 34 MA's), (13, 51141), (14, 51204), (15, 51360), (18, 51432), (20, 51462), (21, 51465), (22, 51483), (23, 51489),

Gene: Spoonbill\_91 Start: 49750, Stop: 50277, Start Num: 12

Candidate Starts for Spoonbill\_91:

(Start: 10 @49738 has 57 MA's), (11, 49744), (Start: 12 @49750 has 34 MA's), (13, 49894), (14, 49957), (15, 50113), (18, 50185), (20, 50215), (21, 50218), (22, 50236), (23, 50242),

Gene: Strokeseat\_91 Start: 49974, Stop: 50513, Start Num: 10

Candidate Starts for Strokeseat\_91:

(Start: 10 @49974 has 57 MA's), (11, 49980), (Start: 12 @49986 has 34 MA's), (13, 50130), (14, 50193), (15, 50349), (18, 50421), (20, 50451), (21, 50454), (22, 50472), (23, 50478),

Gene: SwagPigglett\_93 Start: 52944, Stop: 53483, Start Num: 10

Candidate Starts for SwagPigglett\_93:

(Start: 10 @52944 has 57 MA's), (11, 52950), (Start: 12 @52956 has 34 MA's), (13, 53100), (14, 53163), (15, 53319), (18, 53391), (20, 53421), (21, 53424), (22, 53442), (23, 53448),

Gene: TDanisky\_102 Start: 50985, Stop: 51524, Start Num: 10

Candidate Starts for TDanisky\_102:

(Start: 10 @50985 has 57 MA's), (11, 50991), (Start: 12 @50997 has 34 MA's), (13, 51141), (14, 51204), (15, 51360), (18, 51432), (20, 51462), (21, 51465), (22, 51483), (23, 51489),

Gene: Tootsieroll\_87 Start: 52222, Stop: 52749, Start Num: 12

Candidate Starts for Tootsieroll\_87:

(Start: 10 @52210 has 57 MA's), (11, 52216), (Start: 12 @52222 has 34 MA's), (13, 52366), (14, 52429), (15, 52585), (18, 52657), (20, 52687), (21, 52690), (22, 52708), (23, 52714),

Gene: Velveteen\_89 Start: 48991, Stop: 49530, Start Num: 10

Candidate Starts for Velveteen\_89:

(Start: 8 @48919 has 1 MA's), (Start: 10 @48991 has 57 MA's), (11, 48997), (Start: 12 @49003 has 34 MA's), (13, 49147), (14, 49210), (15, 49366), (18, 49438), (20, 49468), (21, 49471), (22, 49489), (23, 49495),

Gene: Veteran\_84 Start: 50753, Stop: 51280, Start Num: 12

Candidate Starts for Veteran\_84:

(Start: 10 @50741 has 57 MA's), (11, 50747), (Start: 12 @50753 has 34 MA's), (13, 50897), (14, 50960), (15, 51116), (18, 51188), (20, 51218), (21, 51221), (22, 51239), (23, 51245),

Gene: Whatsapiecost\_87 Start: 46858, Stop: 47397, Start Num: 10

Candidate Starts for Whatsapiecost\_87:

(Start: 10 @46858 has 57 MA's), (11, 46864), (Start: 12 @46870 has 34 MA's), (13, 47014), (14, 47077), (15, 47233), (18, 47305), (20, 47335), (21, 47338), (22, 47356), (23, 47362),

Gene: Whouxphf\_94 Start: 52249, Stop: 52788, Start Num: 10

Candidate Starts for Whouxphf\_94:

(Start: 10 @52249 has 57 MA's), (11, 52255), (Start: 12 @52261 has 34 MA's), (13, 52405), (14, 52468), (15, 52624), (18, 52696), (20, 52726), (21, 52729), (22, 52747), (23, 52753),

Gene: Yorick\_87 Start: 52497, Stop: 53024, Start Num: 12

Candidate Starts for Yorick\_87:

(Start: 10 @52485 has 57 MA's), (11, 52491), (Start: 12 @52497 has 34 MA's), (13, 52641), (14, 52704), (15, 52860), (18, 52932), (20, 52962), (21, 52965), (22, 52983), (23, 52989),

Gene: Zerg\_92 Start: 51755, Stop: 52282, Start Num: 12

Candidate Starts for Zerg\_92:

(Start: 10 @51743 has 57 MA's), (11, 51749), (Start: 12 @51755 has 34 MA's), (13, 51899), (14, 51962), (15, 52118), (18, 52190), (20, 52220), (21, 52223), (22, 52241), (23, 52247),

Gene: Zizzle\_94 Start: 53147, Stop: 53674, Start Num: 12

Candidate Starts for Zizzle\_94:

(Start: 10 @53135 has 57 MA's), (11, 53141), (Start: 12 @53147 has 34 MA's), (13, 53291), (14, 53354), (15, 53510), (18, 53582), (20, 53612), (21, 53615), (22, 53633), (23, 53639),