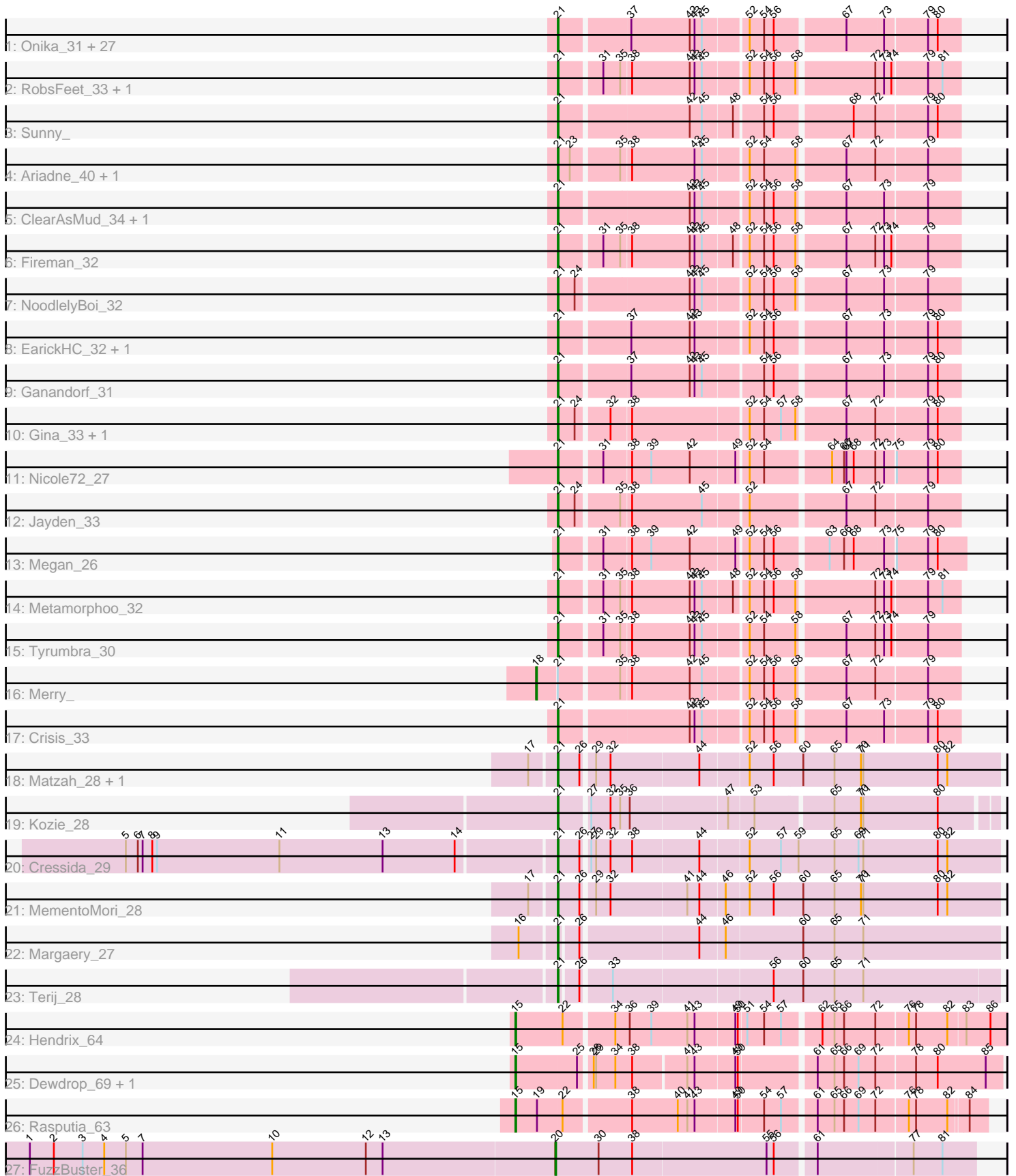


# Pham 216173



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 216173 Report

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

Pham number 216173 has 61 members, 5 are drafts.

Phages represented in each track:

- Track 1 : Onika\_31, Piperis\_32, Selwyn23\_33, Yeti\_32, Pulchra\_33, Cranjis\_33, Ramiel05\_31, Glorp\_33, Honeyfin\_33, Antares\_32, Kowalski\_31, Jollipop\_32, PiperSansNom\_32, Phrancesco\_32, Paschalis\_31, Shotgun\_31, Scumberland\_33, PhedwardCullen\_30, Hermeonysus\_31, CrazyRich\_31, LittleFortune\_33, Jefe\_32, Busephilis\_31, BrazzalePHS\_31, Quhwah\_35, Savannah\_31, Phorgeous\_31, PierreOrion\_32
- Track 2 : RobsFeet\_33, Shrubaron\_32
- Track 3 : Sunny\_
- Track 4 : Ariadne\_40, Smarties\_40
- Track 5 : ClearAsMud\_34, SirFrank\_31
- Track 6 : Fireman\_32
- Track 7 : NoodlelyBoi\_32
- Track 8 : EarickHC\_32, KaiHaiDragon\_32
- Track 9 : Ganandorf\_31
- Track 10 : Gina\_33, Teamocil\_33
- Track 11 : Nicole72\_27
- Track 12 : Jayden\_33
- Track 13 : Megan\_26
- Track 14 : Metamorphoo\_32
- Track 15 : Tyumbra\_30
- Track 16 : Merry\_
- Track 17 : Crisis\_33
- Track 18 : Matzah\_28, Cinna\_27
- Track 19 : Kozie\_28
- Track 20 : Cressida\_29
- Track 21 : MementoMori\_28
- Track 22 : Margaery\_27
- Track 23 : Terij\_28
- Track 24 : Hendrix\_64
- Track 25 : Dewdrop\_69, Leaf\_69
- Track 26 : Rasputia\_63
- Track 27 : FuzzBuster\_36

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

The start number called the most often in the published annotations is 21, it was called in 50 of the 56 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Antares\_32, Ariadne\_40, BrazzalePHS\_31, Busephilis\_31, Cinna\_27, ClearAsMud\_34, Cranjis\_33, CrazyRich\_31, Cressida\_29, Crisis\_33, EarickHC\_32, Fireman\_32, Ganandorf\_31, Gina\_33, Glorp\_33, Hermeonysus\_31, Honeyfin\_33, Jayden\_33, Jefe\_32, Jollipop\_32, KaiHaiDragon\_32, Kowalski\_31, Kozi\_28, LittleFortune\_33, Margaery\_27, Matzah\_28, Megan\_26, MementoMori\_28, Metamorphoo\_32, Nicole72\_27, NoodlelyBoi\_32, Onika\_31, Paschalis\_31, PhedwardCullen\_30, Phorgeous\_31, Phrancesco\_32, PierreOrion\_32, PiperSansNom\_32, Piperis\_32, Pulchra\_33, Quhwah\_35, Ramiel05\_31, RobsFeet\_33, Savannah\_31, Scumberland\_33, Selwyn23\_33, Shotgun\_31, Shrubaron\_32, SirFrank\_31, Smarties\_40, Sunny\_, Teamocil\_33, Terij\_28, Tyumbra\_30, Yeti\_32,

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

- Merry\_

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

- Dewdrop\_69, FuzzBuster\_36, Hendrix\_64, Leaf\_69, Rasputia\_63,

### Summary by start number:

Start 15:

- Found in 4 of 61 ( 6.6% ) of genes in pham
- Manual Annotations of this start: 4 of 56
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Dewdrop\_69 (GC), Hendrix\_64 (GC), Leaf\_69 (GC), Rasputia\_63 (GC),

Start 18:

- Found in 1 of 61 ( 1.6% ) of genes in pham
- Manual Annotations of this start: 1 of 56
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Merry\_ (EC),

Start 20:

- Found in 1 of 61 ( 1.6% ) of genes in pham
- Manual Annotations of this start: 1 of 56
- Called 100.0% of time when present
- Phage (with cluster) where this start called: FuzzBuster\_36 (singleton),

Start 21:

- Found in 56 of 61 ( 91.8% ) of genes in pham
- Manual Annotations of this start: 50 of 56
- Called 98.2% of time when present
- Phage (with cluster) where this start called: Antares\_32 (EC), Ariadne\_40 (EC), BrazzalePHS\_31 (EC), Busephilis\_31 (EC), Cinna\_27 (EI), ClearAsMud\_34 (EC), Cranjis\_33 (EC), CrazyRich\_31 (EC), Cressida\_29 (EI), Crisis\_33 (EC), EarickHC\_32 (EC), Fireman\_32 (EC), Ganandorf\_31 (EC), Gina\_33 (EC), Glorp\_33 (EC), Hermeonysus\_31 (EC), Honeyfin\_33 (EC), Jayden\_33 (EC), Jefe\_32 (EC),

Jollipop\_32 (EC), KaiHaiDragon\_32 (EC), Kowalski\_31 (EC), Kozie\_28 (EI), LittleFortune\_33 (EC), Margaery\_27 (EI), Matzah\_28 (EI), Megan\_26 (EC), MementoMori\_28 (EI), Metamorphoo\_32 (EC), Nicole72\_27 (EC), NoodlelyBoi\_32 (EC), Onika\_31 (EC), Paschalis\_31 (EC), PhedwardCullen\_30 (EC), Phorgeous\_31 (EC), Phrancesco\_32 (EC), PierreOrion\_32 (EC), PiperSansNom\_32 (EC), Piperis\_32 (EC), Pulchra\_33 (EC), Quhwah\_35 (EC), Ramiel05\_31 (EC), RobsFeet\_33 (EC), Savannah\_31 (EC), Scumberland\_33 (EC), Selwyn23\_33 (EC), Shotgun\_31 (EC), Shrubaron\_32 (EC), SirFrank\_31 (EC), Smarties\_40 (EC), Sunny\_ (EC), Teamocil\_33 (EC), Terij\_28 (EI), Tyrumbra\_30 (EC), Yeti\_32 (EC),

### **Summary by clusters:**

There are 4 clusters represented in this pham: GC, singleton, EI, EC,

Info for manual annotations of cluster EC:

- Start number 18 was manually annotated 1 time for cluster EC.
- Start number 21 was manually annotated 43 times for cluster EC.

Info for manual annotations of cluster EI:

- Start number 21 was manually annotated 7 times for cluster EI.

Info for manual annotations of cluster GC:

- Start number 15 was manually annotated 4 times for cluster GC.

### **Gene Information:**

Gene: Antares\_32 Start: 19129, Stop: 19593, Start Num: 21

Candidate Starts for Antares\_32:

(Start: 21 @19129 has 50 MA's), (37, 19210), (42, 19282), (43, 19288), (45, 19297), (52, 19348), (54, 19366), (56, 19378), (67, 19459), (73, 19504), (79, 19555), (80, 19567),

Gene: Ariadne\_40 Start: 20819, Stop: 21283, Start Num: 21

Candidate Starts for Ariadne\_40:

(Start: 21 @20819 has 50 MA's), (23, 20834), (35, 20888), (38, 20900), (43, 20978), (45, 20987), (52, 21038), (54, 21056), (58, 21095), (67, 21149), (72, 21185), (79, 21245),

Gene: BrazzalePHS\_31 Start: 18924, Stop: 19388, Start Num: 21

Candidate Starts for BrazzalePHS\_31:

(Start: 21 @18924 has 50 MA's), (37, 19005), (42, 19077), (43, 19083), (45, 19092), (52, 19143), (54, 19161), (56, 19173), (67, 19254), (73, 19299), (79, 19350), (80, 19362),

Gene: Busephilis\_31 Start: 18859, Stop: 19323, Start Num: 21

Candidate Starts for Busephilis\_31:

(Start: 21 @18859 has 50 MA's), (37, 18940), (42, 19012), (43, 19018), (45, 19027), (52, 19078), (54, 19096), (56, 19108), (67, 19189), (73, 19234), (79, 19285), (80, 19297),

Gene: Cinna\_27 Start: 18274, Stop: 18807, Start Num: 21

Candidate Starts for Cinna\_27:

(17, 18247), (Start: 21 @18274 has 50 MA's), (26, 18301), (29, 18313), (32, 18331), (44, 18439), (52, 18496), (56, 18526), (60, 18562), (65, 18601), (70, 18634), (71, 18637), (80, 18730), (82, 18742),

Gene: ClearAsMud\_34 Start: 19638, Stop: 20102, Start Num: 21

Candidate Starts for ClearAsMud\_34:

(Start: 21 @19638 has 50 MA's), (42, 19791), (43, 19797), (45, 19806), (52, 19857), (54, 19875), (56, 19887), (58, 19914), (67, 19968), (73, 20013), (79, 20064),

Gene: Cranjjs\_33 Start: 19084, Stop: 19548, Start Num: 21

Candidate Starts for Cranjjs\_33:

(Start: 21 @19084 has 50 MA's), (37, 19165), (42, 19237), (43, 19243), (45, 19252), (52, 19303), (54, 19321), (56, 19333), (67, 19414), (73, 19459), (79, 19510), (80, 19522),

Gene: CrazyRich\_31 Start: 18893, Stop: 19357, Start Num: 21

Candidate Starts for CrazyRich\_31:

(Start: 21 @18893 has 50 MA's), (37, 18974), (42, 19046), (43, 19052), (45, 19061), (52, 19112), (54, 19130), (56, 19142), (67, 19223), (73, 19268), (79, 19319), (80, 19331),

Gene: Cressida\_29 Start: 18333, Stop: 18866, Start Num: 21

Candidate Starts for Cressida\_29:

(5, 17808), (6, 17823), (7, 17829), (8, 17841), (9, 17847), (11, 18000), (13, 18129), (14, 18219), (Start: 21 @18333 has 50 MA's), (26, 18360), (27, 18366), (29, 18372), (32, 18390), (38, 18417), (44, 18498), (52, 18555), (57, 18594), (59, 18615), (65, 18660), (69, 18690), (71, 18696), (80, 18789), (82, 18801),

Gene: Crisis\_33 Start: 18878, Stop: 19342, Start Num: 21

Candidate Starts for Crisis\_33:

(Start: 21 @18878 has 50 MA's), (42, 19031), (43, 19037), (45, 19046), (52, 19097), (54, 19115), (56, 19127), (58, 19154), (67, 19208), (73, 19253), (79, 19304), (80, 19316),

Gene: Dewdrop\_69 Start: 38303, Stop: 38872, Start Num: 15

Candidate Starts for Dewdrop\_69:

(Start: 15 @38303 has 4 MA's), (25, 38378), (28, 38390), (29, 38393), (34, 38417), (38, 38438), (41, 38501), (43, 38510), (49, 38558), (50, 38561), (61, 38648), (65, 38669), (66, 38681), (69, 38699), (72, 38720), (78, 38765), (80, 38792), (85, 38852),

Gene: EarickHC\_32 Start: 18804, Stop: 19268, Start Num: 21

Candidate Starts for EarickHC\_32:

(Start: 21 @18804 has 50 MA's), (37, 18885), (42, 18957), (43, 18963), (52, 19023), (54, 19041), (56, 19053), (67, 19134), (73, 19179), (79, 19230), (80, 19242),

Gene: Fireman\_32 Start: 18694, Stop: 19158, Start Num: 21

Candidate Starts for Fireman\_32:

(Start: 21 @18694 has 50 MA's), (31, 18742), (35, 18763), (38, 18775), (42, 18847), (43, 18853), (45, 18862), (48, 18898), (52, 18913), (54, 18931), (56, 18943), (58, 18970), (67, 19024), (72, 19060), (73, 19069), (74, 19078), (79, 19120),

Gene: FuzzBuster\_36 Start: 18981, Stop: 19487, Start Num: 20

Candidate Starts for FuzzBuster\_36:

(1, 18327), (2, 18357), (3, 18393), (4, 18420), (5, 18447), (7, 18468), (10, 18630), (12, 18747), (13, 18768), (Start: 20 @18981 has 1 MA's), (30, 19035), (38, 19077), (55, 19242), (56, 19251), (61, 19296), (77, 19410), (81, 19446),

Gene: Ganandorf\_31 Start: 18940, Stop: 19404, Start Num: 21

Candidate Starts for Ganandorf\_31:

(Start: 21 @18940 has 50 MA's), (37, 19021), (42, 19093), (43, 19099), (45, 19108), (54, 19177), (56, 19189), (67, 19270), (73, 19315), (79, 19366), (80, 19378),

Gene: Gina\_33 Start: 18717, Stop: 19181, Start Num: 21

Candidate Starts for Gina\_33:

(Start: 21 @18717 has 50 MA's), (24, 18738), (32, 18774), (38, 18798), (52, 18936), (54, 18954), (57, 18975), (58, 18993), (67, 19047), (72, 19083), (79, 19143), (80, 19155),

Gene: Glorp\_33 Start: 18941, Stop: 19405, Start Num: 21

Candidate Starts for Glorp\_33:

(Start: 21 @18941 has 50 MA's), (37, 19022), (42, 19094), (43, 19100), (45, 19109), (52, 19160), (54, 19178), (56, 19190), (67, 19271), (73, 19316), (79, 19367), (80, 19379),

Gene: Hendrix\_64 Start: 37513, Stop: 38091, Start Num: 15

Candidate Starts for Hendrix\_64:

(Start: 15 @37513 has 4 MA's), (22, 37570), (34, 37627), (36, 37645), (39, 37672), (41, 37717), (43, 37726), (49, 37774), (50, 37777), (51, 37786), (54, 37807), (57, 37828), (62, 37870), (65, 37885), (66, 37897), (72, 37936), (76, 37972), (78, 37981), (82, 38020), (83, 38041), (86, 38071),

Gene: Hermeonysus\_31 Start: 18813, Stop: 19277, Start Num: 21

Candidate Starts for Hermeonysus\_31:

(Start: 21 @18813 has 50 MA's), (37, 18894), (42, 18966), (43, 18972), (45, 18981), (52, 19032), (54, 19050), (56, 19062), (67, 19143), (73, 19188), (79, 19239), (80, 19251),

Gene: Honeyfin\_33 Start: 19128, Stop: 19592, Start Num: 21

Candidate Starts for Honeyfin\_33:

(Start: 21 @19128 has 50 MA's), (37, 19209), (42, 19281), (43, 19287), (45, 19296), (52, 19347), (54, 19365), (56, 19377), (67, 19458), (73, 19503), (79, 19554), (80, 19566),

Gene: Jayden\_33 Start: 18864, Stop: 19328, Start Num: 21

Candidate Starts for Jayden\_33:

(Start: 21 @18864 has 50 MA's), (24, 18885), (35, 18933), (38, 18945), (45, 19032), (52, 19083), (67, 19194), (72, 19230), (79, 19290),

Gene: Jefe\_32 Start: 18865, Stop: 19329, Start Num: 21

Candidate Starts for Jefe\_32:

(Start: 21 @18865 has 50 MA's), (37, 18946), (42, 19018), (43, 19024), (45, 19033), (52, 19084), (54, 19102), (56, 19114), (67, 19195), (73, 19240), (79, 19291), (80, 19303),

Gene: Jollipop\_32 Start: 19210, Stop: 19674, Start Num: 21

Candidate Starts for Jollipop\_32:

(Start: 21 @19210 has 50 MA's), (37, 19291), (42, 19363), (43, 19369), (45, 19378), (52, 19429), (54, 19447), (56, 19459), (67, 19540), (73, 19585), (79, 19636), (80, 19648),

Gene: KaiHaiDragon\_32 Start: 18804, Stop: 19268, Start Num: 21

Candidate Starts for KaiHaiDragon\_32:

(Start: 21 @18804 has 50 MA's), (37, 18885), (42, 18957), (43, 18963), (52, 19023), (54, 19041), (56, 19053), (67, 19134), (73, 19179), (79, 19230), (80, 19242),

Gene: Kowalski\_31 Start: 18920, Stop: 19384, Start Num: 21

Candidate Starts for Kowalski\_31:

(Start: 21 @18920 has 50 MA's), (37, 19001), (42, 19073), (43, 19079), (45, 19088), (52, 19139), (54, 19157), (56, 19169), (67, 19250), (73, 19295), (79, 19346), (80, 19358),

Gene: Kozie\_28 Start: 18580, Stop: 19092, Start Num: 21

Candidate Starts for Kozie\_28:

(Start: 21 @18580 has 50 MA's), (27, 18613), (32, 18637), (35, 18649), (36, 18661), (47, 18778), (53, 18808), (65, 18898), (70, 18931), (71, 18934), (80, 19027),

Gene: Leaf\_69 Start: 38303, Stop: 38872, Start Num: 15

Candidate Starts for Leaf\_69:

(Start: 15 @38303 has 4 MA's), (25, 38378), (28, 38390), (29, 38393), (34, 38417), (38, 38438), (41, 38501), (43, 38510), (49, 38558), (50, 38561), (61, 38648), (65, 38669), (66, 38681), (69, 38699), (72, 38720), (78, 38765), (80, 38792), (85, 38852),

Gene: LittleFortune\_33 Start: 19170, Stop: 19634, Start Num: 21

Candidate Starts for LittleFortune\_33:

(Start: 21 @19170 has 50 MA's), (37, 19251), (42, 19323), (43, 19329), (45, 19338), (52, 19389), (54, 19407), (56, 19419), (67, 19500), (73, 19545), (79, 19596), (80, 19608),

Gene: Margaery\_27 Start: 18221, Stop: 18748, Start Num: 21

Candidate Starts for Margaery\_27:

(16, 18182), (Start: 21 @18221 has 50 MA's), (26, 18242), (44, 18380), (46, 18410), (60, 18503), (65, 18542), (71, 18578),

Gene: Matzah\_28 Start: 18251, Stop: 18784, Start Num: 21

Candidate Starts for Matzah\_28:

(17, 18224), (Start: 21 @18251 has 50 MA's), (26, 18278), (29, 18290), (32, 18308), (44, 18416), (52, 18473), (56, 18503), (60, 18539), (65, 18578), (70, 18611), (71, 18614), (80, 18707), (82, 18719),

Gene: Megan\_26 Start: 20113, Stop: 20586, Start Num: 21

Candidate Starts for Megan\_26:

(Start: 21 @20113 has 50 MA's), (31, 20161), (38, 20194), (39, 20218), (42, 20266), (49, 20320), (52, 20332), (54, 20350), (56, 20362), (63, 20422), (66, 20440), (68, 20452), (73, 20488), (75, 20500), (79, 20539), (80, 20551),

Gene: MementoMori\_28 Start: 17980, Stop: 18513, Start Num: 21

Candidate Starts for MementoMori\_28:

(17, 17953), (Start: 21 @17980 has 50 MA's), (26, 18007), (29, 18019), (32, 18037), (41, 18130), (44, 18145), (46, 18175), (52, 18202), (56, 18232), (60, 18268), (65, 18307), (70, 18340), (71, 18343), (80, 18436), (82, 18448),

Gene: Merry\_ Start: 20953, Stop: 21441, Start Num: 18

Candidate Starts for Merry\_:

(Start: 18 @20953 has 1 MA's), (Start: 21 @20977 has 50 MA's), (35, 21046), (38, 21058), (42, 21130), (45, 21145), (52, 21196), (54, 21214), (56, 21226), (58, 21253), (67, 21307), (72, 21343), (79, 21403),

Gene: Metamorphoo\_32 Start: 18716, Stop: 19180, Start Num: 21

Candidate Starts for Metamorphoo\_32:

(Start: 21 @18716 has 50 MA's), (31, 18764), (35, 18785), (38, 18797), (42, 18869), (43, 18875), (45, 18884), (48, 18920), (52, 18935), (54, 18953), (56, 18965), (58, 18992), (72, 19082), (73, 19091), (74, 19100), (79, 19142), (81, 19160),

Gene: Nicole72\_27 Start: 20490, Stop: 20954, Start Num: 21

Candidate Starts for Nicole72\_27:

(Start: 21 @20490 has 50 MA's), (31, 20538), (38, 20571), (39, 20595), (42, 20643), (49, 20697), (52, 20709), (54, 20727), (64, 20802), (66, 20817), (67, 20820), (68, 20829), (72, 20856), (73, 20865), (75, 20877), (79, 20916), (80, 20928),

Gene: NoodlelyBoi\_32 Start: 19248, Stop: 19712, Start Num: 21

Candidate Starts for NoodlelyBoi\_32:

(Start: 21 @19248 has 50 MA's), (24, 19269), (42, 19401), (43, 19407), (45, 19416), (52, 19467), (54, 19485), (56, 19497), (58, 19524), (67, 19578), (73, 19623), (79, 19674),

Gene: Onika\_31 Start: 18895, Stop: 19359, Start Num: 21

Candidate Starts for Onika\_31:

(Start: 21 @18895 has 50 MA's), (37, 18976), (42, 19048), (43, 19054), (45, 19063), (52, 19114), (54, 19132), (56, 19144), (67, 19225), (73, 19270), (79, 19321), (80, 19333),

Gene: Paschalis\_31 Start: 18908, Stop: 19372, Start Num: 21

Candidate Starts for Paschalis\_31:

(Start: 21 @18908 has 50 MA's), (37, 18989), (42, 19061), (43, 19067), (45, 19076), (52, 19127), (54, 19145), (56, 19157), (67, 19238), (73, 19283), (79, 19334), (80, 19346),

Gene: PhedwardCullen\_30 Start: 18653, Stop: 19117, Start Num: 21

Candidate Starts for PhedwardCullen\_30:

(Start: 21 @18653 has 50 MA's), (37, 18734), (42, 18806), (43, 18812), (45, 18821), (52, 18872), (54, 18890), (56, 18902), (67, 18983), (73, 19028), (79, 19079), (80, 19091),

Gene: Phorgeous\_31 Start: 18762, Stop: 19226, Start Num: 21

Candidate Starts for Phorgeous\_31:

(Start: 21 @18762 has 50 MA's), (37, 18843), (42, 18915), (43, 18921), (45, 18930), (52, 18981), (54, 18999), (56, 19011), (67, 19092), (73, 19137), (79, 19188), (80, 19200),

Gene: Phrancesco\_32 Start: 19040, Stop: 19504, Start Num: 21

Candidate Starts for Phrancesco\_32:

(Start: 21 @19040 has 50 MA's), (37, 19121), (42, 19193), (43, 19199), (45, 19208), (52, 19259), (54, 19277), (56, 19289), (67, 19370), (73, 19415), (79, 19466), (80, 19478),

Gene: PierreOrion\_32 Start: 19063, Stop: 19527, Start Num: 21

Candidate Starts for PierreOrion\_32:

(Start: 21 @19063 has 50 MA's), (37, 19144), (42, 19216), (43, 19222), (45, 19231), (52, 19282), (54, 19300), (56, 19312), (67, 19393), (73, 19438), (79, 19489), (80, 19501),

Gene: PiperSansNom\_32 Start: 19215, Stop: 19679, Start Num: 21

Candidate Starts for PiperSansNom\_32:

(Start: 21 @19215 has 50 MA's), (37, 19296), (42, 19368), (43, 19374), (45, 19383), (52, 19434), (54, 19452), (56, 19464), (67, 19545), (73, 19590), (79, 19641), (80, 19653),

Gene: Piperis\_32 Start: 18885, Stop: 19349, Start Num: 21

Candidate Starts for Piperis\_32:

(Start: 21 @18885 has 50 MA's), (37, 18966), (42, 19038), (43, 19044), (45, 19053), (52, 19104), (54, 19122), (56, 19134), (67, 19215), (73, 19260), (79, 19311), (80, 19323),

Gene: Pulchra\_33 Start: 19285, Stop: 19749, Start Num: 21

Candidate Starts for Pulchra\_33:

(Start: 21 @19285 has 50 MA's), (37, 19366), (42, 19438), (43, 19444), (45, 19453), (52, 19504), (54, 19522), (56, 19534), (67, 19615), (73, 19660), (79, 19711), (80, 19723),

Gene: Quhwah\_35 Start: 19511, Stop: 19975, Start Num: 21

Candidate Starts for Quhwah\_35:



(Start: 21 @19511 has 50 MA's), (37, 19592), (42, 19664), (43, 19670), (45, 19679), (52, 19730), (54, 19748), (56, 19760), (67, 19841), (73, 19886), (79, 19937), (80, 19949),

Gene: Ramiel05\_31 Start: 18920, Stop: 19384, Start Num: 21

Candidate Starts for Ramiel05\_31:

(Start: 21 @18920 has 50 MA's), (37, 19001), (42, 19073), (43, 19079), (45, 19088), (52, 19139), (54, 19157), (56, 19169), (67, 19250), (73, 19295), (79, 19346), (80, 19358),

Gene: Rasputia\_63 Start: 37173, Stop: 37721, Start Num: 15

Candidate Starts for Rasputia\_63:

(Start: 15 @37173 has 4 MA's), (19, 37200), (22, 37230), (38, 37308), (40, 37365), (41, 37377), (43, 37386), (49, 37434), (50, 37437), (54, 37467), (57, 37488), (61, 37524), (65, 37545), (66, 37557), (69, 37575), (72, 37596), (76, 37632), (78, 37641), (82, 37680), (84, 37701),

Gene: RobsFeet\_33 Start: 18997, Stop: 19461, Start Num: 21

Candidate Starts for RobsFeet\_33:

(Start: 21 @18997 has 50 MA's), (31, 19045), (35, 19066), (38, 19078), (42, 19150), (43, 19156), (45, 19165), (52, 19216), (54, 19234), (56, 19246), (58, 19273), (72, 19363), (73, 19372), (74, 19381), (79, 19423), (81, 19441),

Gene: Savannah\_31 Start: 18947, Stop: 19411, Start Num: 21

Candidate Starts for Savannah\_31:

(Start: 21 @18947 has 50 MA's), (37, 19028), (42, 19100), (43, 19106), (45, 19115), (52, 19166), (54, 19184), (56, 19196), (67, 19277), (73, 19322), (79, 19373), (80, 19385),

Gene: Scumberland\_33 Start: 19136, Stop: 19600, Start Num: 21

Candidate Starts for Scumberland\_33:

(Start: 21 @19136 has 50 MA's), (37, 19217), (42, 19289), (43, 19295), (45, 19304), (52, 19355), (54, 19373), (56, 19385), (67, 19466), (73, 19511), (79, 19562), (80, 19574),

Gene: Selwyn23\_33 Start: 19113, Stop: 19577, Start Num: 21

Candidate Starts for Selwyn23\_33:

(Start: 21 @19113 has 50 MA's), (37, 19194), (42, 19266), (43, 19272), (45, 19281), (52, 19332), (54, 19350), (56, 19362), (67, 19443), (73, 19488), (79, 19539), (80, 19551),

Gene: Shotgun\_31 Start: 18746, Stop: 19210, Start Num: 21

Candidate Starts for Shotgun\_31:

(Start: 21 @18746 has 50 MA's), (37, 18827), (42, 18899), (43, 18905), (45, 18914), (52, 18965), (54, 18983), (56, 18995), (67, 19076), (73, 19121), (79, 19172), (80, 19184),

Gene: Shrubaron\_32 Start: 18631, Stop: 19095, Start Num: 21

Candidate Starts for Shrubaron\_32:

(Start: 21 @18631 has 50 MA's), (31, 18679), (35, 18700), (38, 18712), (42, 18784), (43, 18790), (45, 18799), (52, 18850), (54, 18868), (56, 18880), (58, 18907), (72, 18997), (73, 19006), (74, 19015), (79, 19057), (81, 19075),

Gene: SirFrank\_31 Start: 18848, Stop: 19312, Start Num: 21

Candidate Starts for SirFrank\_31:

(Start: 21 @18848 has 50 MA's), (42, 19001), (43, 19007), (45, 19016), (52, 19067), (54, 19085), (56, 19097), (58, 19124), (67, 19178), (73, 19223), (79, 19274),

Gene: Smarties\_40 Start: 20819, Stop: 21283, Start Num: 21

Candidate Starts for Smarties\_40:

(Start: 21 @20819 has 50 MA's), (23, 20834), (35, 20888), (38, 20900), (43, 20978), (45, 20987), (52, 21038), (54, 21056), (58, 21095), (67, 21149), (72, 21185), (79, 21245),

Gene: Sunny\_ Start: 20982, Stop: 21446, Start Num: 21

Candidate Starts for Sunny\_:

(Start: 21 @20982 has 50 MA's), (42, 21135), (45, 21150), (48, 21186), (54, 21219), (56, 21231), (68, 21321), (72, 21348), (79, 21408), (80, 21420),

Gene: Teamocil\_33 Start: 18816, Stop: 19280, Start Num: 21

Candidate Starts for Teamocil\_33:

(Start: 21 @18816 has 50 MA's), (24, 18837), (32, 18873), (38, 18897), (52, 19035), (54, 19053), (57, 19074), (58, 19092), (67, 19146), (72, 19182), (79, 19242), (80, 19254),

Gene: Terij\_28 Start: 18304, Stop: 18828, Start Num: 21

Candidate Starts for Terij\_28:

(Start: 21 @18304 has 50 MA's), (26, 18325), (33, 18358), (56, 18550), (60, 18586), (65, 18625), (71, 18661),

Gene: Tyrumbra\_30 Start: 18037, Stop: 18501, Start Num: 21

Candidate Starts for Tyrumbra\_30:

(Start: 21 @18037 has 50 MA's), (31, 18085), (35, 18106), (38, 18118), (42, 18190), (43, 18196), (45, 18205), (52, 18256), (54, 18274), (58, 18313), (67, 18367), (72, 18403), (73, 18412), (74, 18421), (79, 18463),

Gene: Yeti\_32 Start: 18915, Stop: 19379, Start Num: 21

Candidate Starts for Yeti\_32:

(Start: 21 @18915 has 50 MA's), (37, 18996), (42, 19068), (43, 19074), (45, 19083), (52, 19134), (54, 19152), (56, 19164), (67, 19245), (73, 19290), (79, 19341), (80, 19353),