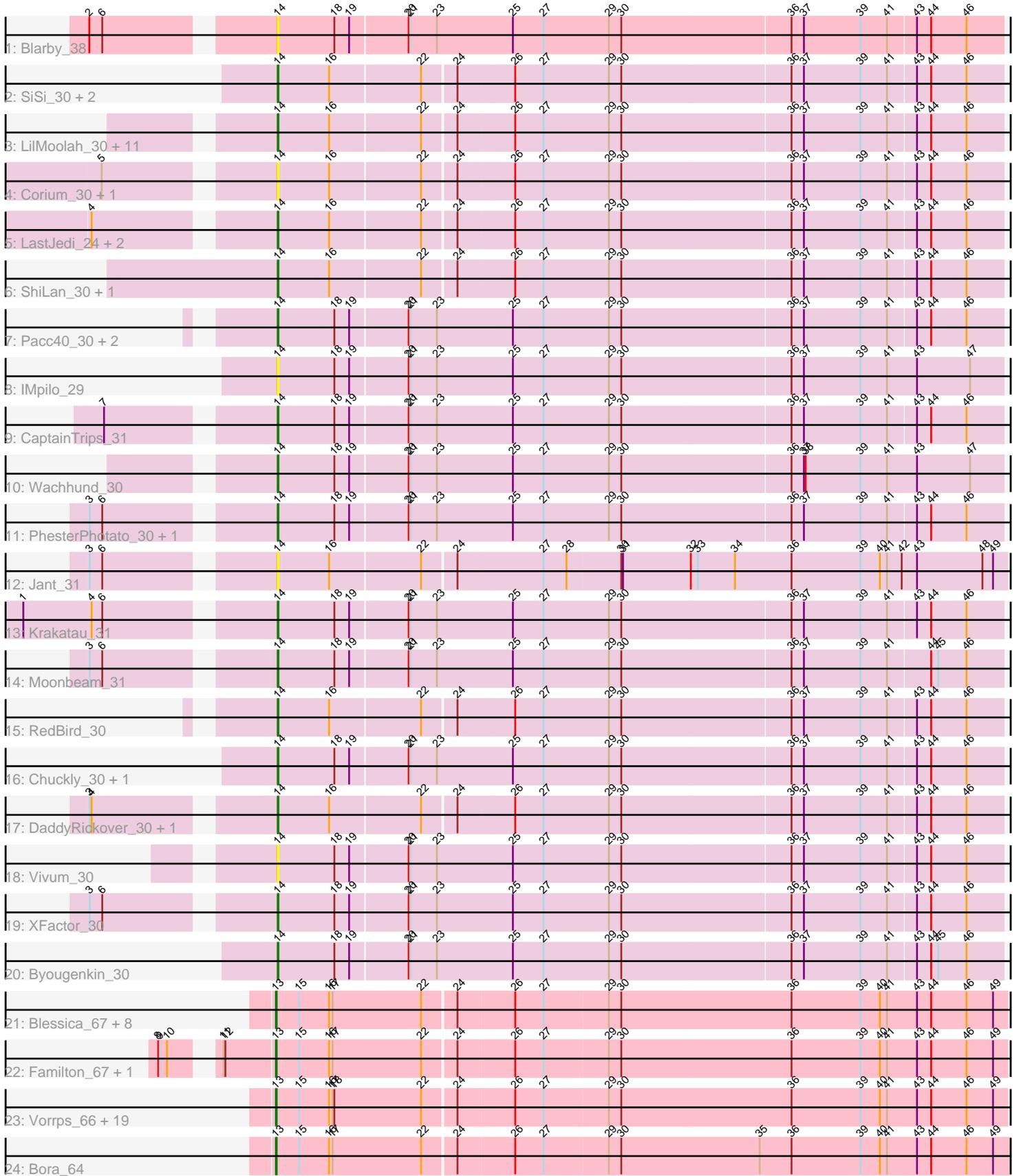


# Pham 221386



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 221386 Report

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

Pham number 221386 has 74 members, 11 are drafts.

Phages represented in each track:

- Track 1 : Blarby\_38
- Track 2 : SiSi\_30, Fastidio\_32, DillTech15\_30
- Track 3 : LilMoolah\_30, Nivrat\_30, Burwell21\_30, Martik\_30, ByChance\_30, ShowerHandel\_30, Zizzle\_30, Maravista\_30, Yorick\_30, NormanBulbieJr\_30, SwagPiggett\_30, Lizziana\_30
- Track 4 : Corium\_30, KingJulian\_30
- Track 5 : LastJedi\_24, Koella\_24, Clifton\_24
- Track 6 : ShiLan\_30, Jarcob\_30
- Track 7 : Pacc40\_30, Blexus\_30, Leperchaun\_30
- Track 8 : IMpilo\_29
- Track 9 : CaptainTrips\_31
- Track 10 : Wachhund\_30
- Track 11 : PhesterPhotato\_30, Phalconet\_30
- Track 12 : Jant\_31
- Track 13 : Krakatau\_31
- Track 14 : Moonbeam\_31
- Track 15 : RedBird\_30
- Track 16 : Chuckly\_30, Renaud18\_30
- Track 17 : DaddyRickover\_30, Dorothy\_30
- Track 18 : Vivum\_30
- Track 19 : XFactor\_30
- Track 20 : Byougenkin\_30
- Track 21 : Blessica\_67, KingPhillip3\_65, MadKillah\_67, Idergollasper\_66, TelAviv\_63, JangDynasty\_66, Catdawg\_66, Zebo\_65, Schuy\_67
- Track 22 : Familton\_67, SchoolBus\_66
- Track 23 : Vorrps\_66, Mori\_66, Zakhe101\_65, Smooch\_69, FoulBall\_66, Alkhayr\_64, NiebruSaylor\_65, Firecracker\_67, Wildflower\_66, Winget\_67, Ashwin\_68, Vagabond\_66, Ryadel\_70, Corndog\_69, Murai\_67, Krili\_65, Shida\_66, Wogge42\_65, YungJamal\_71, Dylan\_66
- Track 24 : Bora\_64

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

The start number called the most often in the published annotations is 14, it was called in 35 of the 63 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Blarby\_38, Blexus\_30, Burwell21\_30, ByChance\_30, Byougenkin\_30, CaptainTrips\_31, Chuckly\_30, Clifton\_24, Corium\_30, DaddyRickover\_30, DillTech15\_30, Dorothy\_30, Fastidio\_32, IMpilo\_29, Jant\_31, Jarcob\_30, KingJulian\_30, Koella\_24, Krakatau\_31, LastJedi\_24, Leperchaun\_30, LilMoolah\_30, Lizziana\_30, Maravista\_30, Martik\_30, Moonbeam\_31, Nivrat\_30, NormanBulbieJr\_30, Pacc40\_30, Phalconet\_30, PhesterPhotato\_30, RedBird\_30, Renaud18\_30, ShiLan\_30, ShowerHandel\_30, SiSi\_30, SwagPigglett\_30, Vivum\_30, Wachhund\_30, XFactor\_30, Yorick\_30, Zizzle\_30,

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

- 

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

- Alkhayr\_64, Ashwin\_68, Blessica\_67, Bora\_64, Catdawg\_66, Corndog\_69, Dylan\_66, Familton\_67, Firecracker\_67, FoulBall\_66, Idergollasper\_66, JangDynasty\_66, KingPhillip3\_65, Krili\_65, MadKillah\_67, Mori\_66, Murai\_67, NiebruSaylor\_65, Ryadel\_70, SchoolBus\_66, Schuy\_67, Shida\_66, Smooch\_69, TelAviv\_63, Vagabond\_66, Vorrrps\_66, Wildflower\_66, Winget\_67, Wogge42\_65, YungJamal\_71, Zakhe101\_65, Zebo\_65,

### Summary by start number:

Start 13:

- Found in 32 of 74 ( 43.2% ) of genes in pham
- Manual Annotations of this start: 28 of 63
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Alkhayr\_64 (O), Ashwin\_68 (O), Blessica\_67 (O), Bora\_64 (O), Catdawg\_66 (O), Corndog\_69 (O), Dylan\_66 (O), Familton\_67 (O), Firecracker\_67 (O), FoulBall\_66 (O), Idergollasper\_66 (O), JangDynasty\_66 (O), KingPhillip3\_65 (O), Krili\_65 (O), MadKillah\_67 (O), Mori\_66 (O), Murai\_67 (O), NiebruSaylor\_65 (O), Ryadel\_70 (O), SchoolBus\_66 (O), Schuy\_67 (O), Shida\_66 (O), Smooch\_69 (O), TelAviv\_63 (O), Vagabond\_66 (O), Vorrrps\_66 (O), Wildflower\_66 (O), Winget\_67 (O), Wogge42\_65 (O), YungJamal\_71 (O), Zakhe101\_65 (O), Zebo\_65 (O),

Start 14:

- Found in 42 of 74 ( 56.8% ) of genes in pham
- Manual Annotations of this start: 35 of 63
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Blarby\_38 (F), Blexus\_30 (F1), Burwell21\_30 (F1), ByChance\_30 (F1), Byougenkin\_30 (F1), CaptainTrips\_31 (F1), Chuckly\_30 (F1), Clifton\_24 (F1), Corium\_30 (F1), DaddyRickover\_30 (F1), DillTech15\_30 (F1), Dorothy\_30 (F1), Fastidio\_32 (F1), IMpilo\_29 (F1), Jant\_31 (F1), Jarcob\_30 (F1), KingJulian\_30 (F1), Koella\_24 (F1), Krakatau\_31 (F1), LastJedi\_24 (F1), Leperchaun\_30 (F1), LilMoolah\_30 (F1), Lizziana\_30 (F1), Maravista\_30 (F1), Martik\_30 (F1), Moonbeam\_31 (F1), Nivrat\_30 (F1), NormanBulbieJr\_30 (F1), Pacc40\_30 (F1), Phalconet\_30 (F1), PhesterPhotato\_30 (F1), RedBird\_30 (F1), Renaud18\_30 (F4), ShiLan\_30 (F1), ShowerHandel\_30 (F1), SiSi\_30 (F1), SwagPigglett\_30 (F1), Vivum\_30 (F1), Wachhund\_30 (F1), XFactor\_30 (F1),

Yorick\_30 (F1), Zizzle\_30 (F1),

### **Summary by clusters:**

There are 4 clusters represented in this pham: F1, F4, O, F,

Info for manual annotations of cluster F1:

- Start number 14 was manually annotated 34 times for cluster F1.

Info for manual annotations of cluster F4:

- Start number 14 was manually annotated 1 time for cluster F4.

Info for manual annotations of cluster O:

- Start number 13 was manually annotated 28 times for cluster O.

### **Gene Information:**

Gene: Alkhayr\_64 Start: 41911, Stop: 43131, Start Num: 13

Candidate Starts for Alkhayr\_64:

(Start: 13 @41911 has 28 MA's), (15, 41947), (16, 41998), (17, 42004), (18, 42007), (22, 42154), (24, 42208), (26, 42301), (27, 42349), (29, 42457), (30, 42478), (36, 42766), (39, 42883), (40, 42916), (41, 42928), (43, 42979), (44, 43003), (46, 43063), (49, 43108),

Gene: Ashwin\_68 Start: 42681, Stop: 43901, Start Num: 13

Candidate Starts for Ashwin\_68:

(Start: 13 @42681 has 28 MA's), (15, 42717), (16, 42768), (17, 42774), (18, 42777), (22, 42924), (24, 42978), (26, 43071), (27, 43119), (29, 43227), (30, 43248), (36, 43536), (39, 43653), (40, 43686), (41, 43698), (43, 43749), (44, 43773), (46, 43833), (49, 43878),

Gene: Blarby\_38 Start: 26777, Stop: 27985, Start Num: 14

Candidate Starts for Blarby\_38:

(2, 26501), (6, 26522), (Start: 14 @26777 has 35 MA's), (18, 26873), (19, 26897), (20, 26990), (21, 26993), (23, 27038), (25, 27167), (27, 27218), (29, 27329), (30, 27350), (36, 27632), (37, 27653), (39, 27749), (41, 27794), (43, 27839), (44, 27863), (46, 27923),

Gene: Blessica\_67 Start: 42510, Stop: 43730, Start Num: 13

Candidate Starts for Blessica\_67:

(Start: 13 @42510 has 28 MA's), (15, 42546), (16, 42597), (17, 42603), (22, 42753), (24, 42807), (26, 42900), (27, 42948), (29, 43056), (30, 43077), (36, 43365), (39, 43482), (40, 43515), (41, 43527), (43, 43578), (44, 43602), (46, 43662), (49, 43707),

Gene: Blexus\_30 Start: 26628, Stop: 27836, Start Num: 14

Candidate Starts for Blexus\_30:

(Start: 14 @26628 has 35 MA's), (18, 26724), (19, 26748), (20, 26841), (21, 26844), (23, 26889), (25, 27018), (27, 27069), (29, 27180), (30, 27201), (36, 27483), (37, 27504), (39, 27600), (41, 27645), (43, 27690), (44, 27714), (46, 27774),

Gene: Bora\_64 Start: 41867, Stop: 43111, Start Num: 13

Candidate Starts for Bora\_64:

(Start: 13 @41867 has 28 MA's), (15, 41903), (16, 41954), (17, 41960), (22, 42110), (24, 42164), (26, 42257), (27, 42305), (29, 42413), (30, 42434), (35, 42668), (36, 42722), (39, 42839), (40, 42872), (41, 42884), (43, 42935), (44, 42959), (46, 43019), (49, 43064),

Gene: Burwell21\_30 Start: 26501, Stop: 27697, Start Num: 14

Candidate Starts for Burwell21\_30:

(Start: 14 @26501 has 35 MA's), (16, 26585), (22, 26735), (24, 26789), (26, 26882), (27, 26930), (29, 27041), (30, 27062), (36, 27344), (37, 27365), (39, 27461), (41, 27506), (43, 27551), (44, 27575), (46, 27635),

Gene: ByChance\_30 Start: 26478, Stop: 27674, Start Num: 14

Candidate Starts for ByChance\_30:

(Start: 14 @26478 has 35 MA's), (16, 26562), (22, 26712), (24, 26766), (26, 26859), (27, 26907), (29, 27018), (30, 27039), (36, 27321), (37, 27342), (39, 27438), (41, 27483), (43, 27528), (44, 27552), (46, 27612),

Gene: Byougenkin\_30 Start: 26387, Stop: 27595, Start Num: 14

Candidate Starts for Byougenkin\_30:

(Start: 14 @26387 has 35 MA's), (18, 26483), (19, 26507), (20, 26600), (21, 26603), (23, 26648), (25, 26777), (27, 26828), (29, 26939), (30, 26960), (36, 27242), (37, 27263), (39, 27359), (41, 27404), (43, 27449), (44, 27473), (45, 27485), (46, 27533),

Gene: CaptainTrips\_31 Start: 26707, Stop: 27915, Start Num: 14

Candidate Starts for CaptainTrips\_31:

(7, 26455), (Start: 14 @26707 has 35 MA's), (18, 26803), (19, 26827), (20, 26920), (21, 26923), (23, 26968), (25, 27097), (27, 27148), (29, 27259), (30, 27280), (36, 27562), (37, 27583), (39, 27679), (41, 27724), (43, 27769), (44, 27793), (46, 27853),

Gene: Catdawg\_66 Start: 42246, Stop: 43466, Start Num: 13

Candidate Starts for Catdawg\_66:

(Start: 13 @42246 has 28 MA's), (15, 42282), (16, 42333), (17, 42339), (22, 42489), (24, 42543), (26, 42636), (27, 42684), (29, 42792), (30, 42813), (36, 43101), (39, 43218), (40, 43251), (41, 43263), (43, 43314), (44, 43338), (46, 43398), (49, 43443),

Gene: Chuckly\_30 Start: 26483, Stop: 27691, Start Num: 14

Candidate Starts for Chuckly\_30:

(Start: 14 @26483 has 35 MA's), (18, 26579), (19, 26603), (20, 26696), (21, 26699), (23, 26744), (25, 26873), (27, 26924), (29, 27035), (30, 27056), (36, 27338), (37, 27359), (39, 27455), (41, 27500), (43, 27545), (44, 27569), (46, 27629),

Gene: Clifton\_24 Start: 22465, Stop: 23661, Start Num: 14

Candidate Starts for Clifton\_24:

(4, 22195), (Start: 14 @22465 has 35 MA's), (16, 22549), (22, 22699), (24, 22753), (26, 22846), (27, 22894), (29, 23005), (30, 23026), (36, 23308), (37, 23329), (39, 23425), (41, 23470), (43, 23515), (44, 23539), (46, 23599),

Gene: Corium\_30 Start: 26519, Stop: 27715, Start Num: 14

Candidate Starts for Corium\_30:

(5, 26267), (Start: 14 @26519 has 35 MA's), (16, 26603), (22, 26753), (24, 26807), (26, 26900), (27, 26948), (29, 27059), (30, 27080), (36, 27362), (37, 27383), (39, 27479), (41, 27524), (43, 27569), (44, 27593), (46, 27653),

Gene: Corndog\_69 Start: 43240, Stop: 44460, Start Num: 13

Candidate Starts for Corndog\_69:

(Start: 13 @43240 has 28 MA's), (15, 43276), (16, 43327), (17, 43333), (18, 43336), (22, 43483), (24, 43537), (26, 43630), (27, 43678), (29, 43786), (30, 43807), (36, 44095), (39, 44212), (40, 44245), (41, 44257), (43, 44308), (44, 44332), (46, 44392), (49, 44437),

Gene: DaddyRickover\_30 Start: 26502, Stop: 27698, Start Num: 14

Candidate Starts for DaddyRickover\_30:

(3, 26229), (4, 26232), (Start: 14 @26502 has 35 MA's), (16, 26586), (22, 26736), (24, 26790), (26, 26883), (27, 26931), (29, 27042), (30, 27063), (36, 27345), (37, 27366), (39, 27462), (41, 27507), (43, 27552), (44, 27576), (46, 27636),

Gene: DillTech15\_30 Start: 26411, Stop: 27607, Start Num: 14

Candidate Starts for DillTech15\_30:

(Start: 14 @26411 has 35 MA's), (16, 26495), (22, 26645), (24, 26699), (26, 26792), (27, 26840), (29, 26951), (30, 26972), (36, 27254), (37, 27275), (39, 27371), (41, 27416), (43, 27461), (44, 27485), (46, 27545),

Gene: Dorothy\_30 Start: 26287, Stop: 27483, Start Num: 14

Candidate Starts for Dorothy\_30:

(3, 26014), (4, 26017), (Start: 14 @26287 has 35 MA's), (16, 26371), (22, 26521), (24, 26575), (26, 26668), (27, 26716), (29, 26827), (30, 26848), (36, 27130), (37, 27151), (39, 27247), (41, 27292), (43, 27337), (44, 27361), (46, 27421),

Gene: Dylan\_66 Start: 42293, Stop: 43513, Start Num: 13

Candidate Starts for Dylan\_66:

(Start: 13 @42293 has 28 MA's), (15, 42329), (16, 42380), (17, 42386), (18, 42389), (22, 42536), (24, 42590), (26, 42683), (27, 42731), (29, 42839), (30, 42860), (36, 43148), (39, 43265), (40, 43298), (41, 43310), (43, 43361), (44, 43385), (46, 43445), (49, 43490),

Gene: Familton\_67 Start: 42203, Stop: 43423, Start Num: 13

Candidate Starts for Familton\_67:

(8, 42050), (9, 42053), (10, 42065), (11, 42119), (12, 42122), (Start: 13 @42203 has 28 MA's), (15, 42239), (16, 42290), (17, 42296), (22, 42446), (24, 42500), (26, 42593), (27, 42641), (29, 42749), (30, 42770), (36, 43058), (39, 43175), (40, 43208), (41, 43220), (43, 43271), (44, 43295), (46, 43355), (49, 43400),

Gene: Fastidio\_32 Start: 26640, Stop: 27836, Start Num: 14

Candidate Starts for Fastidio\_32:

(Start: 14 @26640 has 35 MA's), (16, 26724), (22, 26874), (24, 26928), (26, 27021), (27, 27069), (29, 27180), (30, 27201), (36, 27483), (37, 27504), (39, 27600), (41, 27645), (43, 27690), (44, 27714), (46, 27774),

Gene: Firecracker\_67 Start: 42393, Stop: 43643, Start Num: 13

Candidate Starts for Firecracker\_67:

(Start: 13 @42393 has 28 MA's), (15, 42429), (16, 42480), (17, 42486), (18, 42489), (22, 42636), (24, 42690), (26, 42783), (27, 42831), (29, 42939), (30, 42960), (36, 43248), (39, 43365), (40, 43398), (41, 43410), (43, 43461), (44, 43485), (46, 43545), (49, 43590),

Gene: FoulBall\_66 Start: 42197, Stop: 43417, Start Num: 13

Candidate Starts for FoulBall\_66:

(Start: 13 @42197 has 28 MA's), (15, 42233), (16, 42284), (17, 42290), (18, 42293), (22, 42440), (24, 42494), (26, 42587), (27, 42635), (29, 42743), (30, 42764), (36, 43052), (39, 43169), (40, 43202), (41, 43214), (43, 43265), (44, 43289), (46, 43349), (49, 43394),

Gene: IMpilo\_29 Start: 26117, Stop: 27328, Start Num: 14

Candidate Starts for IMpilo\_29:

(Start: 14 @26117 has 35 MA's), (18, 26213), (19, 26237), (20, 26330), (21, 26333), (23, 26378), (25, 26507), (27, 26558), (29, 26669), (30, 26690), (36, 26972), (37, 26993), (39, 27089), (41, 27134), (43, 27182), (47, 27272),

Gene: Idergollasper\_66 Start: 42197, Stop: 43417, Start Num: 13

Candidate Starts for Idergollasper\_66:

(Start: 13 @42197 has 28 MA's), (15, 42233), (16, 42284), (17, 42290), (22, 42440), (24, 42494), (26, 42587), (27, 42635), (29, 42743), (30, 42764), (36, 43052), (39, 43169), (40, 43202), (41, 43214), (43, 43265), (44, 43289), (46, 43349), (49, 43394),

Gene: JangDynasty\_66 Start: 42283, Stop: 43503, Start Num: 13

Candidate Starts for JangDynasty\_66:

(Start: 13 @42283 has 28 MA's), (15, 42319), (16, 42370), (17, 42376), (22, 42526), (24, 42580), (26, 42673), (27, 42721), (29, 42829), (30, 42850), (36, 43138), (39, 43255), (40, 43288), (41, 43300), (43, 43351), (44, 43375), (46, 43435), (49, 43480),

Gene: Jant\_31 Start: 26496, Stop: 27698, Start Num: 14

Candidate Starts for Jant\_31:

(3, 26223), (6, 26244), (Start: 14 @26496 has 35 MA's), (16, 26580), (22, 26730), (24, 26784), (27, 26925), (28, 26964), (30, 27051), (31, 27054), (32, 27168), (33, 27180), (34, 27243), (36, 27339), (39, 27456), (40, 27489), (41, 27501), (42, 27525), (43, 27549), (48, 27660), (49, 27678),

Gene: Jacob\_30 Start: 26553, Stop: 27749, Start Num: 14

Candidate Starts for Jacob\_30:

(Start: 14 @26553 has 35 MA's), (16, 26637), (22, 26787), (24, 26841), (26, 26934), (27, 26982), (29, 27093), (30, 27114), (36, 27396), (37, 27417), (39, 27513), (41, 27558), (43, 27603), (44, 27627), (46, 27687),

Gene: KingJulian\_30 Start: 26519, Stop: 27715, Start Num: 14

Candidate Starts for KingJulian\_30:

(5, 26267), (Start: 14 @26519 has 35 MA's), (16, 26603), (22, 26753), (24, 26807), (26, 26900), (27, 26948), (29, 27059), (30, 27080), (36, 27362), (37, 27383), (39, 27479), (41, 27524), (43, 27569), (44, 27593), (46, 27653),

Gene: KingPhillip3\_65 Start: 42212, Stop: 43432, Start Num: 13

Candidate Starts for KingPhillip3\_65:

(Start: 13 @42212 has 28 MA's), (15, 42248), (16, 42299), (17, 42305), (22, 42455), (24, 42509), (26, 42602), (27, 42650), (29, 42758), (30, 42779), (36, 43067), (39, 43184), (40, 43217), (41, 43229), (43, 43280), (44, 43304), (46, 43364), (49, 43409),

Gene: Koella\_24 Start: 22477, Stop: 23673, Start Num: 14

Candidate Starts for Koella\_24:

(4, 22207), (Start: 14 @22477 has 35 MA's), (16, 22561), (22, 22711), (24, 22765), (26, 22858), (27, 22906), (29, 23017), (30, 23038), (36, 23320), (37, 23341), (39, 23437), (41, 23482), (43, 23527), (44, 23551), (46, 23611),

Gene: Krakatau\_31 Start: 27006, Stop: 28214, Start Num: 14

Candidate Starts for Krakatau\_31:

(1, 26619), (4, 26733), (6, 26751), (Start: 14 @27006 has 35 MA's), (18, 27102), (19, 27126), (20, 27219), (21, 27222), (23, 27267), (25, 27396), (27, 27447), (29, 27558), (30, 27579), (36, 27861), (37,

27882), (39, 27978), (41, 28023), (43, 28068), (44, 28092), (46, 28152),

Gene: Krili\_65 Start: 41707, Stop: 42927, Start Num: 13

Candidate Starts for Krili\_65:

(Start: 13 @41707 has 28 MA's), (15, 41743), (16, 41794), (17, 41800), (18, 41803), (22, 41950), (24, 42004), (26, 42097), (27, 42145), (29, 42253), (30, 42274), (36, 42562), (39, 42679), (40, 42712), (41, 42724), (43, 42775), (44, 42799), (46, 42859), (49, 42904),

Gene: LastJedi\_24 Start: 22508, Stop: 23704, Start Num: 14

Candidate Starts for LastJedi\_24:

(4, 22238), (Start: 14 @22508 has 35 MA's), (16, 22592), (22, 22742), (24, 22796), (26, 22889), (27, 22937), (29, 23048), (30, 23069), (36, 23351), (37, 23372), (39, 23468), (41, 23513), (43, 23558), (44, 23582), (46, 23642),

Gene: Leperchaun\_30 Start: 26385, Stop: 27593, Start Num: 14

Candidate Starts for Leperchaun\_30:

(Start: 14 @26385 has 35 MA's), (18, 26481), (19, 26505), (20, 26598), (21, 26601), (23, 26646), (25, 26775), (27, 26826), (29, 26937), (30, 26958), (36, 27240), (37, 27261), (39, 27357), (41, 27402), (43, 27447), (44, 27471), (46, 27531),

Gene: LilMoolah\_30 Start: 26601, Stop: 27797, Start Num: 14

Candidate Starts for LilMoolah\_30:

(Start: 14 @26601 has 35 MA's), (16, 26685), (22, 26835), (24, 26889), (26, 26982), (27, 27030), (29, 27141), (30, 27162), (36, 27444), (37, 27465), (39, 27561), (41, 27606), (43, 27651), (44, 27675), (46, 27735),

Gene: Lizziana\_30 Start: 26476, Stop: 27672, Start Num: 14

Candidate Starts for Lizziana\_30:

(Start: 14 @26476 has 35 MA's), (16, 26560), (22, 26710), (24, 26764), (26, 26857), (27, 26905), (29, 27016), (30, 27037), (36, 27319), (37, 27340), (39, 27436), (41, 27481), (43, 27526), (44, 27550), (46, 27610),

Gene: MadKillah\_67 Start: 41976, Stop: 43196, Start Num: 13

Candidate Starts for MadKillah\_67:

(Start: 13 @41976 has 28 MA's), (15, 42012), (16, 42063), (17, 42069), (22, 42219), (24, 42273), (26, 42366), (27, 42414), (29, 42522), (30, 42543), (36, 42831), (39, 42948), (40, 42981), (41, 42993), (43, 43044), (44, 43068), (46, 43128), (49, 43173),

Gene: Maravista\_30 Start: 26258, Stop: 27454, Start Num: 14

Candidate Starts for Maravista\_30:

(Start: 14 @26258 has 35 MA's), (16, 26342), (22, 26492), (24, 26546), (26, 26639), (27, 26687), (29, 26798), (30, 26819), (36, 27101), (37, 27122), (39, 27218), (41, 27263), (43, 27308), (44, 27332), (46, 27392),

Gene: Martik\_30 Start: 26503, Stop: 27699, Start Num: 14

Candidate Starts for Martik\_30:

(Start: 14 @26503 has 35 MA's), (16, 26587), (22, 26737), (24, 26791), (26, 26884), (27, 26932), (29, 27043), (30, 27064), (36, 27346), (37, 27367), (39, 27463), (41, 27508), (43, 27553), (44, 27577), (46, 27637),

Gene: Moonbeam\_31 Start: 26999, Stop: 28207, Start Num: 14

Candidate Starts for Moonbeam\_31:



(3, 26726), (6, 26747), (Start: 14 @26999 has 35 MA's), (18, 27095), (19, 27119), (20, 27212), (21, 27215), (23, 27260), (25, 27389), (27, 27440), (29, 27551), (30, 27572), (36, 27854), (37, 27875), (39, 27971), (41, 28016), (44, 28085), (45, 28097), (46, 28145),

Gene: Mori\_66 Start: 42238, Stop: 43458, Start Num: 13

Candidate Starts for Mori\_66:

(Start: 13 @42238 has 28 MA's), (15, 42274), (16, 42325), (17, 42331), (18, 42334), (22, 42481), (24, 42535), (26, 42628), (27, 42676), (29, 42784), (30, 42805), (36, 43093), (39, 43210), (40, 43243), (41, 43255), (43, 43306), (44, 43330), (46, 43390), (49, 43435),

Gene: Murai\_67 Start: 42419, Stop: 43639, Start Num: 13

Candidate Starts for Murai\_67:

(Start: 13 @42419 has 28 MA's), (15, 42455), (16, 42506), (17, 42512), (18, 42515), (22, 42662), (24, 42716), (26, 42809), (27, 42857), (29, 42965), (30, 42986), (36, 43274), (39, 43391), (40, 43424), (41, 43436), (43, 43487), (44, 43511), (46, 43571), (49, 43616),

Gene: NiebruSaylor\_65 Start: 41626, Stop: 42846, Start Num: 13

Candidate Starts for NiebruSaylor\_65:

(Start: 13 @41626 has 28 MA's), (15, 41662), (16, 41713), (17, 41719), (18, 41722), (22, 41869), (24, 41923), (26, 42016), (27, 42064), (29, 42172), (30, 42193), (36, 42481), (39, 42598), (40, 42631), (41, 42643), (43, 42694), (44, 42718), (46, 42778), (49, 42823),

Gene: Nivrat\_30 Start: 26475, Stop: 27671, Start Num: 14

Candidate Starts for Nivrat\_30:

(Start: 14 @26475 has 35 MA's), (16, 26559), (22, 26709), (24, 26763), (26, 26856), (27, 26904), (29, 27015), (30, 27036), (36, 27318), (37, 27339), (39, 27435), (41, 27480), (43, 27525), (44, 27549), (46, 27609),

Gene: NormanBulbieJr\_30 Start: 26490, Stop: 27686, Start Num: 14

Candidate Starts for NormanBulbieJr\_30:

(Start: 14 @26490 has 35 MA's), (16, 26574), (22, 26724), (24, 26778), (26, 26871), (27, 26919), (29, 27030), (30, 27051), (36, 27333), (37, 27354), (39, 27450), (41, 27495), (43, 27540), (44, 27564), (46, 27624),

Gene: Pacc40\_30 Start: 26481, Stop: 27689, Start Num: 14

Candidate Starts for Pacc40\_30:

(Start: 14 @26481 has 35 MA's), (18, 26577), (19, 26601), (20, 26694), (21, 26697), (23, 26742), (25, 26871), (27, 26922), (29, 27033), (30, 27054), (36, 27336), (37, 27357), (39, 27453), (41, 27498), (43, 27543), (44, 27567), (46, 27627),

Gene: Phalconet\_30 Start: 26423, Stop: 27631, Start Num: 14

Candidate Starts for Phalconet\_30:

(3, 26147), (6, 26168), (Start: 14 @26423 has 35 MA's), (18, 26519), (19, 26543), (20, 26636), (21, 26639), (23, 26684), (25, 26813), (27, 26864), (29, 26975), (30, 26996), (36, 27278), (37, 27299), (39, 27395), (41, 27440), (43, 27485), (44, 27509), (46, 27569),

Gene: PhesterPhotato\_30 Start: 26343, Stop: 27551, Start Num: 14

Candidate Starts for PhesterPhotato\_30:

(3, 26067), (6, 26088), (Start: 14 @26343 has 35 MA's), (18, 26439), (19, 26463), (20, 26556), (21, 26559), (23, 26604), (25, 26733), (27, 26784), (29, 26895), (30, 26916), (36, 27198), (37, 27219), (39, 27315), (41, 27360), (43, 27405), (44, 27429), (46, 27489),

Gene: RedBird\_30 Start: 26299, Stop: 27495, Start Num: 14

Candidate Starts for RedBird\_30:

(Start: 14 @26299 has 35 MA's), (16, 26383), (22, 26533), (24, 26587), (26, 26680), (27, 26728), (29, 26839), (30, 26860), (36, 27142), (37, 27163), (39, 27259), (41, 27304), (43, 27349), (44, 27373), (46, 27433),

Gene: Renaud18\_30 Start: 26514, Stop: 27722, Start Num: 14

Candidate Starts for Renaud18\_30:

(Start: 14 @26514 has 35 MA's), (18, 26610), (19, 26634), (20, 26727), (21, 26730), (23, 26775), (25, 26904), (27, 26955), (29, 27066), (30, 27087), (36, 27369), (37, 27390), (39, 27486), (41, 27531), (43, 27576), (44, 27600), (46, 27660),

Gene: Ryadel\_70 Start: 43007, Stop: 44251, Start Num: 13

Candidate Starts for Ryadel\_70:

(Start: 13 @43007 has 28 MA's), (15, 43043), (16, 43094), (17, 43100), (18, 43103), (22, 43250), (24, 43304), (26, 43397), (27, 43445), (29, 43553), (30, 43574), (36, 43862), (39, 43979), (40, 44012), (41, 44024), (43, 44075), (44, 44099), (46, 44159), (49, 44204),

Gene: SchoolBus\_66 Start: 42191, Stop: 43411, Start Num: 13

Candidate Starts for SchoolBus\_66:

(8, 42038), (9, 42041), (10, 42053), (11, 42107), (12, 42110), (Start: 13 @42191 has 28 MA's), (15, 42227), (16, 42278), (17, 42284), (22, 42434), (24, 42488), (26, 42581), (27, 42629), (29, 42737), (30, 42758), (36, 43046), (39, 43163), (40, 43196), (41, 43208), (43, 43259), (44, 43283), (46, 43343), (49, 43388),

Gene: Schuy\_67 Start: 41982, Stop: 43202, Start Num: 13

Candidate Starts for Schuy\_67:

(Start: 13 @41982 has 28 MA's), (15, 42018), (16, 42069), (17, 42075), (22, 42225), (24, 42279), (26, 42372), (27, 42420), (29, 42528), (30, 42549), (36, 42837), (39, 42954), (40, 42987), (41, 42999), (43, 43050), (44, 43074), (46, 43134), (49, 43179),

Gene: ShiLan\_30 Start: 26544, Stop: 27740, Start Num: 14

Candidate Starts for ShiLan\_30:

(Start: 14 @26544 has 35 MA's), (16, 26628), (22, 26778), (24, 26832), (26, 26925), (27, 26973), (29, 27084), (30, 27105), (36, 27387), (37, 27408), (39, 27504), (41, 27549), (43, 27594), (44, 27618), (46, 27678),

Gene: Shida\_66 Start: 41889, Stop: 43109, Start Num: 13

Candidate Starts for Shida\_66:

(Start: 13 @41889 has 28 MA's), (15, 41925), (16, 41976), (17, 41982), (18, 41985), (22, 42132), (24, 42186), (26, 42279), (27, 42327), (29, 42435), (30, 42456), (36, 42744), (39, 42861), (40, 42894), (41, 42906), (43, 42957), (44, 42981), (46, 43041), (49, 43086),

Gene: ShowerHandel\_30 Start: 26503, Stop: 27699, Start Num: 14

Candidate Starts for ShowerHandel\_30:

(Start: 14 @26503 has 35 MA's), (16, 26587), (22, 26737), (24, 26791), (26, 26884), (27, 26932), (29, 27043), (30, 27064), (36, 27346), (37, 27367), (39, 27463), (41, 27508), (43, 27553), (44, 27577), (46, 27637),

Gene: SiSi\_30 Start: 26302, Stop: 27498, Start Num: 14

Candidate Starts for SiSi\_30:

(Start: 14 @26302 has 35 MA's), (16, 26386), (22, 26536), (24, 26590), (26, 26683), (27, 26731), (29, 26842), (30, 26863), (36, 27145), (37, 27166), (39, 27262), (41, 27307), (43, 27352), (44, 27376), (46, 27436),

Gene: Smooch\_69 Start: 43911, Stop: 45155, Start Num: 13

Candidate Starts for Smooch\_69:

(Start: 13 @43911 has 28 MA's), (15, 43947), (16, 43998), (17, 44004), (18, 44007), (22, 44154), (24, 44208), (26, 44301), (27, 44349), (29, 44457), (30, 44478), (36, 44766), (39, 44883), (40, 44916), (41, 44928), (43, 44979), (44, 45003), (46, 45063), (49, 45108),

Gene: SwagPiggett\_30 Start: 26314, Stop: 27510, Start Num: 14

Candidate Starts for SwagPiggett\_30:

(Start: 14 @26314 has 35 MA's), (16, 26398), (22, 26548), (24, 26602), (26, 26695), (27, 26743), (29, 26854), (30, 26875), (36, 27157), (37, 27178), (39, 27274), (41, 27319), (43, 27364), (44, 27388), (46, 27448),

Gene: TelAviv\_63 Start: 42164, Stop: 43384, Start Num: 13

Candidate Starts for TelAviv\_63:

(Start: 13 @42164 has 28 MA's), (15, 42200), (16, 42251), (17, 42257), (22, 42407), (24, 42461), (26, 42554), (27, 42602), (29, 42710), (30, 42731), (36, 43019), (39, 43136), (40, 43169), (41, 43181), (43, 43232), (44, 43256), (46, 43316), (49, 43361),

Gene: Vagabond\_66 Start: 42027, Stop: 43247, Start Num: 13

Candidate Starts for Vagabond\_66:

(Start: 13 @42027 has 28 MA's), (15, 42063), (16, 42114), (17, 42120), (18, 42123), (22, 42270), (24, 42324), (26, 42417), (27, 42465), (29, 42573), (30, 42594), (36, 42882), (39, 42999), (40, 43032), (41, 43044), (43, 43095), (44, 43119), (46, 43179), (49, 43224),

Gene: Vivum\_30 Start: 26313, Stop: 27521, Start Num: 14

Candidate Starts for Vivum\_30:

(Start: 14 @26313 has 35 MA's), (18, 26409), (19, 26433), (20, 26526), (21, 26529), (23, 26574), (25, 26703), (27, 26754), (29, 26865), (30, 26886), (36, 27168), (37, 27189), (39, 27285), (41, 27330), (43, 27375), (44, 27399), (46, 27459),

Gene: Vorrps\_66 Start: 42239, Stop: 43459, Start Num: 13

Candidate Starts for Vorrps\_66:

(Start: 13 @42239 has 28 MA's), (15, 42275), (16, 42326), (17, 42332), (18, 42335), (22, 42482), (24, 42536), (26, 42629), (27, 42677), (29, 42785), (30, 42806), (36, 43094), (39, 43211), (40, 43244), (41, 43256), (43, 43307), (44, 43331), (46, 43391), (49, 43436),

Gene: Wachhund\_30 Start: 26486, Stop: 27697, Start Num: 14

Candidate Starts for Wachhund\_30:

(Start: 14 @26486 has 35 MA's), (18, 26582), (19, 26606), (20, 26699), (21, 26702), (23, 26747), (25, 26876), (27, 26927), (29, 27038), (30, 27059), (36, 27341), (37, 27362), (38, 27365), (39, 27458), (41, 27503), (43, 27551), (47, 27641),

Gene: Wildflower\_66 Start: 41751, Stop: 42971, Start Num: 13

Candidate Starts for Wildflower\_66:

(Start: 13 @41751 has 28 MA's), (15, 41787), (16, 41838), (17, 41844), (18, 41847), (22, 41994), (24, 42048), (26, 42141), (27, 42189), (29, 42297), (30, 42318), (36, 42606), (39, 42723), (40, 42756), (41, 42768), (43, 42819), (44, 42843), (46, 42903), (49, 42948),

Gene: Winget\_67 Start: 42457, Stop: 43677, Start Num: 13

Candidate Starts for Winget\_67:

(Start: 13 @42457 has 28 MA's), (15, 42493), (16, 42544), (17, 42550), (18, 42553), (22, 42700), (24, 42754), (26, 42847), (27, 42895), (29, 43003), (30, 43024), (36, 43312), (39, 43429), (40, 43462), (41,

43474), (43, 43525), (44, 43549), (46, 43609), (49, 43654),

Gene: Wogge42\_65 Start: 41898, Stop: 43118, Start Num: 13

Candidate Starts for Wogge42\_65:

(Start: 13 @41898 has 28 MA's), (15, 41934), (16, 41985), (17, 41991), (18, 41994), (22, 42141), (24, 42195), (26, 42288), (27, 42336), (29, 42444), (30, 42465), (36, 42753), (39, 42870), (40, 42903), (41, 42915), (43, 42966), (44, 42990), (46, 43050), (49, 43095),

Gene: XFactor\_30 Start: 26489, Stop: 27697, Start Num: 14

Candidate Starts for XFactor\_30:

(3, 26213), (6, 26234), (Start: 14 @26489 has 35 MA's), (18, 26585), (19, 26609), (20, 26702), (21, 26705), (23, 26750), (25, 26879), (27, 26930), (29, 27041), (30, 27062), (36, 27344), (37, 27365), (39, 27461), (41, 27506), (43, 27551), (44, 27575), (46, 27635),

Gene: Yorick\_30 Start: 26501, Stop: 27697, Start Num: 14

Candidate Starts for Yorick\_30:

(Start: 14 @26501 has 35 MA's), (16, 26585), (22, 26735), (24, 26789), (26, 26882), (27, 26930), (29, 27041), (30, 27062), (36, 27344), (37, 27365), (39, 27461), (41, 27506), (43, 27551), (44, 27575), (46, 27635),

Gene: YungJamal\_71 Start: 43649, Stop: 44869, Start Num: 13

Candidate Starts for YungJamal\_71:

(Start: 13 @43649 has 28 MA's), (15, 43685), (16, 43736), (17, 43742), (18, 43745), (22, 43892), (24, 43946), (26, 44039), (27, 44087), (29, 44195), (30, 44216), (36, 44504), (39, 44621), (40, 44654), (41, 44666), (43, 44717), (44, 44741), (46, 44801), (49, 44846),

Gene: Zakhe101\_65 Start: 42297, Stop: 43517, Start Num: 13

Candidate Starts for Zakhe101\_65:

(Start: 13 @42297 has 28 MA's), (15, 42333), (16, 42384), (17, 42390), (18, 42393), (22, 42540), (24, 42594), (26, 42687), (27, 42735), (29, 42843), (30, 42864), (36, 43152), (39, 43269), (40, 43302), (41, 43314), (43, 43365), (44, 43389), (46, 43449), (49, 43494),

Gene: Zebo\_65 Start: 42200, Stop: 43420, Start Num: 13

Candidate Starts for Zebo\_65:

(Start: 13 @42200 has 28 MA's), (15, 42236), (16, 42287), (17, 42293), (22, 42443), (24, 42497), (26, 42590), (27, 42638), (29, 42746), (30, 42767), (36, 43055), (39, 43172), (40, 43205), (41, 43217), (43, 43268), (44, 43292), (46, 43352), (49, 43397),

Gene: Zizzle\_30 Start: 26445, Stop: 27641, Start Num: 14

Candidate Starts for Zizzle\_30:

(Start: 14 @26445 has 35 MA's), (16, 26529), (22, 26679), (24, 26733), (26, 26826), (27, 26874), (29, 26985), (30, 27006), (36, 27288), (37, 27309), (39, 27405), (41, 27450), (43, 27495), (44, 27519), (46, 27579),