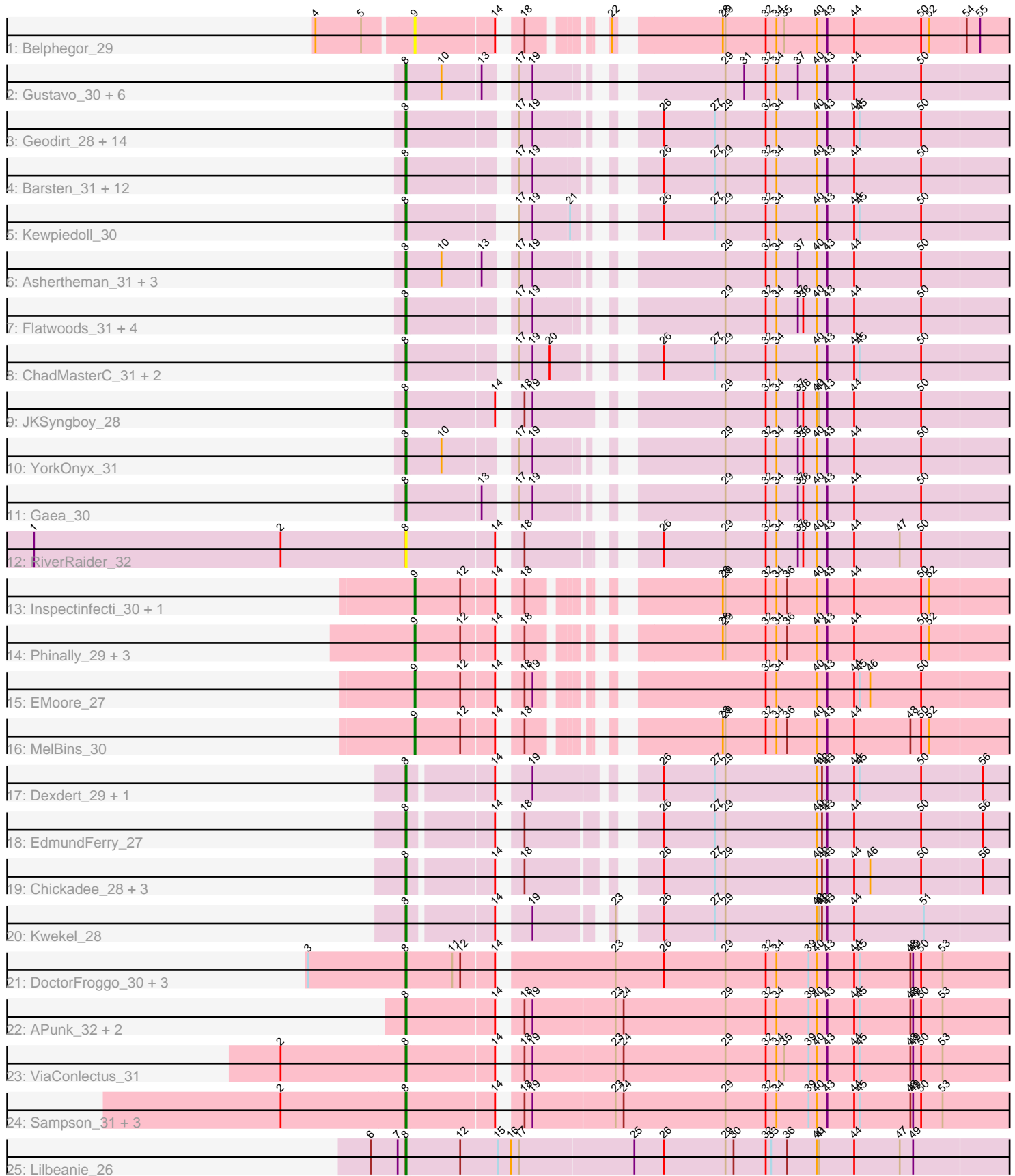


# Pham 85464



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 85464 Report

This analysis was run 04/28/24 on database version 559.

Pham number 85464 has 82 members, 17 are drafts.

Phages represented in each track:

- Track 1 : Belphegor\_29
- Track 2 : Gustavo\_30, Kwobi\_31, Saronaya\_30, Tangerine\_30, StorminNorm\_30, Tycho\_30, Kroos\_31
- Track 3 : Geodirt\_28, Sitar\_31, Affeca\_29, Fosterous\_29, Nordenberg\_25, Lennon\_31, Ailee\_29, Keitabear\_31, BobBob\_28, Brandonk123\_32, Vivi2\_33, Fitzgerald\_29, Charming\_31, Rofo\_31, Tangent\_31
- Track 4 : Barsten\_31, McKinley\_33, Sanjuju\_29, Jabberwocky\_29, Shivanishola\_32, Angelicage\_29, Stultus\_29, Sedona\_31, Love\_34, Bibwit\_30, Galadriel\_31, MoontowerMania\_30, Paries\_33
- Track 5 : Kewpiedoll\_30
- Track 6 : Ashertheman\_31, SchottB\_29, Baumdotcom\_30, LilHam\_28
- Track 7 : Flatwoods\_31, Bizzy\_31, Derg\_28, Ribeye\_31, Baddon\_30
- Track 8 : ChadMasterC\_31, Kamashten\_30, Thing3\_30
- Track 9 : JKSyngboy\_28
- Track 10 : YorkOnyx\_31
- Track 11 : Gaea\_30
- Track 12 : RiverRaider\_32
- Track 13 : Inspectinfecti\_30, Ali17\_27
- Track 14 : Phinally\_29, Leonard\_29, Hans\_31, Phauci\_22
- Track 15 : EMoore\_27
- Track 16 : MelBins\_30
- Track 17 : Dxdert\_29, RoadKill\_26
- Track 18 : EdmundFerry\_27
- Track 19 : Chickadee\_28, Twonlo\_26, Tiamoceli\_29, GTE6\_28
- Track 20 : Kwekel\_28
- Track 21 : DoctorFroggo\_30, Delrey21\_30, Verity\_30, Zipp\_30
- Track 22 : APunk\_32, Tardus\_32, Zitch\_32
- Track 23 : ViaConlectus\_31
- Track 24 : Sampson\_31, Scioto\_31, Abblin\_31, Natkenzie\_31
- Track 25 : Lilbeanie\_26

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

The start number called the most often in the published annotations is 8, it was called in 58 of the 65 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- APunk\_32, Abblin\_31, Affeca\_29, Ailee\_29, Angelicage\_29, Ashertheman\_31, Baddon\_30, Barsten\_31, Baumdotcom\_30, Bibwit\_30, Bizzy\_31, BobBob\_28, Brandonk123\_32, ChadMasterC\_31, Charming\_31, Chickadee\_28, Delrey21\_30, Derg\_28, Dextert\_29, DoctorFroggo\_30, EdmundFerry\_27, Fitzgerald\_29, Flatwoods\_31, Fosterous\_29, GTE6\_28, Gaea\_30, Galadriel\_31, Geodirt\_28, Gustavo\_30, JKSyngboy\_28, Jabberwocky\_29, Kamashten\_30, Keitabear\_31, Kewpiedoll\_30, Kroos\_31, Kwekel\_28, Kwobi\_31, Lennon\_31, LilHam\_28, Lilbeanie\_26, Love\_34, McKinley\_33, MoontowerMania\_30, Natkenzie\_31, Nordenberg\_25, Paries\_33, Ribeye\_31, RiverRaider\_32, RoadKill\_26, Rofo\_31, Sampson\_31, Sanjuju\_29, Saronaya\_30, SchottB\_29, Scioto\_31, Sedona\_31, Shivanishola\_32, Sitar\_31, StorminNorm\_30, Stultus\_29, Tangent\_31, Tangerine\_30, Tardus\_32, Thing3\_30, Tiamoceli\_29, Twonlo\_26, Tycho\_30, Verity\_30, ViaConlectus\_31, Vivi2\_33, YorkOnyx\_31, Zipp\_30, Zitch\_32,

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

- 

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

- Ali17\_27, Belphegor\_29, EMoore\_27, Hans\_31, Inspectinfecti\_30, Leonard\_29, MelBins\_30, Phauci\_22, Phinally\_29,

### Summary by start number:

Start 8:

- Found in 73 of 82 ( 89.0% ) of genes in pham
- Manual Annotations of this start: 58 of 65
- Called 100.0% of time when present
- Phage (with cluster) where this start called: APunk\_32 (DE4), Abblin\_31 (DE4), Affeca\_29 (DE1), Ailee\_29 (DE1), Angelicage\_29 (DE1), Ashertheman\_31 (DE1), Baddon\_30 (DE1), Barsten\_31 (DE1), Baumdotcom\_30 (DE1), Bibwit\_30 (DE1), Bizzy\_31 (DE1), BobBob\_28 (DE1), Brandonk123\_32 (DE1), ChadMasterC\_31 (DE1), Charming\_31 (DE1), Chickadee\_28 (DE3), Delrey21\_30 (DE4), Derg\_28 (DE1), Dextert\_29 (DE3), DoctorFroggo\_30 (DE4), EdmundFerry\_27 (DE3), Fitzgerald\_29 (DE1), Flatwoods\_31 (DE1), Fosterous\_29 (DE1), GTE6\_28 (DE3), Gaea\_30 (DE1), Galadriel\_31 (DE1), Geodirt\_28 (DE1), Gustavo\_30 (DE1), JKSyngboy\_28 (DE1), Jabberwocky\_29 (DE1), Kamashten\_30 (DE1), Keitabear\_31 (DE1), Kewpiedoll\_30 (DE1), Kroos\_31 (DE1), Kwekel\_28 (DE3), Kwobi\_31 (DE1), Lennon\_31 (DE1), LilHam\_28 (DE1), Lilbeanie\_26 (DE5), Love\_34 (DE1), McKinley\_33 (DE1), MoontowerMania\_30 (DE1), Natkenzie\_31 (DE4), Nordenberg\_25 (DE1), Paries\_33 (DE1), Ribeye\_31 (DE1), RiverRaider\_32 (DE1), RoadKill\_26 (DE3), Rofo\_31 (DE1), Sampson\_31 (DE4), Sanjuju\_29 (DE1), Saronaya\_30 (DE1), SchottB\_29 (DE1), Scioto\_31 (DE4), Sedona\_31 (DE1), Shivanishola\_32 (DE1), Sitar\_31 (DE1), StorminNorm\_30 (DE1), Stultus\_29 (DE1), Tangent\_31 (DE1), Tangerine\_30 (DE1), Tardus\_32 (DE4), Thing3\_30 (DE1), Tiamoceli\_29 (DE3), Twonlo\_26 (DE3), Tycho\_30 (DE1), Verity\_30 (DE4), ViaConlectus\_31 (DE4), Vivi2\_33 (DE1), YorkOnyx\_31 (DE1), Zipp\_30 (DE4), Zitch\_32 (DE4),

Start 9:

- Found in 9 of 82 ( 11.0% ) of genes in pham
- Manual Annotations of this start: 7 of 65
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Ali17\_27 (DE2), Belphegor\_29 (DE), EMOore\_27 (DE2), Hans\_31 (DE2), Inspectinfecti\_30 (DE2), Leonard\_29 (DE2), MelBins\_30 (DE2), Phauci\_22 (DE2), Phinally\_29 (DE2),

### **Summary by clusters:**

There are 6 clusters represented in this pham: DE, DE1, DE2, DE3, DE4, DE5,

Info for manual annotations of cluster DE1:

- Start number 8 was manually annotated 42 times for cluster DE1.

Info for manual annotations of cluster DE2:

- Start number 9 was manually annotated 7 times for cluster DE2.

Info for manual annotations of cluster DE3:

- Start number 8 was manually annotated 6 times for cluster DE3.

Info for manual annotations of cluster DE4:

- Start number 8 was manually annotated 9 times for cluster DE4.

Info for manual annotations of cluster DE5:

- Start number 8 was manually annotated 1 time for cluster DE5.

### **Gene Information:**

Gene: APunk\_32 Start: 22894, Stop: 23562, Start Num: 8

Candidate Starts for APunk\_32:

(Start: 8 @22894 has 58 MA's), (14, 22990), (18, 23005), (19, 23014), (23, 23104), (24, 23113), (29, 23227), (32, 23272), (34, 23284), (39, 23320), (40, 23329), (43, 23341), (44, 23371), (45, 23377), (48, 23434), (49, 23437), (50, 23446), (53, 23470),

Gene: Abblin\_31 Start: 23437, Stop: 24105, Start Num: 8

Candidate Starts for Abblin\_31:

(2, 23299), (Start: 8 @23437 has 58 MA's), (14, 23533), (18, 23548), (19, 23557), (23, 23647), (24, 23656), (29, 23770), (32, 23815), (34, 23827), (39, 23863), (40, 23872), (43, 23884), (44, 23914), (45, 23920), (48, 23977), (49, 23980), (50, 23989), (53, 24013),

Gene: Affeca\_29 Start: 23326, Stop: 23937, Start Num: 8

Candidate Starts for Affeca\_29:

(Start: 8 @23326 has 58 MA's), (17, 23431), (19, 23446), (26, 23536), (27, 23593), (29, 23605), (32, 23650), (34, 23662), (40, 23707), (43, 23719), (44, 23749), (45, 23755), (50, 23824),

Gene: Ailee\_29 Start: 24035, Stop: 24646, Start Num: 8

Candidate Starts for Ailee\_29:

(Start: 8 @24035 has 58 MA's), (17, 24140), (19, 24155), (26, 24245), (27, 24302), (29, 24314), (32, 24359), (34, 24371), (40, 24416), (43, 24428), (44, 24458), (45, 24464), (50, 24533),

Gene: Ali17\_27 Start: 21228, Stop: 21812, Start Num: 9

Candidate Starts for Ali17\_27:

(Start: 9 @21228 has 7 MA's), (12, 21279), (14, 21315), (18, 21330), (28, 21483), (29, 21486), (32, 21531), (34, 21543), (36, 21555), (40, 21588), (43, 21600), (44, 21630), (50, 21705), (52, 21714),

Gene: Angelicage\_29 Start: 23743, Stop: 24354, Start Num: 8

Candidate Starts for Angelicage\_29:

(Start: 8 @23743 has 58 MA's), (17, 23848), (19, 23863), (26, 23953), (27, 24010), (29, 24022), (32, 24067), (34, 24079), (40, 24124), (43, 24136), (44, 24166), (50, 24241),

Gene: Ashertheman\_31 Start: 22620, Stop: 23234, Start Num: 8

Candidate Starts for Ashertheman\_31:

(Start: 8 @22620 has 58 MA's), (10, 22659), (13, 22701), (17, 22725), (19, 22740), (29, 22899), (32, 22944), (34, 22956), (37, 22980), (40, 23001), (43, 23013), (44, 23043), (50, 23118),

Gene: Baddon\_30 Start: 23420, Stop: 24034, Start Num: 8

Candidate Starts for Baddon\_30:

(Start: 8 @23420 has 58 MA's), (17, 23525), (19, 23540), (29, 23699), (32, 23744), (34, 23756), (37, 23780), (38, 23786), (40, 23801), (43, 23813), (44, 23843), (50, 23918),

Gene: Barsten\_31 Start: 23167, Stop: 23778, Start Num: 8

Candidate Starts for Barsten\_31:

(Start: 8 @23167 has 58 MA's), (17, 23272), (19, 23287), (26, 23377), (27, 23434), (29, 23446), (32, 23491), (34, 23503), (40, 23548), (43, 23560), (44, 23590), (50, 23665),

Gene: Baumdotcom\_30 Start: 22235, Stop: 22849, Start Num: 8

Candidate Starts for Baumdotcom\_30:

(Start: 8 @22235 has 58 MA's), (10, 22274), (13, 22316), (17, 22340), (19, 22355), (29, 22514), (32, 22559), (34, 22571), (37, 22595), (40, 22616), (43, 22628), (44, 22658), (50, 22733),

Gene: Belphegor\_29 Start: 22835, Stop: 23419, Start Num: 9

Candidate Starts for Belphegor\_29:

(4, 22733), (5, 22784), (Start: 9 @22835 has 7 MA's), (14, 22922), (18, 22937), (22, 22991), (28, 23090), (29, 23093), (32, 23138), (34, 23150), (35, 23159), (40, 23195), (43, 23207), (44, 23237), (50, 23312), (52, 23321), (54, 23360), (55, 23375),

Gene: Bibwit\_30 Start: 23354, Stop: 23965, Start Num: 8

Candidate Starts for Bibwit\_30:

(Start: 8 @23354 has 58 MA's), (17, 23459), (19, 23474), (26, 23564), (27, 23621), (29, 23633), (32, 23678), (34, 23690), (40, 23735), (43, 23747), (44, 23777), (50, 23852),

Gene: Bizzy\_31 Start: 22567, Stop: 23181, Start Num: 8

Candidate Starts for Bizzy\_31:

(Start: 8 @22567 has 58 MA's), (17, 22672), (19, 22687), (29, 22846), (32, 22891), (34, 22903), (37, 22927), (38, 22933), (40, 22948), (43, 22960), (44, 22990), (50, 23065),

Gene: BobBob\_28 Start: 22632, Stop: 23243, Start Num: 8

Candidate Starts for BobBob\_28:

(Start: 8 @22632 has 58 MA's), (17, 22737), (19, 22752), (26, 22842), (27, 22899), (29, 22911), (32, 22956), (34, 22968), (40, 23013), (43, 23025), (44, 23055), (45, 23061), (50, 23130),

Gene: Brandonk123\_32 Start: 23701, Stop: 24312, Start Num: 8

Candidate Starts for Brandonk123\_32:

(Start: 8 @23701 has 58 MA's), (17, 23806), (19, 23821), (26, 23911), (27, 23968), (29, 23980), (32, 24025), (34, 24037), (40, 24082), (43, 24094), (44, 24124), (45, 24130), (50, 24199),

Gene: ChadMasterC\_31 Start: 24359, Stop: 24970, Start Num: 8

Candidate Starts for ChadMasterC\_31:

(Start: 8 @24359 has 58 MA's), (17, 24464), (19, 24479), (20, 24497), (26, 24569), (27, 24626), (29, 24638), (32, 24683), (34, 24695), (40, 24740), (43, 24752), (44, 24782), (45, 24788), (50, 24857),

Gene: Charming\_31 Start: 23210, Stop: 23821, Start Num: 8

Candidate Starts for Charming\_31:

(Start: 8 @23210 has 58 MA's), (17, 23315), (19, 23330), (26, 23420), (27, 23477), (29, 23489), (32, 23534), (34, 23546), (40, 23591), (43, 23603), (44, 23633), (45, 23639), (50, 23708),

Gene: Chickadee\_28 Start: 20076, Stop: 20690, Start Num: 8

Candidate Starts for Chickadee\_28:

(Start: 8 @20076 has 58 MA's), (14, 20163), (18, 20178), (26, 20292), (27, 20349), (29, 20361), (40, 20463), (42, 20469), (43, 20475), (44, 20505), (46, 20523), (50, 20580), (56, 20646),

Gene: Delrey21\_30 Start: 23637, Stop: 24308, Start Num: 8

Candidate Starts for Delrey21\_30:

(3, 23532), (Start: 8 @23637 has 58 MA's), (11, 23688), (12, 23697), (14, 23733), (23, 23850), (26, 23904), (29, 23973), (32, 24018), (34, 24030), (39, 24066), (40, 24075), (43, 24087), (44, 24117), (45, 24123), (48, 24180), (49, 24183), (50, 24192), (53, 24216),

Gene: Derg\_28 Start: 22163, Stop: 22777, Start Num: 8

Candidate Starts for Derg\_28:

(Start: 8 @22163 has 58 MA's), (17, 22268), (19, 22283), (29, 22442), (32, 22487), (34, 22499), (37, 22523), (38, 22529), (40, 22544), (43, 22556), (44, 22586), (50, 22661),

Gene: Dextert\_29 Start: 20507, Stop: 21124, Start Num: 8

Candidate Starts for Dextert\_29:

(Start: 8 @20507 has 58 MA's), (14, 20594), (19, 20618), (26, 20726), (27, 20783), (29, 20795), (40, 20897), (42, 20903), (43, 20909), (44, 20939), (45, 20945), (50, 21014), (56, 21080),

Gene: DoctorFroggo\_30 Start: 23637, Stop: 24308, Start Num: 8

Candidate Starts for DoctorFroggo\_30:

(3, 23532), (Start: 8 @23637 has 58 MA's), (11, 23688), (12, 23697), (14, 23733), (23, 23850), (26, 23904), (29, 23973), (32, 24018), (34, 24030), (39, 24066), (40, 24075), (43, 24087), (44, 24117), (45, 24123), (48, 24180), (49, 24183), (50, 24192), (53, 24216),

Gene: EMoore\_27 Start: 22069, Stop: 22653, Start Num: 9

Candidate Starts for EMoore\_27:

(Start: 9 @22069 has 7 MA's), (12, 22120), (14, 22156), (18, 22171), (19, 22180), (32, 22372), (34, 22384), (40, 22429), (43, 22441), (44, 22471), (45, 22477), (46, 22489), (50, 22546),

Gene: EdmundFerry\_27 Start: 20105, Stop: 20719, Start Num: 8

Candidate Starts for EdmundFerry\_27:

(Start: 8 @20105 has 58 MA's), (14, 20192), (18, 20207), (26, 20321), (27, 20378), (29, 20390), (40, 20492), (42, 20498), (43, 20504), (44, 20534), (50, 20609), (56, 20675),

Gene: Fitzgerald\_29 Start: 23793, Stop: 24404, Start Num: 8

Candidate Starts for Fitzgerald\_29:

(Start: 8 @23793 has 58 MA's), (17, 23898), (19, 23913), (26, 24003), (27, 24060), (29, 24072), (32, 24117), (34, 24129), (40, 24174), (43, 24186), (44, 24216), (45, 24222), (50, 24291),

Gene: Flatwoods\_31 Start: 22524, Stop: 23138, Start Num: 8

Candidate Starts for Flatwoods\_31:

(Start: 8 @22524 has 58 MA's), (17, 22629), (19, 22644), (29, 22803), (32, 22848), (34, 22860), (37, 22884), (38, 22890), (40, 22905), (43, 22917), (44, 22947), (50, 23022),

Gene: Fosterous\_29 Start: 23626, Stop: 24237, Start Num: 8

Candidate Starts for Fosterous\_29:

(Start: 8 @23626 has 58 MA's), (17, 23731), (19, 23746), (26, 23836), (27, 23893), (29, 23905), (32, 23950), (34, 23962), (40, 24007), (43, 24019), (44, 24049), (45, 24055), (50, 24124),

Gene: GTE6\_28 Start: 20594, Stop: 21208, Start Num: 8

Candidate Starts for GTE6\_28:

(Start: 8 @20594 has 58 MA's), (14, 20681), (18, 20696), (26, 20810), (27, 20867), (29, 20879), (40, 20981), (42, 20987), (43, 20993), (44, 21023), (46, 21041), (50, 21098), (56, 21164),

Gene: Gaea\_30 Start: 22175, Stop: 22789, Start Num: 8

Candidate Starts for Gaea\_30:

(Start: 8 @22175 has 58 MA's), (13, 22256), (17, 22280), (19, 22295), (29, 22454), (32, 22499), (34, 22511), (37, 22535), (38, 22541), (40, 22556), (43, 22568), (44, 22598), (50, 22673),

Gene: Galadriel\_31 Start: 24115, Stop: 24726, Start Num: 8

Candidate Starts for Galadriel\_31:

(Start: 8 @24115 has 58 MA's), (17, 24220), (19, 24235), (26, 24325), (27, 24382), (29, 24394), (32, 24439), (34, 24451), (40, 24496), (43, 24508), (44, 24538), (50, 24613),

Gene: Geodirt\_28 Start: 23098, Stop: 23709, Start Num: 8

Candidate Starts for Geodirt\_28:

(Start: 8 @23098 has 58 MA's), (17, 23203), (19, 23218), (26, 23308), (27, 23365), (29, 23377), (32, 23422), (34, 23434), (40, 23479), (43, 23491), (44, 23521), (45, 23527), (50, 23596),

Gene: Gustavo\_30 Start: 22327, Stop: 22941, Start Num: 8

Candidate Starts for Gustavo\_30:

(Start: 8 @22327 has 58 MA's), (10, 22366), (13, 22408), (17, 22432), (19, 22447), (29, 22606), (31, 22627), (32, 22651), (34, 22663), (37, 22687), (40, 22708), (43, 22720), (44, 22750), (50, 22825),

Gene: Hans\_31 Start: 21952, Stop: 22536, Start Num: 9

Candidate Starts for Hans\_31:

(Start: 9 @21952 has 7 MA's), (12, 22003), (14, 22039), (18, 22054), (28, 22207), (29, 22210), (32, 22255), (34, 22267), (36, 22279), (40, 22312), (43, 22324), (44, 22354), (50, 22429), (52, 22438),

Gene: Inspectinfecti\_30 Start: 22314, Stop: 22898, Start Num: 9

Candidate Starts for Inspectinfecti\_30:

(Start: 9 @22314 has 7 MA's), (12, 22365), (14, 22401), (18, 22416), (28, 22569), (29, 22572), (32, 22617), (34, 22629), (36, 22641), (40, 22674), (43, 22686), (44, 22716), (50, 22791), (52, 22800),

Gene: JKSyngboy\_28 Start: 22884, Stop: 23513, Start Num: 8

Candidate Starts for JKSyngboy\_28:

(Start: 8 @22884 has 58 MA's), (14, 22980), (18, 22995), (19, 23004), (29, 23178), (32, 23223), (34, 23235), (37, 23259), (38, 23265), (40, 23280), (41, 23283), (43, 23292), (44, 23322), (50, 23397),

Gene: Jabberwocky\_29 Start: 24254, Stop: 24865, Start Num: 8

Candidate Starts for Jabberwocky\_29:

(Start: 8 @24254 has 58 MA's), (17, 24359), (19, 24374), (26, 24464), (27, 24521), (29, 24533), (32, 24578), (34, 24590), (40, 24635), (43, 24647), (44, 24677), (50, 24752),

Gene: Kamashten\_30 Start: 23703, Stop: 24314, Start Num: 8

Candidate Starts for Kamashten\_30:

(Start: 8 @23703 has 58 MA's), (17, 23808), (19, 23823), (20, 23841), (26, 23913), (27, 23970), (29, 23982), (32, 24027), (34, 24039), (40, 24084), (43, 24096), (44, 24126), (45, 24132), (50, 24201),

Gene: Keitabear\_31 Start: 25059, Stop: 25670, Start Num: 8

Candidate Starts for Keitabear\_31:

(Start: 8 @25059 has 58 MA's), (17, 25164), (19, 25179), (26, 25269), (27, 25326), (29, 25338), (32, 25383), (34, 25395), (40, 25440), (43, 25452), (44, 25482), (45, 25488), (50, 25557),

Gene: Kewpiedoll\_30 Start: 22900, Stop: 23502, Start Num: 8

Candidate Starts for Kewpiedoll\_30:

(Start: 8 @22900 has 58 MA's), (17, 22996), (19, 23011), (21, 23050), (26, 23101), (27, 23158), (29, 23170), (32, 23215), (34, 23227), (40, 23272), (43, 23284), (44, 23314), (45, 23320), (50, 23389),

Gene: Kroos\_31 Start: 23080, Stop: 23694, Start Num: 8

Candidate Starts for Kroos\_31:

(Start: 8 @23080 has 58 MA's), (10, 23119), (13, 23161), (17, 23185), (19, 23200), (29, 23359), (31, 23380), (32, 23404), (34, 23416), (37, 23440), (40, 23461), (43, 23473), (44, 23503), (50, 23578),

Gene: Kwekel\_28 Start: 20026, Stop: 20637, Start Num: 8

Candidate Starts for Kwekel\_28:

(Start: 8 @20026 has 58 MA's), (14, 20113), (19, 20137), (23, 20206), (26, 20236), (27, 20293), (29, 20305), (40, 20407), (41, 20410), (42, 20413), (43, 20419), (44, 20449), (51, 20527),

Gene: Kwobi\_31 Start: 23066, Stop: 23680, Start Num: 8

Candidate Starts for Kwobi\_31:

(Start: 8 @23066 has 58 MA's), (10, 23105), (13, 23147), (17, 23171), (19, 23186), (29, 23345), (31, 23366), (32, 23390), (34, 23402), (37, 23426), (40, 23447), (43, 23459), (44, 23489), (50, 23564),

Gene: Lennon\_31 Start: 24861, Stop: 25472, Start Num: 8

Candidate Starts for Lennon\_31:

(Start: 8 @24861 has 58 MA's), (17, 24966), (19, 24981), (26, 25071), (27, 25128), (29, 25140), (32, 25185), (34, 25197), (40, 25242), (43, 25254), (44, 25284), (45, 25290), (50, 25359),

Gene: Leonard\_29 Start: 21950, Stop: 22534, Start Num: 9

Candidate Starts for Leonard\_29:

(Start: 9 @21950 has 7 MA's), (12, 22001), (14, 22037), (18, 22052), (28, 22205), (29, 22208), (32, 22253), (34, 22265), (36, 22277), (40, 22310), (43, 22322), (44, 22352), (50, 22427), (52, 22436),

Gene: LilHam\_28 Start: 21660, Stop: 22274, Start Num: 8

Candidate Starts for LilHam\_28:

(Start: 8 @21660 has 58 MA's), (10, 21699), (13, 21741), (17, 21765), (19, 21780), (29, 21939), (32, 21984), (34, 21996), (37, 22020), (40, 22041), (43, 22053), (44, 22083), (50, 22158),

Gene: Lilbeanie\_26 Start: 16955, Stop: 17662, Start Num: 8

Candidate Starts for Lilbeanie\_26:



(6, 16916), (7, 16946), (Start: 8 @16955 has 58 MA's), (12, 17015), (15, 17057), (16, 17072), (17, 17081), (25, 17207), (26, 17240), (29, 17309), (30, 17318), (32, 17354), (33, 17360), (36, 17378), (40, 17411), (41, 17414), (44, 17453), (47, 17504), (49, 17519),

Gene: Love\_34 Start: 24625, Stop: 25236, Start Num: 8

Candidate Starts for Love\_34:

(Start: 8 @24625 has 58 MA's), (17, 24730), (19, 24745), (26, 24835), (27, 24892), (29, 24904), (32, 24949), (34, 24961), (40, 25006), (43, 25018), (44, 25048), (50, 25123),

Gene: McKinley\_33 Start: 24657, Stop: 25268, Start Num: 8

Candidate Starts for McKinley\_33:

(Start: 8 @24657 has 58 MA's), (17, 24762), (19, 24777), (26, 24867), (27, 24924), (29, 24936), (32, 24981), (34, 24993), (40, 25038), (43, 25050), (44, 25080), (50, 25155),

Gene: MelBins\_30 Start: 22096, Stop: 22680, Start Num: 9

Candidate Starts for MelBins\_30:

(Start: 9 @22096 has 7 MA's), (12, 22147), (14, 22183), (18, 22198), (28, 22351), (29, 22354), (32, 22399), (34, 22411), (36, 22423), (40, 22456), (43, 22468), (44, 22498), (48, 22561), (50, 22573), (52, 22582),

Gene: MoontowerMania\_30 Start: 23468, Stop: 24079, Start Num: 8

Candidate Starts for MoontowerMania\_30:

(Start: 8 @23468 has 58 MA's), (17, 23573), (19, 23588), (26, 23678), (27, 23735), (29, 23747), (32, 23792), (34, 23804), (40, 23849), (43, 23861), (44, 23891), (50, 23966),

Gene: Natkenzie\_31 Start: 23437, Stop: 24105, Start Num: 8

Candidate Starts for Natkenzie\_31:

(2, 23299), (Start: 8 @23437 has 58 MA's), (14, 23533), (18, 23548), (19, 23557), (23, 23647), (24, 23656), (29, 23770), (32, 23815), (34, 23827), (39, 23863), (40, 23872), (43, 23884), (44, 23914), (45, 23920), (48, 23977), (49, 23980), (50, 23989), (53, 24013),

Gene: Nordenberg\_25 Start: 22827, Stop: 23438, Start Num: 8

Candidate Starts for Nordenberg\_25:

(Start: 8 @22827 has 58 MA's), (17, 22932), (19, 22947), (26, 23037), (27, 23094), (29, 23106), (32, 23151), (34, 23163), (40, 23208), (43, 23220), (44, 23250), (45, 23256), (50, 23325),

Gene: Paries\_33 Start: 24293, Stop: 24904, Start Num: 8

Candidate Starts for Paries\_33:

(Start: 8 @24293 has 58 MA's), (17, 24398), (19, 24413), (26, 24503), (27, 24560), (29, 24572), (32, 24617), (34, 24629), (40, 24674), (43, 24686), (44, 24716), (50, 24791),

Gene: Phauci\_22 Start: 18539, Stop: 19123, Start Num: 9

Candidate Starts for Phauci\_22:

(Start: 9 @18539 has 7 MA's), (12, 18590), (14, 18626), (18, 18641), (28, 18794), (29, 18797), (32, 18842), (34, 18854), (36, 18866), (40, 18899), (43, 18911), (44, 18941), (50, 19016), (52, 19025),

Gene: Phinally\_29 Start: 21947, Stop: 22531, Start Num: 9

Candidate Starts for Phinally\_29:

(Start: 9 @21947 has 7 MA's), (12, 21998), (14, 22034), (18, 22049), (28, 22202), (29, 22205), (32, 22250), (34, 22262), (36, 22274), (40, 22307), (43, 22319), (44, 22349), (50, 22424), (52, 22433),

Gene: Ribeye\_31 Start: 23481, Stop: 24095, Start Num: 8

Candidate Starts for Ribeye\_31:

(Start: 8 @23481 has 58 MA's), (17, 23586), (19, 23601), (29, 23760), (32, 23805), (34, 23817), (37, 23841), (38, 23847), (40, 23862), (43, 23874), (44, 23904), (50, 23979),

Gene: RiverRaider\_32 Start: 21912, Stop: 22535, Start Num: 8

Candidate Starts for RiverRaider\_32:

(1, 21498), (2, 21774), (Start: 8 @21912 has 58 MA's), (14, 22008), (18, 22023), (26, 22131), (29, 22200), (32, 22245), (34, 22257), (37, 22281), (38, 22287), (40, 22302), (43, 22314), (44, 22344), (47, 22395), (50, 22419),

Gene: RoadKill\_26 Start: 19582, Stop: 20205, Start Num: 8

Candidate Starts for RoadKill\_26:

(Start: 8 @19582 has 58 MA's), (14, 19675), (19, 19699), (26, 19807), (27, 19864), (29, 19876), (40, 19978), (42, 19984), (43, 19990), (44, 20020), (45, 20026), (50, 20095), (56, 20161),

Gene: Rofo\_31 Start: 23688, Stop: 24299, Start Num: 8

Candidate Starts for Rofo\_31:

(Start: 8 @23688 has 58 MA's), (17, 23793), (19, 23808), (26, 23898), (27, 23955), (29, 23967), (32, 24012), (34, 24024), (40, 24069), (43, 24081), (44, 24111), (45, 24117), (50, 24186),

Gene: Sampson\_31 Start: 23382, Stop: 24050, Start Num: 8

Candidate Starts for Sampson\_31:

(2, 23244), (Start: 8 @23382 has 58 MA's), (14, 23478), (18, 23493), (19, 23502), (23, 23592), (24, 23601), (29, 23715), (32, 23760), (34, 23772), (39, 23808), (40, 23817), (43, 23829), (44, 23859), (45, 23865), (48, 23922), (49, 23925), (50, 23934), (53, 23958),

Gene: Sanjuju\_29 Start: 23869, Stop: 24480, Start Num: 8

Candidate Starts for Sanjuju\_29:

(Start: 8 @23869 has 58 MA's), (17, 23974), (19, 23989), (26, 24079), (27, 24136), (29, 24148), (32, 24193), (34, 24205), (40, 24250), (43, 24262), (44, 24292), (50, 24367),

Gene: Saronaya\_30 Start: 22327, Stop: 22941, Start Num: 8

Candidate Starts for Saronaya\_30:

(Start: 8 @22327 has 58 MA's), (10, 22366), (13, 22408), (17, 22432), (19, 22447), (29, 22606), (31, 22627), (32, 22651), (34, 22663), (37, 22687), (40, 22708), (43, 22720), (44, 22750), (50, 22825),

Gene: SchottB\_29 Start: 23339, Stop: 23953, Start Num: 8

Candidate Starts for SchottB\_29:

(Start: 8 @23339 has 58 MA's), (10, 23378), (13, 23420), (17, 23444), (19, 23459), (29, 23618), (32, 23663), (34, 23675), (37, 23699), (40, 23720), (43, 23732), (44, 23762), (50, 23837),

Gene: Scioto\_31 Start: 23437, Stop: 24105, Start Num: 8

Candidate Starts for Scioto\_31:

(2, 23299), (Start: 8 @23437 has 58 MA's), (14, 23533), (18, 23548), (19, 23557), (23, 23647), (24, 23656), (29, 23770), (32, 23815), (34, 23827), (39, 23863), (40, 23872), (43, 23884), (44, 23914), (45, 23920), (48, 23977), (49, 23980), (50, 23989), (53, 24013),

Gene: Sedona\_31 Start: 24794, Stop: 25405, Start Num: 8

Candidate Starts for Sedona\_31:

(Start: 8 @24794 has 58 MA's), (17, 24899), (19, 24914), (26, 25004), (27, 25061), (29, 25073), (32, 25118), (34, 25130), (40, 25175), (43, 25187), (44, 25217), (50, 25292),

Gene: Shivanishola\_32 Start: 23768, Stop: 24379, Start Num: 8

Candidate Starts for Shivanishola\_32:

(Start: 8 @23768 has 58 MA's), (17, 23873), (19, 23888), (26, 23978), (27, 24035), (29, 24047), (32, 24092), (34, 24104), (40, 24149), (43, 24161), (44, 24191), (50, 24266),

Gene: Sitar\_31 Start: 24861, Stop: 25472, Start Num: 8

Candidate Starts for Sitar\_31:

(Start: 8 @24861 has 58 MA's), (17, 24966), (19, 24981), (26, 25071), (27, 25128), (29, 25140), (32, 25185), (34, 25197), (40, 25242), (43, 25254), (44, 25284), (45, 25290), (50, 25359),

Gene: StorminNorm\_30 Start: 22206, Stop: 22820, Start Num: 8

Candidate Starts for StorminNorm\_30:

(Start: 8 @22206 has 58 MA's), (10, 22245), (13, 22287), (17, 22311), (19, 22326), (29, 22485), (31, 22506), (32, 22530), (34, 22542), (37, 22566), (40, 22587), (43, 22599), (44, 22629), (50, 22704),

Gene: Stultus\_29 Start: 22776, Stop: 23387, Start Num: 8

Candidate Starts for Stultus\_29:

(Start: 8 @22776 has 58 MA's), (17, 22881), (19, 22896), (26, 22986), (27, 23043), (29, 23055), (32, 23100), (34, 23112), (40, 23157), (43, 23169), (44, 23199), (50, 23274),

Gene: Tangent\_31 Start: 23210, Stop: 23821, Start Num: 8

Candidate Starts for Tangent\_31:

(Start: 8 @23210 has 58 MA's), (17, 23315), (19, 23330), (26, 23420), (27, 23477), (29, 23489), (32, 23534), (34, 23546), (40, 23591), (43, 23603), (44, 23633), (45, 23639), (50, 23708),

Gene: Tangerine\_30 Start: 22212, Stop: 22826, Start Num: 8

Candidate Starts for Tangerine\_30:

(Start: 8 @22212 has 58 MA's), (10, 22251), (13, 22293), (17, 22317), (19, 22332), (29, 22491), (31, 22512), (32, 22536), (34, 22548), (37, 22572), (40, 22593), (43, 22605), (44, 22635), (50, 22710),

Gene: Tardus\_32 Start: 22786, Stop: 23454, Start Num: 8

Candidate Starts for Tardus\_32:

(Start: 8 @22786 has 58 MA's), (14, 22882), (18, 22897), (19, 22906), (23, 22996), (24, 23005), (29, 23119), (32, 23164), (34, 23176), (39, 23212), (40, 23221), (43, 23233), (44, 23263), (45, 23269), (48, 23326), (49, 23329), (50, 23338), (53, 23362),

Gene: Thing3\_30 Start: 23703, Stop: 24314, Start Num: 8

Candidate Starts for Thing3\_30:

(Start: 8 @23703 has 58 MA's), (17, 23808), (19, 23823), (20, 23841), (26, 23913), (27, 23970), (29, 23982), (32, 24027), (34, 24039), (40, 24084), (43, 24096), (44, 24126), (45, 24132), (50, 24201),

Gene: Tiamoceli\_29 Start: 20933, Stop: 21547, Start Num: 8

Candidate Starts for Tiamoceli\_29:

(Start: 8 @20933 has 58 MA's), (14, 21020), (18, 21035), (26, 21149), (27, 21206), (29, 21218), (40, 21320), (42, 21326), (43, 21332), (44, 21362), (46, 21380), (50, 21437), (56, 21503),

Gene: Twonlo\_26 Start: 19551, Stop: 20165, Start Num: 8

Candidate Starts for Twonlo\_26:

(Start: 8 @19551 has 58 MA's), (14, 19638), (18, 19653), (26, 19767), (27, 19824), (29, 19836), (40, 19938), (42, 19944), (43, 19950), (44, 19980), (46, 19998), (50, 20055), (56, 20121),

Gene: Tycho\_30 Start: 22301, Stop: 22915, Start Num: 8

Candidate Starts for Tycho\_30:

(Start: 8 @22301 has 58 MA's), (10, 22340), (13, 22382), (17, 22406), (19, 22421), (29, 22580), (31, 22601), (32, 22625), (34, 22637), (37, 22661), (40, 22682), (43, 22694), (44, 22724), (50, 22799),

Gene: Verity\_30 Start: 23637, Stop: 24308, Start Num: 8

Candidate Starts for Verity\_30:

(3, 23532), (Start: 8 @23637 has 58 MA's), (11, 23688), (12, 23697), (14, 23733), (23, 23850), (26, 23904), (29, 23973), (32, 24018), (34, 24030), (39, 24066), (40, 24075), (43, 24087), (44, 24117), (45, 24123), (48, 24180), (49, 24183), (50, 24192), (53, 24216),

Gene: ViaConlectus\_31 Start: 22061, Stop: 22729, Start Num: 8

Candidate Starts for ViaConlectus\_31:

(2, 21923), (Start: 8 @22061 has 58 MA's), (14, 22157), (18, 22172), (19, 22181), (23, 22271), (24, 22280), (29, 22394), (32, 22439), (34, 22451), (35, 22460), (39, 22487), (40, 22496), (43, 22508), (44, 22538), (45, 22544), (48, 22601), (49, 22604), (50, 22613), (53, 22637),

Gene: Vivi2\_33 Start: 24383, Stop: 24994, Start Num: 8

Candidate Starts for Vivi2\_33:

(Start: 8 @24383 has 58 MA's), (17, 24488), (19, 24503), (26, 24593), (27, 24650), (29, 24662), (32, 24707), (34, 24719), (40, 24764), (43, 24776), (44, 24806), (45, 24812), (50, 24881),

Gene: YorkOnyx\_31 Start: 22557, Stop: 23171, Start Num: 8

Candidate Starts for YorkOnyx\_31:

(Start: 8 @22557 has 58 MA's), (10, 22596), (17, 22662), (19, 22677), (29, 22836), (32, 22881), (34, 22893), (37, 22917), (38, 22923), (40, 22938), (43, 22950), (44, 22980), (50, 23055),

Gene: Zipp\_30 Start: 23534, Stop: 24205, Start Num: 8

Candidate Starts for Zipp\_30:

(3, 23429), (Start: 8 @23534 has 58 MA's), (11, 23585), (12, 23594), (14, 23630), (23, 23747), (26, 23801), (29, 23870), (32, 23915), (34, 23927), (39, 23963), (40, 23972), (43, 23984), (44, 24014), (45, 24020), (48, 24077), (49, 24080), (50, 24089), (53, 24113),

Gene: Zitch\_32 Start: 21408, Stop: 22076, Start Num: 8

Candidate Starts for Zitch\_32:

(Start: 8 @21408 has 58 MA's), (14, 21504), (18, 21519), (19, 21528), (23, 21618), (24, 21627), (29, 21741), (32, 21786), (34, 21798), (39, 21834), (40, 21843), (43, 21855), (44, 21885), (45, 21891), (48, 21948), (49, 21951), (50, 21960), (53, 21984),