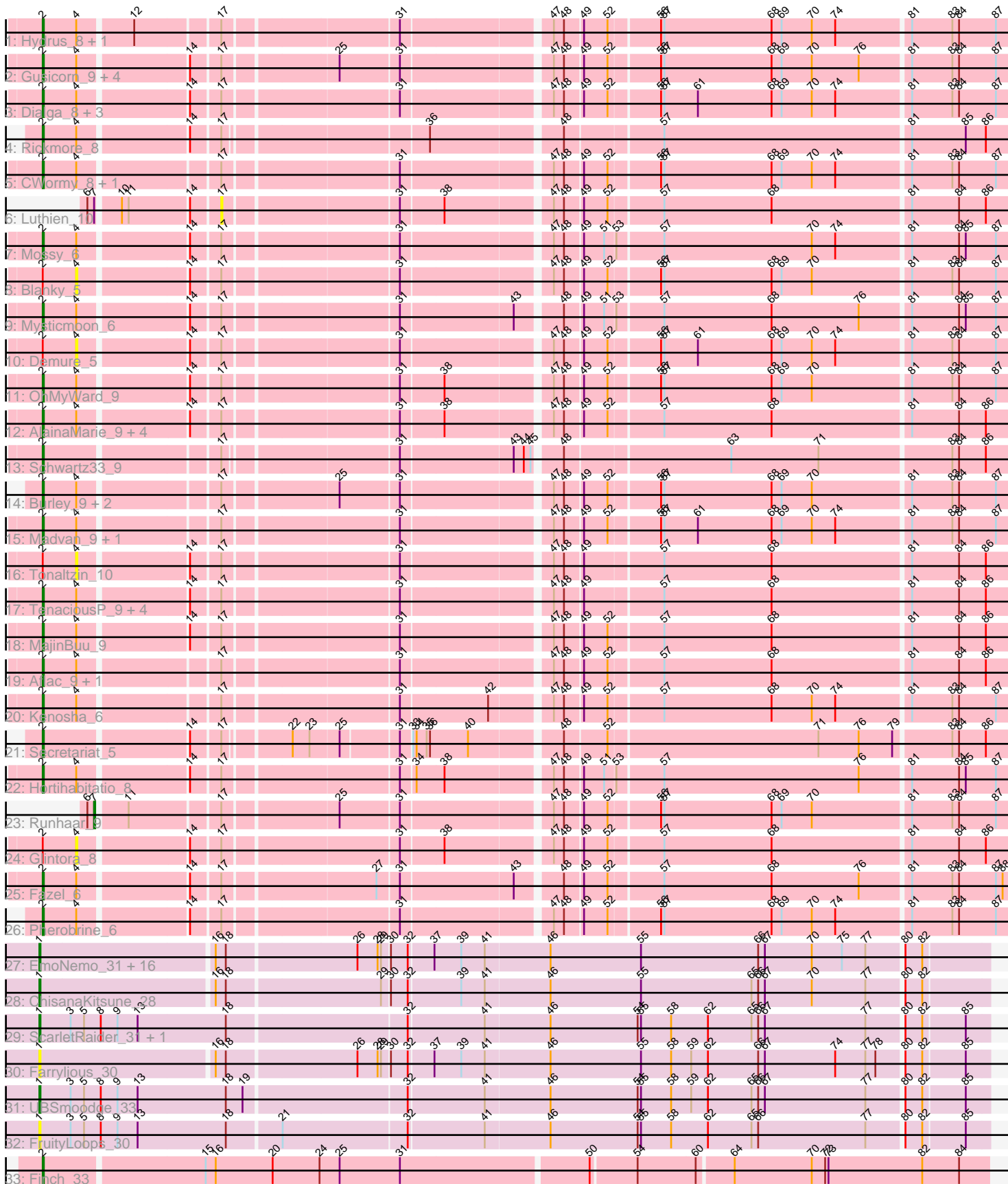


Pham 308546



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 308546 Report

This analysis was run 06/27/26 on database version 652.

Pham number 308546 has 71 members, 22 are drafts.

Phages represented in each track:

- Track 1 : Hydrus\_8, Zeph\_8
- Track 2 : Gusicorn\_9, ShaggyRogers\_9, BetterYeti\_9, Aloe25\_9, PestoPenguin\_9
- Track 3 : Dialga\_8, Arataki\_6, ArtetaBall\_8, Untouchable\_8
- Track 4 : Rickmore\_8
- Track 5 : CWormy\_8, Crocheter\_8
- Track 6 : Luthien\_10
- Track 7 : Mossy\_6
- Track 8 : Blanky\_5
- Track 9 : Mysticmoon\_6
- Track 10 : Demure\_5
- Track 11 : OhMyWard\_9
- Track 12 : AlainaMarie\_9, EndAve\_9, Nithya\_9, Chickenjars\_9, Duffington\_9
- Track 13 : Schwartz33\_9
- Track 14 : Burley\_9, Nadmeg\_9, Vardy\_9
- Track 15 : Madvan\_9, Phepper\_9
- Track 16 : Tonaltzin\_10
- Track 17 : TenaciousP\_9, BluerMoon\_9, OlgasClover\_9, Figliar\_9, Jodelie19\_9
- Track 18 : MajinBuu\_9
- Track 19 : Aflac\_9, Eddiemania\_8
- Track 20 : Kenosha\_6
- Track 21 : Secretariat\_5
- Track 22 : Hortihabitatio\_8
- Track 23 : Runhaar\_9
- Track 24 : Glintora\_8
- Track 25 : Fazel\_6
- Track 26 : Pherobrine\_6
- Track 27 : EmoNemo\_31, Hanem\_32, Lenoshki\_32, Kabocha\_33, Twin\_31, Amoonguss\_31, MintFritos\_31, Pakusa\_31, Aloki\_32, Toneprano\_31, Oogie\_33, Gray\_32, Beted\_32, Argena\_31, Mikronejon\_31, Schomber\_31, Chidiebere\_32
- Track 28 : ChisanaKitsune\_28
- Track 29 : ScarletRaider\_31, FlyingTortilla\_31
- Track 30 : Farrylious\_30
- Track 31 : UBSmoodge\_33
- Track 32 : FruityLoops\_30
- Track 33 : Finch\_33

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

The start number called the most often in the published annotations is 2, it was called in 37 of the 49 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Aflac\_9, AlainaMarie\_9, Aloe25\_9, Arataki\_6, ArtetaBall\_8, BetterYeti\_9, BluerMoon\_9, Burley\_9, CWormy\_8, Chikenjars\_9, Crocheter\_8, Dialga\_8, Duffington\_9, Eddiemania\_8, EndAve\_9, Fazel\_6, Figliar\_9, Finch\_33, Gusicorn\_9, Hortihabitatio\_8, Hydrus\_8, Jodelie19\_9, Kenosha\_6, Madvan\_9, MajinBuu\_9, Mossy\_6, Mysticmoon\_6, Nadmeg\_9, Nithya\_9, OhMyWard\_9, OlgasClover\_9, PestoPenguin\_9, Phepper\_9, Pherobrine\_6, Rickmore\_8, Schwartz33\_9, Secretariat\_5, ShaggyRogers\_9, TenaciousP\_9, Untouchable\_8, Vardy\_9, Zeph\_8,

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

- Blanky\_5, Demure\_5, Glintora\_8, Tonaltzin\_10,

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

- Aloki\_32, Amoonguss\_31, Argena\_31, Beted\_32, Chidiebere\_32, ChisanaKitsune\_28, EmoNemo\_31, Farrylious\_30, FlyingTortilla\_31, FruityLoops\_30, Gray\_32, Hanem\_32, Kabocha\_33, Lenoshki\_32, Luthien\_10, Mikronejon\_31, MintFritos\_31, Oogie\_33, Pakusa\_31, Runhaar\_9, ScarletRaider\_31, Schomber\_31, Toneprano\_31, Twin\_31, UBSmoodge\_33,

## **Summary by start number:**

Start 1:

- Found in 23 of 71 ( 32.4% ) of genes in pham
- Manual Annotations of this start: 11 of 49
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Aloki\_32 (DQ), Amoonguss\_31 (DQ), Argena\_31 (DQ), Beted\_32 (DQ), Chidiebere\_32 (DQ), ChisanaKitsune\_28 (DQ), EmoNemo\_31 (DQ), Farrylious\_30 (DQ), FlyingTortilla\_31 (DQ), FruityLoops\_30 (DQ), Gray\_32 (DQ), Hanem\_32 (DQ), Kabocha\_33 (DQ), Lenoshki\_32 (DQ), Mikronejon\_31 (DQ), MintFritos\_31 (DQ), Oogie\_33 (DQ), Pakusa\_31 (DQ), ScarletRaider\_31 (DQ), Schomber\_31 (DQ), Toneprano\_31 (DQ), Twin\_31 (DQ), UBSmoodge\_33 (DQ),

Start 2:

- Found in 46 of 71 ( 64.8% ) of genes in pham
- Manual Annotations of this start: 37 of 49
- Called 91.3% of time when present
- Phage (with cluster) where this start called: Aflac\_9 (DJ), AlainaMarie\_9 (DJ), Aloe25\_9 (DJ), Arataki\_6 (DJ), ArtetaBall\_8 (DJ), BetterYeti\_9 (DJ), BluerMoon\_9 (DJ), Burley\_9 (DJ), CWormy\_8 (DJ), Chikenjars\_9 (DJ), Crocheter\_8 (DJ), Dialga\_8 (DJ), Duffington\_9 (DJ), Eddiemania\_8 (DJ), EndAve\_9 (DJ), Fazel\_6 (DJ), Figliar\_9 (DJ), Finch\_33 (singleton), Gusicorn\_9 (DJ), Hortihabitatio\_8 (DJ), Hydrus\_8 (DJ), Jodelie19\_9 (DJ), Kenosha\_6 (DJ), Madvan\_9 (DJ), MajinBuu\_9 (DJ), Mossy\_6 (DJ), Mysticmoon\_6 (DJ), Nadmeg\_9 (DJ), Nithya\_9 (DJ), OhMyWard\_9 (DJ), OlgasClover\_9 (DJ), PestoPenguin\_9 (DJ), Phepper\_9 (DJ), Pherobrine\_6 (DJ), Rickmore\_8 (DJ), Schwartz33\_9 (DJ), Secretariat\_5 (DJ), ShaggyRogers\_9 (DJ), TenaciousP\_9 (DJ), Untouchable\_8 (DJ), Vardy\_9 (DJ), Zeph\_8 (DJ),

Start 4:

- Found in 43 of 71 ( 60.6% ) of genes in pham
- No Manual Annotations of this start.
- Called 9.3% of time when present
- Phage (with cluster) where this start called: Blanky\_5 (DJ), Demure\_5 (DJ), Glintora\_8 (DJ), Tonaltzin\_10 (DJ),

Start 7:

- Found in 2 of 71 ( 2.8% ) of genes in pham
- Manual Annotations of this start: 1 of 49
- Called 50.0% of time when present
- Phage (with cluster) where this start called: Runhaar\_9 (DJ),

Start 17:

- Found in 47 of 71 ( 66.2% ) of genes in pham
- No Manual Annotations of this start.
- Called 2.1% of time when present
- Phage (with cluster) where this start called: Luthien\_10 (DJ),

**Summary by clusters:**

There are 3 clusters represented in this pham: singleton, DJ, DQ,

Info for manual annotations of cluster DJ:

- Start number 2 was manually annotated 36 times for cluster DJ.
- Start number 7 was manually annotated 1 time for cluster DJ.

Info for manual annotations of cluster DQ:

- Start number 1 was manually annotated 11 times for cluster DQ.

**Gene Information:**

Gene: Aflac\_9 Start: 4418, Stop: 5221, Start Num: 2

Candidate Starts for Aflac\_9:

(Start: 2 @4418 has 37 MA's), (4, 4448), (17, 4562), (31, 4706), (47, 4829), (48, 4838), (49, 4853), (52, 4874), (57, 4919), (68, 5015), (81, 5135), (84, 5177), (86, 5201),

Gene: AlainaMarie\_9 Start: 4409, Stop: 5212, Start Num: 2

Candidate Starts for AlainaMarie\_9:

(Start: 2 @4409 has 37 MA's), (4, 4439), (14, 4529), (17, 4553), (31, 4697), (38, 4733), (47, 4820), (48, 4829), (49, 4844), (52, 4865), (57, 4910), (68, 5006), (81, 5126), (84, 5168), (86, 5192),

Gene: Aloe25\_9 Start: 4415, Stop: 5221, Start Num: 2

Candidate Starts for Aloe25\_9:

(Start: 2 @4415 has 37 MA's), (4, 4445), (14, 4535), (17, 4559), (25, 4652), (31, 4703), (47, 4826), (48, 4835), (49, 4850), (52, 4871), (56, 4913), (57, 4916), (68, 5012), (69, 5021), (70, 5048), (76, 5090), (81, 5132), (83, 5168), (84, 5174), (87, 5207),

Gene: Alok\_32 Start: 22263, Stop: 23081, Start Num: 1

Candidate Starts for Alok\_32:

(Start: 1 @22263 has 11 MA's), (16, 22413), (18, 22422), (26, 22533), (28, 22551), (29, 22554), (30, 22560), (32, 22575), (37, 22596), (39, 22620), (41, 22641), (46, 22698), (55, 22779), (66, 22884), (67, 22890), (70, 22932), (75, 22959), (77, 22980), (80, 23010), (82, 23025),

Gene: Amoonguss\_31 Start: 22266, Stop: 23084, Start Num: 1

Candidate Starts for Amoonguss\_31:

(Start: 1 @22266 has 11 MA's), (16, 22416), (18, 22425), (26, 22536), (28, 22554), (29, 22557), (30, 22563), (32, 22578), (37, 22599), (39, 22623), (41, 22644), (46, 22701), (55, 22782), (66, 22887), (67, 22893), (70, 22935), (75, 22962), (77, 22983), (80, 23013), (82, 23028),

Gene: Arataki\_6 Start: 2206, Stop: 3009, Start Num: 2

Candidate Starts for Arataki\_6:

(Start: 2 @2206 has 37 MA's), (4, 2236), (14, 2326), (17, 2350), (31, 2494), (47, 2617), (48, 2626), (49, 2641), (52, 2662), (56, 2704), (57, 2707), (61, 2737), (68, 2803), (69, 2812), (70, 2839), (74, 2860), (81, 2923), (83, 2959), (84, 2965), (87, 2998),

Gene: Argenta\_31 Start: 22263, Stop: 23081, Start Num: 1

Candidate Starts for Argenta\_31:

(Start: 1 @22263 has 11 MA's), (16, 22413), (18, 22422), (26, 22533), (28, 22551), (29, 22554), (30, 22560), (32, 22575), (37, 22596), (39, 22620), (41, 22641), (46, 22698), (55, 22779), (66, 22884), (67, 22890), (70, 22932), (75, 22959), (77, 22980), (80, 23010), (82, 23025),

Gene: ArtetaBall\_8 Start: 3342, Stop: 4145, Start Num: 2

Candidate Starts for ArtetaBall\_8:

(Start: 2 @3342 has 37 MA's), (4, 3372), (14, 3462), (17, 3486), (31, 3630), (47, 3753), (48, 3762), (49, 3777), (52, 3798), (56, 3840), (57, 3843), (61, 3873), (68, 3939), (69, 3948), (70, 3975), (74, 3996), (81, 4059), (83, 4095), (84, 4101), (87, 4134),

Gene: Beted\_32 Start: 23940, Stop: 24758, Start Num: 1

Candidate Starts for Beted\_32:

(Start: 1 @23940 has 11 MA's), (16, 24090), (18, 24099), (26, 24210), (28, 24228), (29, 24231), (30, 24237), (32, 24252), (37, 24273), (39, 24297), (41, 24318), (46, 24375), (55, 24456), (66, 24561), (67, 24567), (70, 24609), (75, 24636), (77, 24657), (80, 24687), (82, 24702),

Gene: BetterYeti\_9 Start: 4415, Stop: 5221, Start Num: 2

Candidate Starts for BetterYeti\_9:

(Start: 2 @4415 has 37 MA's), (4, 4445), (14, 4535), (17, 4559), (25, 4652), (31, 4703), (47, 4826), (48, 4835), (49, 4850), (52, 4871), (56, 4913), (57, 4916), (68, 5012), (69, 5021), (70, 5048), (76, 5090), (81, 5132), (83, 5168), (84, 5174), (87, 5207),

Gene: Blanky\_5 Start: 2290, Stop: 3066, Start Num: 4

Candidate Starts for Blanky\_5:

(Start: 2 @2260 has 37 MA's), (4, 2290), (14, 2380), (17, 2404), (31, 2548), (47, 2671), (48, 2680), (49, 2695), (52, 2716), (56, 2758), (57, 2761), (68, 2857), (69, 2866), (70, 2893), (81, 2977), (83, 3013), (84, 3019), (87, 3052),

Gene: BluerMoon\_9 Start: 4412, Stop: 5215, Start Num: 2

Candidate Starts for BluerMoon\_9:

(Start: 2 @4412 has 37 MA's), (4, 4442), (14, 4532), (17, 4556), (31, 4700), (47, 4823), (48, 4832), (49, 4847), (57, 4913), (68, 5009), (81, 5129), (84, 5171), (86, 5195),

Gene: Burley\_9 Start: 4415, Stop: 5218, Start Num: 2

Candidate Starts for Burley\_9:

(Start: 2 @4415 has 37 MA's), (4, 4445), (17, 4559), (25, 4652), (31, 4703), (47, 4826), (48, 4835), (49, 4850), (52, 4871), (56, 4913), (57, 4916), (68, 5012), (69, 5021), (70, 5048), (81, 5132), (83, 5168), (84, 5174), (87, 5207),

Gene: CWormy\_8 Start: 3342, Stop: 4145, Start Num: 2

Candidate Starts for CWormy\_8:

(Start: 2 @3342 has 37 MA's), (4, 3372), (17, 3486), (31, 3630), (47, 3753), (48, 3762), (49, 3777), (52, 3798), (56, 3840), (57, 3843), (68, 3939), (69, 3948), (70, 3975), (74, 3996), (81, 4059), (83, 4095), (84, 4101), (87, 4134),

Gene: Chidiebere\_32 Start: 22263, Stop: 23081, Start Num: 1

Candidate Starts for Chidiebere\_32:

(Start: 1 @22263 has 11 MA's), (16, 22413), (18, 22422), (26, 22533), (28, 22551), (29, 22554), (30, 22560), (32, 22575), (37, 22596), (39, 22620), (41, 22641), (46, 22698), (55, 22779), (66, 22884), (67, 22890), (70, 22932), (75, 22959), (77, 22980), (80, 23010), (82, 23025),

Gene: Chikenjars\_9 Start: 4409, Stop: 5212, Start Num: 2

Candidate Starts for Chikenjars\_9:

(Start: 2 @4409 has 37 MA's), (4, 4439), (14, 4529), (17, 4553), (31, 4697), (38, 4733), (47, 4820), (48, 4829), (49, 4844), (52, 4865), (57, 4910), (68, 5006), (81, 5126), (84, 5168), (86, 5192),

Gene: ChisanaKitsune\_28 Start: 20915, Stop: 21733, Start Num: 1

Candidate Starts for ChisanaKitsune\_28:

(Start: 1 @20915 has 11 MA's), (16, 21065), (18, 21074), (29, 21206), (30, 21212), (32, 21227), (39, 21272), (41, 21293), (46, 21350), (55, 21431), (65, 21530), (66, 21536), (67, 21542), (70, 21584), (77, 21632), (80, 21662), (82, 21677),

Gene: Crocheter\_8 Start: 3342, Stop: 4145, Start Num: 2

Candidate Starts for Crocheter\_8:

(Start: 2 @3342 has 37 MA's), (4, 3372), (17, 3486), (31, 3630), (47, 3753), (48, 3762), (49, 3777), (52, 3798), (56, 3840), (57, 3843), (68, 3939), (69, 3948), (70, 3975), (74, 3996), (81, 4059), (83, 4095), (84, 4101), (87, 4134),

Gene: Demure\_5 Start: 2236, Stop: 3009, Start Num: 4

Candidate Starts for Demure\_5:

(Start: 2 @2206 has 37 MA's), (4, 2236), (14, 2326), (17, 2350), (31, 2494), (47, 2617), (48, 2626), (49, 2641), (52, 2662), (56, 2704), (57, 2707), (61, 2737), (68, 2803), (69, 2812), (70, 2839), (74, 2860), (81, 2923), (83, 2959), (84, 2965), (87, 2998),

Gene: Dialga\_8 Start: 3342, Stop: 4145, Start Num: 2

Candidate Starts for Dialga\_8:

(Start: 2 @3342 has 37 MA's), (4, 3372), (14, 3462), (17, 3486), (31, 3630), (47, 3753), (48, 3762), (49, 3777), (52, 3798), (56, 3840), (57, 3843), (61, 3873), (68, 3939), (69, 3948), (70, 3975), (74, 3996), (81, 4059), (83, 4095), (84, 4101), (87, 4134),

Gene: Duffington\_9 Start: 4394, Stop: 5197, Start Num: 2

Candidate Starts for Duffington\_9:

(Start: 2 @4394 has 37 MA's), (4, 4424), (14, 4514), (17, 4538), (31, 4682), (38, 4718), (47, 4805), (48, 4814), (49, 4829), (52, 4850), (57, 4895), (68, 4991), (81, 5111), (84, 5153), (86, 5177),

Gene: Eddiemania\_8 Start: 3600, Stop: 4403, Start Num: 2

Candidate Starts for Eddiemania\_8:

(Start: 2 @3600 has 37 MA's), (4, 3630), (17, 3744), (31, 3888), (47, 4011), (48, 4020), (49, 4035), (52, 4056), (57, 4101), (68, 4197), (81, 4317), (84, 4359), (86, 4383),

Gene: EmoNemo\_31 Start: 22263, Stop: 23081, Start Num: 1

Candidate Starts for EmoNemo\_31:

(Start: 1 @22263 has 11 MA's), (16, 22413), (18, 22422), (26, 22533), (28, 22551), (29, 22554), (30, 22560), (32, 22575), (37, 22596), (39, 22620), (41, 22641), (46, 22698), (55, 22779), (66, 22884), (67, 22890), (70, 22932), (75, 22959), (77, 22980), (80, 23010), (82, 23025),

Gene: EndAve\_9 Start: 4409, Stop: 5212, Start Num: 2

Candidate Starts for EndAve\_9:

(Start: 2 @4409 has 37 MA's), (4, 4439), (14, 4529), (17, 4553), (31, 4697), (38, 4733), (47, 4820), (48, 4829), (49, 4844), (52, 4865), (57, 4910), (68, 5006), (81, 5126), (84, 5168), (86, 5192),

Gene: Farrylious\_30 Start: 22016, Stop: 22834, Start Num: 1

Candidate Starts for Farrylious\_30:

(Start: 1 @22016 has 11 MA's), (16, 22166), (18, 22175), (26, 22286), (28, 22304), (29, 22307), (30, 22313), (32, 22328), (37, 22349), (39, 22373), (41, 22394), (46, 22451), (55, 22532), (58, 22559), (59, 22577), (62, 22592), (66, 22637), (67, 22643), (74, 22706), (77, 22733), (78, 22742), (80, 22763), (82, 22778), (85, 22814),

Gene: Fazel\_6 Start: 3139, Stop: 3945, Start Num: 2

Candidate Starts for Fazel\_6:

(Start: 2 @3139 has 37 MA's), (4, 3169), (14, 3259), (17, 3283), (27, 3409), (31, 3427), (43, 3523), (48, 3559), (49, 3574), (52, 3595), (57, 3640), (68, 3736), (76, 3814), (81, 3856), (83, 3892), (84, 3898), (87, 3931), (88, 3937),

Gene: Figliar\_9 Start: 4418, Stop: 5221, Start Num: 2

Candidate Starts for Figliar\_9:

(Start: 2 @4418 has 37 MA's), (4, 4448), (14, 4538), (17, 4562), (31, 4706), (47, 4829), (48, 4838), (49, 4853), (57, 4919), (68, 5015), (81, 5135), (84, 5177), (86, 5201),

Gene: Finch\_33 Start: 27863, Stop: 28684, Start Num: 2

Candidate Starts for Finch\_33:

(Start: 2 @27863 has 37 MA's), (15, 28001), (16, 28010), (20, 28061), (24, 28103), (25, 28121), (31, 28175), (50, 28337), (54, 28376), (60, 28427), (64, 28457), (70, 28526), (72, 28538), (73, 28541), (82, 28625), (84, 28658),

Gene: FlyingTortilla\_31 Start: 25138, Stop: 25962, Start Num: 1

Candidate Starts for FlyingTortilla\_31:

(Start: 1 @25138 has 11 MA's), (3, 25165), (5, 25177), (8, 25192), (9, 25207), (13, 25225), (18, 25303), (32, 25456), (41, 25522), (46, 25579), (54, 25657), (55, 25660), (58, 25687), (62, 25720), (65, 25759), (66, 25765), (67, 25771), (77, 25861), (80, 25891), (82, 25906), (85, 25942),

Gene: FruityLoops\_30 Start: 25141, Stop: 25965, Start Num: 1

Candidate Starts for FruityLoops\_30:

(Start: 1 @25141 has 11 MA's), (3, 25168), (5, 25180), (8, 25195), (9, 25210), (13, 25228), (18, 25306), (21, 25351), (32, 25459), (41, 25525), (46, 25582), (54, 25660), (55, 25663), (58, 25690), (62, 25723), (65, 25762), (66, 25768), (77, 25864), (80, 25894), (82, 25909), (85, 25945),

Gene: Glintora\_8 Start: 4439, Stop: 5212, Start Num: 4

Candidate Starts for Glintora\_8:

(Start: 2 @4409 has 37 MA's), (4, 4439), (14, 4529), (17, 4553), (31, 4697), (38, 4733), (47, 4820), (48, 4829), (49, 4844), (52, 4865), (57, 4910), (68, 5006), (81, 5126), (84, 5168), (86, 5192),

Gene: Gray\_32 Start: 22263, Stop: 23081, Start Num: 1

Candidate Starts for Gray\_32:

(Start: 1 @22263 has 11 MA's), (16, 22413), (18, 22422), (26, 22533), (28, 22551), (29, 22554), (30, 22560), (32, 22575), (37, 22596), (39, 22620), (41, 22641), (46, 22698), (55, 22779), (66, 22884), (67, 22890), (70, 22932), (75, 22959), (77, 22980), (80, 23010), (82, 23025),

Gene: Gusicorn\_9 Start: 4415, Stop: 5221, Start Num: 2

Candidate Starts for Gusicorn\_9:

(Start: 2 @4415 has 37 MA's), (4, 4445), (14, 4535), (17, 4559), (25, 4652), (31, 4703), (47, 4826), (48, 4835), (49, 4850), (52, 4871), (56, 4913), (57, 4916), (68, 5012), (69, 5021), (70, 5048), (76, 5090), (81, 5132), (83, 5168), (84, 5174), (87, 5207),

Gene: Hanem\_32 Start: 22263, Stop: 23081, Start Num: 1

Candidate Starts for Hanem\_32:

(Start: 1 @22263 has 11 MA's), (16, 22413), (18, 22422), (26, 22533), (28, 22551), (29, 22554), (30, 22560), (32, 22575), (37, 22596), (39, 22620), (41, 22641), (46, 22698), (55, 22779), (66, 22884), (67, 22890), (70, 22932), (75, 22959), (77, 22980), (80, 23010), (82, 23025),

Gene: Hortihabitatio\_8 Start: 3696, Stop: 4502, Start Num: 2

Candidate Starts for Hortihabitatio\_8:

(Start: 2 @3696 has 37 MA's), (4, 3726), (14, 3816), (17, 3840), (31, 3984), (34, 3996), (38, 4020), (47, 4107), (48, 4116), (49, 4131), (51, 4149), (53, 4158), (57, 4197), (76, 4371), (81, 4413), (84, 4455), (85, 4461), (87, 4488),

Gene: Hydrus\_8 Start: 3600, Stop: 4403, Start Num: 2

Candidate Starts for Hydrus\_8:

(Start: 2 @3600 has 37 MA's), (4, 3630), (12, 3675), (17, 3744), (31, 3888), (47, 4011), (48, 4020), (49, 4035), (52, 4056), (56, 4098), (57, 4101), (68, 4197), (69, 4206), (70, 4233), (74, 4254), (81, 4317), (83, 4353), (84, 4359), (87, 4392),

Gene: Jodelie19\_9 Start: 4412, Stop: 5215, Start Num: 2

Candidate Starts for Jodelie19\_9:

(Start: 2 @4412 has 37 MA's), (4, 4442), (14, 4532), (17, 4556), (31, 4700), (47, 4823), (48, 4832), (49, 4847), (57, 4913), (68, 5009), (81, 5129), (84, 5171), (86, 5195),

Gene: Kabocha\_33 Start: 23076, Stop: 23894, Start Num: 1

Candidate Starts for Kabocha\_33:

(Start: 1 @23076 has 11 MA's), (16, 23226), (18, 23235), (26, 23346), (28, 23364), (29, 23367), (30, 23373), (32, 23388), (37, 23409), (39, 23433), (41, 23454), (46, 23511), (55, 23592), (66, 23697), (67, 23703), (70, 23745), (75, 23772), (77, 23793), (80, 23823), (82, 23838),

Gene: Kenosha\_6 Start: 2201, Stop: 3004, Start Num: 2

Candidate Starts for Kenosha\_6:

(Start: 2 @2201 has 37 MA's), (4, 2231), (17, 2345), (31, 2489), (42, 2564), (47, 2612), (48, 2621), (49, 2636), (52, 2657), (57, 2702), (68, 2798), (70, 2834), (74, 2855), (81, 2918), (83, 2954), (84, 2960), (87, 2993),

Gene: Lenoshki\_32 Start: 23940, Stop: 24758, Start Num: 1

Candidate Starts for Lenoshki\_32:

(Start: 1 @23940 has 11 MA's), (16, 24090), (18, 24099), (26, 24210), (28, 24228), (29, 24231), (30, 24237), (32, 24252), (37, 24273), (39, 24297), (41, 24318), (46, 24375), (55, 24456), (66, 24561), (67, 24567), (70, 24609), (75, 24636), (77, 24657), (80, 24687), (82, 24702),

Gene: Luthien\_10 Start: 4554, Stop: 5213, Start Num: 17

Candidate Starts for Luthien\_10:

(6, 4449), (Start: 7 @4455 has 1 MA's), (10, 4473), (11, 4479), (14, 4530), (17, 4554), (31, 4698), (38, 4734), (47, 4821), (48, 4830), (49, 4845), (52, 4866), (57, 4911), (68, 5007), (81, 5127), (84, 5169), (86, 5193),

Gene: Madvan\_9 Start: 4415, Stop: 5218, Start Num: 2

Candidate Starts for Madvan\_9:

(Start: 2 @4415 has 37 MA's), (4, 4445), (17, 4559), (31, 4703), (47, 4826), (48, 4835), (49, 4850), (52, 4871), (56, 4913), (57, 4916), (61, 4946), (68, 5012), (69, 5021), (70, 5048), (74, 5069), (81, 5132), (83, 5168), (84, 5174), (87, 5207),

Gene: MajinBuu\_9 Start: 4412, Stop: 5215, Start Num: 2

Candidate Starts for MajinBuu\_9:

(Start: 2 @4412 has 37 MA's), (4, 4442), (14, 4532), (17, 4556), (31, 4700), (47, 4823), (48, 4832), (49, 4847), (52, 4868), (57, 4913), (68, 5009), (81, 5129), (84, 5171), (86, 5195),

Gene: Mikronejon\_31 Start: 22263, Stop: 23081, Start Num: 1

Candidate Starts for Mikronejon\_31:

(Start: 1 @22263 has 11 MA's), (16, 22413), (18, 22422), (26, 22533), (28, 22551), (29, 22554), (30, 22560), (32, 22575), (37, 22596), (39, 22620), (41, 22641), (46, 22698), (55, 22779), (66, 22884), (67, 22890), (70, 22932), (75, 22959), (77, 22980), (80, 23010), (82, 23025),

Gene: MintFritos\_31 Start: 22263, Stop: 23081, Start Num: 1

Candidate Starts for MintFritos\_31:

(Start: 1 @22263 has 11 MA's), (16, 22413), (18, 22422), (26, 22533), (28, 22551), (29, 22554), (30, 22560), (32, 22575), (37, 22596), (39, 22620), (41, 22641), (46, 22698), (55, 22779), (66, 22884), (67, 22890), (70, 22932), (75, 22959), (77, 22980), (80, 23010), (82, 23025),

Gene: Mossy\_6 Start: 2261, Stop: 3067, Start Num: 2

Candidate Starts for Mossy\_6:

(Start: 2 @2261 has 37 MA's), (4, 2291), (14, 2381), (17, 2405), (31, 2549), (47, 2672), (48, 2681), (49, 2696), (51, 2714), (53, 2723), (57, 2762), (70, 2894), (74, 2915), (81, 2978), (84, 3020), (85, 3026), (87, 3053),

Gene: Mysticmoon\_6 Start: 2171, Stop: 2977, Start Num: 2

Candidate Starts for Mysticmoon\_6:

(Start: 2 @2171 has 37 MA's), (4, 2201), (14, 2291), (17, 2315), (31, 2459), (43, 2555), (48, 2591), (49, 2606), (51, 2624), (53, 2633), (57, 2672), (68, 2768), (76, 2846), (81, 2888), (84, 2930), (85, 2936), (87, 2963),

Gene: Nadmeg\_9 Start: 4416, Stop: 5219, Start Num: 2

Candidate Starts for Nadmeg\_9:

(Start: 2 @4416 has 37 MA's), (4, 4446), (17, 4560), (25, 4653), (31, 4704), (47, 4827), (48, 4836), (49, 4851), (52, 4872), (56, 4914), (57, 4917), (68, 5013), (69, 5022), (70, 5049), (81, 5133), (83, 5169), (84, 5175), (87, 5208),

Gene: Nithya\_9 Start: 4409, Stop: 5212, Start Num: 2

Candidate Starts for Nithya\_9:

(Start: 2 @4409 has 37 MA's), (4, 4439), (14, 4529), (17, 4553), (31, 4697), (38, 4733), (47, 4820), (48, 4829), (49, 4844), (52, 4865), (57, 4910), (68, 5006), (81, 5126), (84, 5168), (86, 5192),

Gene: OhMyWard\_9 Start: 4413, Stop: 5219, Start Num: 2

Candidate Starts for OhMyWard\_9:

(Start: 2 @4413 has 37 MA's), (4, 4443), (14, 4533), (17, 4557), (31, 4701), (38, 4737), (47, 4824), (48, 4833), (49, 4848), (52, 4869), (56, 4911), (57, 4914), (68, 5010), (69, 5019), (70, 5046), (81, 5130), (83, 5166), (84, 5172), (87, 5205),

Gene: OlgasClover\_9 Start: 4409, Stop: 5212, Start Num: 2

Candidate Starts for OlgasClover\_9:

(Start: 2 @4409 has 37 MA's), (4, 4439), (14, 4529), (17, 4553), (31, 4697), (47, 4820), (48, 4829), (49, 4844), (57, 4910), (68, 5006), (81, 5126), (84, 5168), (86, 5192),

Gene: Oogie\_33 Start: 23966, Stop: 24784, Start Num: 1

Candidate Starts for Oogie\_33:

(Start: 1 @23966 has 11 MA's), (16, 24116), (18, 24125), (26, 24236), (28, 24254), (29, 24257), (30, 24263), (32, 24278), (37, 24299), (39, 24323), (41, 24344), (46, 24401), (55, 24482), (66, 24587), (67, 24593), (70, 24635), (75, 24662), (77, 24683), (80, 24713), (82, 24728),

Gene: Pakusa\_31 Start: 22005, Stop: 22823, Start Num: 1

Candidate Starts for Pakusa\_31:

(Start: 1 @22005 has 11 MA's), (16, 22155), (18, 22164), (26, 22275), (28, 22293), (29, 22296), (30, 22302), (32, 22317), (37, 22338), (39, 22362), (41, 22383), (46, 22440), (55, 22521), (66, 22626), (67, 22632), (70, 22674), (75, 22701), (77, 22722), (80, 22752), (82, 22767),

Gene: PestoPenguin\_9 Start: 4415, Stop: 5221, Start Num: 2

Candidate Starts for PestoPenguin\_9:

(Start: 2 @4415 has 37 MA's), (4, 4445), (14, 4535), (17, 4559), (25, 4652), (31, 4703), (47, 4826), (48, 4835), (49, 4850), (52, 4871), (56, 4913), (57, 4916), (68, 5012), (69, 5021), (70, 5048), (76, 5090), (81, 5132), (83, 5168), (84, 5174), (87, 5207),

Gene: Phepper\_9 Start: 4415, Stop: 5218, Start Num: 2

Candidate Starts for Phepper\_9:

(Start: 2 @4415 has 37 MA's), (4, 4445), (17, 4559), (31, 4703), (47, 4826), (48, 4835), (49, 4850), (52, 4871), (56, 4913), (57, 4916), (61, 4946), (68, 5012), (69, 5021), (70, 5048), (74, 5069), (81, 5132), (83, 5168), (84, 5174), (87, 5207),

Gene: Pherobrine\_6 Start: 2172, Stop: 2975, Start Num: 2

Candidate Starts for Pherobrine\_6:

(Start: 2 @2172 has 37 MA's), (4, 2202), (14, 2292), (17, 2316), (31, 2460), (47, 2583), (48, 2592), (49, 2607), (52, 2628), (56, 2670), (57, 2673), (68, 2769), (69, 2778), (70, 2805), (74, 2826), (81, 2889), (83, 2925), (84, 2931), (87, 2964),

Gene: Rickmore\_8 Start: 2977, Stop: 3777, Start Num: 2

Candidate Starts for Rickmore\_8:

(Start: 2 @2977 has 37 MA's), (4, 3007), (14, 3097), (17, 3121), (36, 3286), (48, 3394), (57, 3475), (81, 3691), (85, 3739), (86, 3757),

Gene: Runhaar\_9 Start: 4461, Stop: 5219, Start Num: 7

Candidate Starts for Runhaar\_9:

(6, 4455), (Start: 7 @4461 has 1 MA's), (11, 4485), (17, 4560), (25, 4653), (31, 4704), (47, 4827), (48, 4836), (49, 4851), (52, 4872), (56, 4914), (57, 4917), (68, 5013), (69, 5022), (70, 5049), (81, 5133), (83,

5169), (84, 5175), (87, 5208),

Gene: ScarletRaider\_31 Start: 25165, Stop: 25989, Start Num: 1

Candidate Starts for ScarletRaider\_31:

(Start: 1 @25165 has 11 MA's), (3, 25192), (5, 25204), (8, 25219), (9, 25234), (13, 25252), (18, 25330), (32, 25483), (41, 25549), (46, 25606), (54, 25684), (55, 25687), (58, 25714), (62, 25747), (65, 25786), (66, 25792), (67, 25798), (77, 25888), (80, 25918), (82, 25933), (85, 25969),

Gene: Schomber\_31 Start: 22013, Stop: 22831, Start Num: 1

Candidate Starts for Schomber\_31:

(Start: 1 @22013 has 11 MA's), (16, 22163), (18, 22172), (26, 22283), (28, 22301), (29, 22304), (30, 22310), (32, 22325), (37, 22346), (39, 22370), (41, 22391), (46, 22448), (55, 22529), (66, 22634), (67, 22640), (70, 22682), (75, 22709), (77, 22730), (80, 22760), (82, 22775),

Gene: Schwartz33\_9 Start: 4431, Stop: 5231, Start Num: 2

Candidate Starts for Schwartz33\_9:

(Start: 2 @4431 has 37 MA's), (17, 4575), (31, 4716), (43, 4812), (44, 4821), (45, 4827), (48, 4848), (63, 4989), (71, 5067), (83, 5181), (84, 5187), (86, 5211),

Gene: Secretariat\_5 Start: 2037, Stop: 2834, Start Num: 2

Candidate Starts for Secretariat\_5:

(Start: 2 @2037 has 37 MA's), (14, 2157), (17, 2181), (22, 2232), (23, 2247), (25, 2271), (31, 2319), (33, 2328), (34, 2331), (35, 2340), (36, 2343), (40, 2376), (48, 2451), (52, 2487), (71, 2670), (76, 2706), (79, 2736), (83, 2784), (84, 2790), (86, 2814),

Gene: ShaggyRogers\_9 Start: 4414, Stop: 5220, Start Num: 2

Candidate Starts for ShaggyRogers\_9:

(Start: 2 @4414 has 37 MA's), (4, 4444), (14, 4534), (17, 4558), (25, 4651), (31, 4702), (47, 4825), (48, 4834), (49, 4849), (52, 4870), (56, 4912), (57, 4915), (68, 5011), (69, 5020), (70, 5047), (76, 5089), (81, 5131), (83, 5167), (84, 5173), (87, 5206),

Gene: TenaciousP\_9 Start: 4412, Stop: 5215, Start Num: 2

Candidate Starts for TenaciousP\_9:

(Start: 2 @4412 has 37 MA's), (4, 4442), (14, 4532), (17, 4556), (31, 4700), (47, 4823), (48, 4832), (49, 4847), (57, 4913), (68, 5009), (81, 5129), (84, 5171), (86, 5195),

Gene: Tonaltzin\_10 Start: 4442, Stop: 5215, Start Num: 4

Candidate Starts for Tonaltzin\_10:

(Start: 2 @4412 has 37 MA's), (4, 4442), (14, 4532), (17, 4556), (31, 4700), (47, 4823), (48, 4832), (49, 4847), (57, 4913), (68, 5009), (81, 5129), (84, 5171), (86, 5195),

Gene: Toneprano\_31 Start: 22263, Stop: 23081, Start Num: 1

Candidate Starts for Toneprano\_31:

(Start: 1 @22263 has 11 MA's), (16, 22413), (18, 22422), (26, 22533), (28, 22551), (29, 22554), (30, 22560), (32, 22575), (37, 22596), (39, 22620), (41, 22641), (46, 22698), (55, 22779), (66, 22884), (67, 22890), (70, 22932), (75, 22959), (77, 22980), (80, 23010), (82, 23025),

Gene: Twin\_31 Start: 22263, Stop: 23081, Start Num: 1

Candidate Starts for Twin\_31:

(Start: 1 @22263 has 11 MA's), (16, 22413), (18, 22422), (26, 22533), (28, 22551), (29, 22554), (30, 22560), (32, 22575), (37, 22596), (39, 22620), (41, 22641), (46, 22698), (55, 22779), (66, 22884), (67, 22890), (70, 22932), (75, 22959), (77, 22980), (80, 23010), (82, 23025),

Gene: UBSmoodge\_33 Start: 24084, Stop: 24908, Start Num: 1

Candidate Starts for UBSmoodge\_33:

(Start: 1 @24084 has 11 MA's), (3, 24111), (5, 24123), (8, 24138), (9, 24153), (13, 24171), (18, 24249), (19, 24264), (32, 24402), (41, 24468), (46, 24525), (54, 24603), (55, 24606), (58, 24633), (59, 24651), (62, 24666), (65, 24705), (66, 24711), (67, 24717), (77, 24807), (80, 24837), (82, 24852), (85, 24888),

Gene: Untouchable\_8 Start: 3341, Stop: 4144, Start Num: 2

Candidate Starts for Untouchable\_8:

(Start: 2 @3341 has 37 MA's), (4, 3371), (14, 3461), (17, 3485), (31, 3629), (47, 3752), (48, 3761), (49, 3776), (52, 3797), (56, 3839), (57, 3842), (61, 3872), (68, 3938), (69, 3947), (70, 3974), (74, 3995), (81, 4058), (83, 4094), (84, 4100), (87, 4133),

Gene: Vardy\_9 Start: 4414, Stop: 5217, Start Num: 2

Candidate Starts for Vardy\_9:

(Start: 2 @4414 has 37 MA's), (4, 4444), (17, 4558), (25, 4651), (31, 4702), (47, 4825), (48, 4834), (49, 4849), (52, 4870), (56, 4912), (57, 4915), (68, 5011), (69, 5020), (70, 5047), (81, 5131), (83, 5167), (84, 5173), (87, 5206),

Gene: Zeph\_8 Start: 3600, Stop: 4403, Start Num: 2

Candidate Starts for Zeph\_8:

(Start: 2 @3600 has 37 MA's), (4, 3630), (12, 3675), (17, 3744), (31, 3888), (47, 4011), (48, 4020), (49, 4035), (52, 4056), (56, 4098), (57, 4101), (68, 4197), (69, 4206), (70, 4233), (74, 4254), (81, 4317), (83, 4353), (84, 4359), (87, 4392),