



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 308491 Report

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

Pham number 308491 has 78 members, 12 are drafts.

Phages represented in each track:

- Track 1 : Ajin\_35
- Track 2 : Kors\_35, TinyMiny\_35, RikSengupta\_35, Sparcetus\_35
- Track 3 : Bramble\_35, LordBart\_35
- Track 4 : KingKamren\_33
- Track 5 : EugeneKrabs\_34
- Track 6 : Zhengyi\_34
- Track 7 : Birdfeeder\_35
- Track 8 : Sorvannah\_34, Salvatore2000\_34
- Track 9 : YellowPanda\_36
- Track 10 : Oatly\_38, HitchHiker\_39, Biozilla\_38, PineapplePluto\_39, CrunchyBoi\_39
- Track 11 : MiamiPanther\_35
- Track 12 : DumpQuist\_36, SwissCheezer\_36, Dashyla\_36
- Track 13 : TinyTimothy\_33
- Track 14 : Unphazed\_37
- Track 15 : TicTac\_38
- Track 16 : LesNorah\_37
- Track 17 : BlueRugrat\_36
- Track 18 : Stormbreaker\_37
- Track 19 : Corn21\_36
- Track 20 : JessellCookie\_35
- Track 21 : Wesak\_34
- Track 22 : Conditioner\_36
- Track 23 : ArMaWen\_36
- Track 24 : LilyLou\_38, Phogo\_37
- Track 25 : Alex44\_37
- Track 26 : Xitlalli\_35
- Track 27 : Pabst\_36
- Track 28 : TownLake\_35
- Track 29 : Ashton\_37, Barroma\_35, AloeVera\_37, JordanFarm\_38, Akoni\_36, ShyRosie\_36, Truong\_36
- Track 30 : Pharky\_36
- Track 31 : Yafa\_36
- Track 32 : SoilSleuth\_38, Waterlily\_39
- Track 33 : Fullmetal\_36, RicoCaldo\_36, Mazun\_37, StagePhright\_36, Keough\_35, Phedro\_36, Moleficent\_36, Phractured\_36
- Track 34 : Atraxi\_34
- Track 35 : PhriedRice\_37

- Track 36 : TrippleS\_35
- Track 37 : Morrill\_34
- Track 38 : ThirteenKH\_35
- Track 39 : Astartes\_36
- Track 40 : JimmyPG\_36
- Track 41 : Fede\_36
- Track 42 : Kosier\_36
- Track 43 : Arete\_32
- Track 44 : DoTi\_32
- Track 45 : Araxxi\_32
- Track 46 : Gshelby23\_30, Hannabella\_32, Casino\_31
- Track 47 : Burro\_32
- Track 48 : Scruffy\_32
- Track 49 : Kikiko\_33
- Track 50 : MissAmericana\_36

**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 58 of the 66 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Ajin\_35, Akoni\_36, Alex44\_37, AloeVera\_37, ArMaWen\_36, Ashton\_37, Astartes\_36, Atraxi\_34, Barroma\_35, Biozilla\_38, Birdfeeder\_35, BlueRugrat\_36, Bramble\_35, Conditioner\_36, Corn21\_36, CrunchyBoi\_39, Dashyla\_36, DumpQuist\_36, EugeneKrabs\_34, Fede\_36, Fullmetal\_36, HitchHiker\_39, JessellCookie\_35, JimmyPG\_36, JordanFarm\_38, Keough\_35, KingKamren\_33, Kors\_35, Kosier\_36, LesNorah\_37, LilyLou\_38, LordBart\_35, Mazun\_37, MiamiPanther\_35, Moleficent\_36, Morrill\_34, Oatly\_38, Pabst\_36, Pharky\_36, Phedro\_36, Phogo\_37, Phracted\_36, PhriedRice\_37, PineapplePluto\_39, RicoCaldo\_36, RikSengupta\_35, Salvatore2000\_34, ShyRosie\_36, SoilSleuth\_38, Sorvannah\_34, Sparcetus\_35, StagePhright\_36, Stormbreaker\_37, SwissCheezer\_36, ThirteenKH\_35, TicTac\_38, TinyMiny\_35, TinyTimothy\_33, TownLake\_35, TrippleS\_35, Truong\_36, Unphazed\_37, Waterlily\_39, Wesak\_34, Xitlalli\_35, Yafa\_36, YellowPanda\_36, Zhengyi\_34,

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

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

- Araxxi\_32, Arete\_32, Burro\_32, Casino\_31, DoTi\_32, Gshelby23\_30, Hannabella\_32, Kikiko\_33, MissAmericana\_36, Scruffy\_32,

**Summary by start number:**

Start 2:

- Found in 68 of 78 ( 87.2% ) of genes in pham
- Manual Annotations of this start: 58 of 66
- Called 100.0% of time when present

- Phage (with cluster) where this start called: Ajin\_35 (EF), Akoni\_36 (EK2), Alex44\_37 (EK1), AloeVera\_37 (EK2), ArMaWen\_36 (EK1), Ashton\_37 (EK2), Astartes\_36 (EK2), Atraxi\_34 (EK2), Barroma\_35 (EK2), Biozilla\_38 (EK1), Birdfeeder\_35 (EK1), BlueRugrat\_36 (EK1), Bramble\_35 (EF), Conditioner\_36 (EK1), Corn21\_36 (EK1), CrunchyBoi\_39 (EK1), Dashyla\_36 (EK1), DumpQuist\_36 (EK1), EugeneKrabs\_34 (EK), Fede\_36 (EK2), Fullmetal\_36 (EK2), HitchHiker\_39 (EK1), JessellCookie\_35 (EK1), JimmyPG\_36 (EK2), JordanFarm\_38 (EK2), Keough\_35 (EK2), KingKamren\_33 (EK), Kors\_35 (EF), Kosier\_36 (EK2), LesNorah\_37 (EK1), LilyLou\_38 (EK1), LordBart\_35 (EF), Mazun\_37 (EK2), MiamiPanther\_35 (EK1), Moleficent\_36 (EK2), Morrill\_34 (EK2), Oatly\_38 (EK1), Pabst\_36 (EK1), Pharky\_36 (EK2), Phedro\_36 (EK2), Phogo\_37 (EK1), Phracted\_36 (EK2), PhriedRice\_37 (EK2), PineapplePluto\_39 (EK1), RicoCaldo\_36 (EK2), RikSengupta\_35 (EF), Salvatore2000\_34 (EK1), ShyRosie\_36 (EK2), SoilSleuth\_38 (EK2), Sorvannah\_34 (EK1), Sparcetus\_35 (EF), StagePhright\_36 (EK2), Stormbreaker\_37 (EK1), SwissCheezer\_36 (EK1), ThirteenKH\_35 (EK2), TicTac\_38 (EK1), TinyMiny\_35 (EF), TinyTimothy\_33 (EK1), TownLake\_35 (EK1), TrippleS\_35 (EK2), Truong\_36 (EK2), Unphazed\_37 (EK1), Waterlily\_39 (EK2), Wesak\_34 (EK1), Xitlalli\_35 (EK1), Yafa\_36 (EK2), YellowPanda\_36 (EK1), Zhengyi\_34 (EK),

#### Start 3:

- Found in 7 of 78 ( 9.0% ) of genes in pham
- Manual Annotations of this start: 6 of 66
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Araxxi\_32 (EM1), Arete\_32 (EM1), Casino\_31 (EM1), DoTi\_32 (EM1), Gshelby23\_30 (EM1), Hannabella\_32 (EM1), Scruffy\_32 (EM1),

#### Start 7:

- Found in 1 of 78 ( 1.3% ) of genes in pham
- Manual Annotations of this start: 1 of 66
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Burro\_32 (EM1),

#### Start 10:

- Found in 9 of 78 ( 11.5% ) of genes in pham
- Manual Annotations of this start: 1 of 66
- Called 22.2% of time when present
- Phage (with cluster) where this start called: Kikiko\_33 (EM2), MissAmericana\_36 (EM2),

### Summary by clusters:

There are 6 clusters represented in this pham: EK, EF, EM1, EM2, EK2, EK1,

Info for manual annotations of cluster EF:

- Start number 2 was manually annotated 7 times for cluster EF.

Info for manual annotations of cluster EK:

- Start number 2 was manually annotated 3 times for cluster EK.

Info for manual annotations of cluster EK1:

- Start number 2 was manually annotated 25 times for cluster EK1.

Info for manual annotations of cluster EK2:

- Start number 2 was manually annotated 23 times for cluster EK2.

Info for manual annotations of cluster EM1:

- Start number 3 was manually annotated 6 times for cluster EM1.
- Start number 7 was manually annotated 1 time for cluster EM1.

Info for manual annotations of cluster EM2:

- Start number 10 was manually annotated 1 time for cluster EM2.

### **Gene Information:**

Gene: Ajin\_35 Start: 21500, Stop: 23185, Start Num: 2

Candidate Starts for Ajin\_35:

(Start: 2 @21500 has 58 MA's), (Start: 10 @21566 has 1 MA's), (21, 21683), (23, 21731), (24, 21764), (55, 22052), (75, 22247), (81, 22304), (100, 22472), (104, 22532), (111, 22595), (112, 22613), (125, 22742), (135, 22817), (136, 22823), (140, 22862), (144, 22901), (154, 23030), (162, 23105), (163, 23111),

Gene: Akoni\_36 Start: 36388, Stop: 38151, Start Num: 2

Candidate Starts for Akoni\_36:

(Start: 2 @36388 has 58 MA's), (11, 36457), (21, 36577), (46, 36916), (50, 36949), (52, 36958), (54, 36973), (56, 36982), (93, 37318), (105, 37465), (109, 37501), (111, 37519), (115, 37564), (119, 37627), (130, 37726), (135, 37759), (145, 37855), (150, 37897), (164, 38086),

Gene: Alex44\_37 Start: 36459, Stop: 38234, Start Num: 2

Candidate Starts for Alex44\_37:

(Start: 2 @36459 has 58 MA's), (6, 36507), (9, 36522), (21, 36666), (27, 36759), (28, 36804), (30, 36819), (33, 36831), (38, 36882), (52, 37041), (53, 37044), (69, 37188), (75, 37257), (86, 37344), (91, 37377), (98, 37470), (109, 37581), (110, 37593), (117, 37650), (129, 37791), (131, 37809), (136, 37845), (138, 37869), (147, 37962), (159, 38130), (166, 38178),

Gene: AloeVera\_37 Start: 36602, Stop: 38365, Start Num: 2

Candidate Starts for AloeVera\_37:

(Start: 2 @36602 has 58 MA's), (11, 36671), (21, 36791), (46, 37130), (50, 37163), (52, 37172), (54, 37187), (56, 37196), (93, 37532), (105, 37679), (109, 37715), (111, 37733), (115, 37778), (119, 37841), (130, 37940), (135, 37973), (145, 38069), (150, 38111), (164, 38300),

Gene: ArMaWen\_36 Start: 36002, Stop: 37777, Start Num: 2

Candidate Starts for ArMaWen\_36:

(Start: 2 @36002 has 58 MA's), (6, 36050), (9, 36065), (21, 36209), (27, 36302), (28, 36347), (30, 36362), (33, 36374), (38, 36425), (52, 36584), (69, 36731), (75, 36800), (86, 36887), (98, 37013), (109, 37124), (110, 37136), (117, 37193), (129, 37334), (131, 37352), (145, 37478), (147, 37505), (154, 37601), (159, 37673), (166, 37721),

Gene: Araxxi\_32 Start: 38313, Stop: 40022, Start Num: 3

Candidate Starts for Araxxi\_32:

(Start: 3 @38313 has 6 MA's), (4, 38322), (12, 38379), (15, 38415), (29, 38631), (31, 38643), (34, 38655), (36, 38673), (48, 38823), (63, 38943), (77, 39069), (87, 39159), (95, 39240), (108, 39375), (118, 39483), (123, 39537), (129, 39591), (133, 39618), (149, 39777), (150, 39780), (155, 39906), (162, 39951), (167, 39981), (168, 39984),

Gene: Arete\_32 Start: 38017, Stop: 39756, Start Num: 3

Candidate Starts for Arete\_32:

(Start: 3 @38017 has 6 MA's), (5, 38056), (12, 38083), (29, 38335), (31, 38347), (34, 38359), (45, 38491), (74, 38743), (85, 38863), (98, 39019), (106, 39100), (118, 39217), (123, 39271), (124, 39274), (133, 39352), (146, 39478), (149, 39511), (150, 39514), (158, 39661), (162, 39685), (164, 39700), (167, 39715), (169, 39739),

Gene: Ashton\_37 Start: 36601, Stop: 38364, Start Num: 2

Candidate Starts for Ashton\_37:

(Start: 2 @36601 has 58 MA's), (11, 36670), (21, 36790), (46, 37129), (50, 37162), (52, 37171), (54, 37186), (56, 37195), (93, 37531), (105, 37678), (109, 37714), (111, 37732), (115, 37777), (119, 37840), (130, 37939), (135, 37972), (145, 38068), (150, 38110), (164, 38299),

Gene: Astartes\_36 Start: 36672, Stop: 38444, Start Num: 2

Candidate Starts for Astartes\_36:

(Start: 2 @36672 has 58 MA's), (20, 36873), (21, 36879), (49, 37230), (52, 37254), (58, 37314), (59, 37317), (84, 37539), (92, 37602), (94, 37626), (105, 37758), (116, 37860), (130, 38019), (145, 38148), (155, 38316), (164, 38379), (166, 38388),

Gene: Atraxi\_34 Start: 36464, Stop: 38236, Start Num: 2

Candidate Starts for Atraxi\_34:

(Start: 2 @36464 has 58 MA's), (20, 36665), (21, 36671), (52, 37046), (58, 37106), (59, 37109), (71, 37202), (84, 37331), (94, 37418), (111, 37604), (116, 37652), (128, 37787), (130, 37811), (155, 38108), (164, 38171), (166, 38180),

Gene: Barroma\_35 Start: 36390, Stop: 38153, Start Num: 2

Candidate Starts for Barroma\_35:

(Start: 2 @36390 has 58 MA's), (11, 36459), (21, 36579), (46, 36918), (50, 36951), (52, 36960), (54, 36975), (56, 36984), (93, 37320), (105, 37467), (109, 37503), (111, 37521), (115, 37566), (119, 37629), (130, 37728), (135, 37761), (145, 37857), (150, 37899), (164, 38088),

Gene: Biozilla\_38 Start: 36500, Stop: 38266, Start Num: 2

Candidate Starts for Biozilla\_38:

(1, 36434), (Start: 2 @36500 has 58 MA's), (17, 36650), (22, 36749), (30, 36860), (35, 36881), (38, 36923), (52, 37085), (71, 37238), (99, 37514), (109, 37622), (119, 37748), (125, 37808), (134, 37865), (136, 37886), (143, 37964), (154, 38093), (164, 38201), (170, 38243),

Gene: Birdfeeder\_35 Start: 36215, Stop: 37990, Start Num: 2

Candidate Starts for Birdfeeder\_35:

(Start: 2 @36215 has 58 MA's), (6, 36263), (21, 36422), (27, 36515), (28, 36560), (30, 36575), (33, 36587), (38, 36638), (42, 36683), (46, 36755), (52, 36797), (69, 36944), (86, 37100), (91, 37133), (98, 37226), (109, 37337), (110, 37349), (117, 37406), (129, 37547), (131, 37565), (145, 37691), (147, 37718), (151, 37742), (154, 37814), (159, 37886), (166, 37934),

Gene: BlueRugrat\_36 Start: 36451, Stop: 38226, Start Num: 2

Candidate Starts for BlueRugrat\_36:

(Start: 2 @36451 has 58 MA's), (21, 36658), (27, 36751), (28, 36796), (30, 36811), (33, 36823), (38, 36874), (42, 36919), (46, 36991), (52, 37033), (61, 37108), (69, 37180), (86, 37336), (98, 37462), (110, 37585), (117, 37642), (129, 37783), (131, 37801), (145, 37927), (147, 37954), (154, 38050), (159, 38122), (166, 38170),

Gene: Bramble\_35 Start: 21466, Stop: 23151, Start Num: 2

Candidate Starts for Bramble\_35:

(Start: 2 @21466 has 58 MA's), (Start: 10 @21532 has 1 MA's), (21, 21649), (23, 21697), (24, 21730), (55, 22018), (75, 22213), (81, 22270), (100, 22438), (104, 22498), (112, 22579), (125, 22708), (135, 22783), (136, 22789), (140, 22828), (144, 22867), (154, 22996), (162, 23071), (163, 23077),

Gene: Burro\_32 Start: 37650, Stop: 39254, Start Num: 7

Candidate Starts for Burro\_32:

(Start: 7 @37650 has 1 MA's), (13, 37683), (47, 38058), (51, 38082), (69, 38232), (73, 38271), (82, 38361), (83, 38367), (103, 38568), (107, 38601), (140, 38916), (145, 38967), (164, 39198), (165, 39204), (171, 39246),

Gene: Casino\_31 Start: 38028, Stop: 39737, Start Num: 3

Candidate Starts for Casino\_31:

(Start: 3 @38028 has 6 MA's), (5, 38067), (12, 38094), (29, 38346), (31, 38358), (34, 38370), (48, 38538), (63, 38658), (77, 38784), (87, 38874), (95, 38955), (107, 39087), (110, 39123), (121, 39243), (123, 39252), (129, 39306), (133, 39333), (141, 39417), (147, 39480), (150, 39495), (156, 39627), (158, 39642), (164, 39681), (167, 39696),

Gene: Conditioner\_36 Start: 36524, Stop: 38299, Start Num: 2

Candidate Starts for Conditioner\_36:

(Start: 2 @36524 has 58 MA's), (6, 36572), (21, 36731), (27, 36824), (28, 36869), (30, 36884), (33, 36896), (38, 36947), (42, 36992), (46, 37064), (52, 37106), (69, 37253), (86, 37409), (91, 37442), (98, 37535), (110, 37658), (117, 37715), (129, 37856), (131, 37874), (145, 38000), (147, 38027), (154, 38123), (159, 38195), (166, 38243),

Gene: Corn21\_36 Start: 36529, Stop: 38304, Start Num: 2

Candidate Starts for Corn21\_36:

(Start: 2 @36529 has 58 MA's), (21, 36736), (30, 36889), (33, 36901), (38, 36952), (42, 36997), (46, 37069), (52, 37111), (61, 37186), (69, 37258), (86, 37414), (98, 37540), (110, 37663), (117, 37720), (129, 37861), (131, 37879), (145, 38005), (147, 38032), (151, 38056), (154, 38128), (159, 38200), (166, 38248),

Gene: CrunchyBoi\_39 Start: 36355, Stop: 38121, Start Num: 2

Candidate Starts for CrunchyBoi\_39:

(1, 36289), (Start: 2 @36355 has 58 MA's), (17, 36505), (22, 36604), (30, 36715), (35, 36736), (38, 36778), (52, 36940), (71, 37093), (99, 37369), (109, 37477), (119, 37603), (125, 37663), (134, 37720), (136, 37741), (143, 37819), (154, 37948), (164, 38056), (170, 38098),

Gene: Dashyla\_36 Start: 36133, Stop: 37908, Start Num: 2

Candidate Starts for Dashyla\_36:

(Start: 2 @36133 has 58 MA's), (6, 36181), (9, 36196), (21, 36340), (27, 36433), (28, 36478), (30, 36493), (33, 36505), (38, 36556), (46, 36673), (52, 36715), (69, 36862), (70, 36865), (75, 36931), (86, 37018), (98, 37144), (109, 37255), (110, 37267), (117, 37324), (129, 37465), (131, 37483), (145, 37609), (147, 37636), (154, 37732), (159, 37804), (166, 37852),

Gene: DoTi\_32 Start: 38398, Stop: 40107, Start Num: 3

Candidate Starts for DoTi\_32:

(Start: 3 @38398 has 6 MA's), (4, 38407), (12, 38464), (15, 38500), (29, 38716), (31, 38728), (34, 38740), (36, 38758), (48, 38908), (57, 38992), (87, 39244), (88, 39247), (95, 39325), (108, 39460), (118, 39568), (121, 39613), (129, 39676), (133, 39703), (141, 39787), (145, 39823), (149, 39862), (150, 39865), (155, 39991), (167, 40066),

Gene: DumpQuist\_36 Start: 35987, Stop: 37762, Start Num: 2

Candidate Starts for DumpQuist\_36:

(Start: 2 @35987 has 58 MA's), (6, 36035), (9, 36050), (21, 36194), (27, 36287), (28, 36332), (30, 36347), (33, 36359), (38, 36410), (46, 36527), (52, 36569), (69, 36716), (70, 36719), (75, 36785), (86, 36872), (98, 36998), (109, 37109), (110, 37121), (117, 37178), (129, 37319), (131, 37337), (145, 37463), (147, 37490), (154, 37586), (159, 37658), (166, 37706),

Gene: EugeneKrabs\_34 Start: 36595, Stop: 38367, Start Num: 2

Candidate Starts for EugeneKrabs\_34:

(Start: 2 @36595 has 58 MA's), (14, 36718), (38, 37018), (40, 37030), (44, 37096), (52, 37177), (68, 37315), (92, 37525), (109, 37717), (111, 37735), (145, 38071), (159, 38263),

Gene: Fede\_36 Start: 35924, Stop: 37696, Start Num: 2

Candidate Starts for Fede\_36:

(Start: 2 @35924 has 58 MA's), (21, 36131), (25, 36212), (26, 36215), (38, 36347), (49, 36482), (52, 36506), (65, 36617), (86, 36809), (93, 36863), (125, 37232), (126, 37238), (139, 37346), (145, 37400), (154, 37523),

Gene: Fullmetal\_36 Start: 36532, Stop: 38292, Start Num: 2

Candidate Starts for Fullmetal\_36:

(Start: 2 @36532 has 58 MA's), (21, 36721), (43, 36991), (52, 37102), (61, 37177), (94, 37474), (109, 37642), (111, 37660), (114, 37696), (143, 37984), (145, 37996),

Gene: Gshelby23\_30 Start: 37963, Stop: 39672, Start Num: 3

Candidate Starts for Gshelby23\_30:

(Start: 3 @37963 has 6 MA's), (5, 38002), (12, 38029), (29, 38281), (31, 38293), (34, 38305), (48, 38473), (63, 38593), (77, 38719), (87, 38809), (95, 38890), (107, 39022), (110, 39058), (121, 39178), (123, 39187), (129, 39241), (133, 39268), (141, 39352), (147, 39415), (150, 39430), (156, 39562), (158, 39577), (164, 39616), (167, 39631),

Gene: Hannabella\_32 Start: 38004, Stop: 39713, Start Num: 3

Candidate Starts for Hannabella\_32:

(Start: 3 @38004 has 6 MA's), (5, 38043), (12, 38070), (29, 38322), (31, 38334), (34, 38346), (48, 38514), (63, 38634), (77, 38760), (87, 38850), (95, 38931), (107, 39063), (110, 39099), (121, 39219), (123, 39228), (129, 39282), (133, 39309), (141, 39393), (147, 39456), (150, 39471), (156, 39603), (158, 39618), (164, 39657), (167, 39672),

Gene: HitchHiker\_39 Start: 36500, Stop: 38266, Start Num: 2

Candidate Starts for HitchHiker\_39:

(1, 36434), (Start: 2 @36500 has 58 MA's), (17, 36650), (22, 36749), (30, 36860), (35, 36881), (38, 36923), (52, 37085), (71, 37238), (99, 37514), (109, 37622), (119, 37748), (125, 37808), (134, 37865), (136, 37886), (143, 37964), (154, 38093), (164, 38201), (170, 38243),

Gene: JessellCookie\_35 Start: 35526, Stop: 37295, Start Num: 2

Candidate Starts for JessellCookie\_35:

(Start: 2 @35526 has 58 MA's), (21, 35715), (30, 35880), (34, 35895), (44, 36021), (52, 36102), (60, 36168), (61, 36177), (67, 36237), (70, 36252), (80, 36360), (89, 36426), (113, 36693), (119, 36768), (142, 36966), (172, 37281),

Gene: JimmyPG\_36 Start: 36809, Stop: 38581, Start Num: 2

Candidate Starts for JimmyPG\_36:

(Start: 2 @36809 has 58 MA's), (8, 36869), (21, 37016), (37, 37226), (38, 37232), (46, 37349), (52, 37391), (59, 37454), (71, 37547), (98, 37820), (111, 37949), (114, 37985), (115, 37994), (130, 38156), (132, 38162), (136, 38195), (145, 38285),

Gene: JordanFarm\_38 Start: 36602, Stop: 38365, Start Num: 2

Candidate Starts for JordanFarm\_38:

(Start: 2 @36602 has 58 MA's), (11, 36671), (21, 36791), (46, 37130), (50, 37163), (52, 37172), (54, 37187), (56, 37196), (93, 37532), (105, 37679), (109, 37715), (111, 37733), (115, 37778), (119, 37841), (130, 37940), (135, 37973), (145, 38069), (150, 38111), (164, 38300),

Gene: Keough\_35 Start: 36265, Stop: 38025, Start Num: 2

Candidate Starts for Keough\_35:

(Start: 2 @36265 has 58 MA's), (21, 36454), (43, 36724), (52, 36835), (61, 36910), (94, 37207), (109, 37375), (111, 37393), (114, 37429), (143, 37717), (145, 37729),

Gene: Kikiko\_33 Start: 36913, Stop: 38559, Start Num: 10

Candidate Starts for Kikiko\_33:

(Start: 10 @36913 has 1 MA's), (19, 37021), (44, 37312), (64, 37483), (72, 37540), (78, 37606), (79, 37612), (90, 37711), (95, 37774), (108, 37906), (120, 38059), (121, 38065), (129, 38128), (133, 38155), (136, 38185), (140, 38224), (152, 38329), (153, 38356), (157, 38455), (158, 38464), (160, 38482), (164, 38503), (168, 38521),

Gene: KingKamren\_33 Start: 36556, Stop: 38328, Start Num: 2

Candidate Starts for KingKamren\_33:

(Start: 2 @36556 has 58 MA's), (16, 36697), (18, 36745), (38, 36979), (44, 37057), (52, 37138), (54, 37153), (66, 37252), (69, 37285), (71, 37294), (131, 37906), (148, 38062), (159, 38224), (164, 38263),

Gene: Kors\_35 Start: 21546, Stop: 23231, Start Num: 2

Candidate Starts for Kors\_35:

(Start: 2 @21546 has 58 MA's), (Start: 10 @21612 has 1 MA's), (21, 21729), (23, 21777), (24, 21810), (55, 22098), (75, 22293), (81, 22350), (97, 22479), (100, 22518), (104, 22578), (112, 22659), (125, 22788), (135, 22863), (136, 22869), (140, 22908), (144, 22947), (154, 23076), (162, 23151), (163, 23157),

Gene: Kosier\_36 Start: 35871, Stop: 37643, Start Num: 2

Candidate Starts for Kosier\_36:

(Start: 2 @35871 has 58 MA's), (21, 36078), (25, 36159), (38, 36294), (49, 36429), (52, 36453), (55, 36474), (59, 36516), (65, 36564), (86, 36756), (93, 36810), (122, 37143), (125, 37179), (126, 37185), (139, 37293), (145, 37347), (154, 37470),

Gene: LesNorah\_37 Start: 36848, Stop: 38623, Start Num: 2

Candidate Starts for LesNorah\_37:

(Start: 2 @36848 has 58 MA's), (21, 37055), (27, 37148), (28, 37193), (30, 37208), (33, 37220), (38, 37271), (42, 37316), (46, 37388), (52, 37430), (61, 37505), (69, 37577), (86, 37733), (98, 37859), (110, 37982), (117, 38039), (131, 38198), (145, 38324), (147, 38351), (154, 38447), (159, 38519), (166, 38567),

Gene: LilyLou\_38 Start: 36451, Stop: 38226, Start Num: 2

Candidate Starts for LilyLou\_38:

(Start: 2 @36451 has 58 MA's), (6, 36499), (9, 36514), (21, 36658), (27, 36751), (28, 36796), (30, 36811), (33, 36823), (38, 36874), (46, 36991), (52, 37033), (53, 37036), (69, 37180), (70, 37183), (75, 37249), (86, 37336), (91, 37369), (98, 37462), (109, 37573), (110, 37585), (117, 37642), (129, 37783), (131, 37801), (145, 37927), (147, 37954), (154, 38050), (159, 38122), (166, 38170),

Gene: LordBart\_35 Start: 21462, Stop: 23147, Start Num: 2

Candidate Starts for LordBart\_35:

(Start: 2 @21462 has 58 MA's), (Start: 10 @21528 has 1 MA's), (21, 21645), (23, 21693), (24, 21726), (55, 22014), (75, 22209), (81, 22266), (100, 22434), (104, 22494), (112, 22575), (125, 22704), (135, 22779), (136, 22785), (140, 22824), (144, 22863), (154, 22992), (162, 23067), (163, 23073),

Gene: Mazun\_37 Start: 36854, Stop: 38614, Start Num: 2

Candidate Starts for Mazun\_37:

(Start: 2 @36854 has 58 MA's), (21, 37043), (43, 37313), (52, 37424), (61, 37499), (94, 37796), (109, 37964), (111, 37982), (114, 38018), (143, 38306), (145, 38318),

Gene: MiamiPanther\_35 Start: 35526, Stop: 37295, Start Num: 2

Candidate Starts for MiamiPanther\_35:

(Start: 2 @35526 has 58 MA's), (21, 35715), (29, 35871), (30, 35880), (34, 35895), (44, 36021), (52, 36102), (60, 36168), (61, 36177), (67, 36237), (70, 36252), (80, 36360), (89, 36426), (113, 36693), (119, 36768), (142, 36966), (172, 37281),

Gene: MissAmericana\_36 Start: 37402, Stop: 39051, Start Num: 10

Candidate Starts for MissAmericana\_36:

(Start: 10 @37402 has 1 MA's), (19, 37510), (44, 37801), (72, 38029), (76, 38086), (93, 38239), (95, 38266), (96, 38275), (108, 38398), (120, 38551), (121, 38557), (136, 38677), (140, 38716), (145, 38767), (160, 38974), (161, 38980), (163, 38986),

Gene: Moleficent\_36 Start: 36539, Stop: 38299, Start Num: 2

Candidate Starts for Moleficent\_36:

(Start: 2 @36539 has 58 MA's), (21, 36728), (43, 36998), (52, 37109), (61, 37184), (94, 37481), (109, 37649), (111, 37667), (114, 37703), (143, 37991), (145, 38003),

Gene: Morrill\_34 Start: 36445, Stop: 38217, Start Num: 2

Candidate Starts for Morrill\_34:

(Start: 2 @36445 has 58 MA's), (20, 36646), (21, 36652), (52, 37027), (58, 37087), (59, 37090), (94, 37399), (105, 37531), (116, 37633), (130, 37792), (145, 37921), (155, 38089), (164, 38152), (166, 38161),

Gene: Oatly\_38 Start: 36060, Stop: 37826, Start Num: 2

Candidate Starts for Oatly\_38:

(1, 35994), (Start: 2 @36060 has 58 MA's), (17, 36210), (22, 36309), (30, 36420), (35, 36441), (38, 36483), (52, 36645), (71, 36798), (99, 37074), (109, 37182), (119, 37308), (125, 37368), (134, 37425), (136, 37446), (143, 37524), (154, 37653), (164, 37761), (170, 37803),

Gene: Pabst\_36 Start: 36130, Stop: 37893, Start Num: 2

Candidate Starts for Pabst\_36:

(Start: 2 @36130 has 58 MA's), (8, 36190), (20, 36331), (26, 36421), (30, 36490), (32, 36499), (35, 36511), (38, 36553), (52, 36712), (62, 36787), (71, 36865), (101, 37171), (113, 37300), (119, 37375), (129, 37459), (136, 37513), (137, 37525), (147, 37630), (154, 37720), (164, 37828), (168, 37846),

Gene: Pharky\_36 Start: 36535, Stop: 38295, Start Num: 2

Candidate Starts for Pharky\_36:

(Start: 2 @36535 has 58 MA's), (21, 36724), (43, 36994), (52, 37105), (61, 37180), (94, 37477), (109, 37645), (111, 37663), (114, 37699), (145, 37999),

Gene: Phedro\_36 Start: 36535, Stop: 38295, Start Num: 2

Candidate Starts for Phedro\_36:

(Start: 2 @36535 has 58 MA's), (21, 36724), (43, 36994), (52, 37105), (61, 37180), (94, 37477), (109, 37645), (111, 37663), (114, 37699), (143, 37987), (145, 37999),

Gene: Phogo\_37 Start: 36273, Stop: 38048, Start Num: 2

Candidate Starts for Phogo\_37:

(Start: 2 @36273 has 58 MA's), (6, 36321), (9, 36336), (21, 36480), (27, 36573), (28, 36618), (30, 36633), (33, 36645), (38, 36696), (46, 36813), (52, 36855), (53, 36858), (69, 37002), (70, 37005), (75, 37071), (86, 37158), (91, 37191), (98, 37284), (109, 37395), (110, 37407), (117, 37464), (129, 37605), (131, 37623), (145, 37749), (147, 37776), (154, 37872), (159, 37944), (166, 37992),

Gene: Phractured\_36 Start: 36535, Stop: 38295, Start Num: 2

Candidate Starts for Phractured\_36:

(Start: 2 @36535 has 58 MA's), (21, 36724), (43, 36994), (52, 37105), (61, 37180), (94, 37477), (109, 37645), (111, 37663), (114, 37699), (143, 37987), (145, 37999),

Gene: PhriedRice\_37 Start: 36639, Stop: 38399, Start Num: 2

Candidate Starts for PhriedRice\_37:

(Start: 2 @36639 has 58 MA's), (21, 36828), (43, 37098), (52, 37209), (61, 37284), (94, 37581), (109, 37749), (111, 37767), (114, 37803), (143, 38091),

Gene: PineapplePluto\_39 Start: 36422, Stop: 38188, Start Num: 2

Candidate Starts for PineapplePluto\_39:

(1, 36356), (Start: 2 @36422 has 58 MA's), (17, 36572), (22, 36671), (30, 36782), (35, 36803), (38, 36845), (52, 37007), (71, 37160), (99, 37436), (109, 37544), (119, 37670), (125, 37730), (134, 37787), (136, 37808), (143, 37886), (154, 38015), (164, 38123), (170, 38165),

Gene: RicoCaldo\_36 Start: 36617, Stop: 38377, Start Num: 2

Candidate Starts for RicoCaldo\_36:

(Start: 2 @36617 has 58 MA's), (21, 36806), (43, 37076), (52, 37187), (61, 37262), (94, 37559), (109, 37727), (111, 37745), (114, 37781), (143, 38069), (145, 38081),

Gene: RikSengupta\_35 Start: 21583, Stop: 23268, Start Num: 2

Candidate Starts for RikSengupta\_35:

(Start: 2 @21583 has 58 MA's), (Start: 10 @21649 has 1 MA's), (21, 21766), (23, 21814), (24, 21847), (55, 22135), (75, 22330), (81, 22387), (97, 22516), (100, 22555), (104, 22615), (112, 22696), (125, 22825), (135, 22900), (136, 22906), (140, 22945), (144, 22984), (154, 23113), (162, 23188), (163, 23194),

Gene: Salvatore2000\_34 Start: 35526, Stop: 37295, Start Num: 2

Candidate Starts for Salvatore2000\_34:

(Start: 2 @35526 has 58 MA's), (21, 35715), (30, 35880), (34, 35895), (44, 36021), (52, 36102), (60, 36168), (61, 36177), (67, 36237), (70, 36252), (80, 36360), (89, 36426), (102, 36573), (105, 36606), (113, 36693), (119, 36768), (142, 36966), (172, 37281),

Gene: Scruffy\_32 Start: 38250, Stop: 39989, Start Num: 3

Candidate Starts for Scruffy\_32:

(Start: 3 @38250 has 6 MA's), (5, 38289), (29, 38568), (31, 38580), (34, 38592), (39, 38640), (45, 38724), (74, 38976), (85, 39096), (98, 39252), (106, 39333), (118, 39450), (123, 39504), (124, 39507), (133, 39585), (146, 39711), (149, 39744), (150, 39747), (158, 39894), (162, 39918), (164, 39933), (167, 39948), (169, 39972),

Gene: ShyRosie\_36 Start: 36610, Stop: 38373, Start Num: 2

Candidate Starts for ShyRosie\_36:

(Start: 2 @36610 has 58 MA's), (11, 36679), (21, 36799), (46, 37138), (50, 37171), (52, 37180), (54, 37195), (56, 37204), (93, 37540), (105, 37687), (109, 37723), (111, 37741), (115, 37786), (119,

37849), (130, 37948), (135, 37981), (145, 38077), (150, 38119), (164, 38308),

Gene: SoilSleuth\_38 Start: 36432, Stop: 38195, Start Num: 2

Candidate Starts for SoilSleuth\_38:

(Start: 2 @36432 has 58 MA's), (11, 36501), (21, 36621), (46, 36960), (50, 36993), (52, 37002), (54, 37017), (56, 37026), (91, 37341), (93, 37362), (105, 37509), (109, 37545), (111, 37563), (115, 37608), (119, 37671), (130, 37770), (135, 37803), (145, 37899), (150, 37941), (164, 38130),

Gene: Sorvannah\_34 Start: 35526, Stop: 37295, Start Num: 2

Candidate Starts for Sorvannah\_34:

(Start: 2 @35526 has 58 MA's), (21, 35715), (30, 35880), (34, 35895), (44, 36021), (52, 36102), (60, 36168), (61, 36177), (67, 36237), (70, 36252), (80, 36360), (89, 36426), (102, 36573), (105, 36606), (113, 36693), (119, 36768), (142, 36966), (172, 37281),

Gene: Sparcetus\_35 Start: 21462, Stop: 23147, Start Num: 2

Candidate Starts for Sparcetus\_35:

(Start: 2 @21462 has 58 MA's), (Start: 10 @21528 has 1 MA's), (21, 21645), (23, 21693), (24, 21726), (55, 22014), (75, 22209), (81, 22266), (97, 22395), (100, 22434), (104, 22494), (112, 22575), (125, 22704), (135, 22779), (136, 22785), (140, 22824), (144, 22863), (154, 22992), (162, 23067), (163, 23073),

Gene: StagePhright\_36 Start: 36535, Stop: 38295, Start Num: 2

Candidate Starts for StagePhright\_36:

(Start: 2 @36535 has 58 MA's), (21, 36724), (43, 36994), (52, 37105), (61, 37180), (94, 37477), (109, 37645), (111, 37663), (114, 37699), (143, 37987), (145, 37999),

Gene: Stormbreaker\_37 Start: 36367, Stop: 38142, Start Num: 2

Candidate Starts for Stormbreaker\_37:

(Start: 2 @36367 has 58 MA's), (6, 36415), (9, 36430), (21, 36574), (27, 36667), (28, 36712), (30, 36727), (33, 36739), (38, 36790), (46, 36907), (52, 36949), (69, 37096), (70, 37099), (75, 37165), (86, 37252), (91, 37285), (98, 37378), (109, 37489), (110, 37501), (117, 37558), (127, 37684), (129, 37699), (131, 37717), (145, 37843), (147, 37870), (154, 37966), (159, 38038), (166, 38086),

Gene: SwissCheezer\_36 Start: 36013, Stop: 37788, Start Num: 2

Candidate Starts for SwissCheezer\_36:

(Start: 2 @36013 has 58 MA's), (6, 36061), (9, 36076), (21, 36220), (27, 36313), (28, 36358), (30, 36373), (33, 36385), (38, 36436), (46, 36553), (52, 36595), (69, 36742), (70, 36745), (75, 36811), (86, 36898), (98, 37024), (109, 37135), (110, 37147), (117, 37204), (129, 37345), (131, 37363), (145, 37489), (147, 37516), (154, 37612), (159, 37684), (166, 37732),

Gene: ThirteenKH\_35 Start: 36455, Stop: 38227, Start Num: 2

Candidate Starts for ThirteenKH\_35:

(Start: 2 @36455 has 58 MA's), (20, 36656), (21, 36662), (52, 37037), (58, 37097), (59, 37100), (94, 37409), (105, 37541), (111, 37595), (130, 37802), (145, 37931), (155, 38099), (164, 38162), (166, 38171),

Gene: TicTac\_38 Start: 36421, Stop: 38187, Start Num: 2

Candidate Starts for TicTac\_38:

(Start: 2 @36421 has 58 MA's), (17, 36571), (22, 36670), (30, 36781), (35, 36802), (38, 36844), (42, 36889), (52, 37006), (71, 37159), (99, 37435), (109, 37543), (119, 37669), (125, 37729), (134, 37786), (136, 37807), (143, 37885), (164, 38122), (170, 38164),

Gene: TinyMiny\_35 Start: 21481, Stop: 23166, Start Num: 2

Candidate Starts for TinyMiny\_35:

(Start: 2 @21481 has 58 MA's), (Start: 10 @21547 has 1 MA's), (21, 21664), (23, 21712), (24, 21745), (55, 22033), (75, 22228), (81, 22285), (97, 22414), (100, 22453), (104, 22513), (112, 22594), (125, 22723), (135, 22798), (136, 22804), (140, 22843), (144, 22882), (154, 23011), (162, 23086), (163, 23092),

Gene: TinyTimothy\_33 Start: 35526, Stop: 37295, Start Num: 2

Candidate Starts for TinyTimothy\_33:

(Start: 2 @35526 has 58 MA's), (21, 35715), (30, 35880), (34, 35895), (44, 36021), (52, 36102), (60, 36168), (61, 36177), (67, 36237), (70, 36252), (80, 36360), (89, 36426), (105, 36606), (113, 36693), (119, 36768), (142, 36966), (154, 37119), (172, 37281),

Gene: TownLake\_35 Start: 36138, Stop: 37913, Start Num: 2

Candidate Starts for TownLake\_35:

(Start: 2 @36138 has 58 MA's), (6, 36186), (21, 36345), (27, 36438), (28, 36483), (30, 36498), (33, 36510), (38, 36561), (42, 36606), (46, 36678), (52, 36720), (86, 37023), (91, 37056), (98, 37149), (105, 37224), (110, 37272), (117, 37329), (129, 37470), (131, 37488), (136, 37524), (145, 37614), (147, 37641), (151, 37665), (154, 37737), (159, 37809), (166, 37857),

Gene: TrippleS\_35 Start: 36603, Stop: 38375, Start Num: 2

Candidate Starts for TrippleS\_35:

(Start: 2 @36603 has 58 MA's), (20, 36804), (21, 36810), (52, 37185), (58, 37245), (59, 37248), (94, 37557), (111, 37743), (116, 37791), (130, 37950), (145, 38079), (155, 38247), (164, 38310), (166, 38319),

Gene: Truong\_36 Start: 36390, Stop: 38153, Start Num: 2

Candidate Starts for Truong\_36:

(Start: 2 @36390 has 58 MA's), (11, 36459), (21, 36579), (46, 36918), (50, 36951), (52, 36960), (54, 36975), (56, 36984), (93, 37320), (105, 37467), (109, 37503), (111, 37521), (115, 37566), (119, 37629), (130, 37728), (135, 37761), (145, 37857), (150, 37899), (164, 38088),

Gene: Unphazed\_37 Start: 36243, Stop: 38018, Start Num: 2

Candidate Starts for Unphazed\_37:

(Start: 2 @36243 has 58 MA's), (6, 36291), (21, 36450), (27, 36543), (28, 36588), (30, 36603), (33, 36615), (38, 36666), (42, 36711), (46, 36783), (52, 36825), (69, 36972), (86, 37128), (91, 37161), (98, 37254), (110, 37377), (117, 37434), (129, 37575), (131, 37593), (145, 37719), (147, 37746), (151, 37770), (154, 37842), (159, 37914), (166, 37962),

Gene: Waterlily\_39 Start: 36644, Stop: 38407, Start Num: 2

Candidate Starts for Waterlily\_39:

(Start: 2 @36644 has 58 MA's), (11, 36713), (21, 36833), (46, 37172), (50, 37205), (52, 37214), (54, 37229), (56, 37238), (91, 37553), (93, 37574), (105, 37721), (109, 37757), (111, 37775), (115, 37820), (119, 37883), (130, 37982), (135, 38015), (145, 38111), (150, 38153), (164, 38342),

Gene: Wesak\_34 Start: 35368, Stop: 37137, Start Num: 2

Candidate Starts for Wesak\_34:

(Start: 2 @35368 has 58 MA's), (21, 35557), (30, 35722), (34, 35737), (44, 35863), (52, 35944), (60, 36010), (61, 36019), (67, 36079), (70, 36094), (80, 36202), (89, 36268), (102, 36415), (105, 36448), (113, 36535), (119, 36610), (142, 36808), (154, 36961), (172, 37123),

Gene: Xitlalli\_35 Start: 36235, Stop: 38010, Start Num: 2

Candidate Starts for Xitlalli\_35:

(Start: 2 @36235 has 58 MA's), (21, 36442), (27, 36535), (28, 36580), (30, 36595), (33, 36607), (38, 36658), (42, 36703), (46, 36775), (52, 36817), (61, 36892), (69, 36964), (86, 37120), (98, 37246), (106, 37327), (110, 37369), (117, 37426), (129, 37567), (131, 37585), (145, 37711), (147, 37738), (154, 37834), (159, 37906), (166, 37954),

Gene: Yafa\_36 Start: 36359, Stop: 38131, Start Num: 2

Candidate Starts for Yafa\_36:

(Start: 2 @36359 has 58 MA's), (20, 36560), (21, 36566), (52, 36941), (58, 37001), (59, 37004), (94, 37313), (105, 37445), (111, 37499), (130, 37706), (145, 37835), (155, 38003), (164, 38066),

Gene: YellowPanda\_36 Start: 35249, Stop: 37018, Start Num: 2

Candidate Starts for YellowPanda\_36:

(Start: 2 @35249 has 58 MA's), (21, 35438), (29, 35594), (30, 35603), (34, 35618), (44, 35744), (52, 35825), (60, 35891), (61, 35900), (67, 35960), (70, 35975), (80, 36083), (89, 36149), (105, 36329), (113, 36416), (119, 36491), (142, 36689), (154, 36842), (172, 37004),

Gene: Zhengyi\_34 Start: 36644, Stop: 38416, Start Num: 2

Candidate Starts for Zhengyi\_34:

(Start: 2 @36644 has 58 MA's), (14, 36767), (38, 37067), (40, 37079), (41, 37103), (44, 37145), (52, 37226), (68, 37364), (92, 37574), (109, 37766), (111, 37784), (145, 38120), (159, 38312), (164, 38351),