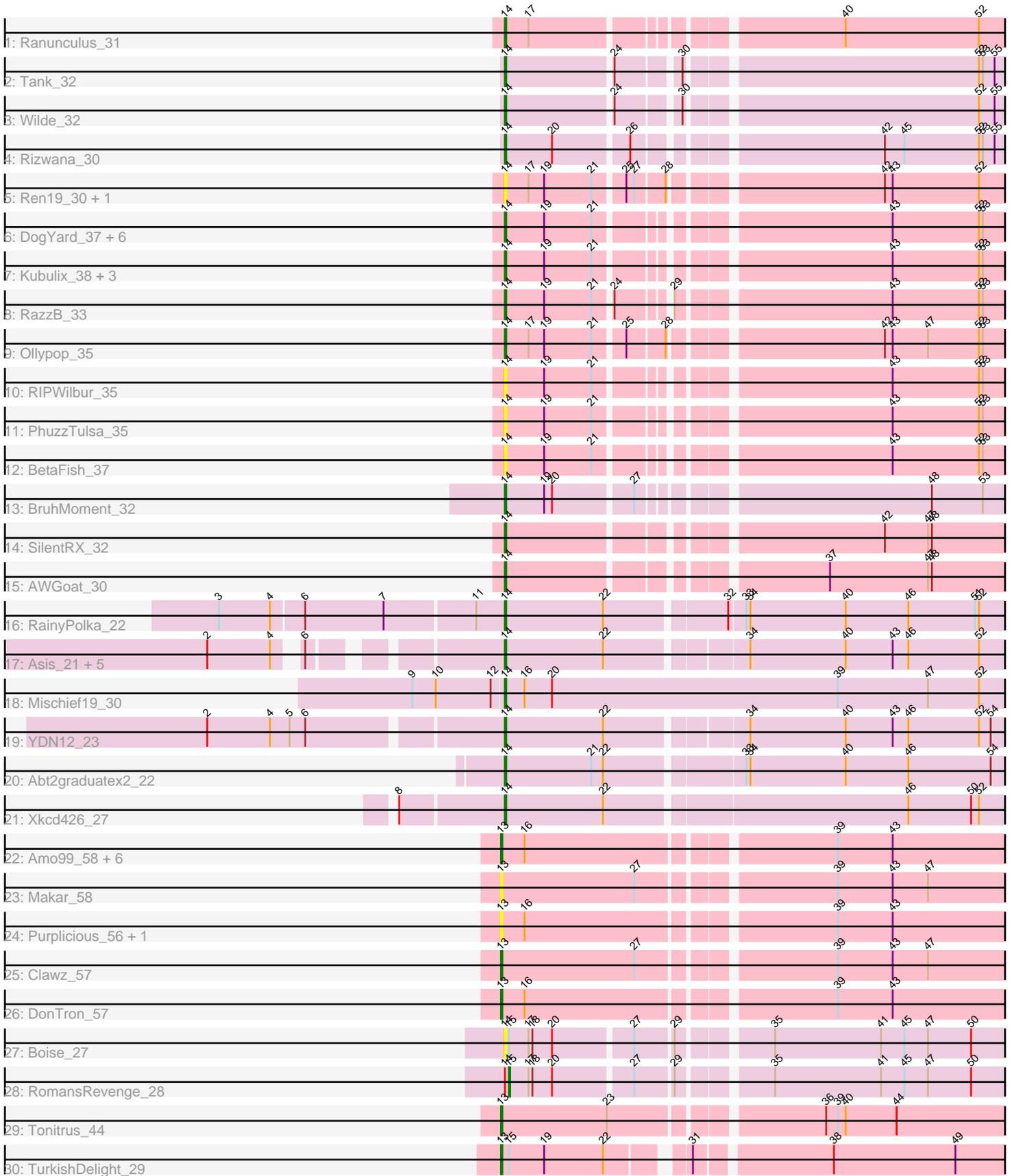


# Zoomed Pham 287960



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 287960 Report

This analysis was run 03/28/26 on database version 641.

Pham number 287960 has 52 members, 16 are drafts.

Phages represented in each track:

- Track 1 : Ranunculus\_31
- Track 2 : Tank\_32
- Track 3 : Wilde\_32
- Track 4 : Rizwana\_30
- Track 5 : Ren19\_30, Nikan\_32
- Track 6 : DogYard\_37, Pureglobe5\_39, Pointis\_37, Odyssey395\_39, NyleyClemson\_33, Forrestell\_34, MellowYellow\_34
- Track 7 : Kubulix\_38, Beagle\_38, Hive\_37, Popstraw\_35
- Track 8 : RazzB\_33
- Track 9 : Ollypop\_35
- Track 10 : RIPWilbur\_35
- Track 11 : PhuzzTulsa\_35
- Track 12 : BetaFish\_37
- Track 13 : BruhMoment\_32
- Track 14 : SilentRX\_32
- Track 15 : AWGoat\_30
- Track 16 : RainyPolka\_22
- Track 17 : Asis\_21, BabyGotBac\_21, BayC\_21, TP1604\_21, Salete\_21, Maih\_21
- Track 18 : Mischief19\_30
- Track 19 : YDN12\_23
- Track 20 : Abt2graduatex2\_22
- Track 21 : Xkcd426\_27
- Track 22 : Amo99\_58, Jollymon\_57, Sting\_56, KingstonB\_58, Stillion\_57, ColdSoup\_58, Soos\_53
- Track 23 : Makar\_58
- Track 24 : Purplicious\_56, Grumio\_57
- Track 25 : Clawz\_57
- Track 26 : DonTron\_57
- Track 27 : Boise\_27
- Track 28 : RomansRevenge\_28
- Track 29 : Tonitrus\_44
- Track 30 : TurkishDelight\_29

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

The start number called the most often in the published annotations is 14, it was called in 28 of the 36 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- AWGoat\_30, Abt2graduatex2\_22, Asis\_21, BabyGotBac\_21, BayC\_21, Beagle\_38, BetaFish\_37, Boise\_27, BruhMoment\_32, DogYard\_37, Forrestell\_34, Hive\_37, Kubulix\_38, Maih\_21, MellowYellow\_34, Mischief19\_30, Nikan\_32, NyleyClemson\_33, Odyssey395\_39, Ollypop\_35, PhuzzTulsa\_35, Pointis\_37, Popstraw\_35, Pureglobe5\_39, RIPWilbur\_35, RainyPolka\_22, Ranunculus\_31, RazzB\_33, Ren19\_30, Rizwana\_30, Salete\_21, SilentRX\_32, TP1604\_21, Tank\_32, Wilde\_32, Xkcd426\_27, YDN12\_23,

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

- RomansRevenge\_28,

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

- Amo99\_58, Clawz\_57, ColdSoup\_58, DonTron\_57, Grumio\_57, Jollymon\_57, KingstonB\_58, Makar\_58, Purplicious\_56, Soos\_53, Stillion\_57, Sting\_56, Tonitrus\_44, TurkishDelight\_29,

### Summary by start number:

Start 13:

- Found in 14 of 52 ( 26.9% ) of genes in pham
- Manual Annotations of this start: 7 of 36
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Amo99\_58 (CP), Clawz\_57 (CP), ColdSoup\_58 (CP), DonTron\_57 (CP), Grumio\_57 (CP), Jollymon\_57 (CP), KingstonB\_58 (CP), Makar\_58 (CP), Purplicious\_56 (CP), Soos\_53 (CP), Stillion\_57 (CP), Sting\_56 (CP), Tonitrus\_44 (singleton), TurkishDelight\_29 (singleton),

Start 14:

- Found in 38 of 52 ( 73.1% ) of genes in pham
- Manual Annotations of this start: 28 of 36
- Called 97.4% of time when present
- Phage (with cluster) where this start called: AWGoat\_30 (AP4), Abt2graduatex2\_22 (BG), Asis\_21 (BG), BabyGotBac\_21 (BG), BayC\_21 (BG), Beagle\_38 (AP2), BetaFish\_37 (AP2), Boise\_27 (FT), BruhMoment\_32 (AP3), DogYard\_37 (AP2), Forrestell\_34 (AP2), Hive\_37 (AP2), Kubulix\_38 (AP2), Maih\_21 (BG), MellowYellow\_34 (AP2), Mischief19\_30 (BG), Nikan\_32 (AP2), NyleyClemson\_33 (AP2), Odyssey395\_39 (AP2), Ollypop\_35 (AP2), PhuzzTulsa\_35 (AP2), Pointis\_37 (AP2), Popstraw\_35 (AP2), Pureglobe5\_39 (AP2), RIPWilbur\_35 (AP2), RainyPolka\_22 (BG), Ranunculus\_31 (AP), RazzB\_33 (AP2), Ren19\_30 (AP2), Rizwana\_30 (AP1), Salete\_21 (BG), SilentRX\_32 (AP4), TP1604\_21 (BG), Tank\_32 (AP1), Wilde\_32 (AP1), Xkcd426\_27 (BG), YDN12\_23 (BG),

Start 15:

- Found in 3 of 52 ( 5.8% ) of genes in pham
- Manual Annotations of this start: 1 of 36
- Called 33.3% of time when present
- Phage (with cluster) where this start called: RomansRevenge\_28 (FT),

## Summary by clusters:

There are 9 clusters represented in this pham: singleton, BG, FT, AP2, AP3, AP1, AP4, AP, CP,

Info for manual annotations of cluster AP:

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

Info for manual annotations of cluster AP1:

- Start number 14 was manually annotated 3 times for cluster AP1.

Info for manual annotations of cluster AP2:

- Start number 14 was manually annotated 10 times for cluster AP2.

Info for manual annotations of cluster AP3:

- Start number 14 was manually annotated 1 time for cluster AP3.

Info for manual annotations of cluster AP4:

- Start number 14 was manually annotated 2 times for cluster AP4.

Info for manual annotations of cluster BG:

- Start number 14 was manually annotated 11 times for cluster BG.

Info for manual annotations of cluster CP:

- Start number 13 was manually annotated 5 times for cluster CP.

Info for manual annotations of cluster FT:

- Start number 15 was manually annotated 1 time for cluster FT.

## Gene Information:

Gene: AWGoat\_30 Start: 26185, Stop: 27399, Start Num: 14

Candidate Starts for AWGoat\_30:

(Start: 14 @26185 has 28 MA's), (37, 26401), (47, 26476), (48, 26479), (56, 26551), (69, 26641), (72, 26662), (76, 26677), (86, 26773), (87, 26785), (124, 27016), (150, 27190), (151, 27193), (152, 27208), (153, 27220), (154, 27226), (157, 27247), (162, 27295), (164, 27307), (166, 27331), (169, 27343), (170, 27346), (175, 27370),

Gene: Abt2graduatex2\_22 Start: 20847, Stop: 22187, Start Num: 14

Candidate Starts for Abt2graduatex2\_22:

(Start: 14 @20847 has 28 MA's), (21, 20913), (22, 20922), (33, 21021), (34, 21024), (40, 21096), (46, 21144), (54, 21207), (59, 21255), (65, 21312), (70, 21339), (86, 21480), (88, 21495), (91, 21534), (92, 21543), (96, 21576), (121, 21744), (126, 21780), (128, 21798), (137, 21855), (154, 22002), (155, 22005), (161, 22071), (165, 22107), (176, 22152), (179, 22167),

Gene: Amo99\_58 Start: 36171, Stop: 37457, Start Num: 13

Candidate Starts for Amo99\_58:

(Start: 13 @36171 has 7 MA's), (16, 36189), (39, 36408), (43, 36450), (60, 36582), (79, 36723), (93, 36870), (104, 36927), (130, 37104), (137, 37155), (145, 37212), (146, 37215), (151, 37245), (152, 37260), (158, 37302), (159, 37317), (178, 37428), (180, 37443),

Gene: Asis\_21 Start: 20262, Stop: 21599, Start Num: 14

Candidate Starts for Asis\_21:

(1, 19857), (2, 20082), (4, 20130), (6, 20142), (Start: 14 @20262 has 28 MA's), (22, 20337), (34, 20436), (40, 20508), (43, 20544), (46, 20556), (52, 20610), (58, 20658), (65, 20724), (86, 20892), (88, 20907), (91, 20946), (92, 20955), (96, 20988), (110, 21063), (115, 21102), (117, 21126), (121, 21156), (125, 21180), (137, 21267), (147, 21357), (154, 21414), (155, 21417), (161, 21483), (176, 21564), (179, 21579),

Gene: BabyGotBac\_21 Start: 20262, Stop: 21599, Start Num: 14

Candidate Starts for BabyGotBac\_21:

(1, 19857), (2, 20082), (4, 20130), (6, 20142), (Start: 14 @20262 has 28 MA's), (22, 20337), (34, 20436), (40, 20508), (43, 20544), (46, 20556), (52, 20610), (58, 20658), (65, 20724), (86, 20892), (88, 20907), (91, 20946), (92, 20955), (96, 20988), (110, 21063), (115, 21102), (117, 21126), (121, 21156), (125, 21180), (137, 21267), (147, 21357), (154, 21414), (155, 21417), (161, 21483), (176, 21564), (179, 21579),

Gene: BayC\_21 Start: 20262, Stop: 21599, Start Num: 14

Candidate Starts for BayC\_21:

(1, 19857), (2, 20082), (4, 20130), (6, 20142), (Start: 14 @20262 has 28 MA's), (22, 20337), (34, 20436), (40, 20508), (43, 20544), (46, 20556), (52, 20610), (58, 20658), (65, 20724), (86, 20892), (88, 20907), (91, 20946), (92, 20955), (96, 20988), (110, 21063), (115, 21102), (117, 21126), (121, 21156), (125, 21180), (137, 21267), (147, 21357), (154, 21414), (155, 21417), (161, 21483), (176, 21564), (179, 21579),

Gene: Beagle\_38 Start: 26417, Stop: 27625, Start Num: 14

Candidate Starts for Beagle\_38:

(Start: 14 @26417 has 28 MA's), (19, 26447), (21, 26483), (43, 26678), (52, 26744), (53, 26747), (56, 26780), (57, 26783), (58, 26792), (60, 26810), (66, 26852), (70, 26870), (79, 26933), (82, 26957), (84, 26987), (86, 26999), (89, 27023), (95, 27068), (112, 27143), (129, 27281), (130, 27284), (135, 27317), (150, 27416), (158, 27476), (166, 27557), (170, 27572), (174, 27593), (176, 27599),

Gene: BetaFish\_37 Start: 26611, Stop: 27819, Start Num: 14

Candidate Starts for BetaFish\_37:

(Start: 14 @26611 has 28 MA's), (19, 26641), (21, 26677), (43, 26872), (52, 26938), (53, 26941), (56, 26974), (57, 26977), (58, 26986), (60, 27004), (66, 27046), (70, 27064), (79, 27127), (82, 27151), (84, 27181), (86, 27193), (89, 27217), (95, 27262), (105, 27310), (112, 27337), (129, 27475), (130, 27478), (135, 27511), (150, 27610), (166, 27751), (170, 27766), (174, 27787), (176, 27793),

Gene: Boise\_27 Start: 23638, Stop: 24843, Start Num: 14

Candidate Starts for Boise\_27:

(Start: 14 @23638 has 28 MA's), (Start: 15 @23641 has 1 MA's), (17, 23656), (18, 23659), (20, 23674), (27, 23731), (29, 23758), (35, 23818), (41, 23899), (45, 23917), (47, 23935), (50, 23968), (56, 24010), (58, 24022), (76, 24136), (78, 24160), (81, 24178), (84, 24214), (86, 24220), (90, 24262), (99, 24313), (115, 24388), (118, 24427), (130, 24499), (138, 24553),

Gene: BruhMoment\_32 Start: 25992, Stop: 27206, Start Num: 14

Candidate Starts for BruhMoment\_32:

(Start: 14 @25992 has 28 MA's), (19, 26022), (20, 26028), (27, 26085), (48, 26286), (53, 26325), (56, 26358), (58, 26370), (61, 26391), (68, 26442), (70, 26448), (89, 26604), (95, 26649), (97, 26661), (118, 26790), (129, 26862), (130, 26865), (131, 26871), (132, 26874), (136, 26907), (166, 27138), (170, 27153), (174, 27174),

Gene: Clawz\_57 Start: 35966, Stop: 37252, Start Num: 13

Candidate Starts for Clawz\_57:

(Start: 13 @35966 has 7 MA's), (27, 36068), (39, 36203), (43, 36245), (47, 36272), (67, 36437), (73, 36476), (82, 36542), (86, 36599), (94, 36668), (95, 36671), (100, 36713), (115, 36785), (127, 36878), (130, 36899), (133, 36911), (139, 36959), (145, 37007), (146, 37010), (151, 37040), (152, 37055), (160, 37115), (163, 37151), (172, 37202), (178, 37223), (180, 37238),

Gene: ColdSoup\_58 Start: 36171, Stop: 37457, Start Num: 13

Candidate Starts for ColdSoup\_58:

(Start: 13 @36171 has 7 MA's), (16, 36189), (39, 36408), (43, 36450), (60, 36582), (79, 36723), (93, 36870), (104, 36927), (130, 37104), (137, 37155), (145, 37212), (146, 37215), (151, 37245), (152, 37260), (158, 37302), (159, 37317), (178, 37428), (180, 37443),

Gene: DogYard\_37 Start: 26311, Stop: 27519, Start Num: 14

Candidate Starts for DogYard\_37:

(Start: 14 @26311 has 28 MA's), (19, 26341), (21, 26377), (43, 26572), (52, 26638), (53, 26641), (56, 26674), (57, 26677), (58, 26686), (60, 26704), (66, 26746), (70, 26764), (79, 26827), (82, 26851), (84, 26881), (86, 26893), (89, 26917), (95, 26962), (105, 27010), (112, 27037), (129, 27175), (130, 27178), (135, 27211), (150, 27310), (158, 27370), (166, 27451), (170, 27466), (174, 27487), (176, 27493),

Gene: DonTron\_57 Start: 36212, Stop: 37498, Start Num: 13

Candidate Starts for DonTron\_57:

(Start: 13 @36212 has 7 MA's), (16, 36230), (39, 36449), (43, 36491), (60, 36623), (67, 36683), (79, 36764), (93, 36911), (104, 36968), (130, 37145), (137, 37196), (145, 37253), (146, 37256), (151, 37286), (152, 37301), (158, 37343), (159, 37358), (178, 37469), (180, 37484),

Gene: Forrestell\_34 Start: 25104, Stop: 26312, Start Num: 14

Candidate Starts for Forrestell\_34:

(Start: 14 @25104 has 28 MA's), (19, 25134), (21, 25170), (43, 25365), (52, 25431), (53, 25434), (56, 25467), (57, 25470), (58, 25479), (60, 25497), (66, 25539), (70, 25557), (79, 25620), (82, 25644), (84, 25674), (86, 25686), (89, 25710), (95, 25755), (105, 25803), (112, 25830), (129, 25968), (130, 25971), (135, 26004), (150, 26103), (158, 26163), (166, 26244), (170, 26259), (174, 26280), (176, 26286),

Gene: Grumio\_57 Start: 35653, Stop: 36939, Start Num: 13

Candidate Starts for Grumio\_57:

(Start: 13 @35653 has 7 MA's), (16, 35671), (39, 35890), (43, 35932), (60, 36064), (67, 36124), (74, 36166), (93, 36352), (104, 36409), (130, 36586), (137, 36637), (145, 36694), (146, 36697), (151, 36727), (152, 36742), (158, 36784), (159, 36799), (180, 36925),

Gene: Hive\_37 Start: 26492, Stop: 27700, Start Num: 14

Candidate Starts for Hive\_37:

(Start: 14 @26492 has 28 MA's), (19, 26522), (21, 26558), (43, 26753), (52, 26819), (53, 26822), (56, 26855), (57, 26858), (58, 26867), (60, 26885), (66, 26927), (70, 26945), (79, 27008), (82, 27032), (84, 27062), (86, 27074), (89, 27098), (95, 27143), (112, 27218), (129, 27356), (130, 27359), (135, 27392), (150, 27491), (158, 27551), (166, 27632), (170, 27647), (174, 27668), (176, 27674),

Gene: Jollymon\_57 Start: 36171, Stop: 37457, Start Num: 13

Candidate Starts for Jollymon\_57:

(Start: 13 @36171 has 7 MA's), (16, 36189), (39, 36408), (43, 36450), (60, 36582), (79, 36723), (93, 36870), (104, 36927), (130, 37104), (137, 37155), (145, 37212), (146, 37215), (151, 37245), (152, 37260), (158, 37302), (159, 37317), (178, 37428), (180, 37443),

Gene: KingstonB\_58 Start: 35650, Stop: 36936, Start Num: 13

Candidate Starts for KingstonB\_58:

(Start: 13 @35650 has 7 MA's), (16, 35668), (39, 35887), (43, 35929), (60, 36061), (79, 36202), (93, 36349), (104, 36406), (130, 36583), (137, 36634), (145, 36691), (146, 36694), (151, 36724), (152, 36739), (158, 36781), (159, 36796), (178, 36907), (180, 36922),

Gene: Kubulix\_38 Start: 26607, Stop: 27815, Start Num: 14

Candidate Starts for Kubulix\_38:

(Start: 14 @26607 has 28 MA's), (19, 26637), (21, 26673), (43, 26868), (52, 26934), (53, 26937), (56, 26970), (57, 26973), (58, 26982), (60, 27000), (66, 27042), (70, 27060), (79, 27123), (82, 27147), (84, 27177), (86, 27189), (89, 27213), (95, 27258), (112, 27333), (129, 27471), (130, 27474), (135, 27507), (150, 27606), (158, 27666), (166, 27747), (170, 27762), (174, 27783), (176, 27789),

Gene: Maih\_21 Start: 20261, Stop: 21598, Start Num: 14

Candidate Starts for Maih\_21:

(1, 19856), (2, 20081), (4, 20129), (6, 20141), (Start: 14 @20261 has 28 MA's), (22, 20336), (34, 20435), (40, 20507), (43, 20543), (46, 20555), (52, 20609), (58, 20657), (65, 20723), (86, 20891), (88, 20906), (91, 20945), (92, 20954), (96, 20987), (110, 21062), (115, 21101), (117, 21125), (121, 21155), (125, 21179), (137, 21266), (147, 21356), (154, 21413), (155, 21416), (161, 21482), (176, 21563), (179, 21578),

Gene: Makar\_58 Start: 35993, Stop: 37279, Start Num: 13

Candidate Starts for Makar\_58:

(Start: 13 @35993 has 7 MA's), (27, 36095), (39, 36230), (43, 36272), (47, 36299), (67, 36464), (73, 36503), (86, 36626), (94, 36695), (95, 36698), (100, 36740), (115, 36812), (127, 36905), (130, 36926), (139, 36986), (145, 37034), (146, 37037), (151, 37067), (152, 37082), (160, 37142), (163, 37178), (172, 37229), (175, 37241), (178, 37250), (180, 37265),

Gene: MellowYellow\_34 Start: 25152, Stop: 26360, Start Num: 14

Candidate Starts for MellowYellow\_34:

(Start: 14 @25152 has 28 MA's), (19, 25182), (21, 25218), (43, 25413), (52, 25479), (53, 25482), (56, 25515), (57, 25518), (58, 25527), (60, 25545), (66, 25587), (70, 25605), (79, 25668), (82, 25692), (84, 25722), (86, 25734), (89, 25758), (95, 25803), (105, 25851), (112, 25878), (129, 26016), (130, 26019), (135, 26052), (150, 26151), (158, 26211), (166, 26292), (170, 26307), (174, 26328), (176, 26334),

Gene: Mischief19\_30 Start: 30827, Stop: 32191, Start Num: 14

Candidate Starts for Mischief19\_30:

(9, 30758), (10, 30776), (12, 30818), (Start: 14 @30827 has 28 MA's), (16, 30842), (20, 30863), (39, 31082), (47, 31151), (52, 31190), (58, 31238), (65, 31304), (101, 31589), (103, 31598), (109, 31628), (119, 31742), (130, 31811), (131, 31817), (134, 31826), (146, 31949), (151, 31979), (159, 32048), (165, 32111),

Gene: Nikan\_32 Start: 25401, Stop: 26615, Start Num: 14

Candidate Starts for Nikan\_32:

(Start: 14 @25401 has 28 MA's), (17, 25419), (19, 25431), (21, 25467), (25, 25488), (27, 25494), (28, 25515), (42, 25662), (43, 25668), (52, 25734), (56, 25770), (57, 25773), (66, 25842), (79, 25923), (83, 25971), (84, 25977), (85, 25980), (89, 26013), (112, 26133), (129, 26271), (130, 26274), (134, 26289), (135, 26307), (136, 26316), (166, 26547), (170, 26562), (173, 26580), (176, 26589),

Gene: NyleyClemson\_33 Start: 25085, Stop: 26293, Start Num: 14

Candidate Starts for NyleyClemson\_33:

(Start: 14 @25085 has 28 MA's), (19, 25115), (21, 25151), (43, 25346), (52, 25412), (53, 25415), (56, 25448), (57, 25451), (58, 25460), (60, 25478), (66, 25520), (70, 25538), (79, 25601), (82, 25625), (84, 25655), (86, 25667), (89, 25691), (95, 25736), (105, 25784), (112, 25811), (129, 25949), (130, 25952), (135, 25985), (150, 26084), (158, 26144), (166, 26225), (170, 26240), (174, 26261), (176, 26267),

Gene: Odyssey395\_39 Start: 26436, Stop: 27644, Start Num: 14

Candidate Starts for Odyssey395\_39:

(Start: 14 @26436 has 28 MA's), (19, 26466), (21, 26502), (43, 26697), (52, 26763), (53, 26766), (56, 26799), (57, 26802), (58, 26811), (60, 26829), (66, 26871), (70, 26889), (79, 26952), (82, 26976), (84, 27006), (86, 27018), (89, 27042), (95, 27087), (105, 27135), (112, 27162), (129, 27300), (130, 27303), (135, 27336), (150, 27435), (158, 27495), (166, 27576), (170, 27591), (174, 27612), (176, 27618),

Gene: Ollypop\_35 Start: 25507, Stop: 26721, Start Num: 14

Candidate Starts for Ollypop\_35:

(Start: 14 @25507 has 28 MA's), (17, 25525), (19, 25537), (21, 25573), (25, 25594), (28, 25621), (42, 25768), (43, 25774), (47, 25801), (52, 25840), (53, 25843), (56, 25876), (57, 25879), (66, 25948), (70, 25966), (79, 26029), (80, 26038), (84, 26083), (85, 26086), (89, 26119), (112, 26239), (129, 26377), (130, 26380), (134, 26395), (135, 26413), (136, 26422), (149, 26506), (150, 26512), (151, 26515), (166, 26653), (168, 26659), (170, 26668), (173, 26686), (176, 26695),

Gene: PhuzzTulsa\_35 Start: 26396, Stop: 27604, Start Num: 14

Candidate Starts for PhuzzTulsa\_35:

(Start: 14 @26396 has 28 MA's), (19, 26426), (21, 26462), (43, 26657), (52, 26723), (53, 26726), (56, 26759), (57, 26762), (58, 26771), (60, 26789), (66, 26831), (70, 26849), (79, 26912), (82, 26936), (84, 26966), (86, 26978), (89, 27002), (95, 27047), (112, 27122), (129, 27260), (130, 27263), (135, 27296), (150, 27395), (166, 27536), (170, 27551), (174, 27572), (176, 27578),

Gene: Pointis\_37 Start: 26434, Stop: 27642, Start Num: 14

Candidate Starts for Pointis\_37:

(Start: 14 @26434 has 28 MA's), (19, 26464), (21, 26500), (43, 26695), (52, 26761), (53, 26764), (56, 26797), (57, 26800), (58, 26809), (60, 26827), (66, 26869), (70, 26887), (79, 26950), (82, 26974), (84, 27004), (86, 27016), (89, 27040), (95, 27085), (105, 27133), (112, 27160), (129, 27298), (130, 27301), (135, 27334), (150, 27433), (158, 27493), (166, 27574), (170, 27589), (174, 27610), (176, 27616),

Gene: Popstraw\_35 Start: 26220, Stop: 27428, Start Num: 14

Candidate Starts for Popstraw\_35:

(Start: 14 @26220 has 28 MA's), (19, 26250), (21, 26286), (43, 26481), (52, 26547), (53, 26550), (56, 26583), (57, 26586), (58, 26595), (60, 26613), (66, 26655), (70, 26673), (79, 26736), (82, 26760), (84, 26790), (86, 26802), (89, 26826), (95, 26871), (112, 26946), (129, 27084), (130, 27087), (135, 27120), (150, 27219), (158, 27279), (166, 27360), (170, 27375), (174, 27396), (176, 27402),

Gene: Pureglobe5\_39 Start: 26617, Stop: 27825, Start Num: 14

Candidate Starts for Pureglobe5\_39:

(Start: 14 @26617 has 28 MA's), (19, 26647), (21, 26683), (43, 26878), (52, 26944), (53, 26947), (56, 26980), (57, 26983), (58, 26992), (60, 27010), (66, 27052), (70, 27070), (79, 27133), (82, 27157), (84, 27187), (86, 27199), (89, 27223), (95, 27268), (105, 27316), (112, 27343), (129, 27481), (130, 27484), (135, 27517), (150, 27616), (158, 27676), (166, 27757), (170, 27772), (174, 27793), (176, 27799),

Gene: Purplicious\_56 Start: 35418, Stop: 36704, Start Num: 13

Candidate Starts for Purplicious\_56:

(Start: 13 @35418 has 7 MA's), (16, 35436), (39, 35655), (43, 35697), (60, 35829), (67, 35889), (74, 35931), (93, 36117), (104, 36174), (130, 36351), (137, 36402), (145, 36459), (146, 36462), (151, 36492), (152, 36507), (158, 36549), (159, 36564), (180, 36690),

Gene: RIPWilbur\_35 Start: 25750, Stop: 26958, Start Num: 14

Candidate Starts for RIPWilbur\_35:

(Start: 14 @25750 has 28 MA's), (19, 25780), (21, 25816), (43, 26011), (52, 26077), (53, 26080), (56, 26113), (57, 26116), (58, 26125), (60, 26143), (66, 26185), (70, 26203), (79, 26266), (82, 26290), (84, 26320), (86, 26332), (89, 26356), (95, 26401), (105, 26449), (112, 26476), (129, 26614), (130, 26617), (135, 26650), (150, 26749), (158, 26809), (166, 26890), (170, 26905), (174, 26926),

Gene: RainyPolka\_22 Start: 20723, Stop: 22063, Start Num: 14

Candidate Starts for RainyPolka\_22:

(3, 20513), (4, 20552), (6, 20576), (7, 20636), (11, 20702), (Start: 14 @20723 has 28 MA's), (22, 20798), (32, 20885), (33, 20897), (34, 20900), (40, 20972), (46, 21020), (51, 21071), (52, 21074), (65, 21188), (70, 21215), (77, 21272), (86, 21356), (88, 21371), (91, 21410), (114, 21563), (115, 21566), (117, 21590), (121, 21620), (137, 21731), (147, 21821), (154, 21878), (155, 21881), (161, 21947), (176, 22028),

Gene: Ranunculus\_31 Start: 25649, Stop: 26857, Start Num: 14

Candidate Starts for Ranunculus\_31:

(Start: 14 @25649 has 28 MA's), (17, 25667), (40, 25877), (52, 25979), (56, 26015), (60, 26045), (66, 26087), (70, 26105), (75, 26132), (82, 26192), (89, 26261), (91, 26291), (112, 26381), (135, 26555), (150, 26648), (158, 26708), (166, 26789), (170, 26804), (173, 26822), (175, 26828),

Gene: RazzB\_33 Start: 24898, Stop: 26106, Start Num: 14

Candidate Starts for RazzB\_33:

(Start: 14 @24898 has 28 MA's), (19, 24928), (21, 24964), (24, 24976), (29, 25009), (43, 25159), (52, 25225), (53, 25228), (56, 25261), (57, 25264), (58, 25273), (60, 25291), (66, 25333), (70, 25351), (79, 25414), (82, 25438), (84, 25468), (86, 25480), (89, 25504), (95, 25549), (105, 25597), (112, 25624), (129, 25762), (130, 25765), (135, 25798), (150, 25897), (158, 25957), (166, 26038), (170, 26053), (174, 26074), (176, 26080),

Gene: Ren19\_30 Start: 25401, Stop: 26615, Start Num: 14

Candidate Starts for Ren19\_30:

(Start: 14 @25401 has 28 MA's), (17, 25419), (19, 25431), (21, 25467), (25, 25488), (27, 25494), (28, 25515), (42, 25662), (43, 25668), (52, 25734), (56, 25770), (57, 25773), (66, 25842), (79, 25923), (83, 25971), (84, 25977), (85, 25980), (89, 26013), (112, 26133), (129, 26271), (130, 26274), (134, 26289), (135, 26307), (136, 26316), (166, 26547), (170, 26562), (173, 26580), (176, 26589),

Gene: Rizwana\_30 Start: 25243, Stop: 26460, Start Num: 14

Candidate Starts for Rizwana\_30:

(Start: 14 @25243 has 28 MA's), (20, 25279), (26, 25333), (42, 25501), (45, 25516), (52, 25573), (53, 25576), (55, 25585), (56, 25609), (60, 25639), (70, 25702), (86, 25831), (106, 25951), (127, 26095), (129, 26113), (142, 26194), (150, 26251), (151, 26254), (154, 26287), (164, 26368), (166, 26392), (170, 26407),

Gene: RomansRevenge\_28 Start: 23641, Stop: 24843, Start Num: 15

Candidate Starts for RomansRevenge\_28:

(Start: 14 @23638 has 28 MA's), (Start: 15 @23641 has 1 MA's), (17, 23656), (18, 23659), (20, 23674), (27, 23731), (29, 23758), (35, 23818), (41, 23899), (45, 23917), (47, 23935), (50, 23968), (56, 24010), (58, 24022), (76, 24136), (78, 24160), (81, 24178), (84, 24214), (86, 24220), (90, 24262), (99, 24313), (115, 24388), (118, 24427), (130, 24499), (138, 24553),

Gene: Salete\_21 Start: 20262, Stop: 21599, Start Num: 14

Candidate Starts for Salete\_21:

(1, 19857), (2, 20082), (4, 20130), (6, 20142), (Start: 14 @20262 has 28 MA's), (22, 20337), (34, 20436), (40, 20508), (43, 20544), (46, 20556), (52, 20610), (58, 20658), (65, 20724), (86, 20892), (88, 20907), (91, 20946), (92, 20955), (96, 20988), (110, 21063), (115, 21102), (117, 21126), (121, 21156),

(125, 21180), (137, 21267), (147, 21357), (154, 21414), (155, 21417), (161, 21483), (176, 21564), (179, 21579),

Gene: SilentRX\_32 Start: 25897, Stop: 27111, Start Num: 14

Candidate Starts for SilentRX\_32:

(Start: 14 @25897 has 28 MA's), (42, 26155), (47, 26188), (48, 26191), (56, 26263), (64, 26323), (69, 26353), (72, 26374), (76, 26389), (87, 26497), (124, 26728), (126, 26746), (130, 26770), (150, 26902), (152, 26920), (153, 26932), (154, 26938), (157, 26959), (162, 27007), (164, 27019), (166, 27043), (169, 27055), (170, 27058), (175, 27082),

Gene: Soos\_53 Start: 35379, Stop: 36665, Start Num: 13

Candidate Starts for Soos\_53:

(Start: 13 @35379 has 7 MA's), (16, 35397), (39, 35616), (43, 35658), (60, 35790), (79, 35931), (93, 36078), (104, 36135), (130, 36312), (137, 36363), (145, 36420), (146, 36423), (151, 36453), (152, 36468), (158, 36510), (159, 36525), (178, 36636), (180, 36651),

Gene: Stillion\_57 Start: 35976, Stop: 37262, Start Num: 13

Candidate Starts for Stillion\_57:

(Start: 13 @35976 has 7 MA's), (16, 35994), (39, 36213), (43, 36255), (60, 36387), (79, 36528), (93, 36675), (104, 36732), (130, 36909), (137, 36960), (145, 37017), (146, 37020), (151, 37050), (152, 37065), (158, 37107), (159, 37122), (178, 37233), (180, 37248),

Gene: Sting\_56 Start: 35818, Stop: 37104, Start Num: 13

Candidate Starts for Sting\_56:

(Start: 13 @35818 has 7 MA's), (16, 35836), (39, 36055), (43, 36097), (60, 36229), (79, 36370), (93, 36517), (104, 36574), (130, 36751), (137, 36802), (145, 36859), (146, 36862), (151, 36892), (152, 36907), (158, 36949), (159, 36964), (178, 37075), (180, 37090),

Gene: TP1604\_21 Start: 20262, Stop: 21599, Start Num: 14

Candidate Starts for TP1604\_21:

(1, 19857), (2, 20082), (4, 20130), (6, 20142), (Start: 14 @20262 has 28 MA's), (22, 20337), (34, 20436), (40, 20508), (43, 20544), (46, 20556), (52, 20610), (58, 20658), (65, 20724), (86, 20892), (88, 20907), (91, 20946), (92, 20955), (96, 20988), (110, 21063), (115, 21102), (117, 21126), (121, 21156), (125, 21180), (137, 21267), (147, 21357), (154, 21414), (155, 21417), (161, 21483), (176, 21564), (179, 21579),

Gene: Tank\_32 Start: 25546, Stop: 26763, Start Num: 14

Candidate Starts for Tank\_32:

(Start: 14 @25546 has 28 MA's), (24, 25624), (30, 25666), (52, 25876), (53, 25879), (55, 25888), (56, 25912), (64, 25972), (68, 25999), (84, 26119), (86, 26134), (106, 26254), (150, 26554), (151, 26557), (154, 26590), (164, 26671), (166, 26695), (170, 26710),

Gene: Tonitrus\_44 Start: 33595, Stop: 34905, Start Num: 13

Candidate Starts for Tonitrus\_44:

(Start: 13 @33595 has 7 MA's), (23, 33676), (36, 33823), (39, 33832), (40, 33838), (44, 33877), (63, 34039), (71, 34084), (76, 34117), (81, 34162), (86, 34231), (98, 34339), (104, 34357), (120, 34471), (125, 34498), (127, 34513), (134, 34549), (139, 34594), (144, 34648), (147, 34663), (148, 34672), (154, 34723), (156, 34729), (160, 34765), (162, 34792), (166, 34828), (167, 34831), (180, 34891),

Gene: TurkishDelight\_29 Start: 26684, Stop: 28108, Start Num: 13

Candidate Starts for TurkishDelight\_29:

(Start: 13 @26684 has 7 MA's), (Start: 15 @26690 has 1 MA's), (19, 26717), (22, 26762), (31, 26813), (38, 26909), (49, 27002), (56, 27056), (59, 27077), (62, 27101), (77, 27215), (86, 27296), (92, 27359),

(101, 27422), (107, 27458), (108, 27467), (111, 27506), (112, 27533), (113, 27575), (116, 27620), (122, 27671), (128, 27722), (130, 27728), (136, 27773), (140, 27800), (141, 27830), (143, 27839), (147, 27872), (154, 27929), (166, 28031), (171, 28049),

Gene: Wilde\_32 Start: 25388, Stop: 26605, Start Num: 14

Candidate Starts for Wilde\_32:

(Start: 14 @25388 has 28 MA's), (24, 25466), (30, 25508), (52, 25718), (55, 25730), (56, 25754), (64, 25814), (68, 25841), (84, 25961), (86, 25976), (106, 26096), (150, 26396), (151, 26399), (154, 26432), (164, 26513), (166, 26537), (170, 26552),

Gene: Xkcd426\_27 Start: 27567, Stop: 28907, Start Num: 14

Candidate Starts for Xkcd426\_27:

(8, 27492), (Start: 14 @27567 has 28 MA's), (22, 27642), (46, 27864), (50, 27912), (52, 27918), (58, 27966), (59, 27975), (61, 27987), (65, 28032), (70, 28062), (77, 28119), (86, 28203), (88, 28218), (102, 28323), (115, 28413), (117, 28437), (130, 28527), (131, 28533), (137, 28578), (141, 28626), (144, 28653), (155, 28728), (165, 28827), (177, 28875), (179, 28887),

Gene: YDN12\_23 Start: 20231, Stop: 21568, Start Num: 14

Candidate Starts for YDN12\_23:

(2, 20018), (4, 20066), (5, 20081), (6, 20093), (Start: 14 @20231 has 28 MA's), (22, 20306), (34, 20405), (40, 20477), (43, 20513), (46, 20525), (52, 20579), (54, 20588), (58, 20627), (65, 20693), (86, 20861), (88, 20876), (91, 20915), (92, 20924), (96, 20957), (110, 21032), (115, 21071), (121, 21125), (123, 21137), (125, 21149), (137, 21236), (147, 21326), (154, 21383), (155, 21386), (161, 21452), (179, 21548),