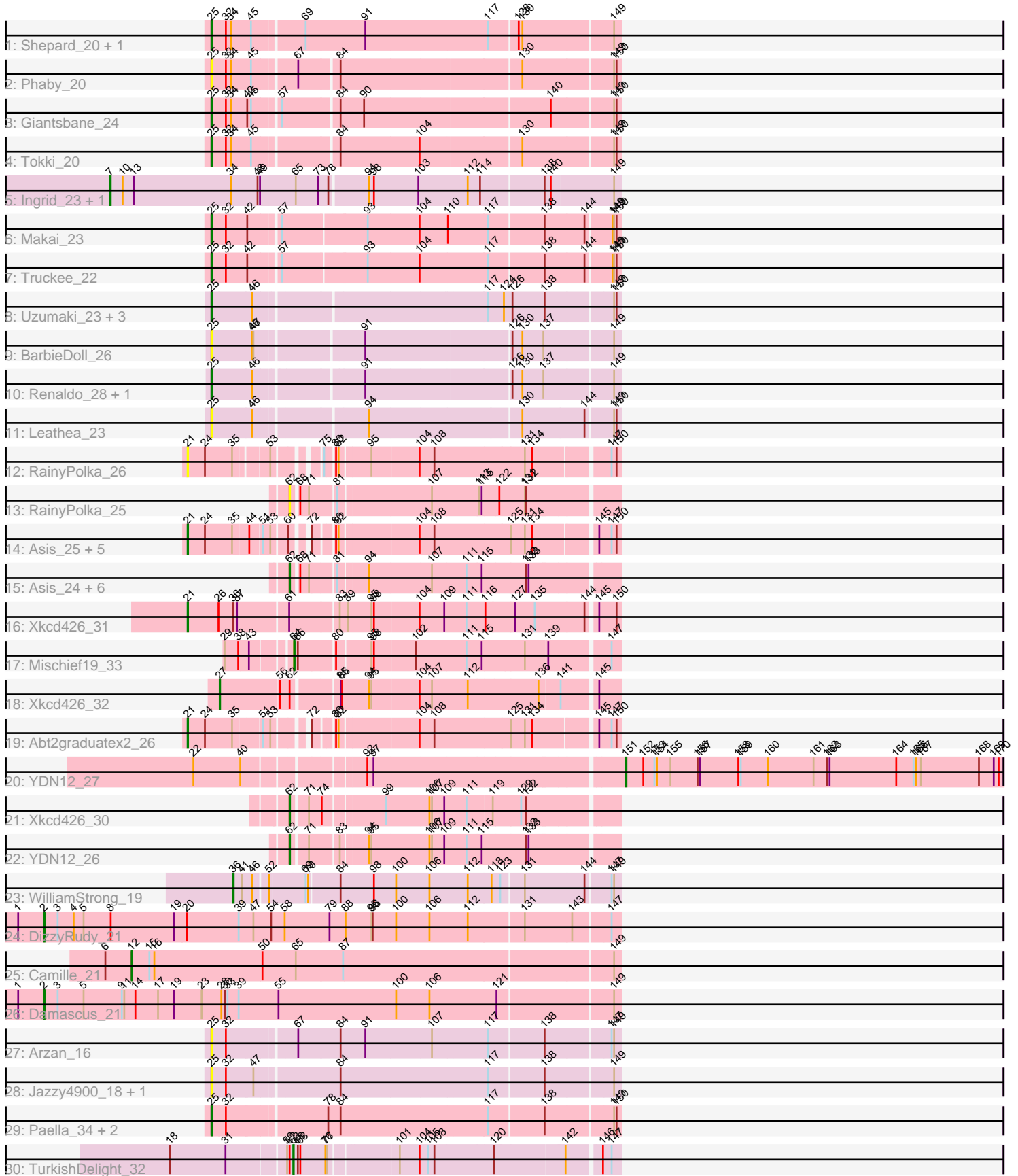


Pham 171526



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 171526 Report

This analysis was run 07/10/24 on database version 566.

Pham number 171526 has 50 members, 10 are drafts.

Phages represented in each track:

- Track 1 : Shepard\_20, LilHuddy\_20
- Track 2 : Phaby\_20
- Track 3 : Giantsbane\_24
- Track 4 : Tokki\_20
- Track 5 : Ingrid\_23, Loretta\_23
- Track 6 : Makai\_23
- Track 7 : Truckee\_22
- Track 8 : Uzumaki\_23, GantcherGoblin\_22, Zeina\_23, Argan\_22
- Track 9 : BarbieDoll\_26
- Track 10 : Renaldo\_28, Lewando\_26
- Track 11 : Leathea\_23
- Track 12 : RainyPolka\_26
- Track 13 : RainyPolka\_25
- Track 14 : Asis\_25, BabyGotBac\_25, Salete\_25, BayC\_25, Maih\_25, TP1604\_25
- Track 15 : Asis\_24, BabyGotBac\_24, TP1604\_24, Salete\_24, BayC\_24, Abt2graduatex2\_25, Maih\_24
- Track 16 : Xkcd426\_31
- Track 17 : Mischief19\_33
- Track 18 : Xkcd426\_32
- Track 19 : Abt2graduatex2\_26
- Track 20 : YDN12\_27
- Track 21 : Xkcd426\_30
- Track 22 : YDN12\_26
- Track 23 : WilliamStrong\_19
- Track 24 : DizzyRudy\_21
- Track 25 : Camille\_21
- Track 26 : Damascus\_21
- Track 27 : Arzan\_16
- Track 28 : Jazzy4900\_18, Sunny4976\_17
- Track 29 : Paella\_34, Qui\_34, Elver\_33
- Track 30 : TurkishDelight\_32

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

The start number called the most often in the published annotations is 25, it was called in 13 of the 40 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Argan\_22, Arzan\_16, BarbieDoll\_26, Elver\_33, GantcherGoblin\_22, Giantsbane\_24, Jazzy4900\_18, Leatheia\_23, Lewando\_26, LilHuddy\_20, Makai\_23, Paella\_34, Phaby\_20, Qui\_34, Renaldo\_28, Shepard\_20, Sunny4976\_17, Tokki\_20, Truckee\_22, Uzumaki\_23, Zeina\_23,

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

- 

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

- Abt2graduatex2\_25, Abt2graduatex2\_26, Asis\_24, Asis\_25, BabyGotBac\_24, BabyGotBac\_25, BayC\_24, BayC\_25, Camille\_21, Damascus\_21, DizzyRudy\_21, Ingrid\_23, Loretta\_23, Maih\_24, Maih\_25, Mischief19\_33, RainyPolka\_25, RainyPolka\_26, Salete\_24, Salete\_25, TP1604\_24, TP1604\_25, TurkishDelight\_32, WilliamStrong\_19, Xkcd426\_30, Xkcd426\_31, Xkcd426\_32, YDN12\_26, YDN12\_27,

### Summary by start number:

Start 2:

- Found in 2 of 50 ( 4.0% ) of genes in pham
- Manual Annotations of this start: 2 of 40
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Damascus\_21 (EL), DizzyRudy\_21 (EL),

Start 7:

- Found in 2 of 50 ( 4.0% ) of genes in pham
- Manual Annotations of this start: 2 of 40
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Ingrid\_23 (AU3), Loretta\_23 (AU3),

Start 12:

- Found in 1 of 50 ( 2.0% ) of genes in pham
- Manual Annotations of this start: 1 of 40
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Camille\_21 (EL),

Start 21:

- Found in 9 of 50 ( 18.0% ) of genes in pham
- Manual Annotations of this start: 8 of 40
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Abt2graduatex2\_26 (BG), Asis\_25 (BG), BabyGotBac\_25 (BG), BayC\_25 (BG), Maih\_25 (BG), RainyPolka\_26 (BG), Salete\_25 (BG), TP1604\_25 (BG), Xkcd426\_31 (BG),

Start 25:

- Found in 21 of 50 ( 42.0% ) of genes in pham
- Manual Annotations of this start: 13 of 40
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Argan\_22 (AU6), Arzan\_16 (FI), BarbieDoll\_26 (AU6), Elver\_33 (FK), GantcherGoblin\_22 (AU6), Giantsbane\_24

(AU2), Jazzy4900\_18 (FI), Leathea\_23 (AU6), Lewando\_26 (AU6), LilHuddy\_20 (AU2), Makai\_23 (AU5), Paella\_34 (FK), Phaby\_20 (AU2), Qui\_34 (FK), Renaldo\_28 (AU6), Shepard\_20 (AU2), Sunny4976\_17 (FI), Tokki\_20 (AU2), Truckee\_22 (AU5), Uzumaki\_23 (AU6), Zeina\_23 (AU6),

Start 27:

- Found in 1 of 50 ( 2.0% ) of genes in pham
- Manual Annotations of this start: 1 of 40
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Xkcd426\_32 (BG),

Start 36:

- Found in 2 of 50 ( 4.0% ) of genes in pham
- Manual Annotations of this start: 1 of 40
- Called 50.0% of time when present
- Phage (with cluster) where this start called: WilliamStrong\_19 (EA6),

Start 62:

- Found in 12 of 50 ( 24.0% ) of genes in pham
- Manual Annotations of this start: 9 of 40
- Called 83.3% of time when present
- Phage (with cluster) where this start called: Abt2graduatex2\_25 (BG), Asis\_24 (BG), BabyGotBac\_24 (BG), BayC\_24 (BG), Maih\_24 (BG), RainyPolka\_25 (BG), Salete\_24 (BG), TP1604\_24 (BG), Xkcd426\_30 (BG), YDN12\_26 (BG),

Start 63:

- Found in 1 of 50 ( 2.0% ) of genes in pham
- Manual Annotations of this start: 1 of 40
- Called 100.0% of time when present
- Phage (with cluster) where this start called: TurkishDelight\_32 (singleton),

Start 64:

- Found in 1 of 50 ( 2.0% ) of genes in pham
- Manual Annotations of this start: 1 of 40
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Mischief19\_33 (BG),

Start 151:

- Found in 1 of 50 ( 2.0% ) of genes in pham
- Manual Annotations of this start: 1 of 40
- Called 100.0% of time when present
- Phage (with cluster) where this start called: YDN12\_27 (BG),

### **Summary by clusters:**

There are 10 clusters represented in this pham: EL, singleton, BG, AU3, AU2, AU5, AU6, FI, FK, EA6,

Info for manual annotations of cluster AU2:

- Start number 25 was manually annotated 4 times for cluster AU2.

Info for manual annotations of cluster AU3:

- Start number 7 was manually annotated 2 times for cluster AU3.

Info for manual annotations of cluster AU5:

- Start number 25 was manually annotated 2 times for cluster AU5.

Info for manual annotations of cluster AU6:

- Start number 25 was manually annotated 5 times for cluster AU6.

Info for manual annotations of cluster BG:

- Start number 21 was manually annotated 8 times for cluster BG.
- Start number 27 was manually annotated 1 time for cluster BG.
- Start number 62 was manually annotated 9 times for cluster BG.
- Start number 64 was manually annotated 1 time for cluster BG.
- Start number 151 was manually annotated 1 time for cluster BG.

Info for manual annotations of cluster EA6:

- Start number 36 was manually annotated 1 time for cluster EA6.

Info for manual annotations of cluster EL:

- Start number 2 was manually annotated 2 times for cluster EL.
- Start number 12 was manually annotated 1 time for cluster EL.

Info for manual annotations of cluster FK:

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

### ***Gene Information:***

Gene: Abt2graduatex2\_25 Start: 23773, Stop: 24504, Start Num: 62

Candidate Starts for Abt2graduatex2\_25:

(Start: 62 @23773 has 9 MA's), (68, 23788), (71, 23809), (81, 23866), (94, 23932), (107, 24079), (111, 24160), (115, 24196), (132, 24298), (133, 24304),

Gene: Abt2graduatex2\_26 Start: 24514, Stop: 25437, Start Num: 21

Candidate Starts for Abt2graduatex2\_26:

(Start: 21 @24514 has 8 MA's), (24, 24556), (35, 24622), (51, 24682), (53, 24700), (72, 24760), (80, 24799), (82, 24805), (104, 24982), (108, 25015), (125, 25192), (131, 25225), (134, 25243), (145, 25384), (147, 25414), (150, 25426),

Gene: Argan\_22 Start: 17327, Stop: 18250, Start Num: 25

Candidate Starts for Argan\_22:

(Start: 25 @17327 has 13 MA's), (46, 17423), (117, 17939), (124, 17978), (126, 17999), (138, 18077), (149, 18233), (150, 18239),

Gene: Arzan\_16 Start: 12657, Stop: 13586, Start Num: 25

Candidate Starts for Arzan\_16:

(Start: 25 @12657 has 13 MA's), (32, 12690), (67, 12837), (84, 12939), (91, 12999), (107, 13155), (117, 13284), (138, 13413), (147, 13563), (149, 13569),

Gene: Asis\_25 Start: 23929, Stop: 24852, Start Num: 21

Candidate Starts for Asis\_25:

(Start: 21 @23929 has 8 MA's), (24, 23971), (35, 24037), (44, 24070), (51, 24097), (53, 24115), (60, 24148), (72, 24175), (80, 24214), (82, 24220), (104, 24397), (108, 24430), (125, 24607), (131, 24640), (134, 24658), (145, 24799), (147, 24829), (150, 24841),

Gene: Asis\_24 Start: 23188, Stop: 23919, Start Num: 62

Candidate Starts for Asis\_24:

(Start: 62 @23188 has 9 MA's), (68, 23203), (71, 23224), (81, 23281), (94, 23347), (107, 23494), (111, 23575), (115, 23611), (132, 23713), (133, 23719),

Gene: BabyGotBac\_25 Start: 23929, Stop: 24852, Start Num: 21

Candidate Starts for BabyGotBac\_25:

(Start: 21 @23929 has 8 MA's), (24, 23971), (35, 24037), (44, 24070), (51, 24097), (53, 24115), (60, 24148), (72, 24175), (80, 24214), (82, 24220), (104, 24397), (108, 24430), (125, 24607), (131, 24640), (134, 24658), (145, 24799), (147, 24829), (150, 24841),

Gene: BabyGotBac\_24 Start: 23188, Stop: 23919, Start Num: 62

Candidate Starts for BabyGotBac\_24:

(Start: 62 @23188 has 9 MA's), (68, 23203), (71, 23224), (81, 23281), (94, 23347), (107, 23494), (111, 23575), (115, 23611), (132, 23713), (133, 23719),

Gene: BarbieDoll\_26 Start: 19306, Stop: 20223, Start Num: 25

Candidate Starts for BarbieDoll\_26:

(Start: 25 @19306 has 13 MA's), (46, 19402), (47, 19405), (91, 19636), (126, 19969), (130, 19993), (137, 20044), (149, 20206),

Gene: BayC\_24 Start: 23188, Stop: 23919, Start Num: 62

Candidate Starts for BayC\_24:

(Start: 62 @23188 has 9 MA's), (68, 23203), (71, 23224), (81, 23281), (94, 23347), (107, 23494), (111, 23575), (115, 23611), (132, 23713), (133, 23719),

Gene: BayC\_25 Start: 23929, Stop: 24852, Start Num: 21

Candidate Starts for BayC\_25:

(Start: 21 @23929 has 8 MA's), (24, 23971), (35, 24037), (44, 24070), (51, 24097), (53, 24115), (60, 24148), (72, 24175), (80, 24214), (82, 24220), (104, 24397), (108, 24430), (125, 24607), (131, 24640), (134, 24658), (145, 24799), (147, 24829), (150, 24841),

Gene: Camille\_21 Start: 14413, Stop: 15567, Start Num: 12

Candidate Starts for Camille\_21:

(6, 14350), (Start: 12 @14413 has 1 MA's), (15, 14455), (16, 14467), (50, 14725), (65, 14806), (87, 14920), (149, 15550),

Gene: Damascus\_21 Start: 14882, Stop: 16249, Start Num: 2

Candidate Starts for Damascus\_21:

(1, 14819), (Start: 2 @14882 has 2 MA's), (3, 14915), (5, 14978), (9, 15071), (11, 15077), (14, 15104), (17, 15158), (19, 15197), (23, 15263), (28, 15311), (30, 15320), (33, 15326), (39, 15353), (55, 15446), (100, 15725), (106, 15806), (121, 15968), (149, 16232),

Gene: DizzyRudy\_21 Start: 14811, Stop: 16178, Start Num: 2

Candidate Starts for DizzyRudy\_21:

(1, 14748), (Start: 2 @14811 has 2 MA's), (3, 14844), (4, 14883), (5, 14907), (8, 14973), (19, 15126), (20, 15156), (39, 15282), (47, 15318), (54, 15357), (58, 15390), (79, 15498), (88, 15534), (95, 15597), (96, 15600), (100, 15654), (106, 15735), (112, 15828), (131, 15957), (143, 16071), (147, 16155),

Gene: Elver\_33 Start: 23694, Stop: 24623, Start Num: 25

Candidate Starts for Elver\_33:

(Start: 25 @23694 has 13 MA's), (32, 23727), (78, 23946), (84, 23976), (117, 24321), (138, 24450), (149, 24606), (150, 24612),

Gene: GantcherGoblin\_22 Start: 17366, Stop: 18289, Start Num: 25

Candidate Starts for GantcherGoblin\_22:

(Start: 25 @17366 has 13 MA's), (46, 17462), (117, 17978), (124, 18017), (126, 18038), (138, 18116), (149, 18272), (150, 18278),

Gene: Giantsbane\_24 Start: 17626, Stop: 18546, Start Num: 25

Candidate Starts for Giantsbane\_24:

(Start: 25 @17626 has 13 MA's), (32, 17659), (34, 17671), (42, 17707), (45, 17716), (57, 17773), (84, 17902), (90, 17956), (140, 18385), (149, 18529), (150, 18535),

Gene: Ingrid\_23 Start: 17977, Stop: 19170, Start Num: 7

Candidate Starts for Ingrid\_23:

(Start: 7 @17977 has 2 MA's), (10, 18007), (13, 18034), (34, 18268), (48, 18331), (49, 18337), (65, 18421), (73, 18475), (78, 18499), (94, 18583), (98, 18595), (103, 18700), (112, 18811), (114, 18841), (138, 18988), (140, 19003), (149, 19153),

Gene: Jazzy4900\_18 Start: 12693, Stop: 13619, Start Num: 25

Candidate Starts for Jazzy4900\_18:

(Start: 25 @12693 has 13 MA's), (32, 12726), (47, 12789), (84, 12975), (117, 13317), (138, 13446), (149, 13602),

Gene: Leathea\_23 Start: 17352, Stop: 18275, Start Num: 25

Candidate Starts for Leathea\_23:

(Start: 25 @17352 has 13 MA's), (46, 17448), (94, 17691), (130, 18045), (144, 18195), (149, 18258), (150, 18264),

Gene: Lewando\_26 Start: 19288, Stop: 20205, Start Num: 25

Candidate Starts for Lewando\_26:

(Start: 25 @19288 has 13 MA's), (46, 19384), (91, 19618), (126, 19951), (130, 19975), (137, 20026), (149, 20188),

Gene: LilHuddy\_20 Start: 14940, Stop: 15875, Start Num: 25

Candidate Starts for LilHuddy\_20:

(Start: 25 @14940 has 13 MA's), (32, 14973), (34, 14985), (45, 15030), (69, 15144), (91, 15285), (117, 15573), (128, 15639), (130, 15648), (149, 15858),

Gene: Loretta\_23 Start: 17977, Stop: 19170, Start Num: 7

Candidate Starts for Loretta\_23:

(Start: 7 @17977 has 2 MA's), (10, 18007), (13, 18034), (34, 18268), (48, 18331), (49, 18337), (65, 18421), (73, 18475), (78, 18499), (94, 18583), (98, 18595), (103, 18700), (112, 18811), (114, 18841), (138, 18988), (140, 19003), (149, 19153),

Gene: Maih\_24 Start: 23187, Stop: 23918, Start Num: 62

Candidate Starts for Maih\_24:

(Start: 62 @23187 has 9 MA's), (68, 23202), (71, 23223), (81, 23280), (94, 23346), (107, 23493), (111, 23574), (115, 23610), (132, 23712), (133, 23718),

Gene: Maih\_25 Start: 23928, Stop: 24851, Start Num: 21

Candidate Starts for Maih\_25:

(Start: 21 @23928 has 8 MA's), (24, 23970), (35, 24036), (44, 24069), (51, 24096), (53, 24114), (60, 24147), (72, 24174), (80, 24213), (82, 24219), (104, 24396), (108, 24429), (125, 24606), (131, 24639), (134, 24657), (145, 24798), (147, 24828), (150, 24840),

Gene: Makai\_23 Start: 18454, Stop: 19380, Start Num: 25

Candidate Starts for Makai\_23:

(Start: 25 @18454 has 13 MA's), (32, 18487), (42, 18535), (57, 18601), (93, 18793), (104, 18916), (110, 18979), (117, 19075), (138, 19204), (144, 19300), (148, 19360), (149, 19363), (150, 19369),

Gene: Mischief19\_33 Start: 33795, Stop: 34517, Start Num: 64

Candidate Starts for Mischief19\_33:

(29, 33657), (38, 33690), (43, 33714), (Start: 64 @33795 has 1 MA's), (66, 33804), (80, 33885), (95, 33960), (98, 33966), (102, 34062), (111, 34179), (115, 34215), (131, 34314), (139, 34365), (147, 34494),

Gene: Paella\_34 Start: 23696, Stop: 24625, Start Num: 25

Candidate Starts for Paella\_34:

(Start: 25 @23696 has 13 MA's), (32, 23729), (78, 23948), (84, 23978), (117, 24323), (138, 24452), (149, 24608), (150, 24614),

Gene: Phaby\_20 Start: 14926, Stop: 15846, Start Num: 25

Candidate Starts for Phaby\_20:

(Start: 25 @14926 has 13 MA's), (32, 14959), (34, 14971), (45, 15016), (67, 15112), (84, 15202), (130, 15616), (149, 15829), (150, 15835),

Gene: Qui\_34 Start: 23696, Stop: 24625, Start Num: 25

Candidate Starts for Qui\_34:

(Start: 25 @23696 has 13 MA's), (32, 23729), (78, 23948), (84, 23978), (117, 24323), (138, 24452), (149, 24608), (150, 24614),

Gene: RainyPolka\_26 Start: 24385, Stop: 25302, Start Num: 21

Candidate Starts for RainyPolka\_26:

(Start: 21 @24385 has 8 MA's), (24, 24427), (35, 24493), (53, 24565), (75, 24646), (80, 24664), (82, 24670), (95, 24736), (104, 24847), (108, 24880), (131, 25090), (134, 25108), (147, 25279), (150, 25291),

Gene: RainyPolka\_25 Start: 23647, Stop: 24375, Start Num: 62

Candidate Starts for RainyPolka\_25:

(Start: 62 @23647 has 9 MA's), (68, 23662), (71, 23683), (81, 23740), (107, 23950), (113, 24061), (115, 24067), (122, 24106), (131, 24166), (132, 24169),

Gene: Renaldo\_28 Start: 19297, Stop: 20214, Start Num: 25

Candidate Starts for Renaldo\_28:

(Start: 25 @19297 has 13 MA's), (46, 19393), (91, 19627), (126, 19960), (130, 19984), (137, 20035), (149, 20197),

Gene: Salete\_25 Start: 23929, Stop: 24852, Start Num: 21

Candidate Starts for Salete\_25:

(Start: 21 @23929 has 8 MA's), (24, 23971), (35, 24037), (44, 24070), (51, 24097), (53, 24115), (60, 24148), (72, 24175), (80, 24214), (82, 24220), (104, 24397), (108, 24430), (125, 24607), (131, 24640), (134, 24658), (145, 24799), (147, 24829), (150, 24841),



Gene: Salete\_24 Start: 23188, Stop: 23919, Start Num: 62

Candidate Starts for Salete\_24:

(Start: 62 @23188 has 9 MA's), (68, 23203), (71, 23224), (81, 23281), (94, 23347), (107, 23494), (111, 23575), (115, 23611), (132, 23713), (133, 23719),

Gene: Shepard\_20 Start: 14937, Stop: 15872, Start Num: 25

Candidate Starts for Shepard\_20:

(Start: 25 @14937 has 13 MA's), (32, 14970), (34, 14982), (45, 15027), (69, 15141), (91, 15282), (117, 15570), (128, 15636), (130, 15645), (149, 15855),

Gene: Sunny4976\_17 Start: 12693, Stop: 13619, Start Num: 25

Candidate Starts for Sunny4976\_17:

(Start: 25 @12693 has 13 MA's), (32, 12726), (47, 12789), (84, 12975), (117, 13317), (138, 13446), (149, 13602),

Gene: TP1604\_24 Start: 23188, Stop: 23919, Start Num: 62

Candidate Starts for TP1604\_24:

(Start: 62 @23188 has 9 MA's), (68, 23203), (71, 23224), (81, 23281), (94, 23347), (107, 23494), (111, 23575), (115, 23611), (132, 23713), (133, 23719),

Gene: TP1604\_25 Start: 23929, Stop: 24852, Start Num: 21

Candidate Starts for TP1604\_25:

(Start: 21 @23929 has 8 MA's), (24, 23971), (35, 24037), (44, 24070), (51, 24097), (53, 24115), (60, 24148), (72, 24175), (80, 24214), (82, 24220), (104, 24397), (108, 24430), (125, 24607), (131, 24640), (134, 24658), (145, 24799), (147, 24829), (150, 24841),

Gene: Tokki\_20 Start: 14976, Stop: 15896, Start Num: 25

Candidate Starts for Tokki\_20:

(Start: 25 @14976 has 13 MA's), (32, 15009), (34, 15021), (45, 15066), (84, 15252), (104, 15438), (130, 15666), (149, 15879), (150, 15885),

Gene: Truckee\_22 Start: 18499, Stop: 19425, Start Num: 25

Candidate Starts for Truckee\_22:

(Start: 25 @18499 has 13 MA's), (32, 18532), (42, 18580), (57, 18646), (93, 18838), (104, 18961), (117, 19120), (138, 19249), (144, 19345), (148, 19405), (149, 19408), (150, 19414),

Gene: TurkishDelight\_32 Start: 29754, Stop: 30473, Start Num: 63

Candidate Starts for TurkishDelight\_32:

(18, 29469), (31, 29604), (59, 29739), (Start: 62 @29745 has 9 MA's), (Start: 63 @29754 has 1 MA's), (66, 29763), (68, 29769), (76, 29826), (77, 29829), (101, 29979), (104, 30027), (105, 30045), (108, 30060), (120, 30198), (142, 30357), (146, 30429), (147, 30450),

Gene: Uzumaki\_23 Start: 18185, Stop: 19108, Start Num: 25

Candidate Starts for Uzumaki\_23:

(Start: 25 @18185 has 13 MA's), (46, 18281), (117, 18797), (124, 18836), (126, 18857), (138, 18935), (149, 19091), (150, 19097),

Gene: WilliamStrong\_19 Start: 16962, Stop: 17843, Start Num: 36

Candidate Starts for WilliamStrong\_19:

(Start: 36 @16962 has 1 MA's), (41, 16983), (46, 17007), (52, 17037), (69, 17115), (70, 17121), (84, 17190), (98, 17268), (100, 17319), (106, 17400), (112, 17493), (118, 17550), (123, 17571), (131, 17622), (144, 17766), (147, 17820), (149, 17826),

Gene: Xkcd426\_31 Start: 31289, Stop: 32287, Start Num: 21

Candidate Starts for Xkcd426\_31:

(Start: 21 @31289 has 8 MA's), (26, 31364), (Start: 36 @31400 has 1 MA's), (37, 31409), (61, 31526), (83, 31640), (89, 31658), (95, 31715), (98, 31721), (104, 31826), (109, 31883), (111, 31937), (116, 31976), (127, 32045), (135, 32093), (144, 32213), (145, 32234), (150, 32276),

Gene: Xkcd426\_32 Start: 32302, Stop: 33195, Start Num: 27

Candidate Starts for Xkcd426\_32:

(Start: 27 @32302 has 1 MA's), (56, 32443), (Start: 62 @32464 has 9 MA's), (85, 32566), (86, 32569), (94, 32629), (95, 32635), (104, 32746), (107, 32773), (112, 32860), (136, 33025), (141, 33067), (145, 33142),

Gene: Xkcd426\_30 Start: 30543, Stop: 31274, Start Num: 62

Candidate Starts for Xkcd426\_30:

(Start: 62 @30543 has 9 MA's), (71, 30579), (74, 30606), (99, 30744), (106, 30846), (107, 30852), (109, 30882), (111, 30930), (119, 30990), (129, 31056), (132, 31068),

Gene: YDN12\_27 Start: 23900, Stop: 24817, Start Num: 151

Candidate Starts for YDN12\_27:

(22, 22943), (40, 23057), (92, 23312), (97, 23327), (Start: 151 @23900 has 1 MA's), (152, 23942), (153, 23969), (154, 23975), (155, 24008), (156, 24074), (157, 24080), (158, 24173), (159, 24179), (160, 24245), (161, 24356), (162, 24389), (163, 24395), (164, 24557), (165, 24599), (166, 24605), (167, 24617), (168, 24758), (169, 24794), (170, 24806),

Gene: YDN12\_26 Start: 23157, Stop: 23888, Start Num: 62

Candidate Starts for YDN12\_26:

(Start: 62 @23157 has 9 MA's), (71, 23193), (83, 23256), (94, 23316), (95, 23322), (106, 23457), (107, 23463), (109, 23493), (111, 23544), (115, 23580), (132, 23682), (133, 23688),

Gene: Zeina\_23 Start: 17566, Stop: 18489, Start Num: 25

Candidate Starts for Zeina\_23:

(Start: 25 @17566 has 13 MA's), (46, 17662), (117, 18178), (124, 18217), (126, 18238), (138, 18316), (149, 18472), (150, 18478),