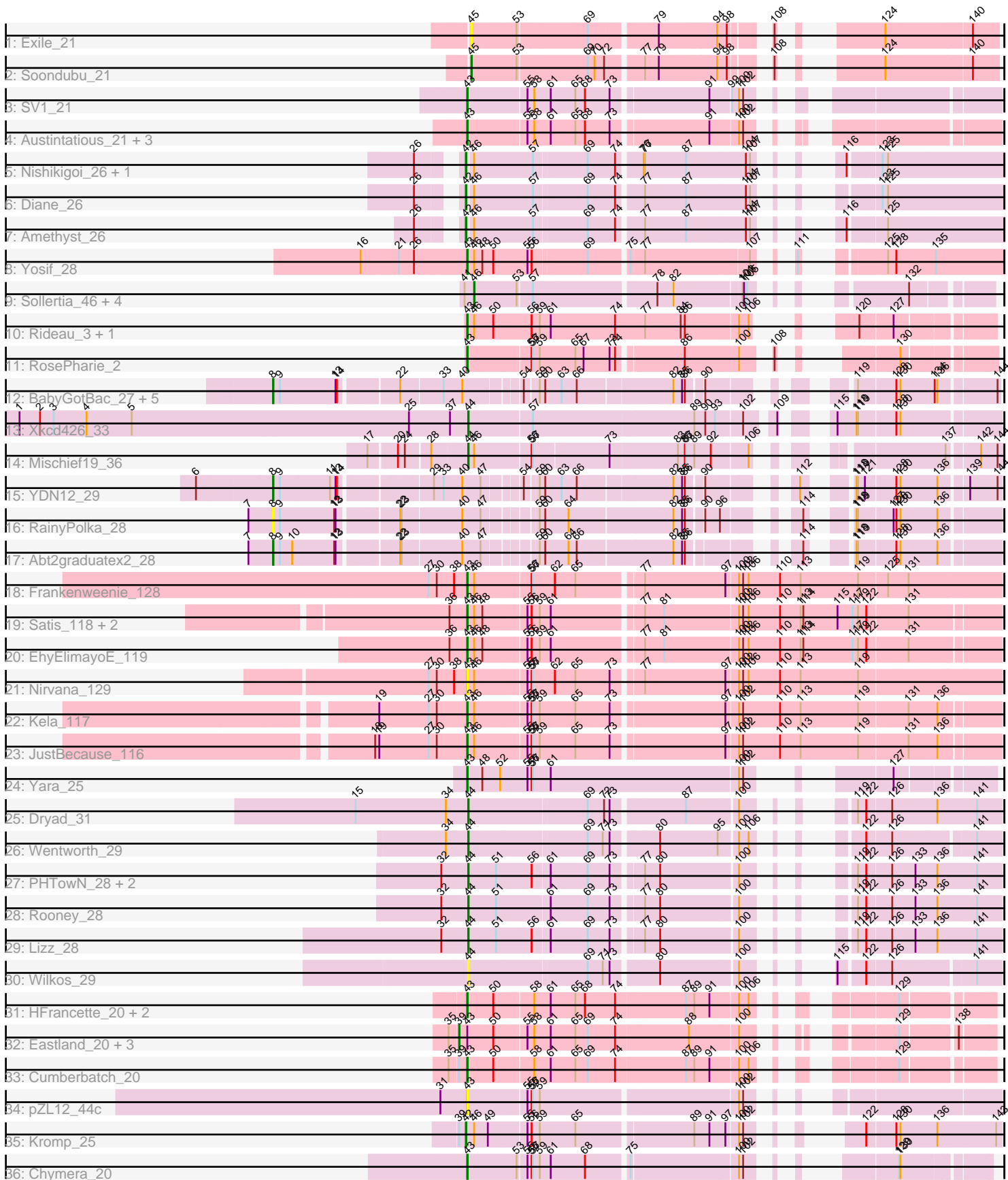


# Pham 196563



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 196563 Report

This analysis was run 12/09/24 on database version 580.

Pham number 196563 has 59 members, 6 are drafts.

Phages represented in each track:

- Track 1 : Exile\_21
- Track 2 : Soondubu\_21
- Track 3 : SV1\_21
- Track 4 : Austintatious\_21, Ididsumtinwong\_21, PapayaSalad\_21, Bioscum\_21
- Track 5 : Nishikigoi\_26, Haizum\_26
- Track 6 : Diane\_26
- Track 7 : Amethyst\_26
- Track 8 : Yosif\_28
- Track 9 : Sollertia\_46, Genie2\_46, Yaboi\_46, Stanimal\_46, BoomerJR\_46
- Track 10 : Rideau\_3, Dennebes\_2
- Track 11 : RosePharie\_2
- Track 12 : BabyGotBac\_27, Asis\_27, BayC\_27, TP1604\_27, Maih\_27, Salete\_27
- Track 13 : Xkcd426\_33
- Track 14 : Mischief19\_36
- Track 15 : YDN12\_29
- Track 16 : RainyPolka\_28
- Track 17 : Abt2graduatex2\_28
- Track 18 : Frankenweenie\_128
- Track 19 : Satis\_118, Quantum\_117, Kradal\_118
- Track 20 : EhyElimayoE\_119
- Track 21 : Nirvana\_129
- Track 22 : Kela\_117
- Track 23 : JustBecause\_116
- Track 24 : Yara\_25
- Track 25 : Dryad\_31
- Track 26 : Wentworth\_29
- Track 27 : PHTowN\_28, Gibson\_28, ShakeNBake\_28
- Track 28 : Rooney\_28
- Track 29 : Lizz\_28
- Track 30 : Wilkos\_29
- Track 31 : HFrancette\_20, Ignacio\_20, Vondra\_20
- Track 32 : Eastland\_20, AxeJC\_20, Piccadilly\_20, Eklok\_20
- Track 33 : Cumberbatch\_20
- Track 34 : pZL12\_44c
- Track 35 : Kromp\_25
- Track 36 : Chymera\_20

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

The start number called the most often in the published annotations is 43, it was called in 21 of the 53 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Austintatious\_21, Bioscum\_21, Chymera\_20, Cumberbatch\_20, Dennebes\_2, EhyElimayoE\_119, Frankenweenie\_128, HFrancette\_20, Ididsumtinwong\_21, Ignacio\_20, JustBecause\_116, Kela\_117, Kradal\_118, Nirvana\_129, PapayaSalad\_21, Quantum\_117, Rideau\_3, RosePharie\_2, SV1\_21, Satis\_118, Vondra\_20, Yara\_25, Yosif\_28, pZL12\_44c,

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

- AxeJC\_20, Eastland\_20, Eklok\_20, Piccadilly\_20,

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

- Abt2graduatex2\_28, Amethyst\_26, Asis\_27, BabyGotBac\_27, BayC\_27, BoomerJR\_46, Diane\_26, Dryad\_31, Exile\_21, Genie2\_46, Gibson\_28, Haizum\_26, Kromp\_25, Lizz\_28, Maih\_27, Mischief19\_36, Nishikigoi\_26, PHTowN\_28, RainyPolka\_28, Rooney\_28, Salete\_27, ShakeNBake\_28, Sollertia\_46, Soondubu\_21, Stanimal\_46, TP1604\_27, Wentworth\_29, Wilkos\_29, Xkcd426\_33, YDN12\_29, Yaboi\_46,

### **Summary by start number:**

Start 8:

- Found in 9 of 59 ( 15.3% ) of genes in pham
- Manual Annotations of this start: 8 of 53
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Abt2graduatex2\_28 (BG), Asis\_27 (BG), BabyGotBac\_27 (BG), BayC\_27 (BG), Maih\_27 (BG), RainyPolka\_28 (BG), Salete\_27 (BG), TP1604\_27 (BG), YDN12\_29 (BG),

Start 39:

- Found in 6 of 59 ( 10.2% ) of genes in pham
- Manual Annotations of this start: 4 of 53
- Called 66.7% of time when present
- Phage (with cluster) where this start called: AxeJC\_20 (BP), Eastland\_20 (BP), Eklok\_20 (BP), Piccadilly\_20 (BP),

Start 42:

- Found in 5 of 59 ( 8.5% ) of genes in pham
- Manual Annotations of this start: 5 of 53
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Amethyst\_26 (BD2), Diane\_26 (BD2), Haizum\_26 (BD2), Kromp\_25 (singleton), Nishikigoi\_26 (BD2),

Start 43:

- Found in 28 of 59 ( 47.5% ) of genes in pham
- Manual Annotations of this start: 21 of 53

- Called 85.7% of time when present
- Phage (with cluster) where this start called: Austintatious\_21 (BC3), Bioscum\_21 (BC3), Chymera\_20 (singleton), Cumberbatch\_20 (BP), Dennebes\_2 (BF), EhyElimayoE\_119 (BM), Frankenweenie\_128 (BM), HFrancette\_20 (BP), Ididsumtinwong\_21 (BC3), Ignacio\_20 (BP), JustBecause\_116 (BM), Kela\_117 (BM), Kradal\_118 (BM), Nirvana\_129 (BM), PapayaSalad\_21 (BC3), Quantum\_117 (BM), Rideau\_3 (BF), RosePharie\_2 (BF), SV1\_21 (BC1), Satis\_118 (BM), Vondra\_20 (BP), Yara\_25 (BN), Yosif\_28 (BD3), pZL12\_44c (singleton),

#### Start 44:

- Found in 10 of 59 ( 16.9% ) of genes in pham
- Manual Annotations of this start: 9 of 53
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Dryad\_31 (BN), Gibson\_28 (BN), Lizz\_28 (BN), Mischief19\_36 (BG), PHTowN\_28 (BN), Rooney\_28 (BN), ShakeNBake\_28 (BN), Wentworth\_29 (BN), Wilkos\_29 (BN), Xkcd426\_33 (BG),

#### Start 45:

- Found in 2 of 59 ( 3.4% ) of genes in pham
- Manual Annotations of this start: 1 of 53
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Exile\_21 (AZ), Soondubu\_21 (AZ),

#### Start 46:

- Found in 22 of 59 ( 37.3% ) of genes in pham
- Manual Annotations of this start: 5 of 53
- Called 22.7% of time when present
- Phage (with cluster) where this start called: BoomerJR\_46 (BE2), Genie2\_46 (BE2), Sollertia\_46 (BE2), Stanimal\_46 (BE2), Yaboi\_46 (BE2),

### Summary by clusters:

There are 12 clusters represented in this pham: BF, BG, BM, BN, singleton, BP, BD3, BD2, BE2, AZ, BC1, BC3,

Info for manual annotations of cluster AZ:

- Start number 45 was manually annotated 1 time for cluster AZ.

Info for manual annotations of cluster BC1:

- Start number 43 was manually annotated 1 time for cluster BC1.

Info for manual annotations of cluster BC3:

- Start number 43 was manually annotated 4 times for cluster BC3.

Info for manual annotations of cluster BD2:

- Start number 42 was manually annotated 4 times for cluster BD2.

Info for manual annotations of cluster BD3:

- Start number 43 was manually annotated 1 time for cluster BD3.

Info for manual annotations of cluster BE2:

- Start number 46 was manually annotated 5 times for cluster BE2.

Info for manual annotations of cluster BF:

- Start number 43 was manually annotated 2 times for cluster BF.

Info for manual annotations of cluster BG:

- Start number 8 was manually annotated 8 times for cluster BG.
- Start number 44 was manually annotated 2 times for cluster BG.

Info for manual annotations of cluster BM:

- Start number 43 was manually annotated 7 times for cluster BM.

Info for manual annotations of cluster BN:

- Start number 43 was manually annotated 1 time for cluster BN.
- Start number 44 was manually annotated 7 times for cluster BN.

Info for manual annotations of cluster BP:

- Start number 39 was manually annotated 4 times for cluster BP.
- Start number 43 was manually annotated 4 times for cluster BP.

### **Gene Information:**

Gene: Abt2graduatex2\_28 Start: 26138, Stop: 27415, Start Num: 8

Candidate Starts for Abt2graduatex2\_28:

(7, 26084), (Start: 8 @26138 has 8 MA's), (9, 26153), (10, 26180), (12, 26270), (13, 26273), (22, 26384), (23, 26387), (40, 26510), (47, 26546), (59, 26642), (60, 26651), (64, 26699), (66, 26714), (82, 26900), (85, 26918), (86, 26924), (114, 27077), (118, 27128), (119, 27131), (128, 27209), (130, 27218), (136, 27293),

Gene: Amethyst\_26 Start: 21581, Stop: 22531, Start Num: 42

Candidate Starts for Amethyst\_26:

(26, 21512), (Start: 42 @21581 has 5 MA's), (Start: 46 @21593 has 5 MA's), (57, 21722), (69, 21833), (74, 21893), (77, 21941), (87, 22031), (104, 22154), (107, 22163), (116, 22208), (125, 22280),

Gene: Asis\_27 Start: 25552, Stop: 26814, Start Num: 8

Candidate Starts for Asis\_27:

(Start: 8 @25552 has 8 MA's), (9, 25564), (13, 25684), (14, 25687), (22, 25795), (33, 25882), (40, 25921), (54, 26029), (59, 26053), (60, 26062), (63, 26095), (66, 26125), (82, 26302), (85, 26320), (86, 26326), (90, 26356), (119, 26533), (128, 26611), (130, 26620), (134, 26689), (136, 26695), (144, 26809),

Gene: Austintatious\_21 Start: 16123, Stop: 17064, Start Num: 43

Candidate Starts for Austintatious\_21:

(Start: 43 @16123 has 21 MA's), (55, 16243), (58, 16258), (61, 16294), (65, 16348), (68, 16369), (73, 16423), (91, 16618), (100, 16672), (102, 16681),

Gene: AxeJC\_20 Start: 16979, Stop: 17923, Start Num: 39

Candidate Starts for AxeJC\_20:

(35, 16961), (Start: 39 @16979 has 4 MA's), (Start: 43 @16994 has 21 MA's), (50, 17048), (55, 17114), (58, 17129), (61, 17165), (65, 17219), (69, 17246), (74, 17306), (88, 17462), (100, 17561), (129, 17750), (138, 17849),

Gene: BabyGotBac\_27 Start: 25552, Stop: 26814, Start Num: 8

Candidate Starts for BabyGotBac\_27:

(Start: 8 @25552 has 8 MA's), (9, 25564), (13, 25684), (14, 25687), (22, 25795), (33, 25882), (40, 25921), (54, 26029), (59, 26053), (60, 26062), (63, 26095), (66, 26125), (82, 26302), (85, 26320), (86, 26326), (90, 26356), (119, 26533), (128, 26611), (130, 26620), (134, 26689), (136, 26695), (144, 26809),

Gene: BayC\_27 Start: 25552, Stop: 26814, Start Num: 8

Candidate Starts for BayC\_27:

(Start: 8 @25552 has 8 MA's), (9, 25564), (13, 25684), (14, 25687), (22, 25795), (33, 25882), (40, 25921), (54, 26029), (59, 26053), (60, 26062), (63, 26095), (66, 26125), (82, 26302), (85, 26320), (86, 26326), (90, 26356), (119, 26533), (128, 26611), (130, 26620), (134, 26689), (136, 26695), (144, 26809),

Gene: Bioscum\_21 Start: 16159, Stop: 17100, Start Num: 43

Candidate Starts for Bioscum\_21:

(Start: 43 @16159 has 21 MA's), (55, 16279), (58, 16294), (61, 16330), (65, 16384), (68, 16405), (73, 16459), (91, 16654), (100, 16708), (102, 16717),

Gene: BoomerJR\_46 Start: 21403, Stop: 22296, Start Num: 46

Candidate Starts for BoomerJR\_46:

(41, 21382), (Start: 46 @21403 has 5 MA's), (53, 21493), (57, 21523), (78, 21778), (82, 21808), (101, 21949), (103, 21952), (105, 21958), (132, 22138),

Gene: Chymera\_20 Start: 16278, Stop: 17153, Start Num: 43

Candidate Starts for Chymera\_20:

(Start: 43 @16278 has 21 MA's), (53, 16380), (55, 16398), (56, 16407), (57, 16410), (59, 16425), (61, 16449), (68, 16524), (75, 16608), (100, 16827), (102, 16836), (129, 16989), (130, 16992),

Gene: Cumberbatch\_20 Start: 16995, Stop: 17939, Start Num: 43

Candidate Starts for Cumberbatch\_20:

(35, 16962), (Start: 39 @16980 has 4 MA's), (Start: 43 @16995 has 21 MA's), (50, 17049), (58, 17130), (61, 17166), (65, 17220), (69, 17247), (74, 17307), (87, 17457), (89, 17475), (91, 17508), (100, 17562), (106, 17583), (129, 17766),

Gene: Dennebes\_2 Start: 2618, Stop: 3529, Start Num: 43

Candidate Starts for Dennebes\_2:

(Start: 43 @2618 has 21 MA's), (Start: 46 @2630 has 5 MA's), (50, 2672), (56, 2753), (59, 2771), (61, 2795), (74, 2936), (77, 3002), (84, 3080), (86, 3089), (100, 3197), (106, 3218), (120, 3278), (127, 3344),

Gene: Diane\_26 Start: 21914, Stop: 22867, Start Num: 42

Candidate Starts for Diane\_26:

(26, 21845), (Start: 42 @21914 has 5 MA's), (Start: 46 @21926 has 5 MA's), (57, 22055), (69, 22166), (74, 22226), (77, 22274), (87, 22364), (104, 22487), (107, 22496), (123, 22604), (125, 22616),

Gene: Dryad\_31 Start: 20705, Stop: 21643, Start Num: 44

Candidate Starts for Dryad\_31:

(15, 20459), (34, 20657), (Start: 44 @20705 has 9 MA's), (69, 20954), (72, 20990), (73, 21002), (87, 21149), (100, 21251), (119, 21344), (122, 21362), (126, 21413), (136, 21506), (141, 21590),

Gene: Eastland\_20 Start: 16964, Stop: 17908, Start Num: 39

Candidate Starts for Eastland\_20:

(35, 16946), (Start: 39 @16964 has 4 MA's), (Start: 43 @16979 has 21 MA's), (50, 17033), (55, 17099), (58, 17114), (61, 17150), (65, 17204), (69, 17231), (74, 17291), (88, 17447), (100, 17546), (129, 17735), (138, 17834),

Gene: EhyElimayoE\_119 Start: 77532, Stop: 78617, Start Num: 43

Candidate Starts for EhyElimayoE\_119:

(36, 77493), (Start: 43 @77532 has 21 MA's), (Start: 46 @77544 has 5 MA's), (48, 77562), (55, 77652), (56, 77661), (59, 77679), (61, 77703), (77, 77886), (81, 77928), (100, 78081), (102, 78090), (106, 78102), (110, 78171), (113, 78216), (114, 78222), (117, 78327), (119, 78339), (122, 78357), (131, 78438),

Gene: Eklok\_20 Start: 16979, Stop: 17923, Start Num: 39

Candidate Starts for Eklok\_20:

(35, 16961), (Start: 39 @16979 has 4 MA's), (Start: 43 @16994 has 21 MA's), (50, 17048), (55, 17114), (58, 17129), (61, 17165), (65, 17219), (69, 17246), (74, 17306), (88, 17462), (100, 17561), (129, 17750), (138, 17849),

Gene: Exile\_21 Start: 20646, Stop: 21581, Start Num: 45

Candidate Starts for Exile\_21:

(Start: 45 @20646 has 1 MA's), (53, 20739), (69, 20886), (79, 21021), (94, 21147), (98, 21168), (108, 21222), (124, 21342), (140, 21525),

Gene: Frankenweenie\_128 Start: 82432, Stop: 83532, Start Num: 43

Candidate Starts for Frankenweenie\_128:

(27, 82351), (30, 82369), (38, 82405), (Start: 43 @82432 has 21 MA's), (Start: 46 @82444 has 5 MA's), (56, 82561), (57, 82564), (62, 82612), (65, 82657), (77, 82786), (97, 82960), (100, 82981), (102, 82990), (106, 83002), (110, 83071), (113, 83116), (119, 83239), (125, 83299), (131, 83338),

Gene: Genie2\_46 Start: 21517, Stop: 22410, Start Num: 46

Candidate Starts for Genie2\_46:

(41, 21496), (Start: 46 @21517 has 5 MA's), (53, 21607), (57, 21637), (78, 21892), (82, 21922), (101, 22063), (103, 22066), (105, 22072), (132, 22252),

Gene: Gibson\_28 Start: 19877, Stop: 20806, Start Num: 44

Candidate Starts for Gibson\_28:

(32, 19820), (Start: 44 @19877 has 9 MA's), (51, 19937), (56, 20012), (61, 20045), (69, 20126), (73, 20174), (77, 20228), (80, 20261), (100, 20420), (119, 20507), (122, 20525), (126, 20576), (133, 20624), (136, 20669), (141, 20753),

Gene: HFrancette\_20 Start: 17010, Stop: 17954, Start Num: 43

Candidate Starts for HFrancette\_20:

(Start: 43 @17010 has 21 MA's), (50, 17064), (58, 17145), (61, 17181), (65, 17235), (68, 17256), (74, 17322), (87, 17472), (89, 17490), (91, 17523), (100, 17577), (106, 17598), (129, 17781),

Gene: Haizum\_26 Start: 21588, Stop: 22541, Start Num: 42

Candidate Starts for Haizum\_26:

(26, 21519), (Start: 42 @21588 has 5 MA's), (Start: 46 @21600 has 5 MA's), (57, 21729), (69, 21840), (74, 21900), (76, 21945), (77, 21948), (87, 22038), (104, 22161), (107, 22170), (116, 22215), (123, 22278), (125, 22290),

Gene: Ididsumtinwong\_21 Start: 16159, Stop: 17100, Start Num: 43

Candidate Starts for Ididsumtinwong\_21:

(Start: 43 @16159 has 21 MA's), (55, 16279), (58, 16294), (61, 16330), (65, 16384), (68, 16405), (73, 16459), (91, 16654), (100, 16708), (102, 16717),

Gene: Ignacio\_20 Start: 17010, Stop: 17954, Start Num: 43

Candidate Starts for Ignacio\_20:

(Start: 43 @17010 has 21 MA's), (50, 17064), (58, 17145), (61, 17181), (65, 17235), (68, 17256), (74, 17322), (87, 17472), (89, 17490), (91, 17523), (100, 17577), (106, 17598), (129, 17781),

Gene: JustBecause\_116 Start: 76599, Stop: 77684, Start Num: 43

Candidate Starts for JustBecause\_116:

(18, 76401), (19, 76410), (27, 76518), (30, 76536), (Start: 43 @76599 has 21 MA's), (Start: 46 @76611 has 5 MA's), (55, 76719), (56, 76728), (57, 76731), (59, 76746), (65, 76824), (73, 76899), (97, 77127), (100, 77148), (102, 77157), (110, 77238), (113, 77283), (119, 77406), (131, 77505), (136, 77562),

Gene: Kela\_117 Start: 76479, Stop: 77564, Start Num: 43

Candidate Starts for Kela\_117:

(19, 76290), (27, 76398), (30, 76416), (Start: 43 @76479 has 21 MA's), (Start: 46 @76491 has 5 MA's), (55, 76599), (56, 76608), (57, 76611), (59, 76626), (65, 76704), (73, 76779), (97, 77007), (100, 77028), (102, 77037), (110, 77118), (113, 77163), (119, 77286), (131, 77385), (136, 77442),

Gene: Kradal\_118 Start: 77529, Stop: 78614, Start Num: 43

Candidate Starts for Kradal\_118:

(36, 77490), (Start: 43 @77529 has 21 MA's), (Start: 46 @77541 has 5 MA's), (48, 77559), (55, 77649), (56, 77658), (59, 77676), (61, 77700), (77, 77883), (81, 77925), (100, 78078), (102, 78087), (106, 78099), (110, 78168), (113, 78213), (114, 78219), (115, 78294), (117, 78324), (119, 78336), (122, 78354), (131, 78435),

Gene: Kromp\_25 Start: 22282, Stop: 23208, Start Num: 42

Candidate Starts for Kromp\_25:

(Start: 39 @22267 has 4 MA's), (Start: 42 @22282 has 5 MA's), (Start: 46 @22294 has 5 MA's), (49, 22324), (55, 22402), (56, 22411), (59, 22429), (65, 22507), (89, 22744), (91, 22777), (97, 22810), (100, 22831), (102, 22840), (122, 22933), (128, 22990), (130, 22999), (136, 23071), (143, 23197),

Gene: Lizz\_28 Start: 19686, Stop: 20615, Start Num: 44

Candidate Starts for Lizz\_28:

(32, 19629), (Start: 44 @19686 has 9 MA's), (51, 19746), (56, 19821), (61, 19854), (69, 19935), (73, 19983), (77, 20037), (80, 20070), (100, 20229), (119, 20316), (122, 20334), (126, 20385), (133, 20433), (136, 20478), (141, 20562),

Gene: Maih\_27 Start: 25551, Stop: 26813, Start Num: 8

Candidate Starts for Maih\_27:

(Start: 8 @25551 has 8 MA's), (9, 25563), (13, 25683), (14, 25686), (22, 25794), (33, 25881), (40, 25920), (54, 26028), (59, 26052), (60, 26061), (63, 26094), (66, 26124), (82, 26301), (85, 26319), (86, 26325), (90, 26355), (119, 26532), (128, 26610), (130, 26619), (134, 26688), (136, 26694), (144, 26808),

Gene: Mischief19\_36 Start: 37234, Stop: 38199, Start Num: 44

Candidate Starts for Mischief19\_36:

(17, 37042), (20, 37096), (24, 37111), (28, 37159), (Start: 44 @37234 has 9 MA's), (Start: 46 @37246 has 5 MA's), (56, 37363), (57, 37366), (73, 37525), (83, 37669), (86, 37684), (87, 37687), (89, 37705), (92, 37741), (106, 37813), (137, 38092), (142, 38152), (144, 38188),



Gene: Nirvana\_129 Start: 80829, Stop: 81929, Start Num: 43

Candidate Starts for Nirvana\_129:

(27, 80748), (30, 80766), (38, 80802), (Start: 43 @80829 has 21 MA's), (Start: 46 @80841 has 5 MA's), (55, 80949), (56, 80958), (57, 80961), (62, 81009), (65, 81054), (73, 81129), (77, 81183), (97, 81357), (100, 81378), (102, 81387), (106, 81399), (110, 81468), (113, 81513), (119, 81636),

Gene: Nishikigoi\_26 Start: 21588, Stop: 22541, Start Num: 42

Candidate Starts for Nishikigoi\_26:

(26, 21519), (Start: 42 @21588 has 5 MA's), (Start: 46 @21600 has 5 MA's), (57, 21729), (69, 21840), (74, 21900), (76, 21945), (77, 21948), (87, 22038), (104, 22161), (107, 22170), (116, 22215), (123, 22278), (125, 22290),

Gene: PHTowN\_28 Start: 19684, Stop: 20613, Start Num: 44

Candidate Starts for PHTowN\_28:

(32, 19627), (Start: 44 @19684 has 9 MA's), (51, 19744), (56, 19819), (61, 19852), (69, 19933), (73, 19981), (77, 20035), (80, 20068), (100, 20227), (119, 20314), (122, 20332), (126, 20383), (133, 20431), (136, 20476), (141, 20560),

Gene: PapayaSalad\_21 Start: 16134, Stop: 17075, Start Num: 43

Candidate Starts for PapayaSalad\_21:

(Start: 43 @16134 has 21 MA's), (55, 16254), (58, 16269), (61, 16305), (65, 16359), (68, 16380), (73, 16434), (91, 16629), (100, 16683), (102, 16692),

Gene: Piccadilly\_20 Start: 16963, Stop: 17907, Start Num: 39

Candidate Starts for Piccadilly\_20:

(35, 16945), (Start: 39 @16963 has 4 MA's), (Start: 43 @16978 has 21 MA's), (50, 17032), (55, 17098), (58, 17113), (61, 17149), (65, 17203), (69, 17230), (74, 17290), (88, 17446), (100, 17545), (129, 17734), (138, 17833),

Gene: Quantum\_117 Start: 77529, Stop: 78614, Start Num: 43

Candidate Starts for Quantum\_117:

(36, 77490), (Start: 43 @77529 has 21 MA's), (Start: 46 @77541 has 5 MA's), (48, 77559), (55, 77649), (56, 77658), (59, 77676), (61, 77700), (77, 77883), (81, 77925), (100, 78078), (102, 78087), (106, 78099), (110, 78168), (113, 78213), (114, 78219), (115, 78294), (117, 78324), (119, 78336), (122, 78354), (131, 78435),

Gene: RainyPolka\_28 Start: 26004, Stop: 27281, Start Num: 8

Candidate Starts for RainyPolka\_28:

(7, 25950), (Start: 8 @26004 has 8 MA's), (9, 26019), (12, 26136), (13, 26139), (22, 26250), (23, 26253), (40, 26376), (47, 26412), (59, 26508), (60, 26517), (64, 26565), (82, 26766), (85, 26784), (86, 26790), (90, 26820), (96, 26847), (114, 26943), (118, 26994), (119, 26997), (127, 27069), (128, 27075), (130, 27084), (136, 27159),

Gene: Rideau\_3 Start: 2618, Stop: 3529, Start Num: 43

Candidate Starts for Rideau\_3:

(Start: 43 @2618 has 21 MA's), (Start: 46 @2630 has 5 MA's), (50, 2672), (56, 2753), (59, 2771), (61, 2795), (74, 2936), (77, 3002), (84, 3080), (86, 3089), (100, 3197), (106, 3218), (120, 3278), (127, 3344),

Gene: Rooney\_28 Start: 19874, Stop: 20803, Start Num: 44

Candidate Starts for Rooney\_28:

(32, 19817), (Start: 44 @19874 has 9 MA's), (51, 19934), (61, 20042), (69, 20123), (73, 20171), (77, 20225), (80, 20258), (100, 20417), (119, 20504), (122, 20522), (126, 20573), (133, 20621), (136,

20666), (141, 20750),

Gene: RosePharie\_2 Start: 2633, Stop: 3526, Start Num: 43

Candidate Starts for RosePharie\_2:

(Start: 43 @2633 has 21 MA's), (56, 2762), (57, 2765), (59, 2780), (65, 2858), (67, 2876), (73, 2933), (74, 2945), (86, 3074), (100, 3191), (108, 3230), (130, 3353),

Gene: SV1\_21 Start: 16368, Stop: 17315, Start Num: 43

Candidate Starts for SV1\_21:

(Start: 43 @16368 has 21 MA's), (55, 16488), (58, 16503), (61, 16539), (65, 16593), (68, 16614), (73, 16668), (91, 16863), (99, 16905), (100, 16917), (102, 16926),

Gene: Salete\_27 Start: 25552, Stop: 26814, Start Num: 8

Candidate Starts for Salete\_27:

(Start: 8 @25552 has 8 MA's), (9, 25564), (13, 25684), (14, 25687), (22, 25795), (33, 25882), (40, 25921), (54, 26029), (59, 26053), (60, 26062), (63, 26095), (66, 26125), (82, 26302), (85, 26320), (86, 26326), (90, 26356), (119, 26533), (128, 26611), (130, 26620), (134, 26689), (136, 26695), (144, 26809),

Gene: Satis\_118 Start: 77525, Stop: 78610, Start Num: 43

Candidate Starts for Satis\_118:

(36, 77486), (Start: 43 @77525 has 21 MA's), (Start: 46 @77537 has 5 MA's), (48, 77555), (55, 77645), (56, 77654), (59, 77672), (61, 77696), (77, 77879), (81, 77921), (100, 78074), (102, 78083), (106, 78095), (110, 78164), (113, 78209), (114, 78215), (115, 78290), (117, 78320), (119, 78332), (122, 78350), (131, 78431),

Gene: ShakeNBake\_28 Start: 19702, Stop: 20631, Start Num: 44

Candidate Starts for ShakeNBake\_28:

(32, 19645), (Start: 44 @19702 has 9 MA's), (51, 19762), (56, 19837), (61, 19870), (69, 19951), (73, 19999), (77, 20053), (80, 20086), (100, 20245), (119, 20332), (122, 20350), (126, 20401), (133, 20449), (136, 20494), (141, 20578),

Gene: Sollertia\_46 Start: 21517, Stop: 22410, Start Num: 46

Candidate Starts for Sollertia\_46:

(41, 21496), (Start: 46 @21517 has 5 MA's), (53, 21607), (57, 21637), (78, 21892), (82, 21922), (101, 22063), (103, 22066), (105, 22072), (132, 22252),

Gene: Soondubu\_21 Start: 20650, Stop: 21585, Start Num: 45

Candidate Starts for Soondubu\_21:

(Start: 45 @20650 has 1 MA's), (53, 20743), (69, 20890), (70, 20905), (72, 20926), (77, 20995), (79, 21025), (94, 21151), (98, 21172), (108, 21226), (124, 21346), (140, 21529),

Gene: Stanimal\_46 Start: 21406, Stop: 22299, Start Num: 46

Candidate Starts for Stanimal\_46:

(41, 21385), (Start: 46 @21406 has 5 MA's), (53, 21496), (57, 21526), (78, 21781), (82, 21811), (101, 21952), (103, 21955), (105, 21961), (132, 22141),

Gene: TP1604\_27 Start: 25552, Stop: 26814, Start Num: 8

Candidate Starts for TP1604\_27:

(Start: 8 @25552 has 8 MA's), (9, 25564), (13, 25684), (14, 25687), (22, 25795), (33, 25882), (40, 25921), (54, 26029), (59, 26053), (60, 26062), (63, 26095), (66, 26125), (82, 26302), (85, 26320), (86, 26326), (90, 26356), (119, 26533), (128, 26611), (130, 26620), (134, 26689), (136, 26695), (144, 26809),

Gene: Vondra\_20 Start: 17009, Stop: 17959, Start Num: 43

Candidate Starts for Vondra\_20:

(Start: 43 @17009 has 21 MA's), (50, 17063), (58, 17144), (61, 17180), (65, 17234), (68, 17255), (74, 17321), (87, 17471), (89, 17489), (91, 17522), (100, 17576), (106, 17597), (129, 17786),

Gene: Wentworth\_29 Start: 20065, Stop: 20982, Start Num: 44

Candidate Starts for Wentworth\_29:

(34, 20017), (Start: 44 @20065 has 9 MA's), (69, 20314), (71, 20347), (73, 20362), (80, 20452), (95, 20578), (100, 20611), (106, 20632), (122, 20716), (126, 20767), (141, 20929),

Gene: Wilkos\_29 Start: 19977, Stop: 20894, Start Num: 44

Candidate Starts for Wilkos\_29:

(Start: 44 @19977 has 9 MA's), (69, 20226), (71, 20259), (73, 20274), (80, 20364), (100, 20523), (115, 20580), (122, 20628), (126, 20679), (141, 20841),

Gene: Xkcd426\_33 Start: 33252, Stop: 34259, Start Num: 44

Candidate Starts for Xkcd426\_33:

(1, 32271), (2, 32316), (3, 32346), (4, 32418), (5, 32517), (25, 33123), (37, 33213), (Start: 44 @33252 has 9 MA's), (57, 33384), (89, 33729), (90, 33753), (93, 33774), (102, 33825), (109, 33876), (115, 33930), (118, 33972), (119, 33975), (128, 34053), (130, 34062),

Gene: YDN12\_29 Start: 25515, Stop: 26783, Start Num: 8

Candidate Starts for YDN12\_29:

(6, 25356), (Start: 8 @25515 has 8 MA's), (9, 25527), (11, 25635), (13, 25647), (14, 25650), (29, 25824), (33, 25845), (40, 25884), (47, 25920), (54, 25992), (59, 26016), (60, 26025), (63, 26058), (66, 26088), (82, 26268), (85, 26286), (86, 26292), (90, 26322), (112, 26439), (118, 26496), (119, 26499), (121, 26514), (128, 26577), (130, 26586), (136, 26661), (139, 26715), (144, 26775),

Gene: Yaboi\_46 Start: 21494, Stop: 22387, Start Num: 46

Candidate Starts for Yaboi\_46:

(41, 21473), (Start: 46 @21494 has 5 MA's), (53, 21584), (57, 21614), (78, 21869), (82, 21899), (101, 22040), (103, 22043), (105, 22049), (132, 22229),

Gene: Yara\_25 Start: 19303, Stop: 20226, Start Num: 43

Candidate Starts for Yara\_25:

(Start: 43 @19303 has 21 MA's), (48, 19333), (52, 19372), (55, 19429), (56, 19438), (57, 19441), (61, 19480), (100, 19879), (102, 19888), (127, 20041),

Gene: Yosif\_28 Start: 22917, Stop: 23870, Start Num: 43

Candidate Starts for Yosif\_28:

(16, 22689), (21, 22770), (26, 22803), (Start: 43 @22917 has 21 MA's), (Start: 46 @22932 has 5 MA's), (48, 22950), (50, 22974), (55, 23049), (56, 23058), (69, 23172), (75, 23250), (77, 23280), (107, 23496), (111, 23517), (125, 23619), (128, 23637), (135, 23721),

Gene: pZL12\_44c Start: 32427, Stop: 31489, Start Num: 43

Candidate Starts for pZL12\_44c:

(31, 32484), (Start: 43 @32427 has 21 MA's), (55, 32307), (56, 32298), (57, 32295), (59, 32280), (100, 31875), (102, 31866),