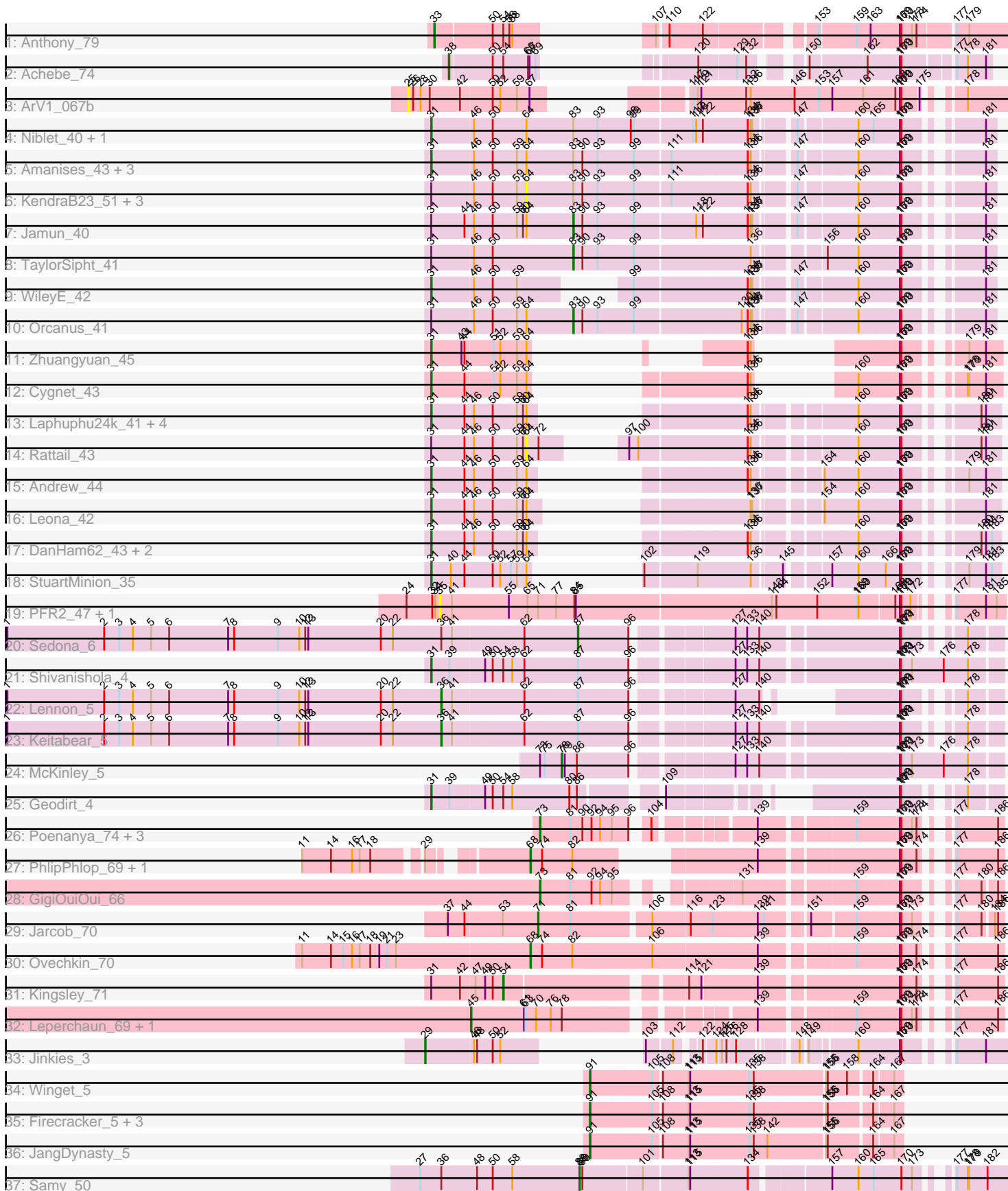


Pham 311624



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 311624 Report

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

Pham number 311624 has 59 members, 11 are drafts.

Phages represented in each track:

- Track 1 : Anthony\_79
- Track 2 : Achebe\_74
- Track 3 : ArV1\_067b
- Track 4 : Niblet\_40, Chicken\_40
- Track 5 : Amanises\_43, Toad24\_43, Zixiang\_40, Shen\_40
- Track 6 : KendraB23\_51, Westrich\_49, Gravel\_50, Pelletreau\_50
- Track 7 : Jamun\_40
- Track 8 : TaylorSipht\_41
- Track 9 : WileyE\_42
- Track 10 : Orcanus\_41
- Track 11 : Zhuangyuan\_45
- Track 12 : Cygnet\_43
- Track 13 : Laphuphu24k\_41, Fingolfin\_43, Oppalora\_42, Juno112\_42, HamCheese\_43
- Track 14 : Rattail\_43
- Track 15 : Andrew\_44
- Track 16 : Leona\_42
- Track 17 : DanHam62\_43, AmiCi24\_42, Atlantica\_43
- Track 18 : StuartMinion\_35
- Track 19 : PFR2\_47, PFR1\_45
- Track 20 : Sedona\_6
- Track 21 : Shivanishola\_4
- Track 22 : Lennon\_5
- Track 23 : Keitabear\_5
- Track 24 : McKinley\_5
- Track 25 : Geodirt\_4
- Track 26 : Poenanya\_74, Empress\_69, Doomphist\_74, RedBird\_72
- Track 27 : PhlipPhlop\_69, EmiMonkey\_67
- Track 28 : GigiOuiOui\_66
- Track 29 : Jacob\_70
- Track 30 : Ovechkin\_70
- Track 31 : Kingsley\_71
- Track 32 : Leperchaun\_69, Polka14\_75
- Track 33 : Jinkies\_3
- Track 34 : Winget\_5
- Track 35 : Firecracker\_5, Corndog\_6, Smooch\_6, YungJamal\_6
- Track 36 : JangDynasty\_5

- Track 37 : Samy\_50

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

The start number called the most often in the published annotations is 31, it was called in 20 of the 48 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Amanises\_43, AmiCi24\_42, Andrew\_44, Atlantica\_43, Chicken\_40, Cygnet\_43, DanHam62\_43, Fingolfin\_43, Geodirt\_4, HamCheese\_43, Juno112\_42, Laphuphu24k\_41, Leona\_42, Niblet\_40, Oppalora\_42, Shen\_40, Shivanishola\_4, StuartMinion\_35, Toad24\_43, WileyE\_42, Zhuangyuan\_45, Zixiang\_40,

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

- Gravel\_50, Jamun\_40, KendraB23\_51, Kingsley\_71, Orcanus\_41, Pelletreau\_50, Rattail\_43, TaylorSipht\_41, Westrich\_49,

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

- Achebe\_74, Anthony\_79, ArV1\_067b, Corndog\_6, Doomphist\_74, EmiMonkey\_67, Empress\_69, Firecracker\_5, GigiOuiOui\_66, JangDynasty\_5, Jarcob\_70, Jinkies\_3, Keitabear\_5, Lennon\_5, Leperchaun\_69, McKinley\_5, Ovechkin\_70, PFR1\_45, PFR2\_47, PhlipPhlop\_69, Poenanya\_74, Polka14\_75, RedBird\_72, Samy\_50, Sedona\_6, Smooch\_6, Winget\_5, YungJamal\_6,

**Summary by start number:**

Start 25:

- Found in 1 of 59 ( 1.7% ) of genes in pham
- No Manual Annotations of this start.
- Called 100.0% of time when present
- Phage (with cluster) where this start called: ArV1\_067b (AR),

Start 29:

- Found in 3 of 59 ( 5.1% ) of genes in pham
- Manual Annotations of this start: 1 of 48
- Called 33.3% of time when present
- Phage (with cluster) where this start called: Jinkies\_3 (FL),

Start 31:

- Found in 31 of 59 ( 52.5% ) of genes in pham
- Manual Annotations of this start: 20 of 48
- Called 71.0% of time when present
- Phage (with cluster) where this start called: Amanises\_43 (AS1), AmiCi24\_42 (AS3), Andrew\_44 (AS3), Atlantica\_43 (AS3), Chicken\_40 (AS1), Cygnet\_43 (AS2), DanHam62\_43 (AS3), Fingolfin\_43 (AS3), Geodirt\_4 (DE1), HamCheese\_43 (AS3), Juno112\_42 (AS3), Laphuphu24k\_41 (AS3), Leona\_42 (AS3), Niblet\_40 (AS1), Oppalora\_42 (AS3), Shen\_40 (AS1), Shivanishola\_4 (DE1), StuartMinion\_35 (AS3), Toad24\_43 (AS1), WileyE\_42 (AS1), Zhuangyuan\_45 (AS2), Zixiang\_40 (AS1),

Start 33:

- Found in 1 of 59 ( 1.7% ) of genes in pham
- Manual Annotations of this start: 1 of 48
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Anthony\_79 (A20),

Start 35:

- Found in 2 of 59 ( 3.4% ) of genes in pham
- No Manual Annotations of this start.
- Called 100.0% of time when present
- Phage (with cluster) where this start called: PFR1\_45 (BX), PFR2\_47 (BX),

Start 36:

- Found in 4 of 59 ( 6.8% ) of genes in pham
- Manual Annotations of this start: 2 of 48
- Called 50.0% of time when present
- Phage (with cluster) where this start called: Keitabear\_5 (DE1), Lennon\_5 (DE1),

Start 38:

- Found in 1 of 59 ( 1.7% ) of genes in pham
- Manual Annotations of this start: 1 of 48
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Achebe\_74 (A4),

Start 45:

- Found in 2 of 59 ( 3.4% ) of genes in pham
- Manual Annotations of this start: 2 of 48
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Leperchaun\_69 (F1), Polka14\_75 (F1),

Start 54:

- Found in 5 of 59 ( 8.5% ) of genes in pham
- Manual Annotations of this start: 1 of 48
- Called 20.0% of time when present
- Phage (with cluster) where this start called: Kingsley\_71 (F1),

Start 64:

- Found in 26 of 59 ( 44.1% ) of genes in pham
- No Manual Annotations of this start.
- Called 19.2% of time when present
- Phage (with cluster) where this start called: Gravel\_50 (AS1), KendraB23\_51 (AS1), Pelletreau\_50 (AS1), Rattail\_43 (AS3), Westrich\_49 (AS1),

Start 68:

- Found in 3 of 59 ( 5.1% ) of genes in pham
- Manual Annotations of this start: 2 of 48
- Called 100.0% of time when present
- Phage (with cluster) where this start called: EmiMonkey\_67 (F1), Ovechkin\_70 (F1), PhilipPhlop\_69 (F1),

Start 71:

- Found in 3 of 59 ( 5.1% ) of genes in pham
- Manual Annotations of this start: 1 of 48
- Called 33.3% of time when present

- Phage (with cluster) where this start called: Jacob\_70 (F1),

#### Start 73:

- Found in 6 of 59 ( 10.2% ) of genes in pham
- Manual Annotations of this start: 5 of 48
- Called 83.3% of time when present
- Phage (with cluster) where this start called: Doomphist\_74 (F1), Empress\_69 (F1), GigiOuiOui\_66 (F1), Poenanya\_74 (F1), RedBird\_72 (F1),

#### Start 78:

- Found in 3 of 59 ( 5.1% ) of genes in pham
- Manual Annotations of this start: 1 of 48
- Called 33.3% of time when present
- Phage (with cluster) where this start called: McKinley\_5 (DE1),

#### Start 83:

- Found in 13 of 59 ( 22.0% ) of genes in pham
- Manual Annotations of this start: 3 of 48
- Called 23.1% of time when present
- Phage (with cluster) where this start called: Jamun\_40 (AS1), Orcanus\_41 (AS1), TaylorSipt\_41 (AS1),

#### Start 87:

- Found in 4 of 59 ( 6.8% ) of genes in pham
- Manual Annotations of this start: 1 of 48
- Called 25.0% of time when present
- Phage (with cluster) where this start called: Sedona\_6 (DE1),

#### Start 88:

- Found in 1 of 59 ( 1.7% ) of genes in pham
- Manual Annotations of this start: 1 of 48
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Samy\_50 (singleton),

#### Start 91:

- Found in 6 of 59 ( 10.2% ) of genes in pham
- Manual Annotations of this start: 6 of 48
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Corndog\_6 (O), Firecracker\_5 (O), JangDynasty\_5 (O), Smooch\_6 (O), Winget\_5 (O), YungJamal\_6 (O),

### **Summary by clusters:**

There are 12 clusters represented in this pham: AS3, F1, singleton, AS2, DE1, AS1, O, A20, AR, A4, FL, BX,

#### Info for manual annotations of cluster A20:

- Start number 33 was manually annotated 1 time for cluster A20.

#### Info for manual annotations of cluster A4:

- Start number 38 was manually annotated 1 time for cluster A4.

Info for manual annotations of cluster AS1:

- Start number 31 was manually annotated 6 times for cluster AS1.
- Start number 83 was manually annotated 3 times for cluster AS1.

Info for manual annotations of cluster AS2:

- Start number 31 was manually annotated 2 times for cluster AS2.

Info for manual annotations of cluster AS3:

- Start number 31 was manually annotated 10 times for cluster AS3.

Info for manual annotations of cluster DE1:

- Start number 31 was manually annotated 2 times for cluster DE1.
- Start number 36 was manually annotated 2 times for cluster DE1.
- Start number 78 was manually annotated 1 time for cluster DE1.
- Start number 87 was manually annotated 1 time for cluster DE1.

Info for manual annotations of cluster F1:

- Start number 45 was manually annotated 2 times for cluster F1.
- Start number 54 was manually annotated 1 time for cluster F1.
- Start number 68 was manually annotated 2 times for cluster F1.
- Start number 71 was manually annotated 1 time for cluster F1.
- Start number 73 was manually annotated 5 times for cluster F1.

Info for manual annotations of cluster FL:

- Start number 29 was manually annotated 1 time for cluster FL.

Info for manual annotations of cluster O:

- Start number 91 was manually annotated 6 times for cluster O.

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

Gene: Achebe\_74 Start: 46689, Stop: 45955, Start Num: 38

Candidate Starts for Achebe\_74:

(Start: 38 @46689 has 1 MA's), (50, 46611), (Start: 54 @46590 has 1 MA's), (66, 46542), (67, 46539), (69, 46527), (120, 46434), (129, 46362), (132, 46344), (150, 46278), (162, 46173), (169, 46113), (170, 46110), (177, 46023), (178, 46002), (181, 45966),

Gene: Amanises\_43 Start: 28549, Stop: 29547, Start Num: 31

Candidate Starts for Amanises\_43:

(Start: 31 @28549 has 20 MA's), (46, 28630), (50, 28666), (59, 28714), (64, 28732), (Start: 83 @28825 has 3 MA's), (90, 28843), (93, 28873), (99, 28945), (111, 29011), (134, 29158), (136, 29164), (147, 29230), (160, 29332), (169, 29407), (170, 29410), (181, 29527),

Gene: AmiCi24\_42 Start: 27168, Stop: 27965, Start Num: 31

Candidate Starts for AmiCi24\_42:

(Start: 31 @27168 has 20 MA's), (44, 27234), (46, 27249), (50, 27285), (59, 27333), (60, 27345), (64, 27351), (134, 27567), (136, 27573), (160, 27741), (169, 27816), (170, 27819), (180, 27927), (181, 27936), (183, 27948),

Gene: Andrew\_44 Start: 27053, Stop: 27850, Start Num: 31

Candidate Starts for Andrew\_44:

(Start: 31 @27053 has 20 MA's), (44, 27119), (46, 27134), (50, 27170), (59, 27218), (64, 27236), (134, 27452), (136, 27458), (154, 27563), (160, 27626), (169, 27701), (170, 27704), (179, 27788), (181, 27821),

Gene: Anthony\_79 Start: 47520, Stop: 46663, Start Num: 33

Candidate Starts for Anthony\_79:

(Start: 33 @47520 has 1 MA's), (50, 47415), (Start: 54 @47394 has 1 MA's), (56, 47382), (58, 47376), (107, 47298), (110, 47280), (122, 47214), (153, 47034), (159, 46965), (163, 46941), (169, 46887), (170, 46884), (173, 46863), (174, 46854), (177, 46791), (179, 46767),

Gene: ArV1\_067b Start: 51785, Stop: 52711, Start Num: 25

Candidate Starts for ArV1\_067b:

(25, 51785), (26, 51794), (28, 51809), (30, 51827), (42, 51887), (50, 51944), (52, 51959), (59, 51992), (67, 52016), (117, 52154), (119, 52163), (121, 52169), (132, 52256), (136, 52265), (146, 52352), (153, 52400), (157, 52424), (161, 52484), (168, 52547), (169, 52556), (170, 52559), (175, 52589), (178, 52634),

Gene: Atlantica\_43 Start: 27170, Stop: 27967, Start Num: 31

Candidate Starts for Atlantica\_43:

(Start: 31 @27170 has 20 MA's), (44, 27236), (46, 27251), (50, 27287), (59, 27335), (60, 27347), (64, 27353), (134, 27569), (136, 27575), (160, 27743), (169, 27818), (170, 27821), (180, 27929), (181, 27938), (183, 27950),

Gene: Chicken\_40 Start: 27850, Stop: 28848, Start Num: 31

Candidate Starts for Chicken\_40:

(Start: 31 @27850 has 20 MA's), (46, 27931), (50, 27967), (64, 28033), (Start: 83 @28126 has 3 MA's), (93, 28174), (98, 28240), (99, 28246), (117, 28354), (118, 28360), (122, 28372), (134, 28459), (136, 28465), (137, 28468), (147, 28531), (160, 28633), (165, 28660), (169, 28708), (170, 28711), (181, 28828),

Gene: Corndog\_6 Start: 2141, Stop: 1578, Start Num: 91

Candidate Starts for Corndog\_6:

(Start: 91 @2141 has 6 MA's), (105, 2024), (108, 2009), (113, 1958), (115, 1955), (135, 1847), (138, 1838), (155, 1709), (156, 1706), (164, 1631), (167, 1595),

Gene: Cygnet\_43 Start: 28047, Stop: 28715, Start Num: 31

Candidate Starts for Cygnet\_43:

(Start: 31 @28047 has 20 MA's), (44, 28113), (51, 28167), (52, 28179), (59, 28212), (64, 28230), (134, 28431), (136, 28437), (160, 28488), (169, 28563), (170, 28566), (178, 28647), (179, 28650), (181, 28683),

Gene: DanHam62\_43 Start: 27169, Stop: 27966, Start Num: 31

Candidate Starts for DanHam62\_43:

(Start: 31 @27169 has 20 MA's), (44, 27235), (46, 27250), (50, 27286), (59, 27334), (60, 27346), (64, 27352), (134, 27568), (136, 27574), (160, 27742), (169, 27817), (170, 27820), (180, 27928), (181, 27937), (183, 27949),

Gene: Doomphist\_74 Start: 45998, Stop: 46735, Start Num: 73

Candidate Starts for Doomphist\_74:

(Start: 73 @45998 has 5 MA's), (81, 46055), (90, 46079), (92, 46097), (94, 46112), (95, 46133), (96, 46166), (104, 46184), (139, 46343), (159, 46505), (169, 46583), (170, 46586), (173, 46607), (174, 46616), (177, 46643), (186, 46724),

Gene: EmiMonkey\_67 Start: 47844, Stop: 48557, Start Num: 68

Candidate Starts for EmiMonkey\_67:

(11, 47481), (14, 47538), (16, 47580), (17, 47595), (18, 47616), (Start: 29 @47697 has 1 MA's), (Start: 68 @47844 has 2 MA's), (74, 47865), (82, 47925), (139, 48165), (169, 48405), (170, 48408), (174, 48438), (177, 48465), (186, 48546),

Gene: Empress\_69 Start: 44809, Stop: 45546, Start Num: 73

Candidate Starts for Empress\_69:

(Start: 73 @44809 has 5 MA's), (81, 44866), (90, 44890), (92, 44908), (94, 44923), (95, 44944), (96, 44977), (104, 44995), (139, 45154), (159, 45316), (169, 45394), (170, 45397), (173, 45418), (174, 45427), (177, 45454), (186, 45535),

Gene: Fingolfin\_43 Start: 27172, Stop: 27969, Start Num: 31

Candidate Starts for Fingolfin\_43:

(Start: 31 @27172 has 20 MA's), (44, 27238), (46, 27253), (50, 27289), (59, 27337), (60, 27349), (64, 27355), (134, 27571), (136, 27577), (160, 27745), (169, 27820), (170, 27823), (180, 27931), (181, 27940),

Gene: Firecracker\_5 Start: 1850, Stop: 1287, Start Num: 91

Candidate Starts for Firecracker\_5:

(Start: 91 @1850 has 6 MA's), (105, 1733), (108, 1718), (113, 1667), (115, 1664), (135, 1556), (138, 1547), (155, 1418), (156, 1415), (164, 1340), (167, 1304),

Gene: Geodirt\_4 Start: 2785, Stop: 3651, Start Num: 31

Candidate Starts for Geodirt\_4:

(Start: 31 @2785 has 20 MA's), (39, 2821), (49, 2884), (50, 2899), (Start: 54 @2920 has 1 MA's), (58, 2938), (80, 3049), (86, 3064), (109, 3181), (169, 3505), (170, 3508), (171, 3511), (178, 3589),

Gene: GigiOuiOui\_66 Start: 44414, Stop: 45145, Start Num: 73

Candidate Starts for GigiOuiOui\_66:

(Start: 73 @44414 has 5 MA's), (81, 44471), (92, 44513), (94, 44528), (95, 44549), (131, 44729), (159, 44921), (169, 45002), (170, 45005), (177, 45062), (180, 45110), (186, 45134),

Gene: Gravel\_50 Start: 28545, Stop: 29360, Start Num: 64

Candidate Starts for Gravel\_50:

(Start: 31 @28362 has 20 MA's), (46, 28443), (50, 28479), (59, 28527), (64, 28545), (Start: 83 @28638 has 3 MA's), (90, 28656), (93, 28686), (99, 28758), (111, 28824), (134, 28971), (136, 28977), (147, 29043), (160, 29145), (169, 29220), (170, 29223), (181, 29340),

Gene: HamCheese\_43 Start: 27156, Stop: 27953, Start Num: 31

Candidate Starts for HamCheese\_43:

(Start: 31 @27156 has 20 MA's), (44, 27222), (46, 27237), (50, 27273), (59, 27321), (60, 27333), (64, 27339), (134, 27555), (136, 27561), (160, 27729), (169, 27804), (170, 27807), (180, 27915), (181, 27924),

Gene: Jamun\_40 Start: 27823, Stop: 28545, Start Num: 83

Candidate Starts for Jamun\_40:

(Start: 31 @27547 has 20 MA's), (44, 27613), (46, 27628), (50, 27664), (59, 27712), (60, 27724), (64, 27730), (Start: 83 @27823 has 3 MA's), (90, 27841), (93, 27871), (99, 27943), (118, 28057), (122, 28069), (134, 28156), (136, 28162), (137, 28165), (147, 28228), (160, 28330), (169, 28405), (170, 28408), (181, 28525),

Gene: JangDynasty\_5 Start: 1854, Stop: 1291, Start Num: 91

Candidate Starts for JangDynasty\_5:

(Start: 91 @1854 has 6 MA's), (105, 1737), (108, 1722), (113, 1671), (115, 1668), (135, 1560), (138, 1551), (142, 1527), (155, 1422), (156, 1419), (164, 1344), (167, 1308),

Gene: Jarcob\_70 Start: 45803, Stop: 46582, Start Num: 71

Candidate Starts for Jarcob\_70:

(37, 45638), (44, 45668), (53, 45740), (Start: 71 @45803 has 1 MA's), (81, 45866), (106, 46013), (116, 46082), (123, 46124), (139, 46208), (141, 46217), (151, 46280), (159, 46361), (169, 46439), (170, 46442), (173, 46463), (177, 46499), (180, 46547), (184, 46565), (186, 46571),

Gene: Jinkies\_3 Start: 2349, Stop: 3125, Start Num: 29

Candidate Starts for Jinkies\_3:

(Start: 29 @2349 has 1 MA's), (46, 2442), (48, 2448), (50, 2478), (52, 2493), (103, 2571), (112, 2616), (122, 2649), (124, 2670), (125, 2676), (126, 2685), (128, 2700), (148, 2784), (149, 2793), (160, 2871), (169, 2952), (170, 2955), (177, 3015), (181, 3072),

Gene: Juno112\_42 Start: 27172, Stop: 27969, Start Num: 31

Candidate Starts for Juno112\_42:

(Start: 31 @27172 has 20 MA's), (44, 27238), (46, 27253), (50, 27289), (59, 27337), (60, 27349), (64, 27355), (134, 27571), (136, 27577), (160, 27745), (169, 27820), (170, 27823), (180, 27931), (181, 27940),

Gene: Keitabear\_5 Start: 4089, Stop: 5051, Start Num: 36

Candidate Starts for Keitabear\_5:

(1, 3228), (2, 3420), (3, 3450), (4, 3477), (5, 3513), (6, 3549), (7, 3666), (8, 3678), (9, 3765), (10, 3807), (12, 3819), (13, 3825), (20, 3969), (22, 3993), (Start: 36 @4089 has 2 MA's), (41, 4110), (62, 4245), (Start: 87 @4350 has 1 MA's), (96, 4446), (127, 4614), (133, 4635), (140, 4656), (169, 4905), (170, 4908), (171, 4911), (178, 4989),

Gene: KendraB23\_51 Start: 28732, Stop: 29547, Start Num: 64

Candidate Starts for KendraB23\_51:

(Start: 31 @28549 has 20 MA's), (46, 28630), (50, 28666), (59, 28714), (64, 28732), (Start: 83 @28825 has 3 MA's), (90, 28843), (93, 28873), (99, 28945), (111, 29011), (134, 29158), (136, 29164), (147, 29230), (160, 29332), (169, 29407), (170, 29410), (181, 29527),

Gene: Kingsley\_71 Start: 46661, Stop: 47491, Start Num: 54

Candidate Starts for Kingsley\_71:

(Start: 31 @46526 has 20 MA's), (42, 46583), (47, 46607), (49, 46625), (50, 46640), (Start: 54 @46661 has 1 MA's), (114, 46967), (121, 46988), (139, 47090), (169, 47339), (170, 47342), (174, 47372), (177, 47399), (186, 47480),

Gene: Laphuphu24k\_41 Start: 27156, Stop: 27953, Start Num: 31

Candidate Starts for Laphuphu24k\_41:

(Start: 31 @27156 has 20 MA's), (44, 27222), (46, 27237), (50, 27273), (59, 27321), (60, 27333), (64, 27339), (134, 27555), (136, 27561), (160, 27729), (169, 27804), (170, 27807), (180, 27915), (181, 27924),

Gene: Lennon\_5 Start: 3295, Stop: 4143, Start Num: 36

Candidate Starts for Lennon\_5:

(1, 2434), (2, 2626), (3, 2656), (4, 2683), (5, 2719), (6, 2755), (7, 2872), (8, 2884), (9, 2971), (10, 3013), (12, 3025), (13, 3031), (20, 3175), (22, 3199), (Start: 36 @3295 has 2 MA's), (41, 3316), (62, 3451), (Start: 87 @3556 has 1 MA's), (96, 3652), (127, 3820), (140, 3862), (169, 3997), (170, 4000), (171,

4003), (178, 4081),

Gene: Leona\_42 Start: 27237, Stop: 28046, Start Num: 31

Candidate Starts for Leona\_42:

(Start: 31 @27237 has 20 MA's), (44, 27303), (46, 27318), (50, 27354), (59, 27402), (60, 27414), (64, 27420), (136, 27654), (137, 27657), (154, 27759), (160, 27822), (169, 27897), (170, 27900), (181, 28017),

Gene: Leperchaun\_69 Start: 44915, Stop: 45781, Start Num: 45

Candidate Starts for Leperchaun\_69:

(Start: 45 @44915 has 2 MA's), (61, 45014), (63, 45017), (70, 45038), (76, 45065), (Start: 78 @45086 has 1 MA's), (139, 45389), (159, 45551), (169, 45629), (170, 45632), (173, 45653), (174, 45662), (177, 45689), (186, 45770),

Gene: McKinley\_5 Start: 3198, Stop: 3983, Start Num: 78

Candidate Starts for McKinley\_5:

(Start: 73 @3156 has 5 MA's), (75, 3165), (Start: 78 @3198 has 1 MA's), (79, 3204), (86, 3228), (96, 3327), (127, 3495), (133, 3516), (140, 3537), (169, 3786), (170, 3789), (171, 3792), (173, 3810), (176, 3873), (178, 3921),

Gene: Niblet\_40 Start: 27937, Stop: 28935, Start Num: 31

Candidate Starts for Niblet\_40:

(Start: 31 @27937 has 20 MA's), (46, 28018), (50, 28054), (64, 28120), (Start: 83 @28213 has 3 MA's), (93, 28261), (98, 28327), (99, 28333), (117, 28441), (118, 28447), (122, 28459), (134, 28546), (136, 28552), (137, 28555), (147, 28618), (160, 28720), (165, 28747), (169, 28795), (170, 28798), (181, 28915),

Gene: Oppalora\_42 Start: 27170, Stop: 27967, Start Num: 31

Candidate Starts for Oppalora\_42:

(Start: 31 @27170 has 20 MA's), (44, 27236), (46, 27251), (50, 27287), (59, 27335), (60, 27347), (64, 27353), (134, 27569), (136, 27575), (160, 27743), (169, 27818), (170, 27821), (180, 27929), (181, 27938),

Gene: Orcanus\_41 Start: 28182, Stop: 28904, Start Num: 83

Candidate Starts for Orcanus\_41:

(Start: 31 @27906 has 20 MA's), (46, 27987), (50, 28023), (59, 28071), (64, 28089), (Start: 83 @28182 has 3 MA's), (90, 28200), (93, 28230), (99, 28302), (130, 28503), (134, 28515), (136, 28521), (137, 28524), (147, 28587), (160, 28689), (169, 28764), (170, 28767), (181, 28884),

Gene: Ovechkin\_70 Start: 44498, Stop: 45319, Start Num: 68

Candidate Starts for Ovechkin\_70:

(11, 44057), (14, 44114), (15, 44138), (16, 44156), (17, 44171), (18, 44192), (19, 44210), (21, 44225), (23, 44243), (Start: 68 @44498 has 2 MA's), (74, 44519), (82, 44579), (106, 44735), (139, 44927), (159, 45089), (169, 45167), (170, 45170), (174, 45200), (177, 45227), (186, 45308),

Gene: PFR1\_45 Start: 31715, Stop: 32761, Start Num: 35

Candidate Starts for PFR1\_45:

(24, 31649), (32, 31700), (34, 31706), (35, 31715), (41, 31739), (55, 31850), (65, 31886), (Start: 71 @31907 has 1 MA's), (77, 31943), (84, 31979), (85, 31982), (143, 32363), (144, 32372), (152, 32453), (159, 32531), (160, 32534), (168, 32600), (169, 32609), (170, 32612), (172, 32630), (177, 32666), (181, 32723), (185, 32744),

Gene: PFR2\_47 Start: 33284, Stop: 34330, Start Num: 35

Candidate Starts for PFR2\_47:

(24, 33218), (32, 33269), (34, 33275), (35, 33284), (41, 33308), (55, 33419), (65, 33455), (Start: 71 @33476 has 1 MA's), (77, 33512), (84, 33548), (85, 33551), (143, 33932), (144, 33941), (152, 34022), (159, 34100), (160, 34103), (168, 34169), (169, 34178), (170, 34181), (172, 34199), (177, 34235), (181, 34292), (185, 34313),

Gene: Pelletreau\_50 Start: 28545, Stop: 29360, Start Num: 64

Candidate Starts for Pelletreau\_50:

(Start: 31 @28362 has 20 MA's), (46, 28443), (50, 28479), (59, 28527), (64, 28545), (Start: 83 @28638 has 3 MA's), (90, 28656), (93, 28686), (99, 28758), (111, 28824), (134, 28971), (136, 28977), (147, 29043), (160, 29145), (169, 29220), (170, 29223), (181, 29340),

Gene: PhlipPhlop\_69 Start: 47844, Stop: 48557, Start Num: 68

Candidate Starts for PhlipPhlop\_69:

(11, 47481), (14, 47538), (16, 47580), (17, 47595), (18, 47616), (Start: 29 @47697 has 1 MA's), (Start: 68 @47844 has 2 MA's), (74, 47865), (82, 47925), (139, 48165), (169, 48405), (170, 48408), (174, 48438), (177, 48465), (186, 48546),

Gene: Poenanya\_74 Start: 45998, Stop: 46735, Start Num: 73

Candidate Starts for Poenanya\_74:

(Start: 73 @45998 has 5 MA's), (81, 46055), (90, 46079), (92, 46097), (94, 46112), (95, 46133), (96, 46166), (104, 46184), (139, 46343), (159, 46505), (169, 46583), (170, 46586), (173, 46607), (174, 46616), (177, 46643), (186, 46724),

Gene: Polka14\_75 Start: 46662, Stop: 47525, Start Num: 45

Candidate Starts for Polka14\_75:

(Start: 45 @46662 has 2 MA's), (61, 46758), (63, 46761), (70, 46782), (76, 46809), (Start: 78 @46830 has 1 MA's), (139, 47133), (159, 47295), (169, 47373), (170, 47376), (173, 47397), (174, 47406), (177, 47433), (186, 47514),

Gene: Rattail\_43 Start: 27437, Stop: 28150, Start Num: 64

Candidate Starts for Rattail\_43:

(Start: 31 @27254 has 20 MA's), (44, 27320), (46, 27335), (50, 27371), (59, 27419), (60, 27431), (64, 27437), (72, 27461), (97, 27530), (100, 27548), (134, 27752), (136, 27758), (160, 27926), (169, 28001), (170, 28004), (180, 28112), (181, 28121),

Gene: RedBird\_72 Start: 44502, Stop: 45227, Start Num: 73

Candidate Starts for RedBird\_72:

(Start: 73 @44502 has 5 MA's), (81, 44559), (90, 44583), (92, 44589), (94, 44604), (95, 44625), (96, 44658), (104, 44676), (139, 44835), (159, 44997), (169, 45075), (170, 45078), (173, 45099), (174, 45108), (177, 45135), (186, 45216),

Gene: Samy\_50 Start: 33615, Stop: 34364, Start Num: 88

Candidate Starts for Samy\_50:

(27, 33303), (Start: 36 @33345 has 2 MA's), (48, 33414), (50, 33444), (58, 33483), (Start: 88 @33615 has 1 MA's), (89, 33618), (90, 33621), (101, 33735), (113, 33819), (115, 33822), (134, 33933), (157, 34071), (160, 34122), (165, 34152), (170, 34203), (173, 34224), (177, 34260), (178, 34281), (179, 34284), (182, 34320),

Gene: Sedona\_6 Start: 4350, Stop: 5051, Start Num: 87

Candidate Starts for Sedona\_6:

(1, 3228), (2, 3420), (3, 3450), (4, 3477), (5, 3513), (6, 3549), (7, 3666), (8, 3678), (9, 3765), (10, 3807), (12, 3819), (13, 3825), (20, 3969), (22, 3993), (Start: 36 @4089 has 2 MA's), (41, 4110), (62, 4245),

(Start: 87 @4350 has 1 MA's), (96, 4446), (127, 4614), (133, 4635), (140, 4656), (169, 4905), (170, 4908), (171, 4911), (178, 4989),

Gene: Shen\_40 Start: 26463, Stop: 27461, Start Num: 31

Candidate Starts for Shen\_40:

(Start: 31 @26463 has 20 MA's), (46, 26544), (50, 26580), (59, 26628), (64, 26646), (Start: 83 @26739 has 3 MA's), (90, 26757), (93, 26787), (99, 26859), (111, 26925), (134, 27072), (136, 27078), (147, 27144), (160, 27246), (169, 27321), (170, 27324), (181, 27441),

Gene: Shivanishola\_4 Start: 2785, Stop: 3819, Start Num: 31

Candidate Starts for Shivanishola\_4:

(Start: 31 @2785 has 20 MA's), (39, 2821), (49, 2884), (50, 2899), (Start: 54 @2920 has 1 MA's), (58, 2938), (62, 2962), (Start: 87 @3067 has 1 MA's), (96, 3163), (127, 3331), (133, 3352), (140, 3373), (169, 3622), (170, 3625), (171, 3628), (173, 3646), (176, 3709), (178, 3757),

Gene: Smooch\_6 Start: 2139, Stop: 1576, Start Num: 91

Candidate Starts for Smooch\_6:

(Start: 91 @2139 has 6 MA's), (105, 2022), (108, 2007), (113, 1956), (115, 1953), (135, 1845), (138, 1836), (155, 1707), (156, 1704), (164, 1629), (167, 1593),

Gene: StuartMinion\_35 Start: 24235, Stop: 25020, Start Num: 31

Candidate Starts for StuartMinion\_35:

(Start: 31 @24235 has 20 MA's), (40, 24274), (44, 24301), (50, 24352), (52, 24367), (57, 24388), (59, 24400), (64, 24418), (102, 24430), (119, 24526), (136, 24625), (145, 24676), (157, 24745), (160, 24796), (166, 24844), (169, 24871), (170, 24874), (179, 24958), (181, 24991), (183, 25003),

Gene: TaylorSipht\_41 Start: 27587, Stop: 28306, Start Num: 83

Candidate Starts for TaylorSipht\_41:

(Start: 31 @27311 has 20 MA's), (46, 27392), (50, 27428), (Start: 83 @27587 has 3 MA's), (90, 27605), (93, 27635), (99, 27707), (136, 27923), (156, 28034), (160, 28091), (169, 28166), (170, 28169), (181, 28286),

Gene: Toad24\_43 Start: 28602, Stop: 29600, Start Num: 31

Candidate Starts for Toad24\_43:

(Start: 31 @28602 has 20 MA's), (46, 28683), (50, 28719), (59, 28767), (64, 28785), (Start: 83 @28878 has 3 MA's), (90, 28896), (93, 28926), (99, 28998), (111, 29064), (134, 29211), (136, 29217), (147, 29283), (160, 29385), (169, 29460), (170, 29463), (181, 29580),

Gene: Westrich\_49 Start: 28469, Stop: 29284, Start Num: 64

Candidate Starts for Westrich\_49:

(Start: 31 @28286 has 20 MA's), (46, 28367), (50, 28403), (59, 28451), (64, 28469), (Start: 83 @28562 has 3 MA's), (90, 28580), (93, 28610), (99, 28682), (111, 28748), (134, 28895), (136, 28901), (147, 28967), (160, 29069), (169, 29144), (170, 29147), (181, 29264),

Gene: WileyE\_42 Start: 27504, Stop: 28385, Start Num: 31

Candidate Starts for WileyE\_42:

(Start: 31 @27504 has 20 MA's), (46, 27585), (50, 27621), (59, 27669), (99, 27783), (134, 27996), (136, 28002), (137, 28005), (147, 28068), (160, 28170), (169, 28245), (170, 28248), (181, 28365),

Gene: Winget\_5 Start: 1850, Stop: 1287, Start Num: 91

Candidate Starts for Winget\_5:

(Start: 91 @1850 has 6 MA's), (105, 1733), (108, 1718), (113, 1667), (115, 1664), (135, 1556), (138, 1547), (155, 1418), (156, 1415), (158, 1379), (164, 1340), (167, 1304),

Gene: YungJamal\_6 Start: 2139, Stop: 1576, Start Num: 91

Candidate Starts for YungJamal\_6:

(Start: 91 @2139 has 6 MA's), (105, 2022), (108, 2007), (113, 1956), (115, 1953), (135, 1845), (138, 1836), (155, 1707), (156, 1704), (164, 1629), (167, 1593),

Gene: Zhuangyuan\_45 Start: 27978, Stop: 28547, Start Num: 31

Candidate Starts for Zhuangyuan\_45:

(Start: 31 @27978 has 20 MA's), (43, 28038), (44, 28044), (51, 28098), (52, 28110), (59, 28143), (64, 28161), (134, 28263), (136, 28269), (169, 28395), (170, 28398), (179, 28482), (181, 28515),

Gene: Zixiang\_40 Start: 27967, Stop: 28965, Start Num: 31

Candidate Starts for Zixiang\_40:

(Start: 31 @27967 has 20 MA's), (46, 28048), (50, 28084), (59, 28132), (64, 28150), (Start: 83 @28243 has 3 MA's), (90, 28261), (93, 28291), (99, 28363), (111, 28429), (134, 28576), (136, 28582), (147, 28648), (160, 28750), (169, 28825), (170, 28828), (181, 28945),