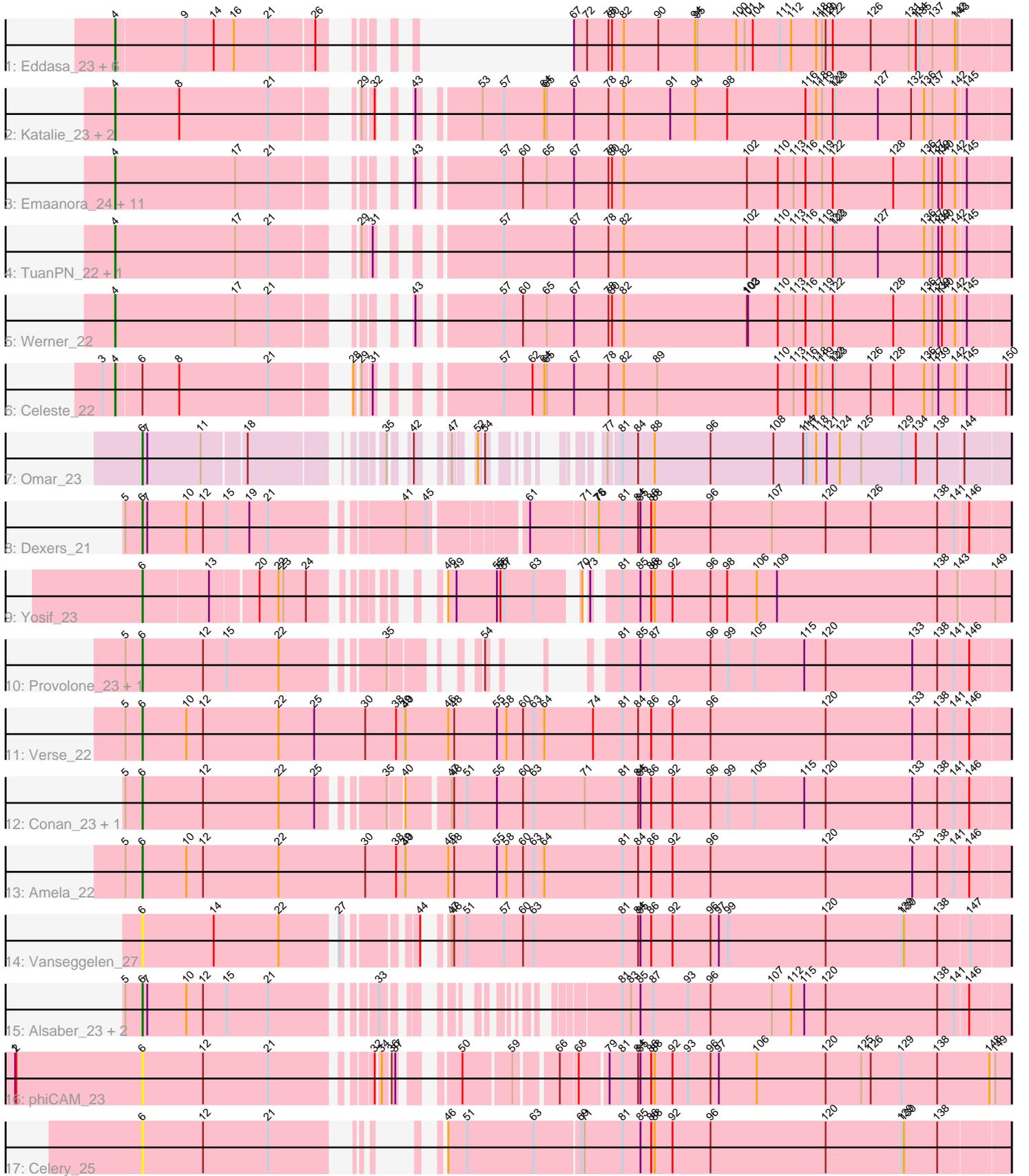


Pham 283961



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 283961 Report

This analysis was run 02/23/26 on database version 636.

Pham number 283961 has 41 members, 5 are drafts.

Phages represented in each track:

- Track 1 : Eddasa\_23, Izzy\_23, EnochSoames\_24, Oliynyk\_23, Jash\_23, Rusticus\_23, BryanRecycles\_23
- Track 2 : Katalie\_23, RedBear\_24, South40\_23
- Track 3 : Emaanora\_24, TagePhighter\_23, Asten\_22, Triste\_22, OzzyJ\_23, Hippo\_22, Chucky\_22, Dwayne\_22, SarahRose\_22, BarryBee\_24, Whatever\_22, Snorlax\_22
- Track 4 : TuanPN\_22, Ejemplo\_22
- Track 5 : Werner\_22
- Track 6 : Celeste\_22
- Track 7 : Omar\_23
- Track 8 : Dexers\_21
- Track 9 : Yosif\_23
- Track 10 : Provolone\_23, ElGato\_23
- Track 11 : Verse\_22
- Track 12 : Conan\_23, Pavo\_23
- Track 13 : Amela\_22
- Track 14 : Vanseggelen\_27
- Track 15 : Alsaber\_23, Sudan\_23, Kaine\_22
- Track 16 : phiCAM\_23
- Track 17 : Celery\_25

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

The start number called the most often in the published annotations is 4, it was called in 25 of the 36 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Asten\_22, BarryBee\_24, BryanRecycles\_23, Celeste\_22, Chucky\_22, Dwayne\_22, Eddasa\_23, Ejemplo\_22, Emaanora\_24, EnochSoames\_24, Hippo\_22, Izzy\_23, Jash\_23, Katalie\_23, Oliynyk\_23, OzzyJ\_23, RedBear\_24, Rusticus\_23, SarahRose\_22, Snorlax\_22, South40\_23, TagePhighter\_23, Triste\_22, TuanPN\_22, Werner\_22, Whatever\_22,

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

•

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

• Alsaber\_23, Amela\_22, Celery\_25, Conan\_23, Dexers\_21, ElGato\_23, Kaine\_22, Omar\_23, Pavo\_23, Provolone\_23, Sudan\_23, Vanseggelen\_27, Verse\_22, Yosif\_23, phiCAM\_23,

### Summary by start number:

Start 4:

- Found in 26 of 41 ( 63.4% ) of genes in pham
- Manual Annotations of this start: 25 of 36
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Asten\_22 (BD1), BarryBee\_24 (BD1), BryanRecycles\_23 (BD1), Celeste\_22 (BD1), Chucky\_22 (BD1), Dwayne\_22 (BD1), Eddasa\_23 (BD1), Ejemplo\_22 (BD1), Emaanora\_24 (BD1), EnochSoames\_24 (BD1), Hippo\_22 (BD1), Izzy\_23 (BD1), Jash\_23 (BD1), Katalie\_23 (BD1), Oliynyk\_23 (BD1), OzzyJ\_23 (BD1), RedBear\_24 (BD1), Rusticus\_23 (BD1), SarahRose\_22 (BD1), Snorlax\_22 (BD1), South40\_23 (BD1), TagePhighter\_23 (BD1), Triste\_22 (BD1), TuanPN\_22 (BD1), Werner\_22 (BD1), Whatever\_22 (BD1),

Start 6:

- Found in 16 of 41 ( 39.0% ) of genes in pham
- Manual Annotations of this start: 11 of 36
- Called 93.8% of time when present
- Phage (with cluster) where this start called: Alsaber\_23 (BD3), Amela\_22 (BD3), Celery\_25 (BD3), Conan\_23 (BD3), Dexers\_21 (BD3), ElGato\_23 (BD3), Kaine\_22 (BD3), Omar\_23 (BD2), Pavo\_23 (BD3), Provolone\_23 (BD3), Sudan\_23 (BD3), Vanseggelen\_27 (BD3), Verse\_22 (BD3), Yosif\_23 (BD3), phiCAM\_23 (BD3),

### Summary by clusters:

There are 3 clusters represented in this pham: BD1, BD3, BD2,

Info for manual annotations of cluster BD1:

- Start number 4 was manually annotated 25 times for cluster BD1.

Info for manual annotations of cluster BD2:

- Start number 6 was manually annotated 1 time for cluster BD2.

Info for manual annotations of cluster BD3:

- Start number 6 was manually annotated 10 times for cluster BD3.

### Gene Information:

Gene: Alsaber\_23 Start: 18064, Stop: 19866, Start Num: 6

Candidate Starts for Alsaber\_23:

(5, 18025), (Start: 6 @18064 has 11 MA's), (7, 18076), (10, 18172), (12, 18214), (15, 18274), (21, 18373), (33, 18589), (81, 18904), (83, 18925), (85, 18949), (87, 18982), (93, 19069), (96, 19126), (107, 19279), (112, 19327), (115, 19360), (120, 19414), (138, 19696), (141, 19738), (146, 19771),

Gene: Amela\_22 Start: 18357, Stop: 20531, Start Num: 6

Candidate Starts for Amela\_22:

(5, 18318), (Start: 6 @18357 has 11 MA's), (10, 18465), (12, 18507), (22, 18693), (30, 18912), (38, 18990), (39, 19011), (40, 19014), (46, 19122), (48, 19137), (55, 19245), (58, 19269), (60, 19311), (63, 19338), (64, 19365), (81, 19563), (84, 19602), (86, 19635), (92, 19689), (96, 19785), (120, 20073), (133, 20292), (138, 20355), (141, 20397), (146, 20436),

Gene: Asten\_22 Start: 17336, Stop: 19312, Start Num: 4

Candidate Starts for Asten\_22:

(Start: 4 @17336 has 25 MA's), (17, 17639), (21, 17717), (43, 17915), (57, 18080), (60, 18125), (65, 18185), (67, 18251), (78, 18332), (80, 18341), (82, 18371), (102, 18665), (110, 18743), (113, 18782), (116, 18812), (119, 18854), (122, 18881), (128, 19034), (136, 19112), (137, 19133), (139, 19148), (140, 19157), (142, 19187), (145, 19211),

Gene: BarryBee\_24 Start: 17346, Stop: 19322, Start Num: 4

Candidate Starts for BarryBee\_24:

(Start: 4 @17346 has 25 MA's), (17, 17649), (21, 17727), (43, 17925), (57, 18090), (60, 18135), (65, 18195), (67, 18261), (78, 18342), (80, 18351), (82, 18381), (102, 18675), (110, 18753), (113, 18792), (116, 18822), (119, 18864), (122, 18891), (128, 19044), (136, 19122), (137, 19143), (139, 19158), (140, 19167), (142, 19197), (145, 19221),

Gene: BryanRecycles\_23 Start: 17521, Stop: 19164, Start Num: 4

Candidate Starts for BryanRecycles\_23:

(Start: 4 @17521 has 25 MA's), (9, 17692), (14, 17764), (16, 17815), (21, 17896), (26, 18007), (67, 18103), (72, 18136), (78, 18184), (80, 18193), (82, 18223), (90, 18304), (94, 18388), (95, 18394), (100, 18490), (101, 18511), (104, 18532), (111, 18601), (112, 18628), (118, 18691), (119, 18706), (120, 18715), (122, 18733), (126, 18829), (131, 18925), (134, 18943), (135, 18952), (137, 18985), (142, 19039), (143, 19045),

Gene: Celery\_25 Start: 18018, Stop: 19919, Start Num: 6

Candidate Starts for Celery\_25:

(Start: 6 @18018 has 11 MA's), (12, 18168), (21, 18327), (46, 18528), (51, 18576), (63, 18744), (69, 18855), (71, 18864), (81, 18960), (85, 19005), (86, 19032), (88, 19041), (92, 19086), (96, 19182), (120, 19470), (129, 19662), (130, 19668), (138, 19749),

Gene: Celeste\_22 Start: 17352, Stop: 19334, Start Num: 4

Candidate Starts for Celeste\_22:

(3, 17322), (Start: 4 @17352 has 25 MA's), (Start: 6 @17412 has 11 MA's), (8, 17505), (21, 17724), (28, 17868), (29, 17877), (31, 17898), (57, 18099), (62, 18168), (64, 18198), (65, 18204), (67, 18273), (78, 18354), (82, 18393), (89, 18471), (110, 18765), (113, 18804), (116, 18834), (118, 18861), (119, 18876), (122, 18903), (123, 18909), (126, 18999), (128, 19056), (136, 19134), (137, 19155), (139, 19170), (142, 19209), (145, 19233), (150, 19320),

Gene: Chucky\_22 Start: 17347, Stop: 19323, Start Num: 4

Candidate Starts for Chucky\_22:

(Start: 4 @17347 has 25 MA's), (17, 17650), (21, 17728), (43, 17926), (57, 18091), (60, 18136), (65, 18196), (67, 18262), (78, 18343), (80, 18352), (82, 18382), (102, 18676), (110, 18754), (113, 18793), (116, 18823), (119, 18865), (122, 18892), (128, 19045), (136, 19123), (137, 19144), (139, 19159), (140, 19168), (142, 19198), (145, 19222),

Gene: Conan\_23 Start: 17786, Stop: 19858, Start Num: 6

Candidate Starts for Conan\_23:

(5, 17747), (Start: 6 @17786 has 11 MA's), (12, 17936), (22, 18122), (25, 18212), (35, 18332), (40, 18362), (47, 18461), (48, 18467), (51, 18500), (55, 18575), (60, 18641), (63, 18668), (71, 18794), (81, 18890), (84, 18929), (85, 18935), (86, 18962), (92, 19016), (96, 19112), (99, 19157), (105, 19223), (115, 19346), (120, 19400), (133, 19619), (138, 19682), (141, 19724), (146, 19763),

Gene: Dexers\_21 Start: 17767, Stop: 19797, Start Num: 6

Candidate Starts for Dexers\_21:

(5, 17728), (Start: 6 @17767 has 11 MA's), (7, 17779), (10, 17875), (12, 17917), (15, 17977), (19, 18031), (21, 18076), (41, 18358), (45, 18409), (61, 18622), (71, 18751), (75, 18772), (76, 18775), (81, 18835), (84, 18874), (85, 18880), (86, 18907), (88, 18916), (96, 19057), (107, 19210), (120, 19345), (126, 19459), (138, 19627), (141, 19669), (146, 19702),

Gene: Dwayne\_22 Start: 17343, Stop: 19310, Start Num: 4

Candidate Starts for Dwayne\_22:

(Start: 4 @17343 has 25 MA's), (17, 17637), (21, 17715), (43, 17913), (57, 18078), (60, 18123), (65, 18183), (67, 18249), (78, 18330), (80, 18339), (82, 18369), (102, 18663), (110, 18741), (113, 18780), (116, 18810), (119, 18852), (122, 18879), (128, 19032), (136, 19110), (137, 19131), (139, 19146), (140, 19155), (142, 19185), (145, 19209),

Gene: Eddasa\_23 Start: 17521, Stop: 19164, Start Num: 4

Candidate Starts for Eddasa\_23:

(Start: 4 @17521 has 25 MA's), (9, 17692), (14, 17764), (16, 17815), (21, 17896), (26, 18007), (67, 18103), (72, 18136), (78, 18184), (80, 18193), (82, 18223), (90, 18304), (94, 18388), (95, 18394), (100, 18490), (101, 18511), (104, 18532), (111, 18601), (112, 18628), (118, 18691), (119, 18706), (120, 18715), (122, 18733), (126, 18829), (131, 18925), (134, 18943), (135, 18952), (137, 18985), (142, 19039), (143, 19045),

Gene: Ejemplo\_22 Start: 17343, Stop: 19334, Start Num: 4

Candidate Starts for Ejemplo\_22:

(Start: 4 @17343 has 25 MA's), (17, 17646), (21, 17724), (29, 17877), (31, 17898), (57, 18099), (67, 18273), (78, 18354), (82, 18393), (102, 18687), (110, 18765), (113, 18804), (116, 18834), (119, 18876), (122, 18903), (123, 18909), (127, 19017), (136, 19134), (137, 19155), (139, 19170), (140, 19179), (142, 19209), (145, 19233),

Gene: ElGato\_23 Start: 17789, Stop: 19504, Start Num: 6

Candidate Starts for ElGato\_23:

(5, 17750), (Start: 6 @17789 has 11 MA's), (12, 17939), (15, 17999), (22, 18125), (35, 18335), (54, 18452), (81, 18536), (85, 18581), (87, 18614), (96, 18758), (99, 18803), (105, 18869), (115, 18992), (120, 19046), (133, 19265), (138, 19328), (141, 19370), (146, 19409),

Gene: Emaanora\_24 Start: 17346, Stop: 19322, Start Num: 4

Candidate Starts for Emaanora\_24:

(Start: 4 @17346 has 25 MA's), (17, 17649), (21, 17727), (43, 17925), (57, 18090), (60, 18135), (65, 18195), (67, 18261), (78, 18342), (80, 18351), (82, 18381), (102, 18675), (110, 18753), (113, 18792), (116, 18822), (119, 18864), (122, 18891), (128, 19044), (136, 19122), (137, 19143), (139, 19158), (140, 19167), (142, 19197), (145, 19221),

Gene: EnochSoames\_24 Start: 17517, Stop: 19160, Start Num: 4

Candidate Starts for EnochSoames\_24:

(Start: 4 @17517 has 25 MA's), (9, 17688), (14, 17760), (16, 17811), (21, 17892), (26, 18003), (67, 18099), (72, 18132), (78, 18180), (80, 18189), (82, 18219), (90, 18300), (94, 18384), (95, 18390), (100, 18486), (101, 18507), (104, 18528), (111, 18597), (112, 18624), (118, 18687), (119, 18702), (120, 18711), (122, 18729), (126, 18825), (131, 18921), (134, 18939), (135, 18948), (137, 18981), (142,

19035), (143, 19041),

Gene: Hippo\_22 Start: 17346, Stop: 19322, Start Num: 4

Candidate Starts for Hippo\_22:

(Start: 4 @17346 has 25 MA's), (17, 17649), (21, 17727), (43, 17925), (57, 18090), (60, 18135), (65, 18195), (67, 18261), (78, 18342), (80, 18351), (82, 18381), (102, 18675), (110, 18753), (113, 18792), (116, 18822), (119, 18864), (122, 18891), (128, 19044), (136, 19122), (137, 19143), (139, 19158), (140, 19167), (142, 19197), (145, 19221),

Gene: Izzy\_23 Start: 17568, Stop: 19211, Start Num: 4

Candidate Starts for Izzy\_23:

(Start: 4 @17568 has 25 MA's), (9, 17739), (14, 17811), (16, 17862), (21, 17943), (26, 18054), (67, 18150), (72, 18183), (78, 18231), (80, 18240), (82, 18270), (90, 18351), (94, 18435), (95, 18441), (100, 18537), (101, 18558), (104, 18579), (111, 18648), (112, 18675), (118, 18738), (119, 18753), (120, 18762), (122, 18780), (126, 18876), (131, 18972), (134, 18990), (135, 18999), (137, 19032), (142, 19086), (143, 19092),

Gene: Jash\_23 Start: 17521, Stop: 19164, Start Num: 4

Candidate Starts for Jash\_23:

(Start: 4 @17521 has 25 MA's), (9, 17692), (14, 17764), (16, 17815), (21, 17896), (26, 18007), (67, 18103), (72, 18136), (78, 18184), (80, 18193), (82, 18223), (90, 18304), (94, 18388), (95, 18394), (100, 18490), (101, 18511), (104, 18532), (111, 18601), (112, 18628), (118, 18691), (119, 18706), (120, 18715), (122, 18733), (126, 18829), (131, 18925), (134, 18943), (135, 18952), (137, 18985), (142, 19039), (143, 19045),

Gene: Kaine\_22 Start: 17767, Stop: 19569, Start Num: 6

Candidate Starts for Kaine\_22:

(5, 17728), (Start: 6 @17767 has 11 MA's), (7, 17779), (10, 17875), (12, 17917), (15, 17977), (21, 18076), (33, 18292), (81, 18607), (83, 18628), (85, 18652), (87, 18685), (93, 18772), (96, 18829), (107, 18982), (112, 19030), (115, 19063), (120, 19117), (138, 19399), (141, 19441), (146, 19474),

Gene: Katalie\_23 Start: 17609, Stop: 19588, Start Num: 4

Candidate Starts for Katalie\_23:

(Start: 4 @17609 has 25 MA's), (8, 17771), (21, 17987), (29, 18140), (32, 18164), (43, 18185), (53, 18299), (57, 18353), (64, 18452), (65, 18458), (67, 18527), (78, 18608), (82, 18647), (91, 18755), (94, 18812), (98, 18893), (116, 19088), (118, 19115), (119, 19130), (122, 19157), (123, 19163), (127, 19271), (132, 19355), (136, 19388), (137, 19409), (142, 19463), (145, 19487),

Gene: Oliynyk\_23 Start: 17521, Stop: 19164, Start Num: 4

Candidate Starts for Oliynyk\_23:

(Start: 4 @17521 has 25 MA's), (9, 17692), (14, 17764), (16, 17815), (21, 17896), (26, 18007), (67, 18103), (72, 18136), (78, 18184), (80, 18193), (82, 18223), (90, 18304), (94, 18388), (95, 18394), (100, 18490), (101, 18511), (104, 18532), (111, 18601), (112, 18628), (118, 18691), (119, 18706), (120, 18715), (122, 18733), (126, 18829), (131, 18925), (134, 18943), (135, 18952), (137, 18985), (142, 19039), (143, 19045),

Gene: Omar\_23 Start: 18196, Stop: 19896, Start Num: 6

Candidate Starts for Omar\_23:

(Start: 6 @18196 has 11 MA's), (7, 18208), (11, 18337), (18, 18433), (35, 18676), (42, 18700), (47, 18739), (52, 18769), (54, 18778), (77, 18904), (81, 18934), (84, 18973), (88, 19015), (96, 19156), (108, 19315), (114, 19390), (117, 19399), (118, 19423), (121, 19450), (124, 19483), (125, 19537), (129, 19639), (134, 19672), (138, 19726), (144, 19789),

Gene: OzzyJ\_23 Start: 17337, Stop: 19313, Start Num: 4

Candidate Starts for OzzyJ\_23:

(Start: 4 @17337 has 25 MA's), (17, 17640), (21, 17718), (43, 17916), (57, 18081), (60, 18126), (65, 18186), (67, 18252), (78, 18333), (80, 18342), (82, 18372), (102, 18666), (110, 18744), (113, 18783), (116, 18813), (119, 18855), (122, 18882), (128, 19035), (136, 19113), (137, 19134), (139, 19149), (140, 19158), (142, 19188), (145, 19212),

Gene: Pavo\_23 Start: 18059, Stop: 20131, Start Num: 6

Candidate Starts for Pavo\_23:

(5, 18020), (Start: 6 @18059 has 11 MA's), (12, 18209), (22, 18395), (25, 18485), (35, 18605), (40, 18635), (47, 18734), (48, 18740), (51, 18773), (55, 18848), (60, 18914), (63, 18941), (71, 19067), (81, 19163), (84, 19202), (85, 19208), (86, 19235), (92, 19289), (96, 19385), (99, 19430), (105, 19496), (115, 19619), (120, 19673), (133, 19892), (138, 19955), (141, 19997), (146, 20036),

Gene: Provolone\_23 Start: 17789, Stop: 19504, Start Num: 6

Candidate Starts for Provolone\_23:

(5, 17750), (Start: 6 @17789 has 11 MA's), (12, 17939), (15, 17999), (22, 18125), (35, 18335), (54, 18452), (81, 18536), (85, 18581), (87, 18614), (96, 18758), (99, 18803), (105, 18869), (115, 18992), (120, 19046), (133, 19265), (138, 19328), (141, 19370), (146, 19409),

Gene: RedBear\_24 Start: 17609, Stop: 19588, Start Num: 4

Candidate Starts for RedBear\_24:

(Start: 4 @17609 has 25 MA's), (8, 17771), (21, 17987), (29, 18140), (32, 18164), (43, 18185), (53, 18299), (57, 18353), (64, 18452), (65, 18458), (67, 18527), (78, 18608), (82, 18647), (91, 18755), (94, 18812), (98, 18893), (116, 19088), (118, 19115), (119, 19130), (122, 19157), (123, 19163), (127, 19271), (132, 19355), (136, 19388), (137, 19409), (142, 19463), (145, 19487),

Gene: Rusticus\_23 Start: 17521, Stop: 19164, Start Num: 4

Candidate Starts for Rusticus\_23:

(Start: 4 @17521 has 25 MA's), (9, 17692), (14, 17764), (16, 17815), (21, 17896), (26, 18007), (67, 18103), (72, 18136), (78, 18184), (80, 18193), (82, 18223), (90, 18304), (94, 18388), (95, 18394), (100, 18490), (101, 18511), (104, 18532), (111, 18601), (112, 18628), (118, 18691), (119, 18706), (120, 18715), (122, 18733), (126, 18829), (131, 18925), (134, 18943), (135, 18952), (137, 18985), (142, 19039), (143, 19045),

Gene: SarahRose\_22 Start: 17343, Stop: 19319, Start Num: 4

Candidate Starts for SarahRose\_22:

(Start: 4 @17343 has 25 MA's), (17, 17646), (21, 17724), (43, 17922), (57, 18087), (60, 18132), (65, 18192), (67, 18258), (78, 18339), (80, 18348), (82, 18378), (102, 18672), (110, 18750), (113, 18789), (116, 18819), (119, 18861), (122, 18888), (128, 19041), (136, 19119), (137, 19140), (139, 19155), (140, 19164), (142, 19194), (145, 19218),

Gene: Snorlax\_22 Start: 17346, Stop: 19322, Start Num: 4

Candidate Starts for Snorlax\_22:

(Start: 4 @17346 has 25 MA's), (17, 17649), (21, 17727), (43, 17925), (57, 18090), (60, 18135), (65, 18195), (67, 18261), (78, 18342), (80, 18351), (82, 18381), (102, 18675), (110, 18753), (113, 18792), (116, 18822), (119, 18864), (122, 18891), (128, 19044), (136, 19122), (137, 19143), (139, 19158), (140, 19167), (142, 19197), (145, 19221),

Gene: South40\_23 Start: 17609, Stop: 19588, Start Num: 4

Candidate Starts for South40\_23:

(Start: 4 @17609 has 25 MA's), (8, 17771), (21, 17987), (29, 18140), (32, 18164), (43, 18185), (53, 18299), (57, 18353), (64, 18452), (65, 18458), (67, 18527), (78, 18608), (82, 18647), (91, 18755), (94,

18812), (98, 18893), (116, 19088), (118, 19115), (119, 19130), (122, 19157), (123, 19163), (127, 19271), (132, 19355), (136, 19388), (137, 19409), (142, 19463), (145, 19487),

Gene: Sudan\_23 Start: 18054, Stop: 19856, Start Num: 6

Candidate Starts for Sudan\_23:

(5, 18015), (Start: 6 @18054 has 11 MA's), (7, 18066), (10, 18162), (12, 18204), (15, 18264), (21, 18363), (33, 18579), (81, 18894), (83, 18915), (85, 18939), (87, 18972), (93, 19059), (96, 19116), (107, 19269), (112, 19317), (115, 19350), (120, 19404), (138, 19686), (141, 19728), (146, 19761),

Gene: TagePighter\_23 Start: 17346, Stop: 19322, Start Num: 4

Candidate Starts for TagePighter\_23:

(Start: 4 @17346 has 25 MA's), (17, 17649), (21, 17727), (43, 17925), (57, 18090), (60, 18135), (65, 18195), (67, 18261), (78, 18342), (80, 18351), (82, 18381), (102, 18675), (110, 18753), (113, 18792), (116, 18822), (119, 18864), (122, 18891), (128, 19044), (136, 19122), (137, 19143), (139, 19158), (140, 19167), (142, 19197), (145, 19221),

Gene: Triste\_22 Start: 17337, Stop: 19313, Start Num: 4

Candidate Starts for Triste\_22:

(Start: 4 @17337 has 25 MA's), (17, 17640), (21, 17718), (43, 17916), (57, 18081), (60, 18126), (65, 18186), (67, 18252), (78, 18333), (80, 18342), (82, 18372), (102, 18666), (110, 18744), (113, 18783), (116, 18813), (119, 18855), (122, 18882), (128, 19035), (136, 19113), (137, 19134), (139, 19149), (140, 19158), (142, 19188), (145, 19212),

Gene: TuanPN\_22 Start: 17343, Stop: 19334, Start Num: 4

Candidate Starts for TuanPN\_22:

(Start: 4 @17343 has 25 MA's), (17, 17646), (21, 17724), (29, 17877), (31, 17898), (57, 18099), (67, 18273), (78, 18354), (82, 18393), (102, 18687), (110, 18765), (113, 18804), (116, 18834), (119, 18876), (122, 18903), (123, 18909), (127, 19017), (136, 19134), (137, 19155), (139, 19170), (140, 19179), (142, 19209), (145, 19233),

Gene: Vanseggelen\_27 Start: 17719, Stop: 19728, Start Num: 6

Candidate Starts for Vanseggelen\_27:

(Start: 6 @17719 has 11 MA's), (14, 17896), (22, 18058), (27, 18184), (44, 18316), (47, 18337), (48, 18343), (51, 18376), (57, 18469), (60, 18517), (63, 18544), (81, 18769), (84, 18808), (85, 18814), (86, 18841), (92, 18895), (96, 18991), (97, 19012), (99, 19036), (120, 19279), (129, 19471), (130, 19477), (138, 19558), (147, 19636),

Gene: Verse\_22 Start: 18351, Stop: 20525, Start Num: 6

Candidate Starts for Verse\_22:

(5, 18312), (Start: 6 @18351 has 11 MA's), (10, 18459), (12, 18501), (22, 18687), (25, 18777), (30, 18906), (38, 18984), (39, 19005), (40, 19008), (46, 19116), (48, 19131), (55, 19239), (58, 19263), (60, 19305), (63, 19332), (64, 19359), (74, 19482), (81, 19557), (84, 19596), (86, 19629), (92, 19683), (96, 19779), (120, 20067), (133, 20286), (138, 20349), (141, 20391), (146, 20430),

Gene: Werner\_22 Start: 17347, Stop: 19323, Start Num: 4

Candidate Starts for Werner\_22:

(Start: 4 @17347 has 25 MA's), (17, 17650), (21, 17728), (43, 17926), (57, 18091), (60, 18136), (65, 18196), (67, 18262), (78, 18343), (80, 18352), (82, 18382), (102, 18676), (103, 18679), (110, 18754), (113, 18793), (116, 18823), (119, 18865), (122, 18892), (128, 19045), (136, 19123), (137, 19144), (139, 19159), (140, 19168), (142, 19198), (145, 19222),

Gene: Whatever\_22 Start: 17347, Stop: 19323, Start Num: 4

Candidate Starts for Whatever\_22:

(Start: 4 @17347 has 25 MA's), (17, 17650), (21, 17728), (43, 17926), (57, 18091), (60, 18136), (65, 18196), (67, 18262), (78, 18343), (80, 18352), (82, 18382), (102, 18676), (110, 18754), (113, 18793), (116, 18823), (119, 18865), (122, 18892), (128, 19045), (136, 19123), (137, 19144), (139, 19159), (140, 19168), (142, 19198), (145, 19222),

Gene: Yosif\_23 Start: 18289, Stop: 20154, Start Num: 6

Candidate Starts for Yosif\_23:

(Start: 6 @18289 has 11 MA's), (13, 18442), (20, 18550), (22, 18595), (23, 18607), (24, 18661), (46, 18826), (49, 18847), (55, 18949), (56, 18958), (57, 18967), (63, 19042), (70, 19126), (73, 19132), (81, 19180), (85, 19225), (86, 19252), (88, 19261), (92, 19306), (96, 19402), (98, 19444), (106, 19519), (109, 19567), (138, 19972), (143, 20023), (149, 20113),

Gene: phiCAM\_23 Start: 20017, Stop: 21960, Start Num: 6

Candidate Starts for phiCAM\_23:

(1, 19699), (2, 19702), (Start: 6 @20017 has 11 MA's), (12, 20167), (21, 20326), (32, 20536), (34, 20545), (36, 20560), (37, 20569), (50, 20659), (59, 20770), (66, 20860), (68, 20902), (79, 20968), (81, 20998), (84, 21037), (85, 21043), (86, 21070), (88, 21079), (92, 21124), (93, 21163), (96, 21220), (97, 21241), (106, 21337), (120, 21508), (125, 21598), (126, 21622), (129, 21700), (138, 21790), (148, 21910), (149, 21919),