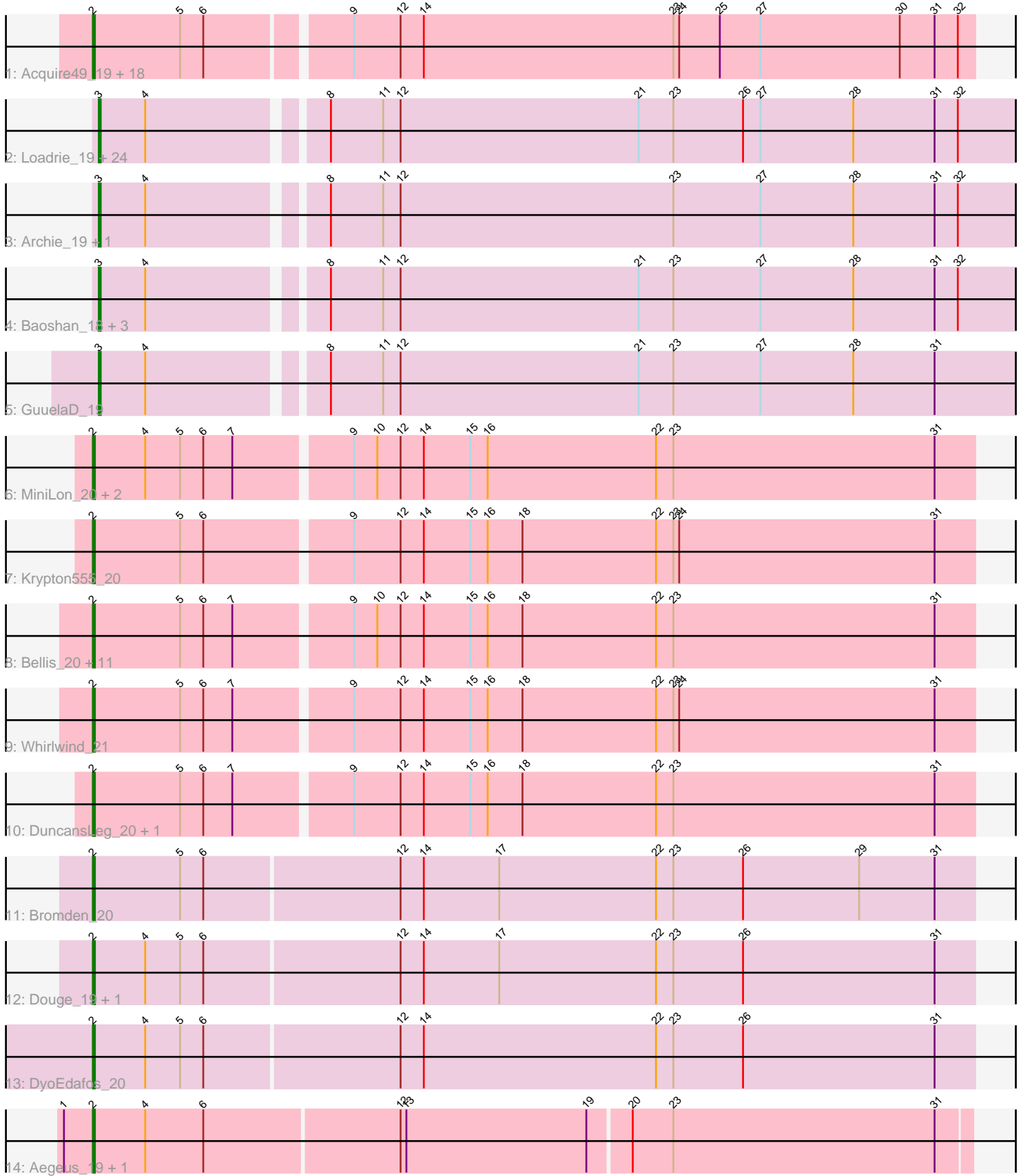


Pham 157822



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 157822 Report

This analysis was run 04/13/24 on database version 558.

Pham number 157822 has 76 members, 9 are drafts.

Phages represented in each track:

- Track 1 : Acquire49\_19, Enceladus\_19, DirkDirk\_19, MAckerman\_19, Calm\_19, JoeDirt\_19, Wamburggrxpress\_19, LeBron\_19, Tyson\_19, Rose5\_19, Halena\_19, Zaria\_19, OhShagHennessy\_19, Silverleaf\_19, Appletree2\_19, UPIE\_19, AvadaKedavra\_19, CicholasNage\_19, Wyatt2\_19
- Track 2 : Loadrie\_19, Crossroads\_19, Miley16\_19, Gabriela\_19, Zakai\_19, Hafay\_19, Kahlid\_19, Breezona\_19, Gardann\_19, Winky\_19, DrSeegs\_19, Faith1\_19, Itos\_19, Vetrix\_19, BobsGarage\_19, Lewan\_19, Finemlucis\_19, Rumpelstiltskin\_19, LilDestine\_19, Wilder\_19, Nicholasp3\_19, MkaliMitinis3\_19, Wigglewiggles\_19, Netyap\_19, BigCheese\_19
- Track 3 : Archie\_19, Bazzle\_19
- Track 4 : Baoshan\_18, Tourach\_19, ZhongYanYuan\_18, Claus\_19
- Track 5 : GuuelaD\_19
- Track 6 : MiniLon\_20, MiniMac\_20, Lolly9\_20
- Track 7 : Krypton555\_20
- Track 8 : Bellis\_20, Samty\_20, Snenia\_20, Jubie\_20, Finnry\_20, MsGreen\_20, Nicholas\_20, Jobypre\_20, Lumos\_20, Moostard\_20, Kingsolomon\_20, Clautastrophe\_20
- Track 9 : Whirlwind\_21
- Track 10 : DuncansLeg\_20, Ellson\_20
- Track 11 : Bromden\_20
- Track 12 : Douge\_19, Chaser\_19
- Track 13 : DyoEdafos\_20
- Track 14 : Aegeus\_19, Baudelaire\_19

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

The start number called the most often in the published annotations is 2, it was called in 39 of the 67 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Acquire49\_19, Aegeus\_19, Appletree2\_19, AvadaKedavra\_19, Baudelaire\_19, Bellis\_20, Bromden\_20, Calm\_19, Chaser\_19, CicholasNage\_19, Clautastrophe\_20, DirkDirk\_19, Douge\_19, DuncansLeg\_20, DyoEdafos\_20, Ellson\_20, Enceladus\_19, Finnry\_20, Halena\_19, Jobypre\_20, JoeDirt\_19, Jubie\_20, Kingsolomon\_20,

Krypton555\_20, LeBron\_19, Lolly9\_20, Lumos\_20, MAckerman\_19, MiniLon\_20, MiniMac\_20, Moostard\_20, MsGreen\_20, Nicholas\_20, OhShagHennessy\_19, Rose5\_19, Samty\_20, Silverleaf\_19, Snenia\_20, Tyson\_19, UPIE\_19, Wamburgxpress\_19, Whirlwind\_21, Wyatt2\_19, Zaria\_19,

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

- 

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

- Archie\_19, Baoshan\_18, Bazzle\_19, BigCheese\_19, BobsGarage\_19, Breezona\_19, Claus\_19, Crossroads\_19, DrSeegs\_19, Faith1\_19, Finemlucis\_19, Gabriela\_19, Gardann\_19, GuuelaD\_19, Hafay\_19, Itos\_19, Kahlid\_19, Lewan\_19, LilDestine\_19, Loadrie\_19, Miley16\_19, MkaliMitinis3\_19, Netyap\_19, Nicholasp3\_19, Rumpelstiltskin\_19, Tourach\_19, Vetrix\_19, Wigglewiggle\_19, Wilder\_19, Winky\_19, Zakai\_19, ZhongYanYuan\_18,

### Summary by start number:

Start 2:

- Found in 44 of 76 ( 57.9% ) of genes in pham
- Manual Annotations of this start: 39 of 67
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Acquire49\_19 (L1), Aegeus\_19 (L5), Appletree2\_19 (L1), AvadaKedavra\_19 (L1), Baudelaire\_19 (L5), Bellis\_20 (L3), Bromden\_20 (L4), Calm\_19 (L1), Chaser\_19 (L4), CicholasNage\_19 (L1), Clautastrophe\_20 (L3), DirkDirk\_19 (L1), Douge\_19 (L4), DuncansLeg\_20 (L3), DyoEdafos\_20 (L4), Ellson\_20 (L3), Enceladus\_19 (L1), Finnry\_20 (L3), Halena\_19 (L1), Jobypre\_20 (L3), JoeDirt\_19 (L1), Jubie\_20 (L3), Kingsolomon\_20 (L3), Krypton555\_20 (L3), LeBron\_19 (L1), Lolly9\_20 (L3), Lumos\_20 (L3), MAckerman\_19 (L1), MiniLon\_20 (L3), MiniMac\_20 (L3), Moostard\_20 (L3), MsGreen\_20 (L3), Nicholas\_20 (L3), OhShagHennessy\_19 (L1), Rose5\_19 (L1), Samty\_20 (L3), Silverleaf\_19 (L1), Snenia\_20 (L3), Tyson\_19 (L1), UPIE\_19 (L1), Wamburgxpress\_19 (L1), Whirlwind\_21 (L3), Wyatt2\_19 (L1), Zaria\_19 (L1),

Start 3:

- Found in 32 of 76 ( 42.1% ) of genes in pham
- Manual Annotations of this start: 28 of 67
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Archie\_19 (L2), Baoshan\_18 (L2), Bazzle\_19 (L2), BigCheese\_19 (L2), BobsGarage\_19 (L2), Breezona\_19 (L2), Claus\_19 (L2), Crossroads\_19 (L2), DrSeegs\_19 (L2), Faith1\_19 (L2), Finemlucis\_19 (L2), Gabriela\_19 (L2), Gardann\_19 (L2), GuuelaD\_19 (L2), Hafay\_19 (L2), Itos\_19 (L2), Kahlid\_19 (L2), Lewan\_19 (L2), LilDestine\_19 (L2), Loadrie\_19 (L2), Miley16\_19 (L2), MkaliMitinis3\_19 (L2), Netyap\_19 (L2), Nicholasp3\_19 (L2), Rumpelstiltskin\_19 (L2), Tourach\_19 (L2), Vetrix\_19 (L2), Wigglewiggle\_19 (L2), Wilder\_19 (L2), Winky\_19 (L2), Zakai\_19 (L2), ZhongYanYuan\_18 (L2),

### Summary by clusters:

There are 5 clusters represented in this pham: L4, L5, L2, L3, L1,

Info for manual annotations of cluster L1:

- Start number 2 was manually annotated 18 times for cluster L1.

Info for manual annotations of cluster L2:

- Start number 3 was manually annotated 28 times for cluster L2.

Info for manual annotations of cluster L3:

- Start number 2 was manually annotated 16 times for cluster L3.

Info for manual annotations of cluster L4:

- Start number 2 was manually annotated 3 times for cluster L4.

Info for manual annotations of cluster L5:

- Start number 2 was manually annotated 2 times for cluster L5.

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

Gene: Acquire49\_19 Start: 18550, Stop: 18996, Start Num: 2

Candidate Starts for Acquire49\_19:

(Start: 2 @18550 has 39 MA's), (5, 18595), (6, 18607), (9, 18676), (12, 18700), (14, 18712), (23, 18841), (24, 18844), (25, 18865), (27, 18886), (30, 18958), (31, 18976), (32, 18988),

Gene: Aegeus\_19 Start: 18088, Stop: 18534, Start Num: 2

Candidate Starts for Aegeus\_19:

(1, 18073), (Start: 2 @18088 has 39 MA's), (4, 18115), (6, 18145), (12, 18244), (13, 18247), (19, 18340), (20, 18361), (23, 18382), (31, 18517),

Gene: Appletree2\_19 Start: 18493, Stop: 18939, Start Num: 2

Candidate Starts for Appletree2\_19:

(Start: 2 @18493 has 39 MA's), (5, 18538), (6, 18550), (9, 18619), (12, 18643), (14, 18655), (23, 18784), (24, 18787), (25, 18808), (27, 18829), (30, 18901), (31, 18919), (32, 18931),

Gene: Archie\_19 Start: 18963, Stop: 19460, Start Num: 3

Candidate Starts for Archie\_19:

(Start: 3 @18963 has 28 MA's), (4, 18987), (8, 19071), (11, 19098), (12, 19107), (23, 19248), (27, 19293), (28, 19341), (31, 19383), (32, 19395),

Gene: AvadaKedavra\_19 Start: 18560, Stop: 19006, Start Num: 2

Candidate Starts for AvadaKedavra\_19:

(Start: 2 @18560 has 39 MA's), (5, 18605), (6, 18617), (9, 18686), (12, 18710), (14, 18722), (23, 18851), (24, 18854), (25, 18875), (27, 18896), (30, 18968), (31, 18986), (32, 18998),

Gene: Baoshan\_18 Start: 18572, Stop: 19069, Start Num: 3

Candidate Starts for Baoshan\_18:

(Start: 3 @18572 has 28 MA's), (4, 18596), (8, 18680), (11, 18707), (12, 18716), (21, 18839), (23, 18857), (27, 18902), (28, 18950), (31, 18992), (32, 19004),

Gene: Baudelaire\_19 Start: 18088, Stop: 18534, Start Num: 2

Candidate Starts for Baudelaire\_19:

(1, 18073), (Start: 2 @18088 has 39 MA's), (4, 18115), (6, 18145), (12, 18244), (13, 18247), (19, 18340), (20, 18361), (23, 18382), (31, 18517),

Gene: Bazzle\_19 Start: 18712, Stop: 19209, Start Num: 3

Candidate Starts for Bazzle\_19:

(Start: 3 @18712 has 28 MA's), (4, 18736), (8, 18820), (11, 18847), (12, 18856), (23, 18997), (27, 19042), (28, 19090), (31, 19132), (32, 19144),

Gene: Bellis\_20 Start: 19277, Stop: 19726, Start Num: 2

Candidate Starts for Bellis\_20:

(Start: 2 @19277 has 39 MA's), (5, 19322), (6, 19334), (7, 19349), (9, 19406), (10, 19418), (12, 19430), (14, 19442), (15, 19466), (16, 19475), (18, 19493), (22, 19562), (23, 19571), (31, 19706),

Gene: BigCheese\_19 Start: 18747, Stop: 19244, Start Num: 3

Candidate Starts for BigCheese\_19:

(Start: 3 @18747 has 28 MA's), (4, 18771), (8, 18855), (11, 18882), (12, 18891), (21, 19014), (23, 19032), (26, 19068), (27, 19077), (28, 19125), (31, 19167), (32, 19179),

Gene: BobsGarage\_19 Start: 18747, Stop: 19244, Start Num: 3

Candidate Starts for BobsGarage\_19:

(Start: 3 @18747 has 28 MA's), (4, 18771), (8, 18855), (11, 18882), (12, 18891), (21, 19014), (23, 19032), (26, 19068), (27, 19077), (28, 19125), (31, 19167), (32, 19179),

Gene: Breezona\_19 Start: 18747, Stop: 19244, Start Num: 3

Candidate Starts for Breezona\_19:

(Start: 3 @18747 has 28 MA's), (4, 18771), (8, 18855), (11, 18882), (12, 18891), (21, 19014), (23, 19032), (26, 19068), (27, 19077), (28, 19125), (31, 19167), (32, 19179),

Gene: Bromden\_20 Start: 18828, Stop: 19280, Start Num: 2

Candidate Starts for Bromden\_20:

(Start: 2 @18828 has 39 MA's), (5, 18873), (6, 18885), (12, 18984), (14, 18996), (17, 19035), (22, 19116), (23, 19125), (26, 19161), (29, 19221), (31, 19260),

Gene: Calm\_19 Start: 18564, Stop: 19010, Start Num: 2

Candidate Starts for Calm\_19:

(Start: 2 @18564 has 39 MA's), (5, 18609), (6, 18621), (9, 18690), (12, 18714), (14, 18726), (23, 18855), (24, 18858), (25, 18879), (27, 18900), (30, 18972), (31, 18990), (32, 19002),

Gene: Chaser\_19 Start: 18428, Stop: 18880, Start Num: 2

Candidate Starts for Chaser\_19:

(Start: 2 @18428 has 39 MA's), (4, 18455), (5, 18473), (6, 18485), (12, 18584), (14, 18596), (17, 18635), (22, 18716), (23, 18725), (26, 18761), (31, 18860),

Gene: CicholasNage\_19 Start: 18552, Stop: 18998, Start Num: 2

Candidate Starts for CicholasNage\_19:

(Start: 2 @18552 has 39 MA's), (5, 18597), (6, 18609), (9, 18678), (12, 18702), (14, 18714), (23, 18843), (24, 18846), (25, 18867), (27, 18888), (30, 18960), (31, 18978), (32, 18990),

Gene: Claus\_19 Start: 18728, Stop: 19225, Start Num: 3

Candidate Starts for Claus\_19:

(Start: 3 @18728 has 28 MA's), (4, 18752), (8, 18836), (11, 18863), (12, 18872), (21, 18995), (23, 19013), (27, 19058), (28, 19106), (31, 19148), (32, 19160),

Gene: Clautastrophe\_20 Start: 19275, Stop: 19724, Start Num: 2

Candidate Starts for Clautastrophe\_20:

(Start: 2 @19275 has 39 MA's), (5, 19320), (6, 19332), (7, 19347), (9, 19404), (10, 19416), (12, 19428), (14, 19440), (15, 19464), (16, 19473), (18, 19491), (22, 19560), (23, 19569), (31, 19704),

Gene: Crossroads\_19 Start: 18747, Stop: 19244, Start Num: 3

Candidate Starts for Crossroads\_19:

(Start: 3 @18747 has 28 MA's), (4, 18771), (8, 18855), (11, 18882), (12, 18891), (21, 19014), (23, 19032), (26, 19068), (27, 19077), (28, 19125), (31, 19167), (32, 19179),

Gene: DirkDirk\_19 Start: 18533, Stop: 18979, Start Num: 2

Candidate Starts for DirkDirk\_19:

(Start: 2 @18533 has 39 MA's), (5, 18578), (6, 18590), (9, 18659), (12, 18683), (14, 18695), (23, 18824), (24, 18827), (25, 18848), (27, 18869), (30, 18941), (31, 18959), (32, 18971),

Gene: Douge\_19 Start: 18369, Stop: 18821, Start Num: 2

Candidate Starts for Douge\_19:

(Start: 2 @18369 has 39 MA's), (4, 18396), (5, 18414), (6, 18426), (12, 18525), (14, 18537), (17, 18576), (22, 18657), (23, 18666), (26, 18702), (31, 18801),

Gene: DrSeegs\_19 Start: 18747, Stop: 19244, Start Num: 3

Candidate Starts for DrSeegs\_19:

(Start: 3 @18747 has 28 MA's), (4, 18771), (8, 18855), (11, 18882), (12, 18891), (21, 19014), (23, 19032), (26, 19068), (27, 19077), (28, 19125), (31, 19167), (32, 19179),

Gene: DuncansLeg\_20 Start: 19260, Stop: 19709, Start Num: 2

Candidate Starts for DuncansLeg\_20:

(Start: 2 @19260 has 39 MA's), (5, 19305), (6, 19317), (7, 19332), (9, 19389), (12, 19413), (14, 19425), (15, 19449), (16, 19458), (18, 19476), (22, 19545), (23, 19554), (31, 19689),

Gene: DyoEdafos\_20 Start: 18576, Stop: 19028, Start Num: 2

Candidate Starts for DyoEdafos\_20:

(Start: 2 @18576 has 39 MA's), (4, 18603), (5, 18621), (6, 18633), (12, 18732), (14, 18744), (22, 18864), (23, 18873), (26, 18909), (31, 19008),

Gene: Ellson\_20 Start: 19268, Stop: 19717, Start Num: 2

Candidate Starts for Ellson\_20:

(Start: 2 @19268 has 39 MA's), (5, 19313), (6, 19325), (7, 19340), (9, 19397), (12, 19421), (14, 19433), (15, 19457), (16, 19466), (18, 19484), (22, 19553), (23, 19562), (31, 19697),

Gene: Enceladus\_19 Start: 18534, Stop: 18980, Start Num: 2

Candidate Starts for Enceladus\_19:

(Start: 2 @18534 has 39 MA's), (5, 18579), (6, 18591), (9, 18660), (12, 18684), (14, 18696), (23, 18825), (24, 18828), (25, 18849), (27, 18870), (30, 18942), (31, 18960), (32, 18972),

Gene: Faith1\_19 Start: 18747, Stop: 19244, Start Num: 3

Candidate Starts for Faith1\_19:

(Start: 3 @18747 has 28 MA's), (4, 18771), (8, 18855), (11, 18882), (12, 18891), (21, 19014), (23, 19032), (26, 19068), (27, 19077), (28, 19125), (31, 19167), (32, 19179),

Gene: Finemlucis\_19 Start: 18755, Stop: 19252, Start Num: 3

Candidate Starts for Finemlucis\_19:

(Start: 3 @18755 has 28 MA's), (4, 18779), (8, 18863), (11, 18890), (12, 18899), (21, 19022), (23, 19040), (26, 19076), (27, 19085), (28, 19133), (31, 19175), (32, 19187),

Gene: Finnry\_20 Start: 19279, Stop: 19728, Start Num: 2

Candidate Starts for Finnry\_20:

(Start: 2 @19279 has 39 MA's), (5, 19324), (6, 19336), (7, 19351), (9, 19408), (10, 19420), (12, 19432), (14, 19444), (15, 19468), (16, 19477), (18, 19495), (22, 19564), (23, 19573), (31, 19708),

Gene: Gabriela\_19 Start: 18747, Stop: 19244, Start Num: 3

Candidate Starts for Gabriela\_19:

(Start: 3 @18747 has 28 MA's), (4, 18771), (8, 18855), (11, 18882), (12, 18891), (21, 19014), (23, 19032), (26, 19068), (27, 19077), (28, 19125), (31, 19167), (32, 19179),

Gene: Gardann\_19 Start: 18752, Stop: 19249, Start Num: 3

Candidate Starts for Gardann\_19:

(Start: 3 @18752 has 28 MA's), (4, 18776), (8, 18860), (11, 18887), (12, 18896), (21, 19019), (23, 19037), (26, 19073), (27, 19082), (28, 19130), (31, 19172), (32, 19184),

Gene: GuuelaD\_19 Start: 18781, Stop: 19278, Start Num: 3

Candidate Starts for GuuelaD\_19:

(Start: 3 @18781 has 28 MA's), (4, 18805), (8, 18889), (11, 18916), (12, 18925), (21, 19048), (23, 19066), (27, 19111), (28, 19159), (31, 19201),

Gene: Hafay\_19 Start: 18780, Stop: 19277, Start Num: 3

Candidate Starts for Hafay\_19:

(Start: 3 @18780 has 28 MA's), (4, 18804), (8, 18888), (11, 18915), (12, 18924), (21, 19047), (23, 19065), (26, 19101), (27, 19110), (28, 19158), (31, 19200), (32, 19212),

Gene: Halena\_19 Start: 18561, Stop: 19007, Start Num: 2

Candidate Starts for Halena\_19:

(Start: 2 @18561 has 39 MA's), (5, 18606), (6, 18618), (9, 18687), (12, 18711), (14, 18723), (23, 18852), (24, 18855), (25, 18876), (27, 18897), (30, 18969), (31, 18987), (32, 18999),

Gene: Itos\_19 Start: 18747, Stop: 19244, Start Num: 3

Candidate Starts for Itos\_19:

(Start: 3 @18747 has 28 MA's), (4, 18771), (8, 18855), (11, 18882), (12, 18891), (21, 19014), (23, 19032), (26, 19068), (27, 19077), (28, 19125), (31, 19167), (32, 19179),

Gene: Jobypre\_20 Start: 19275, Stop: 19724, Start Num: 2

Candidate Starts for Jobypre\_20:

(Start: 2 @19275 has 39 MA's), (5, 19320), (6, 19332), (7, 19347), (9, 19404), (10, 19416), (12, 19428), (14, 19440), (15, 19464), (16, 19473), (18, 19491), (22, 19560), (23, 19569), (31, 19704),

Gene: JoeDirt\_19 Start: 18532, Stop: 18978, Start Num: 2

Candidate Starts for JoeDirt\_19:

(Start: 2 @18532 has 39 MA's), (5, 18577), (6, 18589), (9, 18658), (12, 18682), (14, 18694), (23, 18823), (24, 18826), (25, 18847), (27, 18868), (30, 18940), (31, 18958), (32, 18970),

Gene: Jubie\_20 Start: 19276, Stop: 19725, Start Num: 2

Candidate Starts for Jubie\_20:

(Start: 2 @19276 has 39 MA's), (5, 19321), (6, 19333), (7, 19348), (9, 19405), (10, 19417), (12, 19429), (14, 19441), (15, 19465), (16, 19474), (18, 19492), (22, 19561), (23, 19570), (31, 19705),

Gene: Kahlid\_19 Start: 18752, Stop: 19249, Start Num: 3

Candidate Starts for Kahlid\_19:

(Start: 3 @18752 has 28 MA's), (4, 18776), (8, 18860), (11, 18887), (12, 18896), (21, 19019), (23, 19037), (26, 19073), (27, 19082), (28, 19130), (31, 19172), (32, 19184),

Gene: Kingsolomon\_20 Start: 19275, Stop: 19724, Start Num: 2

Candidate Starts for Kingsolomon\_20:

(Start: 2 @19275 has 39 MA's), (5, 19320), (6, 19332), (7, 19347), (9, 19404), (10, 19416), (12, 19428), (14, 19440), (15, 19464), (16, 19473), (18, 19491), (22, 19560), (23, 19569), (31, 19704),

Gene: Krypton555\_20 Start: 19198, Stop: 19647, Start Num: 2

Candidate Starts for Krypton555\_20:

(Start: 2 @19198 has 39 MA's), (5, 19243), (6, 19255), (9, 19327), (12, 19351), (14, 19363), (15, 19387), (16, 19396), (18, 19414), (22, 19483), (23, 19492), (24, 19495), (31, 19627),

Gene: LeBron\_19 Start: 18576, Stop: 19022, Start Num: 2

Candidate Starts for LeBron\_19:

(Start: 2 @18576 has 39 MA's), (5, 18621), (6, 18633), (9, 18702), (12, 18726), (14, 18738), (23, 18867), (24, 18870), (25, 18891), (27, 18912), (30, 18984), (31, 19002), (32, 19014),

Gene: Lewan\_19 Start: 18747, Stop: 19244, Start Num: 3

Candidate Starts for Lewan\_19:

(Start: 3 @18747 has 28 MA's), (4, 18771), (8, 18855), (11, 18882), (12, 18891), (21, 19014), (23, 19032), (26, 19068), (27, 19077), (28, 19125), (31, 19167), (32, 19179),

Gene: LilDestine\_19 Start: 18746, Stop: 19243, Start Num: 3

Candidate Starts for LilDestine\_19:

(Start: 3 @18746 has 28 MA's), (4, 18770), (8, 18854), (11, 18881), (12, 18890), (21, 19013), (23, 19031), (26, 19067), (27, 19076), (28, 19124), (31, 19166), (32, 19178),

Gene: Loadrie\_19 Start: 18779, Stop: 19276, Start Num: 3

Candidate Starts for Loadrie\_19:

(Start: 3 @18779 has 28 MA's), (4, 18803), (8, 18887), (11, 18914), (12, 18923), (21, 19046), (23, 19064), (26, 19100), (27, 19109), (28, 19157), (31, 19199), (32, 19211),

Gene: Lolly9\_20 Start: 19079, Stop: 19528, Start Num: 2

Candidate Starts for Lolly9\_20:

(Start: 2 @19079 has 39 MA's), (4, 19106), (5, 19124), (6, 19136), (7, 19151), (9, 19208), (10, 19220), (12, 19232), (14, 19244), (15, 19268), (16, 19277), (22, 19364), (23, 19373), (31, 19508),

Gene: Lumos\_20 Start: 19272, Stop: 19721, Start Num: 2

Candidate Starts for Lumos\_20:

(Start: 2 @19272 has 39 MA's), (5, 19317), (6, 19329), (7, 19344), (9, 19401), (10, 19413), (12, 19425), (14, 19437), (15, 19461), (16, 19470), (18, 19488), (22, 19557), (23, 19566), (31, 19701),

Gene: MAckerman\_19 Start: 18550, Stop: 18996, Start Num: 2

Candidate Starts for MAckerman\_19:

(Start: 2 @18550 has 39 MA's), (5, 18595), (6, 18607), (9, 18676), (12, 18700), (14, 18712), (23, 18841), (24, 18844), (25, 18865), (27, 18886), (30, 18958), (31, 18976), (32, 18988),

Gene: Miley16\_19 Start: 18747, Stop: 19244, Start Num: 3

Candidate Starts for Miley16\_19:

(Start: 3 @18747 has 28 MA's), (4, 18771), (8, 18855), (11, 18882), (12, 18891), (21, 19014), (23, 19032), (26, 19068), (27, 19077), (28, 19125), (31, 19167), (32, 19179),

Gene: MiniLon\_20 Start: 19079, Stop: 19528, Start Num: 2

Candidate Starts for MiniLon\_20:



(Start: 2 @19079 has 39 MA's), (4, 19106), (5, 19124), (6, 19136), (7, 19151), (9, 19208), (10, 19220), (12, 19232), (14, 19244), (15, 19268), (16, 19277), (22, 19364), (23, 19373), (31, 19508),

Gene: MiniMac\_20 Start: 19080, Stop: 19529, Start Num: 2

Candidate Starts for MiniMac\_20:

(Start: 2 @19080 has 39 MA's), (4, 19107), (5, 19125), (6, 19137), (7, 19152), (9, 19209), (10, 19221), (12, 19233), (14, 19245), (15, 19269), (16, 19278), (22, 19365), (23, 19374), (31, 19509),

Gene: MkaliMitinis3\_19 Start: 18747, Stop: 19244, Start Num: 3

Candidate Starts for MkaliMitinis3\_19:

(Start: 3 @18747 has 28 MA's), (4, 18771), (8, 18855), (11, 18882), (12, 18891), (21, 19014), (23, 19032), (26, 19068), (27, 19077), (28, 19125), (31, 19167), (32, 19179),

Gene: Moostard\_20 Start: 19278, Stop: 19727, Start Num: 2

Candidate Starts for Moostard\_20:

(Start: 2 @19278 has 39 MA's), (5, 19323), (6, 19335), (7, 19350), (9, 19407), (10, 19419), (12, 19431), (14, 19443), (15, 19467), (16, 19476), (18, 19494), (22, 19563), (23, 19572), (31, 19707),

Gene: MsGreen\_20 Start: 19275, Stop: 19724, Start Num: 2

Candidate Starts for MsGreen\_20:

(Start: 2 @19275 has 39 MA's), (5, 19320), (6, 19332), (7, 19347), (9, 19404), (10, 19416), (12, 19428), (14, 19440), (15, 19464), (16, 19473), (18, 19491), (22, 19560), (23, 19569), (31, 19704),

Gene: Netyap\_19 Start: 18747, Stop: 19244, Start Num: 3

Candidate Starts for Netyap\_19:

(Start: 3 @18747 has 28 MA's), (4, 18771), (8, 18855), (11, 18882), (12, 18891), (21, 19014), (23, 19032), (26, 19068), (27, 19077), (28, 19125), (31, 19167), (32, 19179),

Gene: Nicholas\_20 Start: 19275, Stop: 19724, Start Num: 2

Candidate Starts for Nicholas\_20:

(Start: 2 @19275 has 39 MA's), (5, 19320), (6, 19332), (7, 19347), (9, 19404), (10, 19416), (12, 19428), (14, 19440), (15, 19464), (16, 19473), (18, 19491), (22, 19560), (23, 19569), (31, 19704),

Gene: Nicholasp3\_19 Start: 18752, Stop: 19249, Start Num: 3

Candidate Starts for Nicholasp3\_19:

(Start: 3 @18752 has 28 MA's), (4, 18776), (8, 18860), (11, 18887), (12, 18896), (21, 19019), (23, 19037), (26, 19073), (27, 19082), (28, 19130), (31, 19172), (32, 19184),

Gene: OhShagHennessy\_19 Start: 18515, Stop: 18961, Start Num: 2

Candidate Starts for OhShagHennessy\_19:

(Start: 2 @18515 has 39 MA's), (5, 18560), (6, 18572), (9, 18641), (12, 18665), (14, 18677), (23, 18806), (24, 18809), (25, 18830), (27, 18851), (30, 18923), (31, 18941), (32, 18953),

Gene: Rose5\_19 Start: 18550, Stop: 18996, Start Num: 2

Candidate Starts for Rose5\_19:

(Start: 2 @18550 has 39 MA's), (5, 18595), (6, 18607), (9, 18676), (12, 18700), (14, 18712), (23, 18841), (24, 18844), (25, 18865), (27, 18886), (30, 18958), (31, 18976), (32, 18988),

Gene: Rumpelstiltskin\_19 Start: 18753, Stop: 19250, Start Num: 3

Candidate Starts for Rumpelstiltskin\_19:

(Start: 3 @18753 has 28 MA's), (4, 18777), (8, 18861), (11, 18888), (12, 18897), (21, 19020), (23, 19038), (26, 19074), (27, 19083), (28, 19131), (31, 19173), (32, 19185),

Gene: Samty\_20 Start: 19278, Stop: 19727, Start Num: 2

Candidate Starts for Samty\_20:

(Start: 2 @19278 has 39 MA's), (5, 19323), (6, 19335), (7, 19350), (9, 19407), (10, 19419), (12, 19431), (14, 19443), (15, 19467), (16, 19476), (18, 19494), (22, 19563), (23, 19572), (31, 19707),

Gene: Silverleaf\_19 Start: 18550, Stop: 18996, Start Num: 2

Candidate Starts for Silverleaf\_19:

(Start: 2 @18550 has 39 MA's), (5, 18595), (6, 18607), (9, 18676), (12, 18700), (14, 18712), (23, 18841), (24, 18844), (25, 18865), (27, 18886), (30, 18958), (31, 18976), (32, 18988),

Gene: Snenia\_20 Start: 19276, Stop: 19725, Start Num: 2

Candidate Starts for Snenia\_20:

(Start: 2 @19276 has 39 MA's), (5, 19321), (6, 19333), (7, 19348), (9, 19405), (10, 19417), (12, 19429), (14, 19441), (15, 19465), (16, 19474), (18, 19492), (22, 19561), (23, 19570), (31, 19705),

Gene: Tourach\_19 Start: 18745, Stop: 19242, Start Num: 3

Candidate Starts for Tourach\_19:

(Start: 3 @18745 has 28 MA's), (4, 18769), (8, 18853), (11, 18880), (12, 18889), (21, 19012), (23, 19030), (27, 19075), (28, 19123), (31, 19165), (32, 19177),

Gene: Tyson\_19 Start: 18550, Stop: 18996, Start Num: 2

Candidate Starts for Tyson\_19:

(Start: 2 @18550 has 39 MA's), (5, 18595), (6, 18607), (9, 18676), (12, 18700), (14, 18712), (23, 18841), (24, 18844), (25, 18865), (27, 18886), (30, 18958), (31, 18976), (32, 18988),

Gene: UPIE\_19 Start: 18548, Stop: 18994, Start Num: 2

Candidate Starts for UPIE\_19:

(Start: 2 @18548 has 39 MA's), (5, 18593), (6, 18605), (9, 18674), (12, 18698), (14, 18710), (23, 18839), (24, 18842), (25, 18863), (27, 18884), (30, 18956), (31, 18974), (32, 18986),

Gene: Vetrix\_19 Start: 18753, Stop: 19250, Start Num: 3

Candidate Starts for Vetrix\_19:

(Start: 3 @18753 has 28 MA's), (4, 18777), (8, 18861), (11, 18888), (12, 18897), (21, 19020), (23, 19038), (26, 19074), (27, 19083), (28, 19131), (31, 19173), (32, 19185),

Gene: Wamburgxpress\_19 Start: 18563, Stop: 19009, Start Num: 2

Candidate Starts for Wamburgxpress\_19:

(Start: 2 @18563 has 39 MA's), (5, 18608), (6, 18620), (9, 18689), (12, 18713), (14, 18725), (23, 18854), (24, 18857), (25, 18878), (27, 18899), (30, 18971), (31, 18989), (32, 19001),

Gene: Whirlwind\_21 Start: 19032, Stop: 19481, Start Num: 2

Candidate Starts for Whirlwind\_21:

(Start: 2 @19032 has 39 MA's), (5, 19077), (6, 19089), (7, 19104), (9, 19161), (12, 19185), (14, 19197), (15, 19221), (16, 19230), (18, 19248), (22, 19317), (23, 19326), (24, 19329), (31, 19461),

Gene: Wigglewigggle\_19 Start: 18779, Stop: 19276, Start Num: 3

Candidate Starts for Wigglewigggle\_19:

(Start: 3 @18779 has 28 MA's), (4, 18803), (8, 18887), (11, 18914), (12, 18923), (21, 19046), (23, 19064), (26, 19100), (27, 19109), (28, 19157), (31, 19199), (32, 19211),

Gene: Wilder\_19 Start: 18752, Stop: 19249, Start Num: 3

Candidate Starts for Wilder\_19:

(Start: 3 @18752 has 28 MA's), (4, 18776), (8, 18860), (11, 18887), (12, 18896), (21, 19019), (23, 19037), (26, 19073), (27, 19082), (28, 19130), (31, 19172), (32, 19184),

Gene: Winky\_19 Start: 18747, Stop: 19244, Start Num: 3

Candidate Starts for Winky\_19:

(Start: 3 @18747 has 28 MA's), (4, 18771), (8, 18855), (11, 18882), (12, 18891), (21, 19014), (23, 19032), (26, 19068), (27, 19077), (28, 19125), (31, 19167), (32, 19179),

Gene: Wyatt2\_19 Start: 18550, Stop: 18996, Start Num: 2

Candidate Starts for Wyatt2\_19:

(Start: 2 @18550 has 39 MA's), (5, 18595), (6, 18607), (9, 18676), (12, 18700), (14, 18712), (23, 18841), (24, 18844), (25, 18865), (27, 18886), (30, 18958), (31, 18976), (32, 18988),

Gene: Zakai\_19 Start: 18741, Stop: 19238, Start Num: 3

Candidate Starts for Zakai\_19:

(Start: 3 @18741 has 28 MA's), (4, 18765), (8, 18849), (11, 18876), (12, 18885), (21, 19008), (23, 19026), (26, 19062), (27, 19071), (28, 19119), (31, 19161), (32, 19173),

Gene: Zaria\_19 Start: 18564, Stop: 19010, Start Num: 2

Candidate Starts for Zaria\_19:

(Start: 2 @18564 has 39 MA's), (5, 18609), (6, 18621), (9, 18690), (12, 18714), (14, 18726), (23, 18855), (24, 18858), (25, 18879), (27, 18900), (30, 18972), (31, 18990), (32, 19002),

Gene: ZhongYanYuan\_18 Start: 18572, Stop: 19069, Start Num: 3

Candidate Starts for ZhongYanYuan\_18:

(Start: 3 @18572 has 28 MA's), (4, 18596), (8, 18680), (11, 18707), (12, 18716), (21, 18839), (23, 18857), (27, 18902), (28, 18950), (31, 18992), (32, 19004),