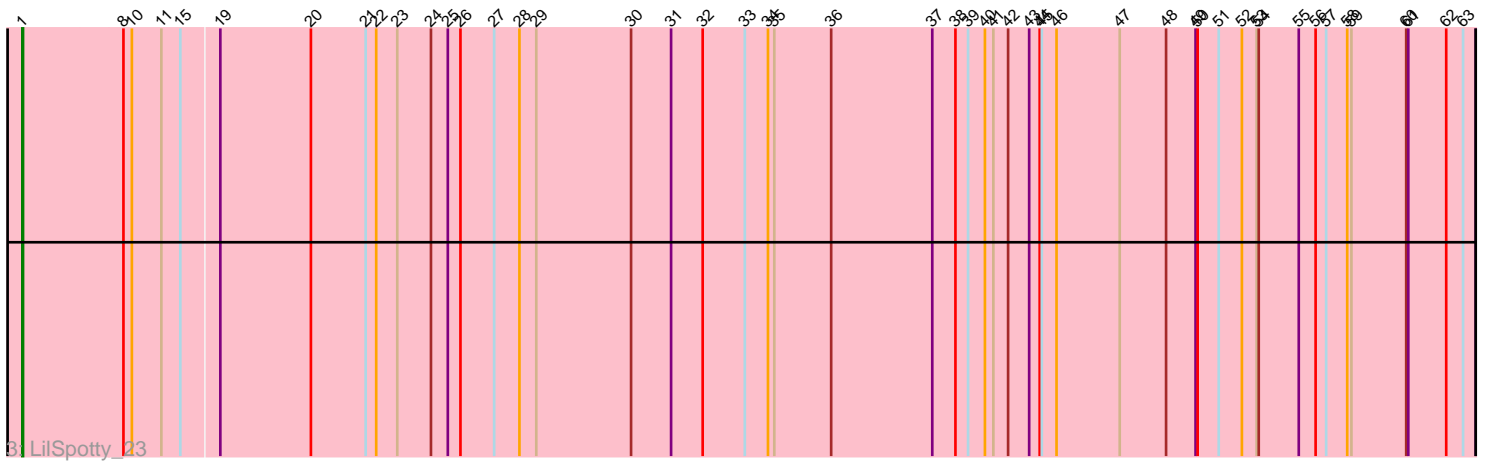
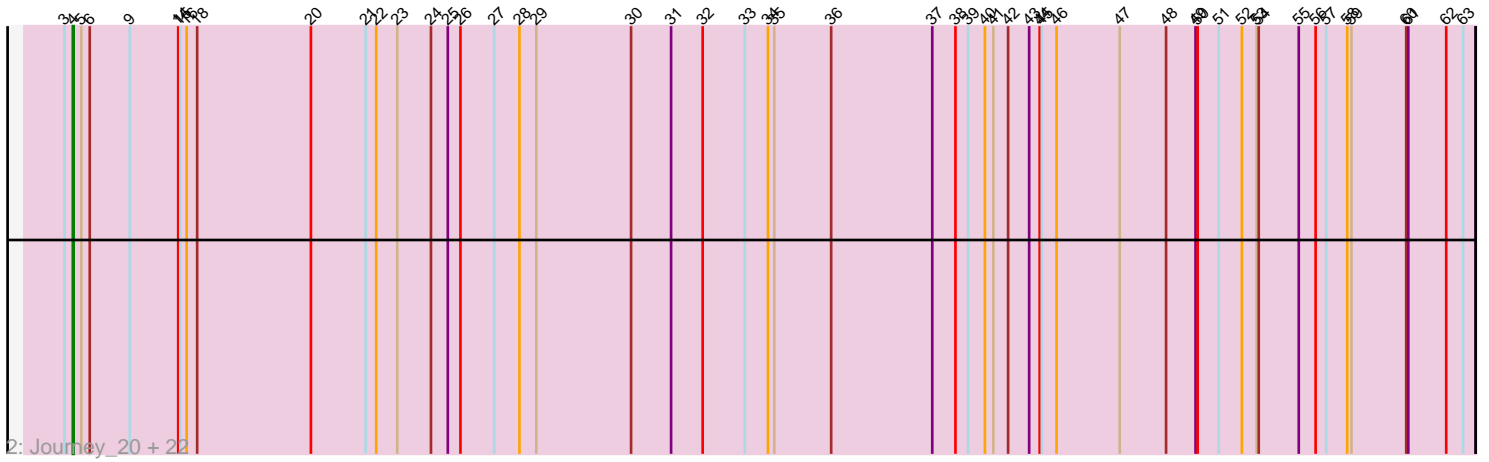
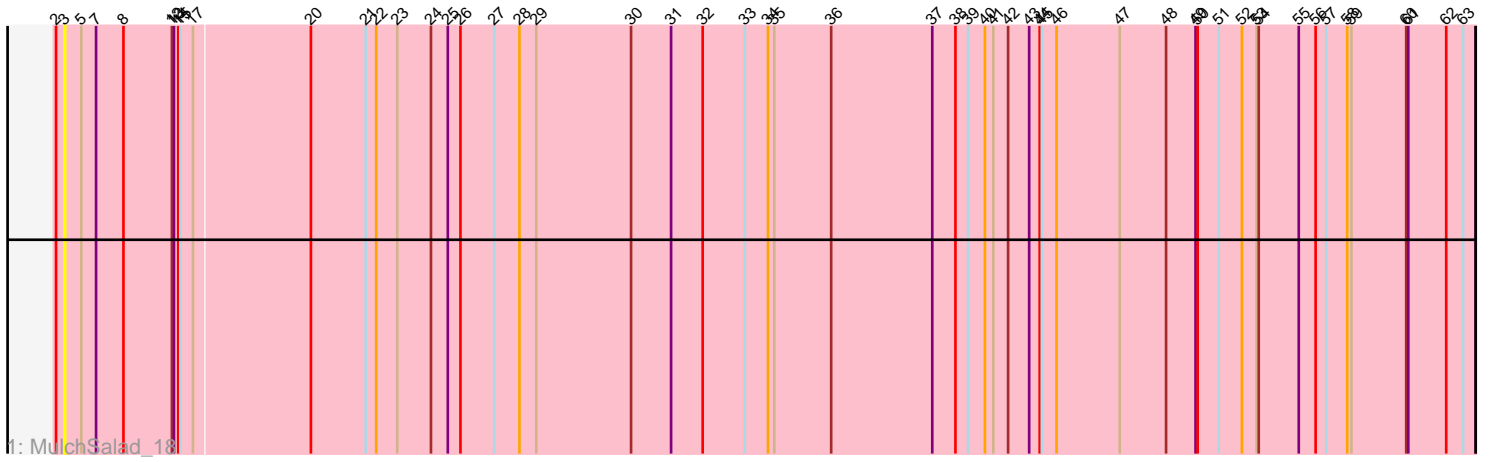


Pham 311947



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 311947 Report

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

Pham number 311947 has 25 members, 3 are drafts.

Phages represented in each track:

- Track 1 : MulchSalad\_18
- Track 2 : Journey\_20, Xerxes\_20, Silvy\_20, Magsby\_20, Charlie\_20, EGUunicorn\_20, Melville\_20, Parmesanjohn\_20, Smurph\_20, Tortoise12\_20, Chewbacca\_20, Cubone\_20, Schnauzer\_20, Pipsqueaks\_20, Philonius\_20, Duplicity\_20, Tapioca\_20, Bosection6\_20, Carcharodon\_20, Tessdabest\_19, Gex\_20, Aggie\_20, Silvafighter\_20
- Track 3 : LilSpotty\_23

### ***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 21 of the 22 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Aggie\_20, Bosection6\_20, Carcharodon\_20, Charlie\_20, Chewbacca\_20, Cubone\_20, Duplicity\_20, EGUunicorn\_20, Gex\_20, Journey\_20, Magsby\_20, Melville\_20, Parmesanjohn\_20, Philonius\_20, Pipsqueaks\_20, Schnauzer\_20, Silvafighter\_20, Silvy\_20, Smurph\_20, Tapioca\_20, Tessdabest\_19, Tortoise12\_20, Xerxes\_20,

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

- 

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

- LilSpotty\_23, MulchSalad\_18,

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

Start 1:

- Found in 1 of 25 ( 4.0% ) of genes in pham
- Manual Annotations of this start: 1 of 22
- Called 100.0% of time when present
- Phage (with cluster) where this start called: LilSpotty\_23 (singleton),

Start 3:

- Found in 24 of 25 ( 96.0% ) of genes in pham
- No Manual Annotations of this start.
- Called 4.2% of time when present
- Phage (with cluster) where this start called: MulchSalad\_18 (F7),

Start 4:

- Found in 23 of 25 ( 92.0% ) of genes in pham
- Manual Annotations of this start: 21 of 22
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Aggie\_20 (N), Bosection6\_20 (N), Carcharodon\_20 (N), Charlie\_20 (N), Chewbacca\_20 (N), Cubone\_20 (N), Duplicity\_20 (N), EGUunicorn\_20 (N), Gex\_20 (N), Journey\_20 (N), Magsby\_20 (N), Melville\_20 (N), Parmesanjohn\_20 (N), Philonius\_20 (N), Pipsqueaks\_20 (N), Schnauzer\_20 (N), Silvafighter\_20 (N), Silvy\_20 (N), Smurph\_20 (N), Tapioca\_20 (N), Tessdabest\_19 (N), Tortoise12\_20 (N), Xerxes\_20 (N),

**Summary by clusters:**

There are 3 clusters represented in this pham: singleton, F7, N,

Info for manual annotations of cluster N:

- Start number 4 was manually annotated 21 times for cluster N.

**Gene Information:**

Gene: Aggie\_20 Start: 17557, Stop: 19551, Start Num: 4

Candidate Starts for Aggie\_20:

(3, 17545), (Start: 4 @17557 has 21 MA's), (5, 17569), (6, 17581), (9, 17635), (14, 17704), (15, 17707), (16, 17716), (18, 17731), (20, 17893), (21, 17971), (22, 17986), (23, 18016), (24, 18064), (25, 18088), (26, 18106), (27, 18154), (28, 18190), (29, 18214), (30, 18349), (31, 18406), (32, 18451), (33, 18511), (34, 18544), (35, 18553), (36, 18634), (37, 18778), (38, 18811), (39, 18829), (40, 18853), (41, 18865), (42, 18886), (43, 18916), (44, 18931), (45, 18934), (46, 18955), (47, 19045), (48, 19111), (49, 19153), (50, 19156), (51, 19186), (52, 19219), (53, 19240), (54, 19243), (55, 19300), (56, 19324), (57, 19339), (58, 19369), (59, 19375), (60, 19453), (61, 19456), (62, 19510), (63, 19534),

Gene: Bosection6\_20 Start: 17556, Stop: 19550, Start Num: 4

Candidate Starts for Bosection6\_20:

(3, 17544), (Start: 4 @17556 has 21 MA's), (5, 17568), (6, 17580), (9, 17634), (14, 17703), (15, 17706), (16, 17715), (18, 17730), (20, 17892), (21, 17970), (22, 17985), (23, 18015), (24, 18063), (25, 18087), (26, 18105), (27, 18153), (28, 18189), (29, 18213), (30, 18348), (31, 18405), (32, 18450), (33, 18510), (34, 18543), (35, 18552), (36, 18633), (37, 18777), (38, 18810), (39, 18828), (40, 18852), (41, 18864), (42, 18885), (43, 18915), (44, 18930), (45, 18933), (46, 18954), (47, 19044), (48, 19110), (49, 19152), (50, 19155), (51, 19185), (52, 19218), (53, 19239), (54, 19242), (55, 19299), (56, 19323), (57, 19338), (58, 19368), (59, 19374), (60, 19452), (61, 19455), (62, 19509), (63, 19533),

Gene: Carcharodon\_20 Start: 17556, Stop: 19550, Start Num: 4

Candidate Starts for Carcharodon\_20:

(3, 17544), (Start: 4 @17556 has 21 MA's), (5, 17568), (6, 17580), (9, 17634), (14, 17703), (15, 17706), (16, 17715), (18, 17730), (20, 17892), (21, 17970), (22, 17985), (23, 18015), (24, 18063), (25, 18087),

(26, 18105), (27, 18153), (28, 18189), (29, 18213), (30, 18348), (31, 18405), (32, 18450), (33, 18510), (34, 18543), (35, 18552), (36, 18633), (37, 18777), (38, 18810), (39, 18828), (40, 18852), (41, 18864), (42, 18885), (43, 18915), (44, 18930), (45, 18933), (46, 18954), (47, 19044), (48, 19110), (49, 19152), (50, 19155), (51, 19185), (52, 19218), (53, 19239), (54, 19242), (55, 19299), (56, 19323), (57, 19338), (58, 19368), (59, 19374), (60, 19452), (61, 19455), (62, 19509), (63, 19533),

Gene: Charlie\_20 Start: 17556, Stop: 19550, Start Num: 4

Candidate Starts for Charlie\_20:

(3, 17544), (Start: 4 @17556 has 21 MA's), (5, 17568), (6, 17580), (9, 17634), (14, 17703), (15, 17706), (16, 17715), (18, 17730), (20, 17892), (21, 17970), (22, 17985), (23, 18015), (24, 18063), (25, 18087), (26, 18105), (27, 18153), (28, 18189), (29, 18213), (30, 18348), (31, 18405), (32, 18450), (33, 18510), (34, 18543), (35, 18552), (36, 18633), (37, 18777), (38, 18810), (39, 18828), (40, 18852), (41, 18864), (42, 18885), (43, 18915), (44, 18930), (45, 18933), (46, 18954), (47, 19044), (48, 19110), (49, 19152), (50, 19155), (51, 19185), (52, 19218), (53, 19239), (54, 19242), (55, 19299), (56, 19323), (57, 19338), (58, 19368), (59, 19374), (60, 19452), (61, 19455), (62, 19509), (63, 19533),

Gene: Chewbacca\_20 Start: 17556, Stop: 19550, Start Num: 4

Candidate Starts for Chewbacca\_20:

(3, 17544), (Start: 4 @17556 has 21 MA's), (5, 17568), (6, 17580), (9, 17634), (14, 17703), (15, 17706), (16, 17715), (18, 17730), (20, 17892), (21, 17970), (22, 17985), (23, 18015), (24, 18063), (25, 18087), (26, 18105), (27, 18153), (28, 18189), (29, 18213), (30, 18348), (31, 18405), (32, 18450), (33, 18510), (34, 18543), (35, 18552), (36, 18633), (37, 18777), (38, 18810), (39, 18828), (40, 18852), (41, 18864), (42, 18885), (43, 18915), (44, 18930), (45, 18933), (46, 18954), (47, 19044), (48, 19110), (49, 19152), (50, 19155), (51, 19185), (52, 19218), (53, 19239), (54, 19242), (55, 19299), (56, 19323), (57, 19338), (58, 19368), (59, 19374), (60, 19452), (61, 19455), (62, 19509), (63, 19533),

Gene: Cubone\_20 Start: 17578, Stop: 19572, Start Num: 4

Candidate Starts for Cubone\_20:

(3, 17566), (Start: 4 @17578 has 21 MA's), (5, 17590), (6, 17602), (9, 17656), (14, 17725), (15, 17728), (16, 17737), (18, 17752), (20, 17914), (21, 17992), (22, 18007), (23, 18037), (24, 18085), (25, 18109), (26, 18127), (27, 18175), (28, 18211), (29, 18235), (30, 18370), (31, 18427), (32, 18472), (33, 18532), (34, 18565), (35, 18574), (36, 18655), (37, 18799), (38, 18832), (39, 18850), (40, 18874), (41, 18886), (42, 18907), (43, 18937), (44, 18952), (45, 18955), (46, 18976), (47, 19066), (48, 19132), (49, 19174), (50, 19177), (51, 19207), (52, 19240), (53, 19261), (54, 19264), (55, 19321), (56, 19345), (57, 19360), (58, 19390), (59, 19396), (60, 19474), (61, 19477), (62, 19531), (63, 19555),

Gene: Duplicity\_20 Start: 17556, Stop: 19550, Start Num: 4

Candidate Starts for Duplicity\_20:

(3, 17544), (Start: 4 @17556 has 21 MA's), (5, 17568), (6, 17580), (9, 17634), (14, 17703), (15, 17706), (16, 17715), (18, 17730), (20, 17892), (21, 17970), (22, 17985), (23, 18015), (24, 18063), (25, 18087), (26, 18105), (27, 18153), (28, 18189), (29, 18213), (30, 18348), (31, 18405), (32, 18450), (33, 18510), (34, 18543), (35, 18552), (36, 18633), (37, 18777), (38, 18810), (39, 18828), (40, 18852), (41, 18864), (42, 18885), (43, 18915), (44, 18930), (45, 18933), (46, 18954), (47, 19044), (48, 19110), (49, 19152), (50, 19155), (51, 19185), (52, 19218), (53, 19239), (54, 19242), (55, 19299), (56, 19323), (57, 19338), (58, 19368), (59, 19374), (60, 19452), (61, 19455), (62, 19509), (63, 19533),

Gene: EGUunicorn\_20 Start: 17556, Stop: 19550, Start Num: 4

Candidate Starts for EGUunicorn\_20:

(3, 17544), (Start: 4 @17556 has 21 MA's), (5, 17568), (6, 17580), (9, 17634), (14, 17703), (15, 17706), (16, 17715), (18, 17730), (20, 17892), (21, 17970), (22, 17985), (23, 18015), (24, 18063), (25, 18087), (26, 18105), (27, 18153), (28, 18189), (29, 18213), (30, 18348), (31, 18405), (32, 18450), (33, 18510), (34, 18543), (35, 18552), (36, 18633), (37, 18777), (38, 18810), (39, 18828), (40, 18852), (41, 18864), (42, 18885), (43, 18915), (44, 18930), (45, 18933), (46, 18954), (47, 19044), (48, 19110), (49, 19152),

(50, 19155), (51, 19185), (52, 19218), (53, 19239), (54, 19242), (55, 19299), (56, 19323), (57, 19338), (58, 19368), (59, 19374), (60, 19452), (61, 19455), (62, 19509), (63, 19533),

Gene: Gex\_20 Start: 17552, Stop: 19546, Start Num: 4

Candidate Starts for Gex\_20:

(3, 17540), (Start: 4 @17552 has 21 MA's), (5, 17564), (6, 17576), (9, 17630), (14, 17699), (15, 17702), (16, 17711), (18, 17726), (20, 17888), (21, 17966), (22, 17981), (23, 18011), (24, 18059), (25, 18083), (26, 18101), (27, 18149), (28, 18185), (29, 18209), (30, 18344), (31, 18401), (32, 18446), (33, 18506), (34, 18539), (35, 18548), (36, 18629), (37, 18773), (38, 18806), (39, 18824), (40, 18848), (41, 18860), (42, 18881), (43, 18911), (44, 18926), (45, 18929), (46, 18950), (47, 19040), (48, 19106), (49, 19148), (50, 19151), (51, 19181), (52, 19214), (53, 19235), (54, 19238), (55, 19295), (56, 19319), (57, 19334), (58, 19364), (59, 19370), (60, 19448), (61, 19451), (62, 19505), (63, 19529),

Gene: Journey\_20 Start: 17556, Stop: 19550, Start Num: 4

Candidate Starts for Journey\_20:

(3, 17544), (Start: 4 @17556 has 21 MA's), (5, 17568), (6, 17580), (9, 17634), (14, 17703), (15, 17706), (16, 17715), (18, 17730), (20, 17892), (21, 17970), (22, 17985), (23, 18015), (24, 18063), (25, 18087), (26, 18105), (27, 18153), (28, 18189), (29, 18213), (30, 18348), (31, 18405), (32, 18450), (33, 18510), (34, 18543), (35, 18552), (36, 18633), (37, 18777), (38, 18810), (39, 18828), (40, 18852), (41, 18864), (42, 18885), (43, 18915), (44, 18930), (45, 18933), (46, 18954), (47, 19044), (48, 19110), (49, 19152), (50, 19155), (51, 19185), (52, 19218), (53, 19239), (54, 19242), (55, 19299), (56, 19323), (57, 19338), (58, 19368), (59, 19374), (60, 19452), (61, 19455), (62, 19509), (63, 19533),

Gene: LilSpotty\_23 Start: 18458, Stop: 20518, Start Num: 1

Candidate Starts for LilSpotty\_23:

(Start: 1 @18458 has 1 MA's), (8, 18599), (10, 18611), (11, 18653), (15, 18680), (19, 18731), (20, 18860), (21, 18938), (22, 18953), (23, 18983), (24, 19031), (25, 19055), (26, 19073), (27, 19121), (28, 19157), (29, 19181), (30, 19316), (31, 19373), (32, 19418), (33, 19478), (34, 19511), (35, 19520), (36, 19601), (37, 19745), (38, 19778), (39, 19796), (40, 19820), (41, 19832), (42, 19853), (43, 19883), (44, 19898), (45, 19901), (46, 19922), (47, 20012), (48, 20078), (49, 20120), (50, 20123), (51, 20153), (52, 20186), (53, 20207), (54, 20210), (55, 20267), (56, 20291), (57, 20306), (58, 20336), (59, 20342), (60, 20420), (61, 20423), (62, 20477), (63, 20501),

Gene: Magsby\_20 Start: 17553, Stop: 19547, Start Num: 4

Candidate Starts for Magsby\_20:

(3, 17541), (Start: 4 @17553 has 21 MA's), (5, 17565), (6, 17577), (9, 17631), (14, 17700), (15, 17703), (16, 17712), (18, 17727), (20, 17889), (21, 17967), (22, 17982), (23, 18012), (24, 18060), (25, 18084), (26, 18102), (27, 18150), (28, 18186), (29, 18210), (30, 18345), (31, 18402), (32, 18447), (33, 18507), (34, 18540), (35, 18549), (36, 18630), (37, 18774), (38, 18807), (39, 18825), (40, 18849), (41, 18861), (42, 18882), (43, 18912), (44, 18927), (45, 18930), (46, 18951), (47, 19041), (48, 19107), (49, 19149), (50, 19152), (51, 19182), (52, 19215), (53, 19236), (54, 19239), (55, 19296), (56, 19320), (57, 19335), (58, 19365), (59, 19371), (60, 19449), (61, 19452), (62, 19506), (63, 19530),

Gene: Melville\_20 Start: 17556, Stop: 19550, Start Num: 4

Candidate Starts for Melville\_20:

(3, 17544), (Start: 4 @17556 has 21 MA's), (5, 17568), (6, 17580), (9, 17634), (14, 17703), (15, 17706), (16, 17715), (18, 17730), (20, 17892), (21, 17970), (22, 17985), (23, 18015), (24, 18063), (25, 18087), (26, 18105), (27, 18153), (28, 18189), (29, 18213), (30, 18348), (31, 18405), (32, 18450), (33, 18510), (34, 18543), (35, 18552), (36, 18633), (37, 18777), (38, 18810), (39, 18828), (40, 18852), (41, 18864), (42, 18885), (43, 18915), (44, 18930), (45, 18933), (46, 18954), (47, 19044), (48, 19110), (49, 19152), (50, 19155), (51, 19185), (52, 19218), (53, 19239), (54, 19242), (55, 19299), (56, 19323), (57, 19338), (58, 19368), (59, 19374), (60, 19452), (61, 19455), (62, 19509), (63, 19533),

Gene: MulchSalad\_18 Start: 17319, Stop: 19319, Start Num: 3

Candidate Starts for MulchSalad\_18:

(2, 17307), (3, 17319), (5, 17340), (7, 17361), (8, 17400), (12, 17469), (13, 17472), (14, 17478), (15, 17481), (17, 17499), (20, 17661), (21, 17739), (22, 17754), (23, 17784), (24, 17832), (25, 17856), (26, 17874), (27, 17922), (28, 17958), (29, 17982), (30, 18117), (31, 18174), (32, 18219), (33, 18279), (34, 18312), (35, 18321), (36, 18402), (37, 18546), (38, 18579), (39, 18597), (40, 18621), (41, 18633), (42, 18654), (43, 18684), (44, 18699), (45, 18702), (46, 18723), (47, 18813), (48, 18879), (49, 18921), (50, 18924), (51, 18954), (52, 18987), (53, 19008), (54, 19011), (55, 19068), (56, 19092), (57, 19107), (58, 19137), (59, 19143), (60, 19221), (61, 19224), (62, 19278), (63, 19302),

Gene: Parmesanjohn\_20 Start: 17556, Stop: 19550, Start Num: 4

Candidate Starts for Parmesanjohn\_20:

(3, 17544), (Start: 4 @17556 has 21 MA's), (5, 17568), (6, 17580), (9, 17634), (14, 17703), (15, 17706), (16, 17715), (18, 17730), (20, 17892), (21, 17970), (22, 17985), (23, 18015), (24, 18063), (25, 18087), (26, 18105), (27, 18153), (28, 18189), (29, 18213), (30, 18348), (31, 18405), (32, 18450), (33, 18510), (34, 18543), (35, 18552), (36, 18633), (37, 18777), (38, 18810), (39, 18828), (40, 18852), (41, 18864), (42, 18885), (43, 18915), (44, 18930), (45, 18933), (46, 18954), (47, 19044), (48, 19110), (49, 19152), (50, 19155), (51, 19185), (52, 19218), (53, 19239), (54, 19242), (55, 19299), (56, 19323), (57, 19338), (58, 19368), (59, 19374), (60, 19452), (61, 19455), (62, 19509), (63, 19533),

Gene: Philonius\_20 Start: 17556, Stop: 19550, Start Num: 4

Candidate Starts for Philonius\_20:

(3, 17544), (Start: 4 @17556 has 21 MA's), (5, 17568), (6, 17580), (9, 17634), (14, 17703), (15, 17706), (16, 17715), (18, 17730), (20, 17892), (21, 17970), (22, 17985), (23, 18015), (24, 18063), (25, 18087), (26, 18105), (27, 18153), (28, 18189), (29, 18213), (30, 18348), (31, 18405), (32, 18450), (33, 18510), (34, 18543), (35, 18552), (36, 18633), (37, 18777), (38, 18810), (39, 18828), (40, 18852), (41, 18864), (42, 18885), (43, 18915), (44, 18930), (45, 18933), (46, 18954), (47, 19044), (48, 19110), (49, 19152), (50, 19155), (51, 19185), (52, 19218), (53, 19239), (54, 19242), (55, 19299), (56, 19323), (57, 19338), (58, 19368), (59, 19374), (60, 19452), (61, 19455), (62, 19509), (63, 19533),

Gene: Pipsqueaks\_20 Start: 17556, Stop: 19550, Start Num: 4

Candidate Starts for Pipsqueaks\_20:

(3, 17544), (Start: 4 @17556 has 21 MA's), (5, 17568), (6, 17580), (9, 17634), (14, 17703), (15, 17706), (16, 17715), (18, 17730), (20, 17892), (21, 17970), (22, 17985), (23, 18015), (24, 18063), (25, 18087), (26, 18105), (27, 18153), (28, 18189), (29, 18213), (30, 18348), (31, 18405), (32, 18450), (33, 18510), (34, 18543), (35, 18552), (36, 18633), (37, 18777), (38, 18810), (39, 18828), (40, 18852), (41, 18864), (42, 18885), (43, 18915), (44, 18930), (45, 18933), (46, 18954), (47, 19044), (48, 19110), (49, 19152), (50, 19155), (51, 19185), (52, 19218), (53, 19239), (54, 19242), (55, 19299), (56, 19323), (57, 19338), (58, 19368), (59, 19374), (60, 19452), (61, 19455), (62, 19509), (63, 19533),

Gene: Schnauzer\_20 Start: 17556, Stop: 19550, Start Num: 4

Candidate Starts for Schnauzer\_20:

(3, 17544), (Start: 4 @17556 has 21 MA's), (5, 17568), (6, 17580), (9, 17634), (14, 17703), (15, 17706), (16, 17715), (18, 17730), (20, 17892), (21, 17970), (22, 17985), (23, 18015), (24, 18063), (25, 18087), (26, 18105), (27, 18153), (28, 18189), (29, 18213), (30, 18348), (31, 18405), (32, 18450), (33, 18510), (34, 18543), (35, 18552), (36, 18633), (37, 18777), (38, 18810), (39, 18828), (40, 18852), (41, 18864), (42, 18885), (43, 18915), (44, 18930), (45, 18933), (46, 18954), (47, 19044), (48, 19110), (49, 19152), (50, 19155), (51, 19185), (52, 19218), (53, 19239), (54, 19242), (55, 19299), (56, 19323), (57, 19338), (58, 19368), (59, 19374), (60, 19452), (61, 19455), (62, 19509), (63, 19533),

Gene: Silvafighter\_20 Start: 17556, Stop: 19550, Start Num: 4

Candidate Starts for Silvafighter\_20:

(3, 17544), (Start: 4 @17556 has 21 MA's), (5, 17568), (6, 17580), (9, 17634), (14, 17703), (15, 17706), (16, 17715), (18, 17730), (20, 17892), (21, 17970), (22, 17985), (23, 18015), (24, 18063), (25, 18087), (26, 18105), (27, 18153), (28, 18189), (29, 18213), (30, 18348), (31, 18405), (32, 18450), (33, 18510), (34, 18543), (35, 18552), (36, 18633), (37, 18777), (38, 18810), (39, 18828), (40, 18852), (41, 18864), (42, 18885), (43, 18915), (44, 18930), (45, 18933), (46, 18954), (47, 19044), (48, 19110), (49, 19152), (50, 19155), (51, 19185), (52, 19218), (53, 19239), (54, 19242), (55, 19299), (56, 19323), (57, 19338), (58, 19368), (59, 19374), (60, 19452), (61, 19455), (62, 19509), (63, 19533),

Gene: Silvy\_20 Start: 17557, Stop: 19551, Start Num: 4

Candidate Starts for Silvy\_20:

(3, 17545), (Start: 4 @17557 has 21 MA's), (5, 17569), (6, 17581), (9, 17635), (14, 17704), (15, 17707), (16, 17716), (18, 17731), (20, 17893), (21, 17971), (22, 17986), (23, 18016), (24, 18064), (25, 18088), (26, 18106), (27, 18154), (28, 18190), (29, 18214), (30, 18349), (31, 18406), (32, 18451), (33, 18511), (34, 18544), (35, 18553), (36, 18634), (37, 18778), (38, 18811), (39, 18829), (40, 18853), (41, 18865), (42, 18886), (43, 18916), (44, 18931), (45, 18934), (46, 18955), (47, 19045), (48, 19111), (49, 19153), (50, 19156), (51, 19186), (52, 19219), (53, 19240), (54, 19243), (55, 19300), (56, 19324), (57, 19339), (58, 19369), (59, 19375), (60, 19453), (61, 19456), (62, 19510), (63, 19534),

Gene: Smurph\_20 Start: 17556, Stop: 19550, Start Num: 4

Candidate Starts for Smurph\_20:

(3, 17544), (Start: 4 @17556 has 21 MA's), (5, 17568), (6, 17580), (9, 17634), (14, 17703), (15, 17706), (16, 17715), (18, 17730), (20, 17892), (21, 17970), (22, 17985), (23, 18015), (24, 18063), (25, 18087), (26, 18105), (27, 18153), (28, 18189), (29, 18213), (30, 18348), (31, 18405), (32, 18450), (33, 18510), (34, 18543), (35, 18552), (36, 18633), (37, 18777), (38, 18810), (39, 18828), (40, 18852), (41, 18864), (42, 18885), (43, 18915), (44, 18930), (45, 18933), (46, 18954), (47, 19044), (48, 19110), (49, 19152), (50, 19155), (51, 19185), (52, 19218), (53, 19239), (54, 19242), (55, 19299), (56, 19323), (57, 19338), (58, 19368), (59, 19374), (60, 19452), (61, 19455), (62, 19509), (63, 19533),

Gene: Tapioca\_20 Start: 17556, Stop: 19550, Start Num: 4

Candidate Starts for Tapioca\_20:

(3, 17544), (Start: 4 @17556 has 21 MA's), (5, 17568), (6, 17580), (9, 17634), (14, 17703), (15, 17706), (16, 17715), (18, 17730), (20, 17892), (21, 17970), (22, 17985), (23, 18015), (24, 18063), (25, 18087), (26, 18105), (27, 18153), (28, 18189), (29, 18213), (30, 18348), (31, 18405), (32, 18450), (33, 18510), (34, 18543), (35, 18552), (36, 18633), (37, 18777), (38, 18810), (39, 18828), (40, 18852), (41, 18864), (42, 18885), (43, 18915), (44, 18930), (45, 18933), (46, 18954), (47, 19044), (48, 19110), (49, 19152), (50, 19155), (51, 19185), (52, 19218), (53, 19239), (54, 19242), (55, 19299), (56, 19323), (57, 19338), (58, 19368), (59, 19374), (60, 19452), (61, 19455), (62, 19509), (63, 19533),

Gene: Tessdabest\_19 Start: 17553, Stop: 19547, Start Num: 4

Candidate Starts for Tessdabest\_19:

(3, 17541), (Start: 4 @17553 has 21 MA's), (5, 17565), (6, 17577), (9, 17631), (14, 17700), (15, 17703), (16, 17712), (18, 17727), (20, 17889), (21, 17967), (22, 17982), (23, 18012), (24, 18060), (25, 18084), (26, 18102), (27, 18150), (28, 18186), (29, 18210), (30, 18345), (31, 18402), (32, 18447), (33, 18507), (34, 18540), (35, 18549), (36, 18630), (37, 18774), (38, 18807), (39, 18825), (40, 18849), (41, 18861), (42, 18882), (43, 18912), (44, 18927), (45, 18930), (46, 18951), (47, 19041), (48, 19107), (49, 19149), (50, 19152), (51, 19182), (52, 19215), (53, 19236), (54, 19239), (55, 19296), (56, 19320), (57, 19335), (58, 19365), (59, 19371), (60, 19449), (61, 19452), (62, 19506), (63, 19530),

Gene: Tortoise12\_20 Start: 17556, Stop: 19550, Start Num: 4

Candidate Starts for Tortoise12\_20:

(3, 17544), (Start: 4 @17556 has 21 MA's), (5, 17568), (6, 17580), (9, 17634), (14, 17703), (15, 17706), (16, 17715), (18, 17730), (20, 17892), (21, 17970), (22, 17985), (23, 18015), (24, 18063), (25, 18087), (26, 18105), (27, 18153), (28, 18189), (29, 18213), (30, 18348), (31, 18405), (32, 18450), (33, 18510),

(34, 18543), (35, 18552), (36, 18633), (37, 18777), (38, 18810), (39, 18828), (40, 18852), (41, 18864), (42, 18885), (43, 18915), (44, 18930), (45, 18933), (46, 18954), (47, 19044), (48, 19110), (49, 19152), (50, 19155), (51, 19185), (52, 19218), (53, 19239), (54, 19242), (55, 19299), (56, 19323), (57, 19338), (58, 19368), (59, 19374), (60, 19452), (61, 19455), (62, 19509), (63, 19533),

Gene: Xerxes\_20 Start: 17553, Stop: 19547, Start Num: 4

Candidate Starts for Xerxes\_20:

(3, 17541), (Start: 4 @17553 has 21 MA's), (5, 17565), (6, 17577), (9, 17631), (14, 17700), (15, 17703), (16, 17712), (18, 17727), (20, 17889), (21, 17967), (22, 17982), (23, 18012), (24, 18060), (25, 18084), (26, 18102), (27, 18150), (28, 18186), (29, 18210), (30, 18345), (31, 18402), (32, 18447), (33, 18507), (34, 18540), (35, 18549), (36, 18630), (37, 18774), (38, 18807), (39, 18825), (40, 18849), (41, 18861), (42, 18882), (43, 18912), (44, 18927), (45, 18930), (46, 18951), (47, 19041), (48, 19107), (49, 19149), (50, 19152), (51, 19182), (52, 19215), (53, 19236), (54, 19239), (55, 19296), (56, 19320), (57, 19335), (58, 19365), (59, 19371), (60, 19449), (61, 19452), (62, 19506), (63, 19530),