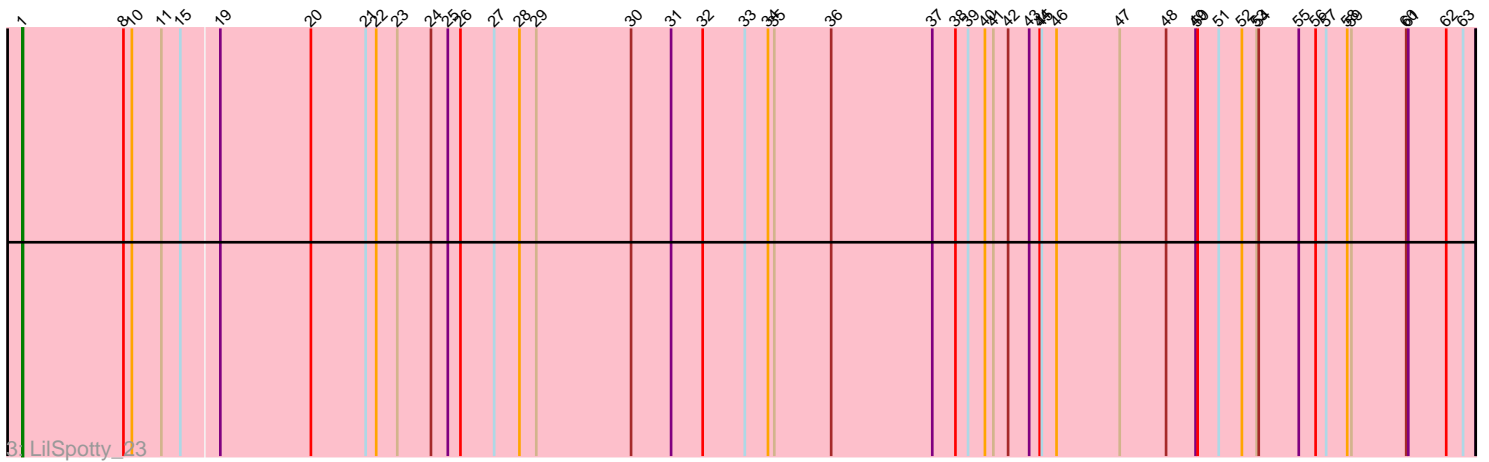
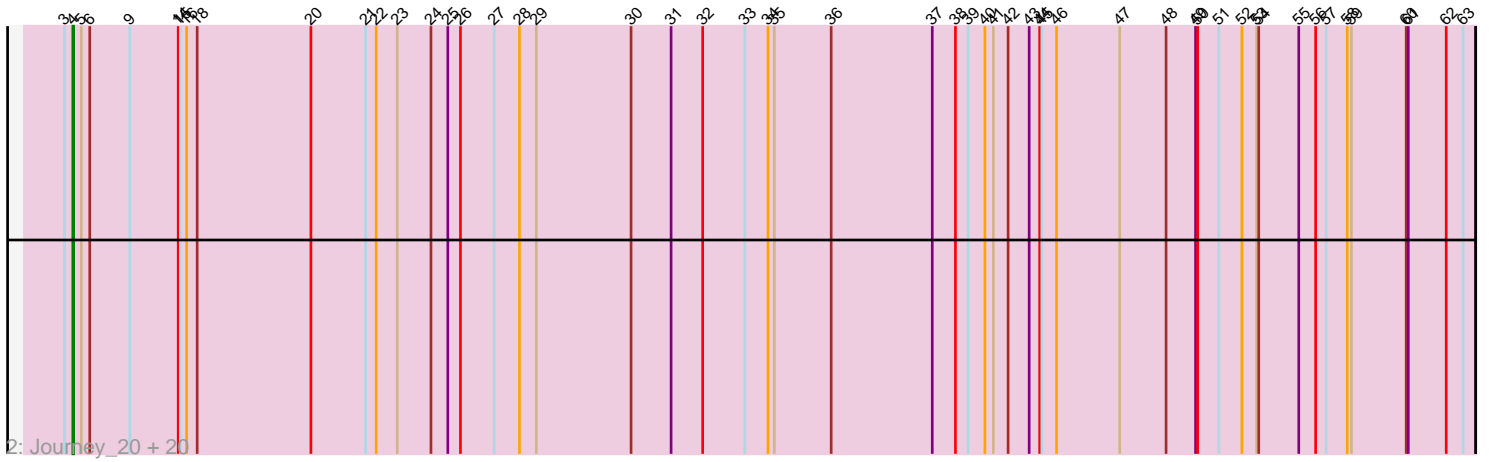
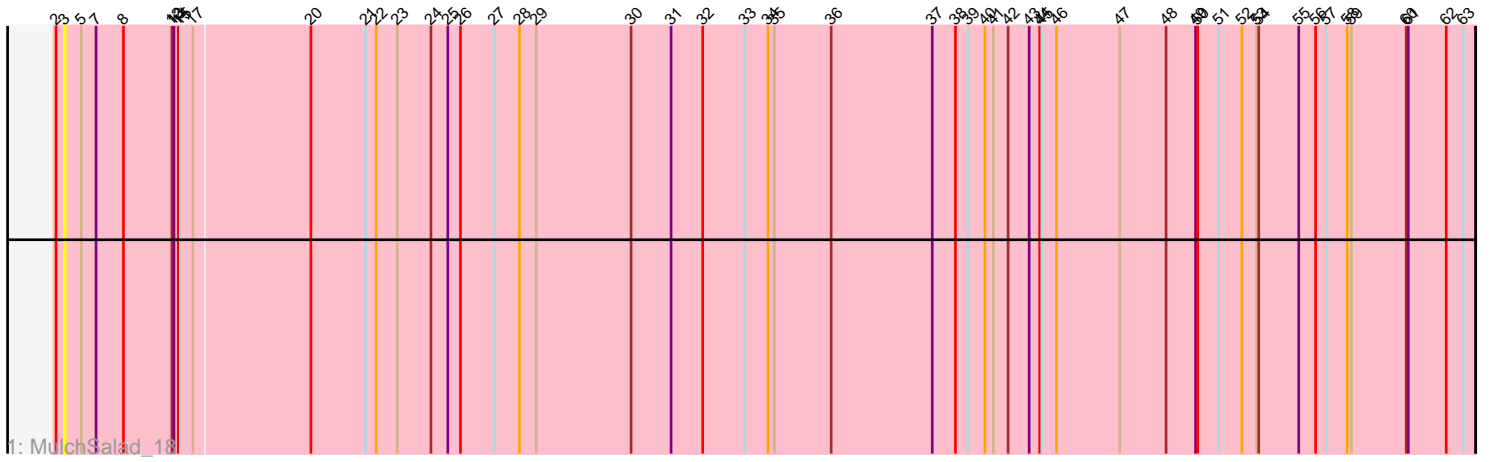


Pham 216528



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 216528 Report

This analysis was run 02/22/25 on database version 588.

Pham number 216528 has 23 members, 4 are drafts.

Phages represented in each track:

- Track 1 : MulchSalad_18
- Track 2 : Journey_20, Xerxes_20, Silvy_20, Magsby_20, Charlie_20, EGUnicorn_21, Melville_20, Parmesanjohn_20, Smurph_20, Tortoise12_20, Chewbacca_20, Schnauzer_20, Pipsqueaks_20, Philonius_20, Duplicity_20, Tapioca_20, Bosection6_20, Carcharodon_20, 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 18 of the 19 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Aggie_20, Bosection6_20, Carcharodon_20, Charlie_20, Chewbacca_20, Duplicity_20, EGUnicorn_21, Gex_20, Journey_20, Magsby_20, Melville_20, Parmesanjohn_20, Philonius_20, Pipsqueaks_20, Schnauzer_20, Silvafighter_20, Silvy_20, Smurph_20, Tapioca_20, 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 23 (4.3%) of genes in pham
- Manual Annotations of this start: 1 of 19
- Called 100.0% of time when present
- Phage (with cluster) where this start called: LilSpotty_23 (singleton),

Start 3:

- Found in 22 of 23 (95.7%) of genes in pham

- No Manual Annotations of this start.
- Called 4.5% of time when present
- Phage (with cluster) where this start called: MulchSalad_18 (F),

Start 4:

- Found in 21 of 23 (91.3%) of genes in pham
- Manual Annotations of this start: 18 of 19
- 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), Duplicity_20 (N), EGunicorn_21 (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), Tortoise12_20 (N), Xerxes_20 (N),

Summary by clusters:

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

Info for manual annotations of cluster N:

- Start number 4 was manually annotated 18 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 18 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 18 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 18 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 18 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 18 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: Duplicity_20 Start: 17556, Stop: 19550, Start Num: 4

Candidate Starts for Duplicity_20:

(3, 17544), (Start: 4 @17556 has 18 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_21 Start: 17556, Stop: 19550, Start Num: 4

Candidate Starts for EGUunicorn_21:

(3, 17544), (Start: 4 @17556 has 18 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 18 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 18 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 18 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 18 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 18 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 18 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 18 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 18 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 18 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 18 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 18 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 18 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: Tortoise12_20 Start: 17556, Stop: 19550, Start Num: 4

Candidate Starts for Tortoise12_20:

(3, 17544), (Start: 4 @17556 has 18 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 18 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),