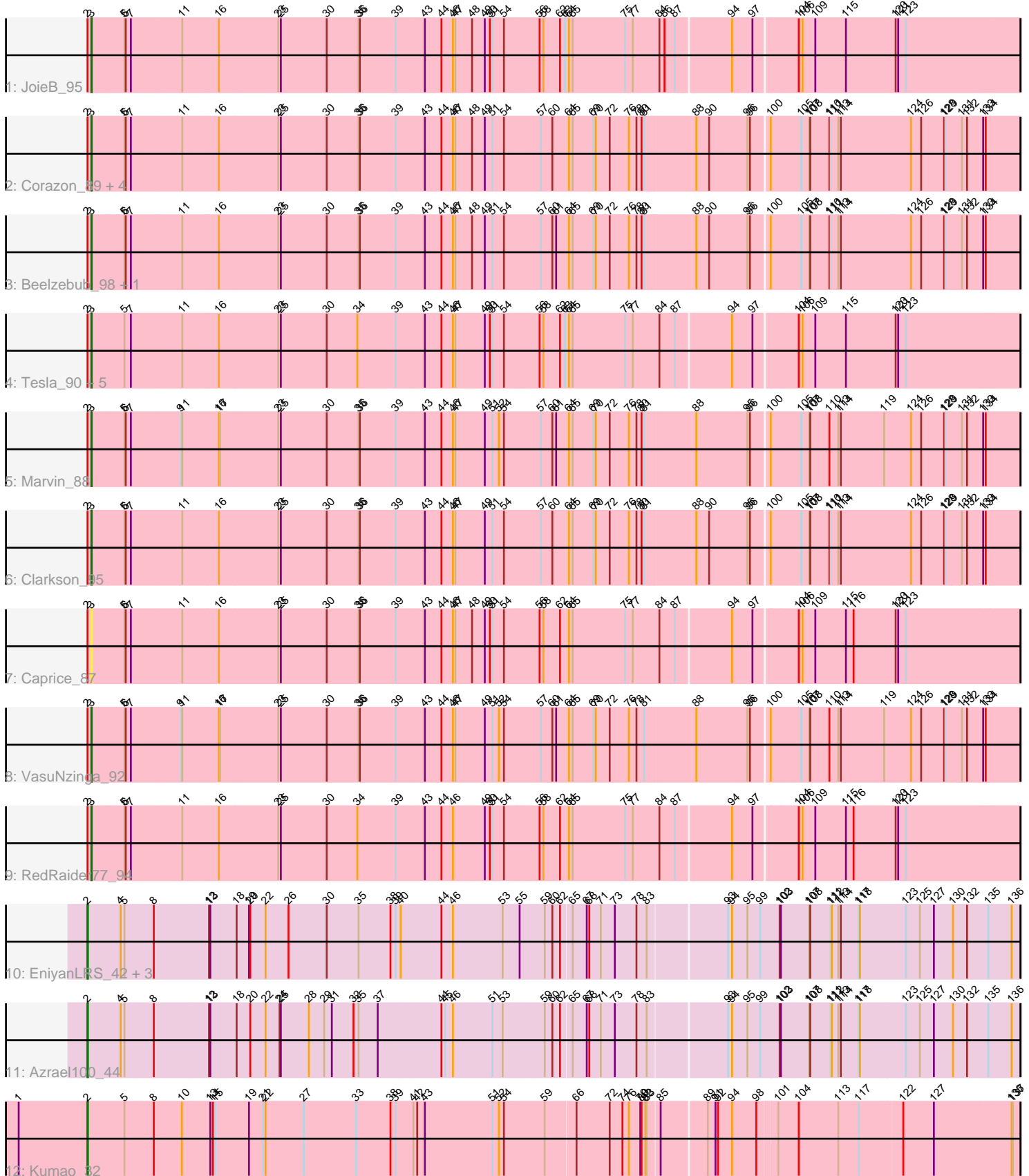


Pham 192835



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 192835 Report

This analysis was run 11/02/24 on database version 579.

Pham number 192835 has 25 members, 3 are drafts.

Phages represented in each track:

- Track 1 : JoieB\_95
- Track 2 : Corazon\_89, Huphlepuuff\_96, LittleLaf\_92, Lilbit\_92, FeliMaine\_90
- Track 3 : Beelzebub\_98, Pringar\_90
- Track 4 : Tesla\_90, Gattaca\_93, Poise\_95, Raela\_96, Blackbeetle\_95, MosMoris\_90
- Track 5 : Marvin\_88
- Track 6 : Clarkson\_95
- Track 7 : Caprice\_87
- Track 8 : VasuNzinga\_92
- Track 9 : RedRaider77\_94
- Track 10 : EniyanLRS\_42, Wildcat\_45, Cosmo\_45, MaryV\_45
- Track 11 : Azrael100\_44
- Track 12 : Kumao\_32

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

The start number called the most often in the published annotations is 3, it was called in 16 of the 22 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Beelzebub\_98, Blackbeetle\_95, Caprice\_87, Clarkson\_95, Corazon\_89, FeliMaine\_90, Gattaca\_93, Huphlepuuff\_96, JoieB\_95, Lilbit\_92, LittleLaf\_92, Marvin\_88, MosMoris\_90, Poise\_95, Pringar\_90, Raela\_96, RedRaider77\_94, Tesla\_90, VasuNzinga\_92,

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

- 

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

- Azrael100\_44, Cosmo\_45, EniyanLRS\_42, Kumao\_32, MaryV\_45, Wildcat\_45,

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

Start 2:

- Found in 25 of 25 ( 100.0% ) of genes in pham
- Manual Annotations of this start: 6 of 22
- Called 24.0% of time when present
- Phage (with cluster) where this start called: Azrael100\_44 (V), Cosmo\_45 (V), EniyanLRS\_42 (V), Kumao\_32 (singleton), MaryV\_45 (V), Wildcat\_45 (V),

Start 3:

- Found in 19 of 25 ( 76.0% ) of genes in pham
- Manual Annotations of this start: 16 of 22
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Beelzebub\_98 (S), Blackbeetle\_95 (S), Caprice\_87 (S), Clarkson\_95 (S), Corazon\_89 (S), FeliMaine\_90 (S), Gattaca\_93 (S), Huphlepuuff\_96 (S), JoieB\_95 (S), Lilbit\_92 (S), LittleLaf\_92 (S), Marvin\_88 (S), MosMoris\_90 (S), Poise\_95 (S), Pringar\_90 (S), Raela\_96 (S), RedRaider77\_94 (S), Tesla\_90 (S), VasuNzinga\_92 (S),

### Summary by clusters:

There are 3 clusters represented in this pham: S, singleton, V,

Info for manual annotations of cluster S:

- Start number 3 was manually annotated 16 times for cluster S.

Info for manual annotations of cluster V:

- Start number 2 was manually annotated 5 times for cluster V.

### Gene Information:

Gene: Azrael100\_44 Start: 32883, Stop: 35012, Start Num: 2

Candidate Starts for Azrael100\_44:

(Start: 2 @32883 has 6 MA's), (4, 32961), (5, 32970), (8, 33036), (12, 33165), (13, 33168), (18, 33225), (20, 33255), (22, 33291), (24, 33324), (25, 33327), (28, 33393), (29, 33429), (31, 33447), (32, 33498), (35, 33510), (37, 33555), (44, 33699), (45, 33708), (46, 33726), (51, 33819), (53, 33843), (59, 33933), (60, 33951), (62, 33969), (65, 33993), (67, 34026), (68, 34032), (71, 34059), (73, 34092), (78, 34143), (83, 34167), (93, 34344), (94, 34353), (95, 34389), (99, 34419), (102, 34464), (103, 34467), (107, 34530), (108, 34533), (111, 34581), (112, 34584), (113, 34599), (114, 34605), (117, 34647), (118, 34650), (123, 34755), (125, 34788), (127, 34818), (130, 34863), (132, 34893), (135, 34938), (136, 34992),

Gene: Beelzebub\_98 Start: 53499, Stop: 55637, Start Num: 3

Candidate Starts for Beelzebub\_98:

(Start: 2 @53490 has 6 MA's), (Start: 3 @53499 has 16 MA's), (5, 53574), (6, 53577), (7, 53589), (11, 53706), (16, 53790), (23, 53928), (25, 53934), (30, 54042), (35, 54117), (36, 54120), (39, 54204), (43, 54270), (44, 54309), (46, 54336), (47, 54342), (48, 54381), (49, 54411), (51, 54429), (54, 54456), (57, 54543), (60, 54570), (61, 54579), (64, 54609), (65, 54618), (69, 54666), (70, 54672), (72, 54705), (76, 54750), (78, 54768), (80, 54780), (81, 54786), (88, 54903), (90, 54933), (95, 55020), (96, 55026), (100, 55065), (105, 55134), (107, 55152), (108, 55155), (110, 55200), (111, 55203), (113, 55221), (114, 55227), (124, 55389), (126, 55413), (128, 55467), (129, 55470), (131, 55506), (132, 55518), (133, 55551), (134, 55557),

Gene: Blackbeetle\_95 Start: 52997, Stop: 55138, Start Num: 3

Candidate Starts for Blackbeetle\_95:

(Start: 2 @52988 has 6 MA's), (Start: 3 @52997 has 16 MA's), (5, 53072), (7, 53087), (11, 53204), (16, 53288), (23, 53426), (25, 53432), (30, 53540), (34, 53612), (39, 53702), (43, 53768), (44, 53807), (46, 53834), (47, 53840), (49, 53909), (50, 53921), (51, 53927), (54, 53954), (56, 54035), (58, 54044), (62, 54083), (63, 54095), (64, 54104), (65, 54113), (75, 54236), (77, 54254), (84, 54317), (87, 54353), (94, 54479), (97, 54524), (104, 54620), (106, 54629), (109, 54659), (115, 54731), (120, 54848), (121, 54854), (123, 54872),

Gene: Caprice\_87 Start: 52935, Stop: 55076, Start Num: 3

Candidate Starts for Caprice\_87:

(Start: 2 @52926 has 6 MA's), (Start: 3 @52935 has 16 MA's), (5, 53010), (6, 53013), (7, 53025), (11, 53142), (16, 53226), (23, 53364), (25, 53370), (30, 53478), (35, 53553), (36, 53556), (39, 53640), (43, 53706), (44, 53745), (46, 53772), (47, 53778), (48, 53817), (49, 53847), (50, 53859), (51, 53865), (54, 53892), (56, 53973), (58, 53982), (62, 54021), (64, 54042), (65, 54051), (75, 54174), (77, 54192), (84, 54255), (87, 54291), (94, 54417), (97, 54462), (104, 54558), (106, 54567), (109, 54597), (115, 54669), (116, 54687), (120, 54786), (121, 54792), (123, 54810),

Gene: Clarkson\_95 Start: 53179, Stop: 55317, Start Num: 3

Candidate Starts for Clarkson\_95:

(Start: 2 @53170 has 6 MA's), (Start: 3 @53179 has 16 MA's), (5, 53254), (6, 53257), (7, 53269), (11, 53386), (16, 53470), (23, 53608), (25, 53614), (30, 53722), (35, 53797), (36, 53800), (39, 53884), (43, 53950), (44, 53989), (46, 54016), (47, 54022), (49, 54091), (51, 54109), (54, 54136), (57, 54223), (60, 54250), (64, 54289), (65, 54298), (69, 54346), (70, 54352), (72, 54385), (76, 54430), (78, 54448), (80, 54460), (81, 54466), (88, 54583), (90, 54613), (95, 54700), (96, 54706), (100, 54745), (105, 54814), (107, 54832), (108, 54835), (110, 54880), (111, 54883), (113, 54901), (114, 54907), (124, 55069), (126, 55093), (128, 55147), (129, 55150), (131, 55186), (132, 55198), (133, 55231), (134, 55237),

Gene: Corazon\_89 Start: 53373, Stop: 55511, Start Num: 3

Candidate Starts for Corazon\_89:

(Start: 2 @53364 has 6 MA's), (Start: 3 @53373 has 16 MA's), (5, 53448), (6, 53451), (7, 53463), (11, 53580), (16, 53664), (23, 53802), (25, 53808), (30, 53916), (35, 53991), (36, 53994), (39, 54078), (43, 54144), (44, 54183), (46, 54210), (47, 54216), (48, 54255), (49, 54285), (51, 54303), (54, 54330), (57, 54417), (60, 54444), (64, 54483), (65, 54492), (69, 54540), (70, 54546), (72, 54579), (76, 54624), (78, 54642), (80, 54654), (81, 54660), (88, 54777), (90, 54807), (95, 54894), (96, 54900), (100, 54939), (105, 55008), (107, 55026), (108, 55029), (110, 55074), (111, 55077), (113, 55095), (114, 55101), (124, 55263), (126, 55287), (128, 55341), (129, 55344), (131, 55380), (132, 55392), (133, 55425), (134, 55431),

Gene: Cosmo\_45 Start: 32890, Stop: 35013, Start Num: 2

Candidate Starts for Cosmo\_45:

(Start: 2 @32890 has 6 MA's), (4, 32968), (5, 32977), (8, 33043), (12, 33172), (13, 33175), (18, 33232), (19, 33259), (20, 33262), (22, 33298), (26, 33352), (30, 33442), (35, 33517), (38, 33592), (39, 33604), (40, 33613), (44, 33706), (46, 33733), (53, 33850), (55, 33886), (59, 33940), (60, 33958), (62, 33976), (65, 34000), (67, 34033), (68, 34039), (71, 34066), (73, 34099), (78, 34150), (83, 34174), (93, 34351), (94, 34360), (95, 34396), (99, 34426), (102, 34471), (103, 34474), (107, 34534), (108, 34537), (111, 34585), (112, 34588), (113, 34603), (114, 34609), (117, 34651), (118, 34654), (123, 34756), (125, 34789), (127, 34819), (130, 34864), (132, 34894), (135, 34939), (136, 34993),

Gene: EniyanLRS\_42 Start: 32588, Stop: 34711, Start Num: 2

Candidate Starts for EniyanLRS\_42:

(Start: 2 @32588 has 6 MA's), (4, 32666), (5, 32675), (8, 32741), (12, 32870), (13, 32873), (18, 32930), (19, 32957), (20, 32960), (22, 32996), (26, 33050), (30, 33140), (35, 33215), (38, 33290), (39, 33302), (40, 33311), (44, 33404), (46, 33431), (53, 33548), (55, 33584), (59, 33638), (60, 33656), (62,

33674), (65, 33698), (67, 33731), (68, 33737), (71, 33764), (73, 33797), (78, 33848), (83, 33872), (93, 34049), (94, 34058), (95, 34094), (99, 34124), (102, 34169), (103, 34172), (107, 34232), (108, 34235), (111, 34283), (112, 34286), (113, 34301), (114, 34307), (117, 34349), (118, 34352), (123, 34454), (125, 34487), (127, 34517), (130, 34562), (132, 34592), (135, 34637), (136, 34691),

Gene: FeliMaine\_90 Start: 53421, Stop: 55559, Start Num: 3

Candidate Starts for FeliMaine\_90:

(Start: 2 @53412 has 6 MA's), (Start: 3 @53421 has 16 MA's), (5, 53496), (6, 53499), (7, 53511), (11, 53628), (16, 53712), (23, 53850), (25, 53856), (30, 53964), (35, 54039), (36, 54042), (39, 54126), (43, 54192), (44, 54231), (46, 54258), (47, 54264), (48, 54303), (49, 54333), (51, 54351), (54, 54378), (57, 54465), (60, 54492), (64, 54531), (65, 54540), (69, 54588), (70, 54594), (72, 54627), (76, 54672), (78, 54690), (80, 54702), (81, 54708), (88, 54825), (90, 54855), (95, 54942), (96, 54948), (100, 54987), (105, 55056), (107, 55074), (108, 55077), (110, 55122), (111, 55125), (113, 55143), (114, 55149), (124, 55311), (126, 55335), (128, 55389), (129, 55392), (131, 55428), (132, 55440), (133, 55473), (134, 55479),

Gene: Gattaca\_93 Start: 53409, Stop: 55550, Start Num: 3

Candidate Starts for Gattaca\_93:

(Start: 2 @53400 has 6 MA's), (Start: 3 @53409 has 16 MA's), (5, 53484), (7, 53499), (11, 53616), (16, 53700), (23, 53838), (25, 53844), (30, 53952), (34, 54024), (39, 54114), (43, 54180), (44, 54219), (46, 54246), (47, 54252), (49, 54321), (50, 54333), (51, 54339), (54, 54366), (56, 54447), (58, 54456), (62, 54495), (63, 54507), (64, 54516), (65, 54525), (75, 54648), (77, 54666), (84, 54729), (87, 54765), (94, 54891), (97, 54936), (104, 55032), (106, 55041), (109, 55071), (115, 55143), (120, 55260), (121, 55266), (123, 55284),

Gene: Huphleuff\_96 Start: 52984, Stop: 55122, Start Num: 3

Candidate Starts for Huphleuff\_96:

(Start: 2 @52975 has 6 MA's), (Start: 3 @52984 has 16 MA's), (5, 53059), (6, 53062), (7, 53074), (11, 53191), (16, 53275), (23, 53413), (25, 53419), (30, 53527), (35, 53602), (36, 53605), (39, 53689), (43, 53755), (44, 53794), (46, 53821), (47, 53827), (48, 53866), (49, 53896), (51, 53914), (54, 53941), (57, 54028), (60, 54055), (64, 54094), (65, 54103), (69, 54151), (70, 54157), (72, 54190), (76, 54235), (78, 54253), (80, 54265), (81, 54271), (88, 54388), (90, 54418), (95, 54505), (96, 54511), (100, 54550), (105, 54619), (107, 54637), (108, 54640), (110, 54685), (111, 54688), (113, 54706), (114, 54712), (124, 54874), (126, 54898), (128, 54952), (129, 54955), (131, 54991), (132, 55003), (133, 55036), (134, 55042),

Gene: JoieB\_95 Start: 53584, Stop: 55725, Start Num: 3

Candidate Starts for JoieB\_95:

(Start: 2 @53575 has 6 MA's), (Start: 3 @53584 has 16 MA's), (5, 53659), (6, 53662), (7, 53674), (11, 53791), (16, 53875), (23, 54013), (25, 54019), (30, 54127), (35, 54202), (36, 54205), (39, 54289), (43, 54355), (44, 54394), (46, 54421), (47, 54427), (48, 54466), (49, 54496), (50, 54508), (51, 54514), (54, 54541), (56, 54622), (58, 54631), (62, 54670), (63, 54682), (64, 54691), (65, 54700), (75, 54823), (77, 54841), (84, 54904), (86, 54916), (87, 54940), (94, 55066), (97, 55111), (104, 55207), (106, 55216), (109, 55246), (115, 55318), (120, 55435), (121, 55441), (123, 55459),

Gene: Kumao\_32 Start: 28241, Stop: 30346, Start Num: 2

Candidate Starts for Kumao\_32:

(1, 28079), (Start: 2 @28241 has 6 MA's), (5, 28325), (8, 28391), (10, 28457), (13, 28523), (14, 28529), (15, 28535), (19, 28607), (21, 28640), (22, 28646), (27, 28736), (33, 28859), (38, 28940), (39, 28952), (41, 28991), (42, 29000), (43, 29018), (51, 29177), (52, 29192), (54, 29204), (59, 29294), (66, 29363), (72, 29441), (74, 29471), (76, 29486), (79, 29513), (80, 29516), (82, 29525), (83, 29528), (85, 29555), (89, 29657), (91, 29675), (92, 29681), (94, 29714), (98, 29768), (101, 29810), (104, 29852), (113, 29945), (117, 29990), (122, 30083), (127, 30152), (136, 30326), (137, 30329),

Gene: Lilbit\_92 Start: 53544, Stop: 55682, Start Num: 3

Candidate Starts for Lilbit\_92:

(Start: 2 @53535 has 6 MA's), (Start: 3 @53544 has 16 MA's), (5, 53619), (6, 53622), (7, 53634), (11, 53751), (16, 53835), (23, 53973), (25, 53979), (30, 54087), (35, 54162), (36, 54165), (39, 54249), (43, 54315), (44, 54354), (46, 54381), (47, 54387), (48, 54426), (49, 54456), (51, 54474), (54, 54501), (57, 54588), (60, 54615), (64, 54654), (65, 54663), (69, 54711), (70, 54717), (72, 54750), (76, 54795), (78, 54813), (80, 54825), (81, 54831), (88, 54948), (90, 54978), (95, 55065), (96, 55071), (100, 55110), (105, 55179), (107, 55197), (108, 55200), (110, 55245), (111, 55248), (113, 55266), (114, 55272), (124, 55434), (126, 55458), (128, 55512), (129, 55515), (131, 55551), (132, 55563), (133, 55596), (134, 55602),

Gene: LittleLaf\_92 Start: 53273, Stop: 55411, Start Num: 3

Candidate Starts for LittleLaf\_92:

(Start: 2 @53264 has 6 MA's), (Start: 3 @53273 has 16 MA's), (5, 53348), (6, 53351), (7, 53363), (11, 53480), (16, 53564), (23, 53702), (25, 53708), (30, 53816), (35, 53891), (36, 53894), (39, 53978), (43, 54044), (44, 54083), (46, 54110), (47, 54116), (48, 54155), (49, 54185), (51, 54203), (54, 54230), (57, 54317), (60, 54344), (64, 54383), (65, 54392), (69, 54440), (70, 54446), (72, 54479), (76, 54524), (78, 54542), (80, 54554), (81, 54560), (88, 54677), (90, 54707), (95, 54794), (96, 54800), (100, 54839), (105, 54908), (107, 54926), (108, 54929), (110, 54974), (111, 54977), (113, 54995), (114, 55001), (124, 55163), (126, 55187), (128, 55241), (129, 55244), (131, 55280), (132, 55292), (133, 55325), (134, 55331),

Gene: Marvin\_88 Start: 53069, Stop: 55204, Start Num: 3

Candidate Starts for Marvin\_88:

(Start: 2 @53060 has 6 MA's), (Start: 3 @53069 has 16 MA's), (5, 53144), (6, 53147), (7, 53159), (9, 53273), (11, 53276), (16, 53360), (17, 53363), (23, 53498), (25, 53504), (30, 53612), (35, 53687), (36, 53690), (39, 53774), (43, 53840), (44, 53879), (46, 53906), (47, 53912), (49, 53981), (51, 53999), (52, 54014), (54, 54026), (57, 54113), (60, 54140), (61, 54149), (64, 54179), (65, 54188), (69, 54236), (70, 54242), (72, 54275), (76, 54320), (78, 54338), (80, 54350), (81, 54356), (88, 54473), (95, 54590), (96, 54596), (100, 54635), (105, 54701), (107, 54719), (108, 54722), (110, 54767), (113, 54788), (114, 54794), (119, 54896), (124, 54956), (126, 54980), (128, 55034), (129, 55037), (131, 55073), (132, 55085), (133, 55118), (134, 55124),

Gene: MaryV\_45 Start: 32875, Stop: 34998, Start Num: 2

Candidate Starts for MaryV\_45:

(Start: 2 @32875 has 6 MA's), (4, 32953), (5, 32962), (8, 33028), (12, 33157), (13, 33160), (18, 33217), (19, 33244), (20, 33247), (22, 33283), (26, 33337), (30, 33427), (35, 33502), (38, 33577), (39, 33589), (40, 33598), (44, 33691), (46, 33718), (53, 33835), (55, 33871), (59, 33925), (60, 33943), (62, 33961), (65, 33985), (67, 34018), (68, 34024), (71, 34051), (73, 34084), (78, 34135), (83, 34159), (93, 34336), (94, 34345), (95, 34381), (99, 34411), (102, 34456), (103, 34459), (107, 34519), (108, 34522), (111, 34570), (112, 34573), (113, 34588), (114, 34594), (117, 34636), (118, 34639), (123, 34741), (125, 34774), (127, 34804), (130, 34849), (132, 34879), (135, 34924), (136, 34978),

Gene: MosMoris\_90 Start: 53415, Stop: 55556, Start Num: 3

Candidate Starts for MosMoris\_90:

(Start: 2 @53406 has 6 MA's), (Start: 3 @53415 has 16 MA's), (5, 53490), (7, 53505), (11, 53622), (16, 53706), (23, 53844), (25, 53850), (30, 53958), (34, 54030), (39, 54120), (43, 54186), (44, 54225), (46, 54252), (47, 54258), (49, 54327), (50, 54339), (51, 54345), (54, 54372), (56, 54453), (58, 54462), (62, 54501), (63, 54513), (64, 54522), (65, 54531), (75, 54654), (77, 54672), (84, 54735), (87, 54771), (94, 54897), (97, 54942), (104, 55038), (106, 55047), (109, 55077), (115, 55149), (120, 55266), (121, 55272), (123, 55290),

Gene: Poise\_95 Start: 52997, Stop: 55138, Start Num: 3

Candidate Starts for Poise\_95:

(Start: 2 @52988 has 6 MA's), (Start: 3 @52997 has 16 MA's), (5, 53072), (7, 53087), (11, 53204), (16, 53288), (23, 53426), (25, 53432), (30, 53540), (34, 53612), (39, 53702), (43, 53768), (44, 53807), (46, 53834), (47, 53840), (49, 53909), (50, 53921), (51, 53927), (54, 53954), (56, 54035), (58, 54044), (62, 54083), (63, 54095), (64, 54104), (65, 54113), (75, 54236), (77, 54254), (84, 54317), (87, 54353), (94, 54479), (97, 54524), (104, 54620), (106, 54629), (109, 54659), (115, 54731), (120, 54848), (121, 54854), (123, 54872),

Gene: Pringar\_90 Start: 52785, Stop: 54923, Start Num: 3

Candidate Starts for Pringar\_90:

(Start: 2 @52776 has 6 MA's), (Start: 3 @52785 has 16 MA's), (5, 52860), (6, 52863), (7, 52875), (11, 52992), (16, 53076), (23, 53214), (25, 53220), (30, 53328), (35, 53403), (36, 53406), (39, 53490), (43, 53556), (44, 53595), (46, 53622), (47, 53628), (48, 53667), (49, 53697), (51, 53715), (54, 53742), (57, 53829), (60, 53856), (61, 53865), (64, 53895), (65, 53904), (69, 53952), (70, 53958), (72, 53991), (76, 54036), (78, 54054), (80, 54066), (81, 54072), (88, 54189), (90, 54219), (95, 54306), (96, 54312), (100, 54351), (105, 54420), (107, 54438), (108, 54441), (110, 54486), (111, 54489), (113, 54507), (114, 54513), (124, 54675), (126, 54699), (128, 54753), (129, 54756), (131, 54792), (132, 54804), (133, 54837), (134, 54843),

Gene: Raela\_96 Start: 53548, Stop: 55689, Start Num: 3

Candidate Starts for Raela\_96:

(Start: 2 @53539 has 6 MA's), (Start: 3 @53548 has 16 MA's), (5, 53623), (7, 53638), (11, 53755), (16, 53839), (23, 53977), (25, 53983), (30, 54091), (34, 54163), (39, 54253), (43, 54319), (44, 54358), (46, 54385), (47, 54391), (49, 54460), (50, 54472), (51, 54478), (54, 54505), (56, 54586), (58, 54595), (62, 54634), (63, 54646), (64, 54655), (65, 54664), (75, 54787), (77, 54805), (84, 54868), (87, 54904), (94, 55030), (97, 55075), (104, 55171), (106, 55180), (109, 55210), (115, 55282), (120, 55399), (121, 55405), (123, 55423),

Gene: RedRaider77\_94 Start: 52942, Stop: 55083, Start Num: 3

Candidate Starts for RedRaider77\_94:

(Start: 2 @52933 has 6 MA's), (Start: 3 @52942 has 16 MA's), (5, 53017), (6, 53020), (7, 53032), (11, 53149), (16, 53233), (23, 53371), (25, 53377), (30, 53485), (34, 53557), (39, 53647), (43, 53713), (44, 53752), (46, 53779), (49, 53854), (50, 53866), (51, 53872), (54, 53899), (56, 53980), (58, 53989), (62, 54028), (64, 54049), (65, 54058), (75, 54181), (77, 54199), (84, 54262), (87, 54298), (94, 54424), (97, 54469), (104, 54565), (106, 54574), (109, 54604), (115, 54676), (116, 54694), (120, 54793), (121, 54799), (123, 54817),

Gene: Tesla\_90 Start: 52791, Stop: 54932, Start Num: 3

Candidate Starts for Tesla\_90:

(Start: 2 @52782 has 6 MA's), (Start: 3 @52791 has 16 MA's), (5, 52866), (7, 52881), (11, 52998), (16, 53082), (23, 53220), (25, 53226), (30, 53334), (34, 53406), (39, 53496), (43, 53562), (44, 53601), (46, 53628), (47, 53634), (49, 53703), (50, 53715), (51, 53721), (54, 53748), (56, 53829), (58, 53838), (62, 53877), (63, 53889), (64, 53898), (65, 53907), (75, 54030), (77, 54048), (84, 54111), (87, 54147), (94, 54273), (97, 54318), (104, 54414), (106, 54423), (109, 54453), (115, 54525), (120, 54642), (121, 54648), (123, 54666),

Gene: VasuNzinga\_92 Start: 52880, Stop: 55015, Start Num: 3

Candidate Starts for VasuNzinga\_92:

(Start: 2 @52871 has 6 MA's), (Start: 3 @52880 has 16 MA's), (5, 52955), (6, 52958), (7, 52970), (9, 53084), (11, 53087), (16, 53171), (17, 53174), (23, 53309), (25, 53315), (30, 53423), (35, 53498), (36, 53501), (39, 53585), (43, 53651), (44, 53690), (46, 53717), (47, 53723), (49, 53792), (51, 53810), (52, 53825), (54, 53837), (57, 53924), (60, 53951), (61, 53960), (64, 53990), (65, 53999), (69, 54047), (70,

54053), (72, 54086), (76, 54131), (78, 54149), (81, 54167), (88, 54284), (95, 54401), (96, 54407), (100, 54446), (105, 54512), (107, 54530), (108, 54533), (110, 54578), (113, 54599), (114, 54605), (119, 54707), (124, 54767), (126, 54791), (128, 54845), (129, 54848), (131, 54884), (132, 54896), (133, 54929), (134, 54935),

Gene: Wildcat\_45 Start: 32885, Stop: 35008, Start Num: 2

Candidate Starts for Wildcat\_45:

(Start: 2 @32885 has 6 MA's), (4, 32963), (5, 32972), (8, 33038), (12, 33167), (13, 33170), (18, 33227), (19, 33254), (20, 33257), (22, 33293), (26, 33347), (30, 33437), (35, 33512), (38, 33587), (39, 33599), (40, 33608), (44, 33701), (46, 33728), (53, 33845), (55, 33881), (59, 33935), (60, 33953), (62, 33971), (65, 33995), (67, 34028), (68, 34034), (71, 34061), (73, 34094), (78, 34145), (83, 34169), (93, 34346), (94, 34355), (95, 34391), (99, 34421), (102, 34466), (103, 34469), (107, 34529), (108, 34532), (111, 34580), (112, 34583), (113, 34598), (114, 34604), (117, 34646), (118, 34649), (123, 34751), (125, 34784), (127, 34814), (130, 34859), (132, 34889), (135, 34934), (136, 34988),