S5 Table. Gene sequences used in this study.

Gene Name	Sequence	Notes
acrIIA22wt	atggtagtagaagagacgcgggatttagccgaaactgcggattgtgtagtgatcgaagccattttagtggatgacggattgcgttacagacagctttctgtcggcatcaaaga cgaaaacggcgacattattcgtatcgtccctatttcaaccgttc*ctgatc*tag	The italicized six base pairs were deleted in the Δ2aa truncation mutant via Q5 site-directed mutagenesis (NEB).
acrIIA22-null	atggtagtagaagagacgcgggatttagccgaaactgcggattgtgtagtgatcgaagccattt**A**agtggatgacggattgcgttacagacagctttctgtcggcatcaaa gacgaaaacggcgacattattcgtatcgtccctatttcaaccgttctgatctag	Mutation to introduce early stop codon via Q5 site-directed mutagenesis (NEB). Indicated in bold, capitalized, underline
acrIIA22a	atggtcatagaagagacgcgggatttagctgaaactgcggattgtgtagtgatcgaagccattttagtggatgacggattgcgttacaaacagctttccgtcggcatcaaaga cgaaaacggtgacattattcgtatcgtccctatttcaaccgttctgatctag	Same amino acid sequence as NCBI protein CDB51368.1; synthesized by GenScript and cloned into pZE21_tetR
acrIIA22b	atgattgtggaagataccaaagatttggttgaaactgcggactatgtgatcatcgaagctgttttagtggatgatggattgcgttacaaacaactttctgttggcattaaagccaa aaatggtgacattatccgcataattccaatatcgacaatgctgatgtaa	Synthesized by GenScript and cloned into pZE21_tetR
acrIIA22c	atgaaaatgattgtggaagatacgaaagatctggtagaaacggacgattatgtaatcattgaagcgactttgtcagagggcgatttgttgtttgtgcaaattgccgtgggcattc gcaacgaagtgggcgacattgttcgtattattcccatttccaccaacccaatctaa	Same amino acid sequence as NCBI protein CDB51757.1; synthesized by GenScript and cloned into pZE21_tetR
ts-acrIIA22	atg***tggagtcatccacaatttgagaag****ggaggaggcagtggaggaggcag****tggaggaagtgcctggagccacccgcagttcgaaaaa****ggcagtggtggtggt* *agtggtggagga*atggtagtagaagagacgcgggatttagccgaaactgcggattgtgtagtgatcgaagccattttagtggatgacggattgcgttacagacagctttctgt cggcatcaaagacgaaaacggcgacattattcgtatcgtccctatttcaaccgttctgatctag	N-terminal twin-strep (ts) tagged AcrIIA22. The tag is indicated in bold italics, linker regions are only italicized; synthesized by GenScript and cloned into pZE21_tetR for functional testing.
acrIIA22-ts	atggtagtagaagagacgcgggatttagccgaaactgcggattgtgtagtgatcgaagccattttagtggatgacggattgcgttacagacagctttctgtcggcatcaaaga cgaaaacggcgacattattcgtatcgtccctatttcaaccgttctgatc*ggaggaggcagtggaggaggcagtggaggaagtgcc****tggagtcatccacaatttgagaag*** *ggaggaggcagtggaggaggcagtggaggaagtgcc****tggagccacccgcagttcgaaaaa***tag	C-terminal twin-strep (ts) tagged AcrIIA22. The tag is indicated in bold italics, linker regions are only italicized; synthesized by GenScript and cloned into pZE21_tetR or pET15 for functional testing or protein purification, respectively.
purF	atgttcgatagtttgcacgaggaatgcggtgttttcggcgtatttgaaaatcagaccactacggtggcccagacggcgtatctggctctgtttgccttgcagcacagagggcag gagagttgcggcattgccgtgaatgacgacggcgtgtttcgccaccatcggggcgacggactggtgccggatgtgtttagcaaggagcagctggctgccctgggtacagg taatatggccatcggtcatgtgcgctactccaccaccggcggcaaaaacgccaacaatattcagcccctggtcattcgccatattaagggtaatttggcggtggcacataac ggcaatttggtaaacgccccggagctgcgccgccagtttgagctgaagggcgccatttttcacggcacatcggacaccgagtccattgcctattctattgtagaggagcgcc tgcacagtaagagcacggaagaggccatcgaaaaaatcatgccccggctgcaaggggcattctcttgcgtggtgatgactgccaccaaactcattgcgtttcgtgaccc aacggctttcggcctctttgcctgggtaagactgcggacgatgcttatgtggtggcgtcggagagttgtgcgctggattccatcggcgcccactttgtgcggaatattgctcccg gcgagatcgttgtgatcagcaaggatggcgtgcgctctattaccacccattgcggcggactacgccacatttgtgtgtttgagtacatctattttgctcggccggacagtgtgatt gagggcgtgtctgtgcagcacgccagaatgcgggccggtgcgtacctggcgaaggaacacccggtagacgcggatattgtcatcggcgtgccggacagcggcctgga cgccgccttgggctatgcccaggagagcggcattccttacggtattggatttatcaagaaccgctacatcggccgcagctttattcagcctacccaaggtcagcgtgaggac gcggtgaagatcaagctgaatgtactgcgagagaatatcaagggcaagcgggtggtgatgatcgatgactctattgttcgcggcaccaccagcgctcggattgtcagcctg ctgcgagaggccggcgccaccgaggtgcatatgcgggtttctgcccctccgtttcggcatccttgcttctttggaacggacattgatagcgaagaaaacctgattgcatgcaa atttcacgaaatttctgaaatttcttgccaattaggggttgacagcttggggtatcttagtgtaaaatctactcacgaacttgcgaaggagtccggattcgatttttgcgacggttgc ttcaccggccattatcccatccccaccccgaagcaacagtccaaggataagtttgaggaaaagctgaatcagttctcctcttactaccaggtcttggattaa	Flanks *acrIIA22*-encoding bacterial genomic islands. Used as bait to retrieve additional examples of this locus for genomic and evolutionary analyses.
radC	atgcgtgccgcttatctgcaaggcggcggcgacgctatgccggaccaccagttgctggaattgctgctgtccatcagcattccccgcagagatgtaaagcccattgcctatg cgctcattaaccgcttcggctcgctggagcaggtgtttgccgccggcgcagcagatctgcaacaagtgccgggcgtcggcgaacagaccgccgtacagattctgctggta cgggatctgaaccggcggatccatcaaaatcaaaacaaaccggtcaagcacctgacagatgccacccagtcctgcgcctacttttccaatctgttacgggacaaaaccg ccgagcaggtgtacttggtcacccctggacggcagtgccaaaatcctgcaaacccacgccgtaggcagcggcagcgtcaacctggcctctgtggatcagcgcactttgatg gaacatattctgcgagacaacgccaacgctgttatgctggcacacaaccatcccggcggcaaggcccagccctctgcgcaggatctggaattcaccattcgtctgctttcca ttctgcgttccattcatgtgcagctgctggatcatattatcgtcagtcctaccgacacctactccatgcgcagcgacccggagtacggcagcttcttcaccgtcaaataa	Flanks *acrIIA22*-encoding bacterial genomic islands. Used as bait to retrieve additional examples of this locus for genomic and evolutionary analyses.
acrIIA4	atgaatattaacgatttgatccgtgagattaagaataaggattatactgtcaaattgtccgggacagattccaattctattacacaattaatcatccgtgtgaataacgatggtaa tgagtatgtcatctctgaatcagaaaacgagagcatcgtagaaaagttcatcagtgccttcaagaacgggtggaaccaagagtatgaagatgaggaggaattttacaatg atatgcagacaattacgcttaaatcagaattgaattaa	Discovered by (Rauch et al., 2017); synthesized by GenScript and cloned into pZE21_tetR
spyCas9	atggataagaaatactcaataggcttagatatcggcacaaatagcgtcggatgggcggtgatcactgatgaatataaggttccgtctaaaaagttcaaggttctgggaaata cagaccgccacagtatcaaaaaaaatcttatagggctcttttatttgacagtggagagacagcggaagcgactcgtctcaaacggacagctcgtagaaggtatacacgt cggaagaatcgtatttgttatctacaggagatttttcaaatgagatggcgaaagtagatgatagtttctttcatcgacttgaagagtctttttggtggaagaagacaagaagcat gaacgtcatcctatttttggaaatatagtagatgaagttgcttatcatgagaaatatccaactatctatcatctgcgaaaaaaattggtagattctactgataaagcggatttgcgc ttaatctatttggccttagcgcatatgattaagtttcgtggtcatttttttgattgagggagatttaaatcctgataatagtgatgtggacaaactatttatccagttggtacaaacctac	The sequence was amplified from Addgene plasmid #48645 (Esvelt *et al.*, 2013) for use in this study as described in (Forsberg *et al.*, 2019).

	aatcaattatttgaagaaaaccctattaacgcaagtggagtagatgctaaagcgattctttctgcacgattgagtaaatcaagacgattagaaaatctcattgctcagctcccc ggtgagaagaaaaatggcttatttgggaatctcattgctttgtcattgggtttgacccctaattttaaatcaaattttgatttggcagaagatgctaaattacagctttcaaaagata cttacgatgatgatttagataatttattggcgcaaattggagatcaatatgctgatttgtttttggcagctaagaatttatcagatgctattttactttcagatatcctaagagtaaatac tgaaataactaaggctcccctatcagcttcaatgattaaacgctacgatgaacatcatcaagacttgactcttttaaaagctttagttcgacaacaacttccagaaaagtataa agaaatctttttgatcaatcaaaaaacggatatgcaggttatattgatgggggagctagccaagaagaattttataaatttatcaaaccaattttagaaaaaatggatggtact gaggaattattggtgaaactaaatcgtgaagatttgctgcgcaagcaacggacctttgacaacggctctattccccatcaaattcacttgggtgagctgcatgctattttgagaa gacaagaagactttttatccatttttaaaagacaatcgtgagaagattgaaaaaatcttgacttttcgaattccttattatgttggtccattggcgcgtggcaatagtcgttttgcatgg atgactcggaagtctgaagaaacaattaccccatggaattttgaagaagttgtcgataaaggtgcttcagctcaatcatttattgaacgcatgacaaactttgataaaaatcttc caaatgaaaaagtactaccaaaacatagtttgctttatgagtattttacggtttataacgaattgacaaaggtcaaatatgttactgaaggaatgcgaaaaccagcatttctttc aggtgaacagaagaaagccattgttgatttactcttcaaaacaaatcgaaaagtaaccgttaagcaattaaaagaagattatttcaaaaaaatagaatgttttgatagtgttg aaatttcaggagttgaagatagatttaatgcttcattaggtacctaccatgatttgctaaaaattattaaagataaagatttttggataatgaagaaaatgaagatatcttagagg atattgttttaacattgaccttatttgaagatagggagatgattgaggaaagacttaaaacatatgctcacctctttgatgataaggtgatgaaacagcttaaacgtcgccgttat actggttggggacgtttgtctcgaaaattgattaatggtattagggataagcaatctggcaaaacaatattagatttttgaaatcagatggttttgccaatcgcaattttatgcagc tgatccatgatgatagtttgacatttaaagaagacattcaaaaagcacaagtgtctggacaaggcgatagtttacatgaacatattgcaaatttagctggtagccctgctattaa aaaaggtattttacagactgtaaaagttgttgatgaattggtcaaagtaatggggcggcataagccagaaaatatcgttattgaaatggcacgtgaaaatcagacaactcaa aagggccagaaaaattcgcgagagcgtatgaaacgaatcgaagaaggtatcaaagaattaggaagtcagattcttaaagagcatcctgttgaaaatactcaattgcaaa atgaaaagctctatctctattatctccaaaatggaagagacatgtatgtggaccaagaattagatattaatcgtttaagtgattatgatgtcgatcacattgttccacaaagtttcct taaagacgattcaatagacaataaggtcttaacgcgttctgataaaaatcgtggtaaatcggataacgttccaagtgaagaagtagtcaaaaagatgaaaaactattggag acaacttctaaacgccaagttaatcactcaacgtaagtttgataatttaacgaaagctgaacgtggaggtttgagtgaacttgataaagctggttttatcaaacgccaattggtt gaaactcgccaaatcactaagcatgtggcacaaattttggatagtcgcatgaatactaaatacgatgaaaatgataaacttattcgagaggttaaagtgattaccttaaaatct aaattagtttctgacttccgaaaagatttccaattctataaagtacgtgagattaacaattaccatcatgcccatgatgcgtatctaaatgccgtcgttggaactgctttgattaag aaatatccaaaacttgaatcggagtttgtctatggtgattataaagtttatgatgttcgtaaaatgattgctaagtctgagcaagaaataggcaaagcaaccgcaaaatatttctt ttactctaatatcatgaacttcttcaaaacagaaattacacttgcaaatggagagattcgcaaacgccctctaatcgaaactaatggggaaactggagaaattgtctgggata aagggcgagattttgccacagtgcgcaaagtattgtccatgccccaagtcaatattgtcaagaaaacagaagtacagacaggcggattctccaaggagtcaattttaccaa aaagaaattcggacaagcttattgctcgtaaaaaagactgggatccaaaaaaatatggtggttttgatagtccaacggtagcttattcagtcctagtggttgctaaggtggaa aaagggaaatcgaagaagttaaaatccgttaaagagttactagggatcacaattatggaaagaagttcctttgaaaaaaatccgattgacttttagaagctaaaggatata aggaagttaaaaaagacttaatcattaaactacctaaatatagtctttttgagttagaaaacggtcgtaaacggatgctggctagtgccggagaattacaaaaaggaaatga gctggctctgccaagcaaatatgtgaatttttatatttagctagtcattatgaaaagttgaagggtagtccagaagataacgaacaaaaacaattgtttgtggagcagcataa gcattatttagatgagattattgagcaaatcagtgaattttctaagcgtgttattttagcagatgccaatttagataaagttcttagtgcatataacaaacatagagacaaaccaat acgtgaacaagcagaaaatattattcatttatttacgttgacgaatcttggagctcccgctgcttttaaatattttgatacaacaattgatcgtaaacgatatacgtctacaaaaga agttttagatgccactcttatccatcaatccatcactggtctttatgaaacacgcattgatttgagtcagctaggaggtgactga	
nmCas9	atggccgccttcaagcccaaccccatcaactacatcctgggcctggacatcggcatcgccagcgtgggctgggccatggtggagatcgacgaggacgagaaccccatc tgcctgatcgacctgggtgtgcgcgtgttcgagcgcgctgaggtgcccaagactggtgacagtctggctatggctcgccggcttgctcgctctgttcggcgccttactcgccgg cgcgctcaccgccttctgcgcgctcgccgcctgctgaagcgcgagggtgtgctgcaggctgccgacttcgacgagaacggcctgatcaagagcctgcccaacactccttg gcagctgcgcgctgccgctctggaccgcaagctgactcctctggagtggagcgccgtgctgctgcacctgatcaagcaccgcggctacctgagccagcgcaagaacga gggcgagaccgccgacaaggagctgggtgctctgctgaagggcgtggccgacaacgcccacgccctgcagactggtgacttccgcactcctgctgagctggccctgaa caagttcgagaaggagagcggccacatccgcaaccagcgcggcgactacagccacaccttcagccgcaaggacctgcaggccgagctgatcctgctgttcgagaag cagaaggagttcggcaacccccacgtgagcggcggcctgaaggagggcatcgagaccctgctgatgacccagcgccccgccctgagcggcgacgccgtgcagaag atgctgggccactgcaccttcgagccagccgagcccaaggccgccaagaacacctacaccgccgagcgcttcatctggctgaccaagctgaacaacctgcgcatcctg gagcagggcagcgagcgcccccctgaccgacaccgagcgcgccaccctgatggacgagccctaccgcaagagcaagctgacctacgcccaggcccgcaagctgct gggtctggaggacaccgccttcttcaagggcctgcgctacggcaaggacaacgccgaggccagcaccctgatggagatgaaggcctaccacgccatcagccgcgccc tggagaaggagggcctgaaggacaagaagagtcctctgaacctgagccccgagctgcaggacgagatcggcaccgccttcagcctgttcaagaccgacgaggacat caccggccgcctgaaggaccgcatccagcccgagatcctggaggccctgctgaagcacatcagcttcgacaagttcgtgcagatcagcctgaaggccctgcgccgcat cgtgcccctgatggagcagggcaagcgctacgacgaggcctgcgccgagatctacggcgaccactacggcaagaagaacaccgaggagaagatctacctgcctcct atccccgccgacgagatccgcaaccccgtggtgctgcgcgccctgagccaggcccgcaaggtgatcaacggcgtggtgcgccgctacggcagccccgcccgcatcca catcgagaccgcccgcgaggtgggcaagagcttcaaggaccgcaaggagatcgagaagcgccaggaggagaaccgcaaggaccgcgagaaggccgccgccaa gttccgcgagtacttccccaacttcgtgggcgagcccaagagcaaggacatcctgaagctgcgcctgtacgagcagcagcacggcaagtgcctgtacagcggcaagga gatcaacctgggccgcctgaacgagaagggctacgtggagatcgaccacgccctgcccttcagccgcacctgggacgacagcttcaacaacaaggtgctggtgctggg cagcgagaaccagaacaagggcaaccagacccccctacgagtacttcaacggcaaggacaacagccgcgagtggcaggagttcaaggcccgcgtggagaccagcc gcttcccccgcagcaagaagcagcgcatcctgctgcagaagttcgacgaggacggcttcaaggagcgcaacctgaacgacacccgctacgtgaaccgcttcctgtgcc agttcgtggccgaccgcatgcgcctgaccggcaagggcaagaagcgcgtgttcgccagcaacggccagatcaccaacctgctgcgcggcttctggggcctgcgcaag gtgcgcgccgagaacgaccgccaccacgccctggacgccgtggtggtggcctgcagcaccgtggccatgcagcagaagatcacccgcttcgtgcgctacaaggagat gaacgccttcgacggtaaaaccatcgacaaggagaccggcgaggtgctgcaccagaagacccacttcccccagccctgggagttcttcgcccaggaggtgatgatccg cgtgttcggcaagcccgacggcaagcccgagttcgaggaggccgacacccccgagaagctgcgcaccctgctggccgagaagctgagcagccgccctgaggccgtg cacgagtacgtgactcctctgttcgtgagccgcgcccccaaccgcaagatgagcggtcagggtcacatggagaccgtgaagagcgccaagcgcctggacgagggcgt gagcgtgctgcgcgtgcccctgacccagctgaagctgaaggacctggagaagatggtgaaccgcgagcgcgagcccaagctgtacgaggccctgaaggcccgcctg gaggcccacaaggacgaccccgccaaggccttcgccgagcccttctacaagtacgacaaggccggcaaccgcacccagcaggtgaaggccgtgcgcgtggagcag gtgcagaagaccggcgtgtgggtgcgcaaccacaacggcatcgccgacaacgccaccatggtgcgcgtggacgtgttcgagaagggcgacaagtactacctggtgcc	The sequence was amplified from Addgene plasmid #48646 (Esvelt *et al.*, 2013). The sequence of NmCas9 was cloned in place of the cas9 gene in pSpyCas9_Fig3C.

	catctacagctggcaggtggccaagggcatcctgcccgaccgcgccgtggtgcagggcaaggacgaggaggactggcagctgatcgacgacagcttcaacttcaagtt cagcctgcaccccaacgacctggtggaggtgatcaccaagaaggcccgcatgttcggctacttcgccagctgccaccgcggcaccggcaacatcaacatccgcatcca cgacctggaccacaagatcggcaagaacggcatcctggagggcatcggcgtgaagaccgccctgagcttccagaagtaccagatcgacgagctgggcaaggagatc cgcccctgccgcctgaagaagcgccctcctgtgcgctaa	
lbCas12	atgtcaaagctcgagaaattcaccaactgttattcgttgagcaaaacactgcggtttaaagcgattccagtcggcaagactcaagagaatatagacaataagcggctgttg gtggaagatgaaaagcgcgcggaagactacaaaggggtgaagaagttgttggacagatactacctctcttttatcaatgatgtcttgcactcaatcaaattgaagaatctga acaactacatctccctcttcagaaagaaaacaaggacagaaaaggagaataaggaacttgaaaatttggagatcaatctgaggaaagagatcgcgaaagcctttaaag gcaacgaaggatacaaaagtctgttcaagaaggatataattgagacaattttgccagagttcctcgatgacaaggacgagattgcgctggtcaattcgttcaacggattcac aacagcattcacaggcttctttgataatcgggaaaatatgttctctgaggaggcaaagtccacttctattgcgttcaggtgtatcaatgagaatctcactaggtacatttccaaca tggatatctttgagaaggttgacgcaatttttgacaagcacgaagttcaggagattaaggagaagatcctcaattccgattatgacgttgaggacttcttcgaaggtgagtttttt aatttcgtgctcactcaagagggtatcgacgtgtataatgcgatcatcggtgggttcgtgactgagtccggtgaaaagattaagggattgaacgagtatatcaacctttacaac caaaagacgaaacagaagctgccaaagttcaagcctctttacaaacaggttctttcagaccgcgagtcactctcgttctatggggagggctacacttcggatgaggaagtc ctggaggtgttcaggaatactctcaataagaattcggagattttctcttctataaaaaaactggaaaagttgtttaagaattttgacgaatactctagcgccggcatatttgtgaa aaacggcccggccatatcaacgataagtaaagatatcttcggcgaatggaacgtgatcagagacaaatggaacgcggagtatgacgatattcacctgaagaagaagg ctgtcgtaacggagaagtacgaggatgatcgcaggaaaagcttcaaaaagatcggaagtttcagcctggaacagttgcaggagtatgctgacgccgatcttagcgtcgtc gagaagttgaaggagataatcatccaaaaggtcgacgagatatataaagtctatggatcaagtgaaaaactgttcgacgccgacttcgttttggagaagtccctgaagaa gaacgacgctgttgttgccattatgaaggatctgctcgacagcgtgaagagtttcgagaactatattaaggctttttcggggaggggaaggagactaacagagatgagtcct tctacggagacttcgtcctcgcgtacgatatactccttaaggtagaccacatctacgacgcaatcagaaattacgtgacacaaaagccgtacagcaaggacaagttcaaa ctctacttccagaacccccagttcatgggcggctgggacaaggacaaggaaacggattacagggctacgatcctgaggtatggttcaaaatactacttggcgattatggac aagaagtacgccaagtgtctccagaagattgacaaagacgatgtcaatggcaattatgagaagatcaactacaagctgcttccgggtccgaacaagatgctcccaaagg ttttcttcagcaagaaatggatggcctactataacccaagcgaggacatccagaagatttataagaacggtacgttcaagaagggcgacatgttcaatcttaacgactgtca caagctgatcgacttcttcaaagactcaattagccggtacccaaagtggtctaacgcctatgacttcaacttttcggaaaccgagaagtacaaggatatagccggattttata gagaggtggaagagcagggctacaaggtgtcattcgagtccgccagcaagaaggaagtggacaagctcgtggaagagggtaagctctacatgttccagatttataataa agactttagcgataagagccacgggacacctaatctccacacaatgtatttcaagctgctcttcgacgagaataaccacggccaaatcaggttgtcaggaggggctgaact cttcatgcggcgcgctagccttaagaaggaggagcttgtagtccaccctgcgaatagtccaattgcgaataagaacccggacaatcctaaaaagactacaacattgagct acgacgtgtacaaggataagaggttttccgaggatcagtacgagctccacatcccgattgcgatcaacaagtgcccaaagaatattttcaagataaacacagaggtgcgt gtactcctgaagcatgacgacaatccttacgtcattgggattgatcggggcgagaggaacctcctctatattgtggtggtggacgggaaggggaacatagtcgaacagtac tcccttaacgaaataattaacaatttcaacggcatccgtatcaagaccgactaccattcgttgctggacaagaaggagaaggagagatttgaggcgcggcaaaattggac aagtatcgagaacatcaaggaactcaaagcaggttatatctctcaagttgtgcataagatatgcgagctggttgagaagtatgacgcagtgatcgctcttgaggacctcaac tcgggctttaagaattctagagttaaagtggagaagcaggtctatcaaaagttcgagaagatgcttatagataagctcaactacatggtcgataagaaatcgaacccatgtg ccaccggcggcgcactcaaaggttaccaaataacaaacaaattcgagtccttcaaatcgatgagtactcagaatgggttcatattttatataccggcgtggcttacgtctaag atcgacccgtcaactggttttgtcaacctgttgaagacgaaatacacgtccattgccgattcgaaaaagttcatatctagttttgatcgtattatgtacgtcccagaggaagatctt ttcgagtttgctctcgactacaaaaactttcgcggaccgatgcggattacattaaaaaatggaaactctattcgtacggcaacagaatcaggatttttcgcaaccctaagaag aataacgtctttgattgggaggaagtttgcttgactagcgcgtacaaggagctctttaataagtatggcattaactaccaacagggtgatatcagagcactgctttgcgaacaa tctgacaaggctttctactcatccttcatggctttgatgagcctgatgctccagatgagaaattcaattacaggcagaaccgacgtggatttcttgatctccccggttaaaaattct gatggcatcttttacgatagcaggaactatgaagcgcaagagaatgcgattctgccaaaaaatgcagacgccaacggtgcctataacatcgccaggaaagtcctgtggg cgatcggccagttcaaaaaggccgaagacgaaaaattggacaaggtcaaaatcgctatcagcaacaaagagtggctggagtatgctcagacatccgtaaagcattaa	The amino acid sequence was obtained from Uniprot accession no A0A182DWE3 and codon optimized for expression in *E.coli*. The DNA sequence was synthetized by Twist bioscience and cloned in place of the cas9 gene in pSpyCas9.
fnCas12	atgtcaatttatcaagaatttgttaataaatatagtttaagtaaaactctaagatttgagttaatcccacagggtaaaacacttgaaaacataaaagcaagaggtttgattttaga tgatgagaaaagagctaaagactacaaaaaggctaaacaaataattgataaatatcatcagtttttatagaggagatattaagttcggtttgtattagcgaagatttattacaa aactattctgatgtttattttaaacttaaaaagagtgatgatgataatctacaaaaagattttaaaagtgcaaaagatacgataaagaaacaaatatctgaatatataaaggac tcagagaaatttaagaatttgtttaatcaaaaccttatcgatgctaaaaaagggcaagagtcagatttaattctatggctaaagcaatctaaggataatggtatagaactattta aagccaatagtgatatcacagatatagatgaggcgttagaaataatcaaatcttttaaaggttggacaacttattttaagggttttcatgaaaatagaaaaaatgtttatagtag caatgatattcctacatctattatttataggatagtagatgataatttgcctaaatttctagaaaataaagctaagtatgagagtttaaaagacaaagctccagaagctataaact atgaacaaattaaaaaagatttggcagaagagctaacctttgatattgactacaaaacatctgaagttaatcaaagagtttttttcacttgatgaagtttttgagatagcaaactt aataattatctaaatcaaagtggtattactaaatttaatactattattggtggtaaatttgtaaatggtgaaaatacaaagagaaaaggtataaatgaatatataaatctatactca cagcaaataaatgataaaacactcaaaaaatataaaatgagtgttttatttaagcaaattttaagtgatacagaatctaaatcttttgtaattgataagttagaagatgatagtga tgtagttacaacgatgcaaagtttttatgagcaaatagcagcttttaaaacagtagaagaaaaatctattaaagaaacactatctttattatttgatgatttaaaagctcaaaaac ttgatttgagtaaaatttattttaaaaatgataaatctcttactgatctatcacaacaagttttgatgattatagtgttattggtacagcggtactagaatatataactcaacaaatag cacctaaaaatcttgataaccctagtaagaaagagcaagaattaatagccaaaaaaactgaaaaagcaaaatacttatctctagaaactataaagcttgccttagaagaa tttaataagcatagagatatagataaacagtgtaggtttgaagaaatacttgcaaactttgcggctattccgatgatatttgatgaaatagctcaaaacaaagacaatttggca cagatatctatcaaatatcaaaatcaaggtaaaaaagacctacttcaagctagtgcggaagatgatgttaaagctatcaaggatcttttagatcaaactaataatctcttacat aaactaaaaatatttcatattagtcagtcagaagataaggcaaatattttagacaaggatgagcatttttatctagtatttgaggagtgctactttgagctagcgaatatagtgcct ctttataacaaaattagaaactatataactcaaaagccatatagtgatgagaaatttaagctcaattttgagaactcgactttggctaatggttgggataaaaataaagagcct gacaatacggcaattttatttatcaaagatgataaatattatctgggtgtgatgaataagaaaaataacaaaatatttgatgataaagctatcaaagaaaataaaggcgagg gttataaaaaaattgtttataaacttttacctggcgcaaataaaatgttacctaaggttttcttttctgctaaatctataaaattttataatcctagtgaagatatacttagaataagaa atcattccacacatacaaaaaatggtagtcctcaaaaaggatatgaaaaatttgagtttaatattgaagattgccgaaaatttatagatttttataaacagtctataagtaagcat ccggagtggaaagattttggatttagattttctgatactcaaagatataattctatagatgaattttatagagaagttgaaaatcaaggctacaaactaacttttgaaaatatatca gagagctatattgatagcgtagttaatcagggtaaattgtacctattccaaatctataataaagatttttcagcttatagcaaagggcgaccaaatctacatactttatattggaa	The sequence was amplified from Addgene plasmid #69973 (Zetsche *et al*., 2015). The sequence of FnCas12 was cloned in place of the cas9 gene in pSpyCas9_Fig3C.

	agcgctgtttgatgagagaaatcttcaagatgtggtttataagctaaatggtgaggcagagctttttatcgtaaacaatcaatacctaaaaaaatcactcacccagctaaaga ggcaatagctaataaaaacaaagataatcctaaaaaagagagtgtttttgaatatgatttaatcaaagataaacgctttactgaagataagtttttctttcactgtcctattacaat caattttaaatctagtggagctaataagtttaatgatgaaatcaatttattgctaaaagaaaaagcaaatgatgttcatatattaagtatagatagaggtgaaagacatttagctt actatactttggtagatggtaaaggcaatatcatcaaacaagatactttcaacatcattggtaatgatagaatgaaaacaaactaccatgataagcttgctgcaatagagaa agatagggattcagctaggaaagactggaaaaagataaataacatcaaagagatgaaagagggctatctatctcaggtagttcatgaaatagctaagctagttatagagt ataatgctattgtggtttttgaggatttaaattttggatttaaaagagggcgtttcaaggtagagaagcaggtctatcaaaagttagaaaaaatgctaattgagaaactaaactat ctagttttcaaagataatgagtttgataaaactgggggagtgcttagagcttatcagctaacagcacctttgagacttttaaaaagatgggtaaacaaacaggtattatctact atgtaccagctggttttacttcaaaaatttgtcctgtaactggttttgtaaatcagttatatcctaagtatgaaagtgtcagcaaatctcaagagttctttagtaagtttgacaagattt gttataaccttgataagggctattttgagtttagttttgattataaaaactttggtgacaaggctgccaaaggcaagtggactatagctagctttgggagtagattgattaactttag aaattcagataaaaatcataattgggatactcgagaagtttatccaactaaagagttggagaaattgctaaaagattattctatcgaatatgggcatggcgaatgtatcaaag cagctatttgcggtgagagcgacaaaaagtttttgctaagctaactagtgtcctaaatactatcttacaaatgcgtaactcaaaaacaggtactgagttagattatctaatttca ccagtagcagatgtaaatggcaatttctttgattcgcgacaggcgccaaaaaatatgcctcaagatgctgatgccaatggtgcttatcatattgggctaaaaggtctgatgcta ctaggtaggatcaaaaataatcaagagggcaaaaaactcaatttggttatcaaaaatgaagagtattttgagttcgtgcagaataggaataactaa	

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