

Supplementary Table 1: DNA and amino acid sequences of newly identified II-C anti-CRISPRs and Cas9 orthologs.

	Nucleotide sequence (5'→3')	Amino acid sequence (N→C)
AcrIIc4 _{Hpa}	ATGAAGATCACCCAGCAGCAACTTCGCGACCATTGCGACCAGCGAGAAC TTTGCGAAGCTGAGCGTGCTGCCGAAAAACCACCGTGAGCCGATCAAG GGTCTGTTCAAAAGCGCGGTTGAACAGTTTAGCAGCGCGCGTGACTTC TTTAAGAACGAGAAGTACAGCAAAGAGCTGGCGGAAAAAGTTCAACAAAG AAGCGGTGAACGAGGCGGTTGAAAAGCTGCAAAAAGCGATCGATCTGG CGGAAAAACAGGGCATTCAATTT	MKITSSNFATIATSENFA KLSVLPKNHREPIKGLFK SAVEQFSSARDFFKNENY SKELAEKFNKEAVNEAV EKLQKAILDLAEKQGIQF
AcrIIc5 _{Smu}	ATGAACAACAGCATCAAGTTCACGCTGAGCTACGACGGTACCGCGCGT GCGCTGTTTAAACACCAAGGAGCAGGCGGAAAAATACTGCCTGGTTGAG GAAATTAACGATGAGATGAACGGCTATAAGCGTAAAAGCTGGGAGGAA AAGCTGCGTGAGGAAAAGTGCAGGAGCGTGCAGGACTGGGTTGAGAAG AACTACACCAGCAGCTATAGCGACCTGTTCAACATCTGCGAGATTGAAG TGAGCAGCGCGGGTCAACTGGTTAAGATCGACAACACCGAGGTGGACG ATTTCTGTTGAAAAGTGCATGCTTTACCCTGGAGGACGATCTGGAGG AATTCACAACAGGCGAAAACAGTACCTGCAAAAATTTTATGCGGAGTGCGA AAAC	MNNSIKFHVSVDGTARA LFNTKEQAEKYCLVEEIN DEMNGYKFKSWEKLR EENCASVQDWVEKNYTS SYSDLFNICEIEVSSAGQL VKIDNTEVDDFVENCYG FTLEDDLEEFNKAKQYL QKFYAECE
HpaCas9	ATGGAAAATAAAAACTTAAATATATCCTTGGTCTCGACCTTGGTATCG CCTCTGTTGGCTGGGCTGTGGTTGAAATGACGAAAAAGAGAATCCTC TGCGTTTAAATTGATGTTGGTGTACGTACTTTGCAACGAGCAGAAAGTGC CCAAAACAGGTGAAAGCCTTGGCGTTTCTCGCCGTTTAGCCCGCTCCG CTCGTCGATTAACCAACGTCGCGTTGCTCGTCTGAAAAAGCAAAAC GACTTCTAAAATCAGAAAATATCTTATTCACCTGATGAACGCTCTTCC TCAATCAAGTTTGGCAGCTACGTGTCGAAGGCTAGATCATAAACTAGAA CGCCAAGAATGGGCTGCTGTGTTATTACATTTAATTAAGCACCGTGGT TATTTATCTCAGCGTAAAAATGAAAGTAAAAGCGAAAAATAAAGAGCTAG GTGCGTTATTAAGCGGTGTAGACAATAATCATAAATTAAGTGCAGCAAGC TACATATCGCTCGCCAGCAGAACTTCCCGTAAAAAATTTGAGGTGCGAA GAAGGTATATCCGTAACCAACAAGGCGCCTATACTCACACGTTTAGCC GACTAGACTTACTCGCCGAAATGGAACCTCCTTCTCTCGTCAACAACA CTTTGGTAATCCATTCGCTTCAGAAAAATTTATAGAAAATTTGACCGCA CTTTAATGTGGCAAAAACCTGCCCTTATCTGGTGAAGCTATTTTAAAAA TGCTCGTAAATGTACTTTTGAAGTAAATATAAAGGCAAGTAAAGAACAC TTATTCGCGCAGAACGTTTGTGTTGGATAACGAAATTAATAATTTACGT ATTCAGAAAATGGCTTAGAGCGTGTCTTAAATGATAATGAACGTTTAG CATTAAATGGAGCAACCTTATGACAAAAATAGATTATTCTATTCAACAGT ACGCTCAATATAAATAATTTGATGAGGCAATCTTTAAAGCCCTCCGT TATTCGCGGTGAGGATAAAAAGGCCATTGAAACTAAAGCAGTACTGATG GAAATGAAAGCCTATCACCAAAATTCGTAAGTATTGGAAGGTAATAACC TAAAAGCTGAATGGGCAGAAATTAAGGCAATCCAACATTATTAGATGA AATTTGGTACGGCATTTCATTATATAAAAAGTAAAGTAAAGTAAAGTAAAG TACTTAGCAGGAAAAGTCTCTCAGCCTGTATTAATAGCCTTATTGGAAA ATCTTAGTTTGGATAAATTTATCCAATATCCCTTAAAGCTTTATATAA ACTTCTACCATTAATGCAACAAGGACTACGCTATGATGAGGCTTGTCTGT GAAATTTATGGCGATCATTATGTAAGTAAAGTAAAGTAAAGTAAAGTAAAG TCTTACCACAGATTCCAGCTGATGAAATCCGTAATCCTGTGGTTTTTACG AACACTCACGCAAGCTCGTAAAGTGATTAATGGCGTAGTGAGATTATAT GGTTCGCGAGCTCGTATTCATATTGAAACGGGACGAGAAGTTGGCAAA TCTTACAAAAGATCGTCTGTAAGTAAAGTAAAGTAAAGTAAAGTAAAGTAAAG AACAGCGTGAACGCAATCAAGGAATTTAAAGAGTACTTCCCTCATT TGCTGGTGGACCTAAAGCCAAAGACATTTTAAAAATGGGACTTTATAAA CAGCAAAATGCAAAATGTTTATATTCGCGCAAAACCTATCGAATTGCACC GTTTATTAGAAAAAGGCTATGTAGAAGTCGATCAGCCTTGGCGTTTT CCCGTACTTGGGATGATGTTTCAACAATAAAGTAAAGTAAAGTAAAGTAAAG ATGAAAATCAAAAACAAAGGCAATTTAACCCCTTTTGAATGGCTTGTATGG TAAACATAACAGCGAACGCTGGAGAGCGTTCAAAGCATTAGTTGAAACC AGTGCAATCCCTTATGCGAAAAACAACGCATCCTAAGCCAAAAACTTG ATGAAAAGGGCTTATTTGAACGTAATTTAAATGATACGCGCTACGTTGC TCGTTTCTTATGTAATTTTATTGCAGATAATATGCACTTAACAGGTGAA GGAAAACGAAAAGTATTTGCTTCCAACGGGCAAAATACCCTTTACTTC GTAGCCGTTGGGATTAGCAAAATCACGGGAAGACAATGACCGCCATC ACGCTTAGATGCGGTTGGTGTGCTTGTCTGCAACCGTCCCATGCAAGC AAAAATCACACGTTTTTGTTCGTTTTTGAAGCTGGTGTGATGATTCACTG GTGAACGAATAGATCGTGAACAGGTGAAATATTCCATTACACTTCCC TACTCCATGGCAATTTTCAACAAGAAGTTGAAATCCGAATTTTATG	MENKNLNYLGLDLGIAS VGWAVVEIDEKENPLRI DVGVRTFERAEVPKTGE SLALSRRLARSARRLTQR RVARLKKAKRLLKSENIL LSTDERLPHQVWQLRVE GLDHHKLERQEWAAVLL HLIKHRGYLSQRKNESK SENKELGALLSGVDNNH KLLQQATYRSPAELAVK KFEVEEGHIRNQGGAYT HTFSRLDLLAEMELLFSR QQHFNGNPFASEKLENT ALLMWQKPAISGEAILK MLGKCTFEDEYKAAKNT YSAERFVWITKLNARIQ ENGLERALNDNERLALM EQPYDKNRLFYSQVRSIL KLSDEAIFKGLRYSGEDK KAJETKAVLMEKAYH QIRKVVLEGNLKAWEAE LKANPTLLDEIGTAFSLY KTDEDISAYLAGKLSQPV LNALLENLSFDKFIQLSLK ALYKLLPLMQQGLRYDE ACREIYGDHYGKKTEEN HHFLPQIPADEIRNPVVL RILTQARKVINGVVRVLY GSPARIHIETGREVGKSY KDRRELEKRQEENRQK RENAIKEFKEYFPFHAGE PKAKDILKMRLYKQNA KCLYSGKPIELHRLLEK YVEVDHALPFSRTWDDS FNNKVLVLANENQNK NLTPFEWLDGKHNSERW RAFALVETSAPFYAKKQ RILSQKLEDEKGFIERNLN DTRYVARFLCNFIADNM HLTGEGKRKVFASNGQI TALLRSRWGLAKSREDN DRHHALDAVVVACSTVA MQQKITRFRVFEAGDVF TGERIDRETGEIPLHPT PWQFQVEVEIRIFSDNP KLELENRLPDRPQANHE FVQPLFVSRMPTRKMTG QGHMETVKSARKLNEGI

	<p>GATAATCCTAAACTGGAAGTAGAAAATAGATTGCGGGATCGTCCACAAG CAAATCATGAATTTGTCCAACCTCTGTTTGTATCTCGAATGCCAACACG CAAATGACCGGTCAAGGACACATGAAAACCGTAAATCAGCGAAACG TCTCAATGAAGGGATAAGCGTGATTAAAATGCCACTCACTAAATTA TTAAAAGATTTAGAATTGATGGTAAATCGTGAACGTGAAAAAGATCTTT ATGATACTTTAAAAGCTCGTCTAGAGGCTTTTAAATGATGATCCTGCTAA AGCGTTTGTGTAACCTTTTATAAAAAAAGGTGGGGCTATTGTTAAATCA GTACGAGTAGAACAAATACAAAAATCTGGCGTATTAGTCCGTGAGGGG AATGGTGTGCGGATAATGCCTCAATGGTGAGAGTGGATGTATTCACT AAAGGTGGAATAATTTCCCTTGTGCCAATTTATACCTGGCAAGTCGCTA AGGGAATTTTACCTAATAAAGCAGCAACACAATATAAAGATGAGGAAGA TTGGGAAGTGATGGATAACTCTGCAACTTTCAAATTTTCATTACACCCA AATGACTTAGTAAAATTAGTCACTAAAAAGAAAACCATTTTAGGTTACT TTAATGGACTTAATCGTGCCACAGGTAATATAGATATTAAAGAATGA TTTAGATAAATCAAAAAGGGAACAAGGTATTTTTGAAGGTGTTGGTATT AAATAGCCCTTTCCTTCGAAAAATATCAAGTCGATGAACTTGGA ATAATTCGTTTATGTAACCAAGTAAACGCCAACCTGTTTCGTTAA</p>	<p>SVIKMPLTKLKLKLDLEL MVNREREKDLDYDTLKA RLEAFNDPAKAFAPFI KKGGAIVKSVRVEQIQK SGVLVREGNGVADNASM VRVDVFTKGGKYFLVPI YTWQVAKGILPNKAATQ YKDEEDWEVMDNSATF KPSLHPNDLVKLVTKKK TILGYFNLNRATGNIDI KEHDLDKSKGKQGIFEG VGIKLALSFEKYQVDELG KNIRLCKPSKRQPV</p>
<p>SmuCas9</p>	<p>ATGATGATGGAAAAATTTCACTATGTATTGGGTTTGGATTGGGTATC GCCTCTGTGGGGTGGGCTGCCATTGAAATTGACAAGGAAACCGAAACA TCAATCGGTTTATTGGATTGCGGTGTCAGAACATTTGAACGTGCAGAA TACCCCAAACAGCGATTCTCTTGGCAAGCTCCGCGTGAAGCCAGA AGTACTCGCCGTTTAAATTCGACAGCGTTCGCATCGCTTATTACGTTTA AAACGTTTATTGAAACGTGAAATTTTCAGGCAGCTGAAACGTTTAAAG ACTTACCAATCAATGCTTGGCAATTCGCTGTTAAAGGCTTGGATAGTC GGTTGAATGAATATGAATGAGGCGCGGCTTTTAAATGTCATTGGTGAAGC ATCGCGGTTATTTATCGCAACGCAAAAGCGAAATGAGCGAAACAGACA GCAAAATCTGAAATGGGACAGATTACTGGCAGGTGTGGCGGAAAAATCACC AACTTTTACAACAAGAACAATATCGTACACCAGCCGAATTAGCACTCAA AAAATTTGTGAAACATTTTCGCAATAAAGGTGGCGATTATGCACACACT TTCAACCGTTTGGATTGCAAGCCGAATTCATTTATTGTTTCAAAAAC AACGTGAATTAGGCAATCCATTCACTTCACAGAAATTGGAACGGCAAGT TGATGATTTGTTGATGACGACGCGAGTGCCTTACAAGGTGATGCGAT TTTGAATGTTGGGTCATTGGGTTTGAACCTGAACAATTCAAAGC AGCGAAAAACACATTCAGTGCCGAACGTTTATTTGGTTGACAAAACCTC ATAATCTTCGCATTCAAGACCAAGGCAAGAAGGTGCGTTAACTGCCG ATGAGCGTACCAAATTTGTTGGCAGGCTTATAAAAAAAGTAAATGAC TTACGCACAAGTTTCGCAATTTAAGCTTGCTCAAACCTGCTATTTTT AAAGGTTTTCGTTATGATTTGGAACATGACAAAAAGCAGAAAAACGTA CGTTGATGGAATGAAATCCTATCACAAATCCGCCAAACATTGGA ATCAGGTTTGAACAGAAATGGCAAAGTATTGCCACGCGAGCCTGAAAT TTAGATGCAATTTGGCAGCGGCTTTCCATTTATAAAACCGATGAAGATA TTTTCGCATGAATTAAAAACGTCAGGCTGCCTGAAACGTTATTGAATGA ATTACTGAAAAACATCAATTTTATGATGGATTCAATTATCGTTGACT GCATTACGCAAAATTTGCCCTTATGGAACAAAGCTACCGTTATGAT GAAGCGTGTACCAAATTTACGGTAATCATCATTCAGGCAGCTTGAAC AAGAATGAAAGCAATTTTTCGCACATATTCGGATTGATGATGTCGCA TCCTGTGGTGTTCCTACTTTGACCAAGCAAGAAAAGTGGTGAATGC GATTATTCGTGCGTATGGTTCGCCAGCTCGTGTGCATATTGAGATGGC CGGTGAATTTGGTAAGTCTAAATCAGACCGTGACCGAATGAAAAACAA CAACAAAAAATAAAAAAGAACGTGAAAACGCGTCCCAAATTCAAAG AAGATTTCCCTGATTTTGTGGGCGAACCCAGAGGGAAGATATTTTGA AAATGCGTTTGTATGAACAACAACACGGCAATGTTTGTATTGGGTCA TGATATTGATATTAATCGATTGAATGAAAAAGGTTATGTTGAAATGAC CATGCCCTGCCATTTTCACGGACTTGGGATGATGATCAAAATAATAAAG TTTTGGTACTTGGCAGCGAAAAACAAAATAAACGCAATCAAACGCCTGA TGAATATTTGGACGGTGCAAACAATAGCCAACGTTGGCTTGAATTTCAA GCGCGTGTACAACTTGTCAATTTTCTTACGGTAAAAACAACGCATTC AATTAGCCAAATFAGACGATGAAACCGAAAAAGGATTTTTAGAACGCAA TCTAAATGATACGCGGTATATTGCTCGTTTTATGTGTCAATTTGTCCAA GAAAATTTATATTTGACAGGTAAGGAAAACGCTCTTGTTTTTGCATCAA ACGGCGGAATGACCGCAACATTGAGAAATTTATGGGGTTTGAAGAAAAG TCCGTGAAGACAACGACCGCCATCATGCTCTTGTATGCGATTGTGGTGG CGTGTCCACTGCTTCTATGCAACAATAAACAAGCAATTTCAACG CCATGAAAGCATTGAATATGTGGATACCGAAACGGGCGAAGTAAAATTT CGTATTCCACAGCCTTGGGATTTTTCCGTCAGGAAGTGAATGATCGT GTGTTTCAGCGACCAACCGTGTGAAGATTTGGTGAATAAATTTGTCGGCT CGTCCCAAGCTTTGATGACAAACGTAACCGCTTAAATTTGTCGCGT GCACCAAAATCGCAAAATGTCGGGGCAAGGGCATTTGAAACCATCAAA TCTGCAAAAAGGCTGTCTGAAGAAAACAGTATGGTAAAAAACCATTA CCACATTTGAAATTAAGAATATTCAGAAATCGTAGGCTACCCGAGTGC</p>	<p>MMMEKFHYVLGLDLGLIA SVGWAAIETDKETETISGL LDCGVRTFERAEVPKTG DSLAKARREARSTRRLIR RRSHRLLRLKRLKREIF RQPETFKDLINAWQLR VKGLDSRLNEYEWAVAL LHLVKHRGYSRKSEM SETDSKSEMGRLLAGVA ENHQLLQQEQYRTPAEL ALKKFVKHFRNKGGDY AHTFNRLDLQAEHLHLF QKQRELGNPFTSPELER QVDDLMTQRSALQGD AILKMLGHCGFEPEQFK AAKNTFSAERFIWLTKLN NLRIQDQKERALTADE RTKLLDEPYKSKLTYA QVRKLLSLPQTAFKGLR YDLEHDKKAENSTLME MKSYHNIRQTLKESGLK TEWQSIATQPEILDAIGT AFSIYKTDEDISHLKT RLPENLVNELLKNINFDG FIQLSLALRKLPLMEQ GYRYDEACTQJYGNHHS GSLQQESKQFLPHIPIDD VRNPVVFRTLTQARKVV NAIIRRYGSPARVHEMA RELGKSKSDRDRIEKQQ QKNKKERENAVAKFKE DFPDFVGEPRGKDILKM RLPYEQHGKCLYSGHDI DINRLNEKGYVEIDHALP FSRTWDDSQNNKVLVLG SENQNKRNQTPDEYLDG ANNSQRWLEFQARVQT CHFSYGKKQRIQLAKLD DETEKGFLERNLNDTRYI ARFMCQFVQENLYLTGK GKRLVFASNGGMTATLR NLWGLRKYREDNDRHH ALDAIVVACSTASMQQKI TKAFQRHESIEYVDTET GEMKFRIPQPWDFFRQE VIMRVSDQPCEDLVEK LSARPEALHDNVTPLFVS RAPNRKMSGQGHLETIK SAKRLSEENSMVKKPLT TLKLDIPEIVGYPSREPO LYAALKTRLETHDDDP KAFAPFYKPNKNGELG ALRVSVRVKGVQNTGV</p>

	<p>TGAACCTCAATTGTATGCCGCATTGAAAACACGTTTAgAAACGCATGAT GATGACCCAATTAAAGCCTTTGCCAAACCCTTTTACAAACCCAATAAAA ATGGTGAATTGGGGGCGTTGGTTCGATCGGTGCGTGTGAAAGGTGTA CAAAATACGGGTGTAATGGTTCATGATGGCAAAGGCATTGCCGATAAT GCCACAATGGTTCGTGTGATGTCTATACCAAAGCGGGCAAAAATTAC CTTGTTCCCTGTGTATGTTGGCAGGTGGCTCAAGGAATTTGCCAAAT CGGGCGGTTACTTCTGGCAAAAGTGAAGCAGATTGGGATTTAATTGAT GAAAGTTTTGAATTTAAATTTTCGCTGTCTCGTGGGGATTTAGTGGA ATGATTAGCAATAAAGGAAGAATTTTGGTTATFACAATGGGTTAGATC GTGCAAAATGGAAGTATGGGATTCGTGAACATGATTTGAAAAAGTCCA AAGGAAAAGATGGTGTTCATCGTGTGGCGTGAAAACCGCCACCGCAT TCAACAAATACCACGTTGACCCACTTGGTAAAGAAATTCATCGGTGTT ATCTGAACCACGCCCCACATTAATAATCAAATCCAAGAAATAA</p>	<p>MVHDGKGIADNATMVR VDVYTKAGKNYLVPVYV WQVAQGILPNRAVTSBK SEADWDLIDESFEKFSLS RGDLVEMISNKGRIFGYY NGLDRANGSIGIREHDL KSKGKDVHRVGVKTA TAFNKYHVDPLGKEIHR CSSEPRPTLKIKSKK</p>
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