

LEGENDS TO SUPPLEMENTARY INFORMATION

Figure S1. Alignment of the native *C. jejuni* and *C. coli* Cas9 proteins with the CampyICE1 Cas9 proteins from *C. jejuni* and *C. coli* clades. Part A shows an alignment of the *C. jejuni* chromosomal Cas9 protein with the CampyICE1 Cas9 from a *C. jejuni* strain, whereas Part B combines the different version from the *C. jejuni* and *C. coli* clades. Asterisks indicate identical residues, full stops and colon indicate conservative substitutions. Functional domains of Cas9 are indicated in yellow shading, while conserved amino acid residues are highlighted by underlined bold typeface [34].

Figure S2. Genetic structure of CampyICE1 and related mobile genetic elements (integrative conjugative elements) present in related *Campylobacter* species, presented as output of a comparison of Prokka-generated annotations [38] using Clinker [43].

Figure S3. Graphical representation of genetic variability of the mobile elements CJIE1, CJIE2, CJIE3 and CJIE4 from *C. jejuni* and *C. coli* genomes, presented as output of a comparison of Prokka-generated annotations [38] using Clinker [43].

Figure S4. Graphical representation of genetic variability of the plasmids pCC42, pTet and pVir from *C. jejuni* and *C. coli* genomes, presented as output of a comparison of Prokka-generated annotations [38] using Clinker [43].

Table S1. Overview of *C. jejuni* and *C. coli* genomes used in this study, with the Genbank or Campylobacter PubMLST accession numbers, metadata (source, MLST clonal complex, sequence type), and the presence/absence of the CJIE1-4 and CampyICE1 mobile elements and the pCC42, pTet and pVir plasmids. The position on the cgMLST tree used in Figures 3 and 4 is provided for

ordering purposes.

Table S2. Sequences of CampyICE1 spacers and variant families with their predicted targets, as identified using CRISPRTarget [42].

Table S3. Description of the three CampyICE1 spacer arrays per CampyICE1-positive *C. jejuni* or *C. coli* genome, and linkage to plasmid carriage.

Table S4. Distribution of CampyICE1 plasmid-specific CRISPR-spacers and pVir, pTet and pCC42 plasmids in CampyICE1-positive *C. jejuni* and *C. coli*.

van Vliet et al, Figure S1

Part A

	RuvC I	R-rich region
Cj_Cas9	VARILAF DI GISSIG WA FSENDELKDCGVRIFTKVENPKT GESLALP RRLARSARKRLAR	
Cj_ICE1_Cas9	-MKIIGF NL GIANIG WA LRENDEIIDCGVRVFDIPENPKNG NSLALERRENKARMKIVK R	
	: : * : : * : * : * : * : * : * : * : * : * : * : * : * : * : *	: : * : * : * : * : * : * : * : * : * : * : * : * : *
Cj_Cas9	R KARLNHLKHLIANEF KLN YEDYQSFDESLAKAYKGLISPYELRFRALNELLSKQDFAR	
Cj_ICE1_Cas9	K KARMLATK TFLK KELV DLS -----KLFLIGSTQSIYELRTKALSSLSKEELSA	
	: * * * : * : : * : * : * : * : * : * : * : * : * : * : * : * : *	: * * : * * * * : * * * : * * * : * * * : * * * : * * * : * * * : *
Cj_Cas9	VILHIAKRGRYDDIKNSDDKEKGAILKAIKQNEEKLANYQSVGEYLYKEYFQKFKENSKE	
Cj_ICE1_Cas9	IILHIAKHRGYDSSALKN--ENGTIIIEALNKNKEAMLKFKSVGEYFYKNFVQ-----NKE	
	: * * * * * : * * * * * : * : * : * : * : * : * : * : * : * : * : * : * : *	: * * * * * : * * * * * : * * * * * : * * * * * : * * * * * : * * * * * : *
Cj_Cas9	FTNVRNKESYERCIAQSFLLKDELKLIFFKQREFGFSFSSKFFEEVLSVAFYKRALKD	
Cj_ICE1_Cas9	VKKIRNTTEDYSNSVPRSLKQELDLILDQKELGLIKNADFKAFLFEIIFKRP	
	. . . : * * . * . * : * : * : * : * : * : * : * : * : * : * : * : * : *	. . . : * * . * . * : * : * : * : * : * : * : * : * : * : * : * : * : *
Cj_Cas9	HLVGNCSFFTDEKRAPKNSPLAFMFVALTRIIINLLNLLKNTGILYTKDDLNALLNEVLK	
Cj_ICE1_Cas9	NKIGNCIFFENEKRAAKNTISACEFVALGKVVNLLKSEKDIGIVYEKDSINEIMSII	
	: : * * * * : * * * * * : * : * * * : * * * * : * * * * * : * * * * : * * * * : *	: : * * * * : * * * * * : * : * * * : * * * * : * * * * * : * * * * : * * * * : *
Cj_Cas9	NGTLTYKQTKKLLGLSDDYEFK-----GEKGYFIEFKYKEFIKALGE--HNLSQDD	
Cj_ICE1_Cas9	KTSISYKIRDILNLPQDINFKGLDYSKNNNAENSKLVLDLKLNEFKKALGDGFTNLDKDI	
	: : : * * : : * * * : * : * * : * * : * * : * * : * * : * * : * * : * * : *	: : : * * : : * * * : * : * * : * * : * * : * * : * * : * * : * * : * * : *
Cj_Cas9	LNEIAKDITLIKDEIKLKALAKY-DLNQNDLSKLEFKDHLNLSFKALKLVTPMLME	
Cj_ICE1_Cas9	LDSIATDITLTKDTATLKEKLNKYNVNLNAEQIEKLSLVFNDHINLSLKALKQIIP	
	* : * * . * * * * * * : * : * : * : * * : * : * : * : * : * : * : * : * : *	* : * * . * * * * * * : * : * : * : * * : * : * : * : * : * : * : * : * : *
Cj_Cas9	GKKYDEACNELNLKVAINEDKKDFLPAFNETYKDEVTPNVVLRRAIKEYRVLNALLKKY	
Cj_ICE1_Cas9	GKRYDEACELCNFTIAKNQEKSEYLPLFEKTRFAKDISSPVVIRAIKFRLLNDIIRY	
	* : * : * * * : * : * * : * : * : * : * : * : * : * : * : * : * : * : *	* : * : * * * : * : * * : * : * : * : * : * : * : * : * : * : * : * : *
		RuvC II
Cj_Cas9	GKVHK I NI EL AREVGNHSQRAKIEKEQNENYKAKKDAELECEKGLKINSKNILKRL	
Cj_ICE1_Cas9	GSVHK I H EL TRDFGISFSDRKKIIEIEQNEQSRIKALETIKELKLETSKNIQIVR	
	* . * * * * : * : * : * : * * : * : * : * : * : * : * : * : * : * : *	* . * * * * : * : * : * : * * : * : * : * : * : * : * : * : * : * : *
		HNH domain
Cj_Cas9	KEQKEFCAYSGEKIKISDLQDEKML E IDH I YPYSRSFDDSY M N K VLVFT K Q N QEKLNQ	
Cj_ICE1_Cas9	EDQKGICPYSGLKMDLNRLE---L V ID V IRPYNRSLDDSY S N K ILT F K L SDLKQK	
	: * * * : * . * * * * * : * : * : * : * * : * * * : * * * : * * * : * * * : *	: * * * : * . * * * * * : * : * : * : * * : * * * : * * * : * * * : * * * : *
Cj_Cas9	FEAFGNSAKWQKIEVLAKNLPTKKQKRILDKNYKDKEQKNFKDRNLNDRYIARLV	
Cj_ICE1_Cas9	FEAFGEDEKLWAEINERIKYNGKKRFKIFDKFFKDKKPFDFTEQTLQDTRWLTKL	
	* * * * * : * : * * : * : * : * * : * * : * * : * * : * * : * * : * * : *	* * * * * : * : * * : * : * : * * : * * : * * : * * : * * : * * : * * : *
		RuvC III
Cj_Cas9	TKDYLDLPLSDDENTKLN T QKGSKVHVEAKSGMLTSALRHTWGFSAKDRNNH H HA I D	
Cj_ICE1_Cas9	LNEYLSFLPISEDENTALGYGEKGSQHVVLSSGMITQMLRNFWYLGFKNHKDY K NN A M D	
	: * * . * * : * * * * * : * : * * * : * * : * * : * * : * * : * * : * * : *	: * * . * * : * * * * * : * : * * * : * * : * * : * * : * * : * * : * * : *
Cj_Cas9	A V I IAYANNSIVKAFSDFKKEQESNSAELYAKKISELDYKNKRKFFPEPFSGRQK	
Cj_ICE1_Cas9	A I I VAF T TNSIIFAFNFKKELDLAKAEFYANKISESDYLLK R KFLPPFS G FK E Q A L E K	
	* : * : * : * : * * : * * : * * : * : * : * * * : * * : * * * : * * : *	* : * : * : * : * * : * * : * * : * : * : * * * : * * : * * * : * * : *
Cj_Cas9	DEIFVSKPERKKPSGALHEETFRKEEEFYQSYGGKEGVLKALELKGIRKVN G KIVK--	
Cj_ICE1_Cas9	KNIFVSHSLKIKNKGT L HE L TPLKIKELKNTYGD L D---LAVK L GKIRKYN D KYYAN A	
	. : * * * * : * : * * * : * : * * : * * : * * : * * : * * : * * : * * : *	. : * * * * : * : * * * : * : * * : * * : * * : * * : * * : * * : * * : *

Cj_Cas9 DMFRVDIFKHKKTNKFYAVPIYTMDFALKVLPNKAVARSKKGEIKDWILMDENYEFCSL
Cj_ICE1_Cas9 SLVRADLFVDKK-NKFHAVSIYKADFSTKKLPNKTPATTSNGETKEGIEMNENYNFCMSL
.:*.:* .* **:**.**.* **:* * **:* * :.:** *:* * *.***:***:*

Cj_Cas9 YKDSLILIQTKDMQEPEFVYNAFTSSTVSLIVSKHDNKFETLSKNQKILFKNANEKEVI
Cj_ICE1_Cas9 YKNTPISVKIKGMKEPIICYHGFNTSGSKITYKKHDNNYHNLSEDEMVFVR-KNDK--
:* * :.: *.*: : **.*.*:* .: .***:..**::: :.*: *:*

Cj_Cas9 AKSIGIQNLKVFKEYIVSALGEVTKAEFRQREDFKK
Cj_ICE1_Cas9 -ESIAVGKILEIKKYSISPSGELSLIENEERKWF--
:*.:.: :.: ** :*. **:* * .:*: *

Part B

RuvC I

C_jejuni_Cas9 VARILAFDIGISSIGWAFSENDELKDCGVRIFTKVENPKTGESLALPRRL
C_coli_Clade1a_Cas9 MARILAFDIGISSIGWAFSENDELKDCGVRIFTKAENPKTGESLALPRRL
C_coli_Clade1b_Cas9 MARILAFDIGISSIGWAFSENDELKDCGVRIFTKAENPKTGESLALPRRL
C_coli_Clade1c_Cas9 -MKILGFDIGINSIGWAFVEDNQLQDCGVRLFTKAEDPKTKESLALPRRN
C_coli_Clade2_Cas9 -MKILGFDIGINSIGWAFVEDNQLQDCGVRLFTKAEDPKRRESLALPRRN
C_coli_Clade3_Cas9 -MKILGFDIGINSIGWAFVEDNQLQDCGVRLFTKAEDPKTKESLALPRRN
C_jejuni_ICE1_Cas9 -MKIIGFNLGIANIGWALRENDEIIDCGVRVFDIPENPKNGNSLALERRE
C_coli_ICE1_Clade1a_Cas9 -MKIIGFNLGIANIGWALRENDEIIDCGVRVFDIPENPKNGNSLALERRE
C_coli_ICE1_Clade1c_Cas9 -MKILGFNLGIANIGWALRVNDEIIDCGVRVFDIPENPKNGNSLALERRE
C_coli_ICE1_Clade2_Cas9 -MKILGFNLGIANIGWALRENDEIIDCGVRVFDIPENPKNGNSLALERRE
C_coli_ICE1_Clade3_Cas9 -MKILGFNLGIANIGWALRVNDEIIDCGVRVFDIPENPKNGNSLALERRE

R-rich region

C_jejuni_Cas9 ARSARKRLARRKARLNHLKHLIANEFKLNVEDYQSFDES LAKAYKGLIS
C_coli_Clade1a_Cas9 ARSARKRLARRKARLNHLKHLIANEFKLNVEDYQSFDES LAKAYKGLIS
C_coli_Clade1b_Cas9 ARSARKRLARRKARLNHLKHLIANEFKLNVEDYQSFDES LAKAYKGLIS
C_coli_Clade1c_Cas9 ARSNRRRLGRRRSRLIALKHIISKELKLNQDYMANDREL PKAYEGR LIS
C_coli_Clade2_Cas9 ARSNRRRLGRRRSRLIALKHIISKELKLNQDYIANDGELPKAYEGR LVS
C_coli_Clade3_Cas9 ARSNRRRLGRRRSRLIALKHIISKELKLNQDYIANDGELPKAYEGR LVS
C_jejuni_ICE1_Cas9 NKARMKIVKRKKARMLATKTFLKKE LNV DLSKLF LIGS-----TQS
C_coli_ICE1_Clade1a_Cas9 NKARMKIVKRKKARMLATKTFLKKE LNV DLSKLF LIGS-----TQS
C_coli_ICE1_Clade1c_Cas9 NKARMKTIKRKKARMLTTKTFLKKE FGI DLSKLF LIGS-----TQS
C_coli_ICE1_Clade2_Cas9 NKARMKTIKRKKARMLTTKTFLKKE FGI DLSKLF LIGS-----TQS
C_coli_ICE1_Clade3_Cas9 NKARMKTIKRKKARMLTTKTFLKKE FGI DLSKLF LIGS-----TQS

C_jejuni_Cas9 PYELRFRALNELLSKQDFARVILHI AKRRGYDD--IKNSDDKEKGAILKA
C_coli_Clade1a_Cas9 PYELRFRALNELLSKQDFARVILHI AKRRGYDD--IKNNGDEEKSEILKA
C_coli_Clade1b_Cas9 PYELRFRALNELLSKQDFARVILHI AKRRGYDD--IKNSDDKEKGAILKA
C_coli_Clade1c_Cas9 PYELRYKALNEKIEPKDLARVILHI AKHRGYMKNKNEKSSDNEKGKILSA
C_coli_Clade2_Cas9 PYELRYKALNEKIEPKDLARVILHI AKHRGYMKNKNEKSSDNEKGKILSA
C_coli_Clade3_Cas9 PYELRYKALNEKIEPKDLARVILHI AKHRGYMKNKNEKSSDNEKGKILSA
C_jejuni_ICE1_Cas9 IYELRTKALSSLISKEELSAIILHI AKHRGYDDSA LKN----ENGTII EA
C_coli_ICE1_Clade1a_Cas9 IYELRTKALSSLISKEELSAIILHI AKHRGYDDSA LKN----ENGTII EA
C_coli_ICE1_Clade1c_Cas9 IYELRTKALNSLISKEELAAIILHI AKHRGYDDSA LKN----ENGIIEA
C_coli_ICE1_Clade2_Cas9 IYELRTKALNSLISKEELAAIILHI AKHRGYDDSA LKN----ENGIIEA
C_coli_ICE1_Clade3_Cas9 IYELRTKALNSLISKEELAAIILHI AKHRGYDDSA LKN----ENGIIEA

C_jejuni_Cas9 IKQNEEKLANYQSVGEYLYKEYFQKFKENSKEFTNVRNKESYERCIAQS
C_coli_Clade1a_Cas9 IKQNEEKLANYQSVGEYLYKEYFQKFKENSKEFTNVRNKESYERCIAQS
C_coli_Clade1b_Cas9 IKQNEEKLANYQSVGEYLYKEYFQKFKENSKEFTNVRNKESYERCIAQS
C_coli_Clade1c_Cas9 LKTNALKLEKYQSVGEYFYKEFFQKHKENTKDFINIRNKKGSYDNCV LAS
C_coli_Clade2_Cas9 LKTNALKLEKYQSVGEYFYKEFFQKYKENTKDFINIRNKEGSYENCV LAS
C_coli_Clade3_Cas9 LKTNALKLEKYQSVGEYFYKEFFQKYRENTKDFINIRNKEGSYENCV LAS
C_jejuni_ICE1_Cas9 LKNKNEAMLKFKSVGEYFYKNFVQN----KEVKKIRNTTEDYSNSVPRS
C_coli_ICE1_Clade1a_Cas9 LKNKNEAMLKFKSVGEYFYKNFVQN----KEVKKIRNTTEDYSNSVPRS
C_coli_ICE1_Clade1c_Cas9 LKNKNEAMLKFKSVGEYFYKNFVQS----KEVRKIRNTTEDYSNSIPRS
C_coli_ICE1_Clade2_Cas9 LKNKNEAMLKFKSVGEYFYKNFVQS----KEVRKIRNTTEDYSNSIPRS
C_coli_ICE1_Clade3_Cas9 LKNKNEAMLKFKSVGEYFYKNFVQS----KEVRKIRNTTEDYSNSIPRS

C_jejuni_Cas9
C_coli_Clade1a_Cas9
C_coli_Clade1b_Cas9
C_coli_Clade1c_Cas9
C_coli_Clade2_Cas9
C_coli_Clade3_Cas9
C_jejuni_ICE1_Cas9
C_coli_ICE1_Clade1a_Cas9
C_coli_ICE1_Clade1c_Cas9
C_coli_ICE1_Clade2_Cas9
C_coli_ICE1_Clade3_Cas9
FLKDELKLIFFKKQREFGFSFSKFFEEVLSVAFYKRALKDFSHLVGNCSF
FLKDELKLIFFKQREFGFSFSKFFEEVLSVAFYKRALKDFSHLVGNCSF
FLKDELKLIFFKKQREFGFSFSKFFEEVLSVAFYKRALKDFSHLVGNCSF
DLEKELKLILEKQKEWGYSDDNFIKEILKVAFFQRPLKDFSYLVGCTF
DLEKELKLILEKQKEWGYSYDNFIKEILKVAFFQRPLKDFSYLVGACTF
DLEKELKLILEKQKEWGYSYDNFIKEILKVAFFQRPLKDFSYLVGACTF
LLKQELDLILDQKQELGLIKNADFKAFLFEIIFFKRPLKDFSNKIGNCIF
LLKQELDLILDQKQELGLIKNADFKEKLFEEIFFKRPLKDFSNKIGNCIF
LLKQELDLILNKQKELGLIKNADFKEKLFEEIFFKRPLKDFSNKIGNCIF
LLKQELDLILNKQKELGLIKNADFKEKLFEEIFFKRPLKDFSNKIGNCIF
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C_jejuni_Cas9
C_coli_Clade1a_Cas9
C_coli_Clade1b_Cas9
C_coli_Clade1c_Cas9
C_coli_Clade2_Cas9
C_coli_Clade3_Cas9
C_jejuni_ICE1_Cas9
C_coli_ICE1_Clade1a_Cas9
C_coli_ICE1_Clade1c_Cas9
C_coli_ICE1_Clade2_Cas9
C_coli_ICE1_Clade3_Cas9
FTDEKRAPKNSPLAFMFVALTRIINLLNNLKNTEGILYTKDDLNALLNEV
FTDEKRAPKNSPLAFMFVALTRIINLLNNLKNTEGILYTKDDLNALLNEV
FTDEKRAPKNSPLAFMFVALTRIINLLNNLKNTEGILYTKDDLNALLNEV
FEDEKRACKNSYSAWEFVALTKIINELKSLEKESGELVSSQIINEILNHV
FEDEKRACKNSYSAWEFVALTKIINELKSLEKESGELVSSQIINEILNHI
FEDEKRACKNSYSAWEFVALTKIINELKSLEKESGELVSSQIINEILNHI
FENEKRAAKNTISACEFVALGKVVNLLKSIEKDIGIVYEKDSINEIMSI
FENEKRAAKNTISACEFVALGKVVNLLKSIEKDIGIVYEKDSINEIMSI
FENEKRAAKNTLSACEFVALGKVINLLKSIEKDTGIVYEKDIISEIMNI
FENEKRAAKNTLSACEFVALGKVINLLKSIEKDTGIVYEKDIISEIMNI
FENEKRAAKNTLSACEFVALGKVINLLKSIEKDTGIVYEKDIISEIMNI
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C_jejuni_Cas9
C_coli_Clade1a_Cas9
C_coli_Clade1b_Cas9
C_coli_Clade1c_Cas9
C_coli_Clade2_Cas9
C_coli_Clade3_Cas9
C_jejuni_ICE1_Cas9
C_coli_ICE1_Clade1a_Cas9
C_coli_ICE1_Clade1c_Cas9
C_coli_ICE1_Clade2_Cas9
C_coli_ICE1_Clade3_Cas9
LKNGLTYKQTKKLLGLSDDYEFKG-----EKGTYFIEFKKYKEFIKA
LKNGLTYKQTKKLLGLSDDYEFKG-----EKGTYFIEFKKYKEFIKA
LKNGLTYKQTKKLLGLSDDYEFKG-----EKGTYFIEFKKYKEFIKA
LDKGSITYKFFREYIKLHESMKFKSLKYDKDNAESTKLIIEFRKLVFEFKKA
LDKGSITYKFFREYIKLHESMKFKSLKYDKDNAESVKLIEFRKLVFEFKKA
LDKGSITYKFFREYIKLHESMKFKSLKYDKDNVESTKLIIEFRKLVFEFKKA
LDKTSISYKKIRDILNLPQDINFKGLDYSKNNAENSKLVDLKLLNEFKKA
LDKTSISYKKIRDILNLPQDINFKGLDYSKNNAENSKLVDFKLLNEFKKA
LNKASISYKKIRDILNLPQDISFKGLDYSKNNAENSKLVDFKLLNEFKKA
LNKASISYKKIRDILNLPQDISFKGLDYSKNNAENSKLVDFKLLNEFKKA
LNKASISYKKIRDILNLPQDISFKGLDYSKNNAENSKLVDFKLLNEFKKA
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C_jejuni_Cas9
C_coli_Clade1a_Cas9
C_coli_Clade1b_Cas9
C_coli_Clade1c_Cas9
C_coli_Clade2_Cas9
C_coli_Clade3_Cas9
C_jejuni_ICE1_Cas9
C_coli_ICE1_Clade1a_Cas9
C_coli_ICE1_Clade1c_Cas9
C_coli_ICE1_Clade2_Cas9
C_coli_ICE1_Clade3_Cas9
LGEH--NLSQDDLNEIAKDITLIKDEIKLKKALAKY-DLNQNQIDSLSKL
LGEH--NLSQDDLNEIAKDITLIKDEIKLKKALAKY-DLNQNQIDSLSKL
LGDH--SLSQDDLNEIAKDITLIKDEIKLKKALAKY-DLNQNQIDSLSKL
LGEH--SLTREELDQIATYITLIKDNKELKITLEKY-SLNNEQIKNLIEI
LGEH--SLTREELDQIATYITLIKDNKELKITLEKY-SLNNEQIKNLIEI
LGEH--SLSREELDQIATYITLIKDNKELKITLEKY-SLNNEQIKNLLEI
LGDGFTNLDKDIILDSIATDITLTKDTATLKEKLNYNVNAEQIEKLSEL
LGDGFANLDKDIILDSIATDITLTKDTATLKEKLNYNVNAEQIEKLSEL
LDDSFVNLDDKDIILDSIATDITLTKDMTALKEKLESYNVNLKEQIEKLSEL
LDDSFVNLDDKDIILDSIATDITLTKDMTALKEKLESYNVNLKEQIEKLSEL
LDDSFVNLDDKDIILDSIATDITLTKDMTALKEKLESYNVNLKEQIEKLSEL
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C_jejuni_Cas9
C_coli_Clade1a_Cas9
C_coli_Clade1b_Cas9
C_coli_Clade1c_Cas9
C_coli_Clade2_Cas9
C_coli_Clade3_Cas9
C_jejuni_ICE1_Cas9
C_coli_ICE1_Clade1a_Cas9
C_coli_ICE1_Clade1c_Cas9
C_coli_ICE1_Clade2_Cas9
C_coli_ICE1_Clade3_Cas9
EFKDHLNISFKALKLVTPLMLEGKKYDEACNELNLKVAINEDKKDFLPAF
EFKDHLNISFKALKLVTPLMLEGKKYDEACNELNLKVAINEDKKDFLPAF
EFKDHLNISFKALKLITPLMLEGKKYDEACNELNLKVAINEDKKDFLPAF
DFNDHINLSFKALNLIPLMKEGKRYDEACKLLNLKTKSNNQKDFLPAF
DFNDHINLSFKALNLIPLMKEGKRYDEACKLLNLKTKSNNQKDFLPAF
DFNDHINLSFKALNLIPLMKEGKRYDEACKLLNLKTKSNNQKDFLPAF
VFNDHINLSLALKQIIPLMYEGKRYDEACELCNFTIAKNQEKSEYPLPLF
VFNDHINLSLALKQIIPLMYEGKRYDEACELCNFTIAKNQEKSEYPLPLF
AFNDYINLSLALKQIIPLMYEGKRYDEACKLCNFAIAKNQEKSEYPLPLF
AFNDYINLSLALKQIIPLMYEGKRYDEACKLCNFAIAKNQEKSEYPLPLF
AFNDYINLSLALKQIIPLMYEGKRYDEACKLCNFAIAKNQEKSEYPLPLF
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RuvC II

C_jejuni_Cas9 NETYYKDEVTPVVLRAIKEYRKVLNALLKKYGKVHK **INIELARE**VGKNH
 C_coli_Clade1a_Cas9 NETYYKDEVTPVVLRAIKEYRKVLNALLKKYGKVHK **INIELARE**VGKNH
 C_coli_Clade1b_Cas9 NETYYKDEVTPVVLRAIKEYRKILNALLKKYGKVHK **INIELARE**VGKNH
 C_coli_Clade1c_Cas9 CDSIFAQELTNPVIVNRAISEYRKVLNALLKKYGKMHK **THIELARD**IGLSK
 C_coli_Clade2_Cas9 CDSIFAQELTNPVIVNRAISEYRKVLNALLKKYGKMHK **THIELARD**IGLSK
 C_coli_Clade3_Cas9 CDSIFAQELTNPVIVNRAISEYRKVLNALLKKYGKMHK **THIELARD**IGLSK
 C_jejuni_ICE1_Cas9 EKTRFAKDISSPVVIRAIACEFRKLLNDIIRRYGSVHK **THLELTRD**FGISF
 C_coli_ICE1_Clade1a_Cas9 EKTRFAKDISSPVVIRAIACEFRKLLNDIIRRYGSVHK **THLELTRD**FGISF
 C_coli_ICE1_Clade1c_Cas9 EKTRFAKDISSPVVIRAVCEFRKLLNDIIRRYGSVHK **THLELTRD**FGISF
 C_coli_ICE1_Clade2_Cas9 EKTRFAKDISSPVVIRAVCEFRKLLNDIIRRYGSVHK **THLELTRD**FGISF
 C_coli_ICE1_Clade3_Cas9 EKTRFAKDISSPVVIRAVCEFRKLLNDIIRRYGSVHK **THLELTRD**FGISF
 . : : . : : . * : * ** : * : * : * * : : : * : * : * : * : * : * .

C_jejuni_Cas9 SQRAKIEKEQENENYKAKKDAELECEKLGKINSKNILKLRFLKEQKEFCA
 C_coli_Clade1a_Cas9 SQRAKIEKEQENENYKAKKDAELECEKLGKINSKNILKLRFLKEQKEFCA
 C_coli_Clade1b_Cas9 SQRAKIEKEQENENYKAKKDAEIECEKLGKINSKNILKLRFLKEQKEFCA
 C_coli_Clade1c_Cas9 KLRTKIEKEQKENYENNIWALNECENFGLKANTKNILKLRFLKEQKEFCI
 C_coli_Clade2_Cas9 KLRTKIEKEQKENYENNIWALNECENFGLKANAKNILKLRFLKEQKEFCI
 C_coli_Clade3_Cas9 KLRAKIEKEQKENYENNIWALNECENFGLKANAKNILKLRFLKEQKEFCI
 C_jejuni_ICE1_Cas9 SDRKKIIEKEIEQNEQSRIKALETIKELKLEETSKNIQIVRLFEDQKIGCP
 C_coli_ICE1_Clade1a_Cas9 NDRKKIIEKEIEQNEQSRIKALETIKELKLEETSKNIQIVRLFEDQKIGCP
 C_coli_ICE1_Clade1c_Cas9 NDRKKIIEKEIEQNEQSRIKALETIKELKLEETPKNIQIVRLFEDQKIGCP
 C_coli_ICE1_Clade2_Cas9 NDRKKIIEKEIEQNEQSRIKALETIKELKLEETPKNIQIVRLFEDQKIGCP
 C_coli_ICE1_Clade3_Cas9 NDRKKIIEKEIEQNEQSRIKALETIKELKLEETPKNIQIVRLFEDQKIGCP
 . * ** * : : * : . * : : : * : . * * * : : : * * : *

HNH domain

C_jejuni_Cas9 YSGEKIKISDLQDEKML**EIDHI**YPYSRSFDDSYM**NKVLVFTKQ**NQEKLNQ
 C_coli_Clade1a_Cas9 YSGEKIKISDLQDEKML**EIDHI**YPYSRSFDDSYM**NKVLVFTKQ**NQEKLNQ
 C_coli_Clade1b_Cas9 YSGEKIKISDLQDEKML**EIDHI**YPYSRSFDDSYM**NKVLVFTKQ**NQEKLNQ
 C_coli_Clade1c_Cas9 YSGKKISIEHLRDEKTL**EVDHI**YPYSRSFDDSF**LNKVLVFTKEN**NQEKLNQ
 C_coli_Clade2_Cas9 YSGKKISIEHLRDEKAL**EVDHI**YPYSRSFDDSF**LNKVLVFTKEN**NQEKLNQ
 C_coli_Clade3_Cas9 YSGKKISIEHLRDEKAL**EVDHI**YPYSRSFDDSF**LNKVLVFTKEN**NQEKLNQ
 C_jejuni_ICE1_Cas9 YSGLKMDLNRDLDE---L**VIDYI**RPYNRS**LDDSY****NKILTFKKLS**DLKQGK
 C_coli_ICE1_Clade1a_Cas9 YSGLKMDLNRDLDE---L**VIDYI**RPYNRS**LDDSY****NKVLTFKKLN**DLKQGK
 C_coli_ICE1_Clade1c_Cas9 YSGLKMDLNRDLDE---L**VIDYI**RPYNRS**FDDSY****NKVLTFKKLN**DLKQGK
 C_coli_ICE1_Clade2_Cas9 YSGLKMDLNRDLDE---L**VIDYI**RPYNRS**FDDSY****NKVLTFKKLN**DLKQGK
 C_coli_ICE1_Clade3_Cas9 YSGLKMDLNRDLDE---L**VIDYI**RPYNRS**FDDSY****NKVLTFKKLN**DLKQGK
 *** * : : . * : * : * : * * : * : * : * : * : * : * : *

C_jejuni_Cas9 TPFEAFGNDSAKWQKIEVLAKNLPKQKQKRILDKNYKDKQKDFKDRNLN
 C_coli_Clade1a_Cas9 TPFEAFGNDSAKWQKIEVLAKNLPKQKQKRILDKNYKDKQKDFKDRNLN
 C_coli_Clade1b_Cas9 TPFEAFGNDSAKWQKIEVLAKNLPKQKQKRILDKNYKDKQKDFKDRNLN
 C_coli_Clade1c_Cas9 TPFEAFGANERWSKIQAALQNLQYKKNKILDEAFKQKQKQDFISRNLN
 C_coli_Clade2_Cas9 TPFEAFGANERWSKIQAALQNLQYKKNKILDEAFKQKQKQDFISRNLN
 C_coli_Clade3_Cas9 TPFEAFGANERWSKIQAALQNLQYKKNKILDEAFKQKQKQDFISRNLN
 C_jejuni_ICE1_Cas9 TPFEAFGEDEKLWAEINERIKEYNGKKRKFIFDKFFKDKKPFDFTEQTLQ
 C_coli_ICE1_Clade1a_Cas9 TPFEAFGEDEKLWAEINERIKEYNGKKRKFIFDKFFKDKKPFDFTEQTLQ
 C_coli_ICE1_Clade1c_Cas9 TPFEAFGEDEKLWAEINERIKEYNGKKRKFIFDKFFKDKKPFDFTEQTLQ
 C_coli_ICE1_Clade2_Cas9 TPFEAFGEDEKLWAEINERIKEYNGKKRKFIFDKFFKDKKPFDFTEQTLQ
 C_coli_ICE1_Clade3_Cas9 TPFEAFGEDEKLWAEINERIKEYNGKKRKFIFDKFFKDKKPFDFTEQTLQ
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C_jejuni_Cas9 DTRYIARLVNLNYTKDYLDLFLPLSDDENTKLNQKQKSVHVEAKSGMLTS
 C_coli_Clade1a_Cas9 DTRYIARLVNLNYTKDYLDLFLPLSDDENTKLNQKQKSVHVEAKSGMLTS
 C_coli_Clade1b_Cas9 DTRYIARLVNLNYTKDYLDLFLPLSDDENTKLNQKQKSVHVEAKSGMLTS
 C_coli_Clade1c_Cas9 DTRYISTLIVKYTKDYLDLFLPLDEKEDISLKSGEKGSKIHVQTINGMLTS
 C_coli_Clade2_Cas9 DTRYISTLIVKYTKDYLDLFLPLDEKEDINLKSGEKGSKIHVQTINGMLTS
 C_coli_Clade3_Cas9 DTRYISTLIVKYTKDYLDLFLPLDEKEDINLKSGEKGSKIHVQTINGMLTS
 C_jejuni_ICE1_Cas9 DTRWLTKLVASYLNEYLSFLPISEDENTALGYGEKGSQHVVLSSGMITQ
 C_coli_ICE1_Clade1a_Cas9 DTRWLTKLVASYLNEYLSFLPISEDENTALGYGEKGSQHVVLSSGMITQ
 C_coli_ICE1_Clade1c_Cas9 DTRWLTKLVASYLNEYLLFLPISEDENTALGYGEKGSQHVVLSSGMITQ
 C_coli_ICE1_Clade2_Cas9 DTRWLTKLVASYLNEYLLFLPISEDENTALGYGEKGSQHVVLSSGMITQ
 C_coli_ICE1_Clade3_Cas9 DTRWLTKLVASYLNEYLLFLPISEDENTALGYGEKGSQHVVLSSGMITQ
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RuvC III

C_jejuni_Cas9 ALRHTWGFSAKDRNNHL**HHAI**DAVI**I**IAYANNSIVKAFSDFKKEQESNSAE
 C_coli_Clade1a_Cas9 ALRHTWGFSAKDRNNHL**HHAI**DAVI**I**IAYANNSIVKAFSDFKKEQESNSAE
 C_coli_Clade1b_Cas9 ALRHTWGFSAKDRNNHL**HHAI**DAVI**I**IAYANNSIVKAFSDFKKEQESNSAE
 C_coli_Clade1c_Cas9 ALRHTWGFSAKDRNNHL**HHAI**DAVI**I**IAYANNSIVKAFSDFKKEQESNSAE
 VLRHTWGFSAKDRNNHL**HHAI**DAVI**I**IAYANNSIVKAFSDFKKEQESNSAE

C_coli_Clade2_Cas9
C_coli_Clade3_Cas9
C_jejuni_ICE1_Cas9
C_coli_ICE1_Clade1a_Cas9
C_coli_ICE1_Clade1c_Cas9
C_coli_ICE1_Clade2_Cas9
C_coli_ICE1_Clade3_Cas9

VLRHTWGFAQKDRNHLHHALDATTVAYSTNAIIKAFSDFKKEQELLKAK
VLRHTWGFAQKDRNHLHHALDATTVAYSTNAIIKAFSDFKKEQELLKAK
MLRNFWYLGFKNHKDYKNNAMDAIIVAF TTNSII FAFNNFKKELDLAKAE
MLRNFWYLGFKNHKDYKNNAMDAIIVAF TTNSII FAFNNFKKELDLAKAE
MLRNFWYLGFKNYKDYKNNAMDAIIVAF TTNSII FAFNNFKKELDLAKAE
MLRNFWYLGFKNYKDYKNNAMDAIIVAF TTNSII FAFNNFKKELDLAKAE
MLRNFWYLGFKNYKDYKNNAMDAIIVAF TTNSII FAFNNFKKELDLAKAE

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C_jejuni_Cas9
C_coli_Clade1a_Cas9
C_coli_Clade1b_Cas9
C_coli_Clade1c_Cas9
C_coli_Clade2_Cas9
C_coli_Clade3_Cas9
C_jejuni_ICE1_Cas9
C_coli_ICE1_Clade1a_Cas9
C_coli_ICE1_Clade1c_Cas9
C_coli_ICE1_Clade2_Cas9
C_coli_ICE1_Clade3_Cas9

LYAKKISELDYKNKRKFFFPFSGFRQKVLDKIDEIFVSKPERKKPSGALH
LYAKKISELDYKNKRKFFFPFSGFRQKVLDKIDEIFVSKPERKKPSGALH
LYAKKISELDYKNKRKFFFPFSGFRQKVLDKIDEIFVSKPERKKPSGALH
LYAKELTSDSYKHQAKFFFPFEGFREQILNQINKLQVSKPPRKRARGALH
LYAKELTNSYKHQAKFFFPFEGFREQILNQINKLQVSKPPRKRARGALH
LYAKELTSDSYKHQAKFFFPFEGFREQILIQINKLQVSKPPRKRARGALH
FYANKISESDYLLKRKFLPPFSGFKEQALEKVKNI FVSHSLKIKNKGTLH
FYANKISESDYLLKRKFLPPFSGFKEQALEKVKNI FVSHSLKIKNKGTLH
FYANKISESDYLLKRKFLPPFKGFKEQAFKVNNI FVSHSLRIKKNKGALH
FYANKISESDYLLKRKFLPPFKGFKEQAFKVNNI FVSHSLRIKKNKGALH
FYANKISESDYLLKRKFLPPFKGFKEQAFKVNNI FVSHSLRIKKNKGALH

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C_jejuni_Cas9
C_coli_Clade1a_Cas9
C_coli_Clade1b_Cas9
C_coli_Clade1c_Cas9
C_coli_Clade2_Cas9
C_coli_Clade3_Cas9
C_jejuni_ICE1_Cas9
C_coli_ICE1_Clade1a_Cas9
C_coli_ICE1_Clade1c_Cas9
C_coli_ICE1_Clade2_Cas9
C_coli_ICE1_Clade3_Cas9

EETFRKEEEFYQSYGKEGVLKALELGKIRKVNKIVKN--GDMFRVDIF
EETFRKEEEFYQSYGKEGVLKALELGKIRKVNKIVKN--GDMFRVDIF
EETFRKEEEFYQSYGKEGVLKALELGKIRKVNKIVKN--GDMFRVDIF
KETFYSKDEMICKYNSQEGVEIALNCGKIRKIGTKYVEN--DTMVRIDIF
KETFYSKDEMICKYNSQEGVEIALNCGKIRKIGTKYVEN--DTMVRIDIF
KETFYPKDEMICKYNSQEGLEIALNCGKIRKIGTKYVEN--DTIVRIDIF
ELTPLKIKELKN TYG---DLDLAVKLGKIRKYNDKYYANANGSLVRADLF
ELTPLKIKELKN TYG---DLDLAVKLGKIRKYNDKYYVNAKGLARTDLF
NLNPLKIKELKN TYK---DLEFAIASGRIRNYNGKFYSNANGSLVRVDLF
NLNPLKIKELKN TYK---DLEFAIASGRIRNYNGKFYSNANGSLVRVDLF
NLNPLKIKELKN TYK---DLEFAIASGRIRNYNGKFYSNANGSLVRVDLF

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C_jejuni_Cas9
C_coli_Clade1a_Cas9
C_coli_Clade1b_Cas9
C_coli_Clade1c_Cas9
C_coli_Clade2_Cas9
C_coli_Clade3_Cas9
C_jejuni_ICE1_Cas9
C_coli_ICE1_Clade1a_Cas9
C_coli_ICE1_Clade1c_Cas9
C_coli_ICE1_Clade2_Cas9
C_coli_ICE1_Clade3_Cas9

KHKKTNKFYAVPIYTMDFALKVLPNKAV--ARSKKGEIKDWILMDENYEF
KHKKTNKFYAVPIYTMDFALKVLPNKAV--ARSKKGEIKDWILMDENYEF
KHKKTNKFYAVPIYTMDFALKVLPNKAV--ARSKKGEIKDWILMDENYEF
KKQ--NKFYAIPIYTMDFALGVLPNKI VIGKDKKGNPKQWQEIDESYEF
KKQ--NKFYAIPIYTMDFALGVLPNKI VIGKDKKGNPKQWQEIDESYEF
KKQ--NKIYAIPIYTMDFALGVLPNKI VIGKDKKGNPKQWQEIDESYEF
VDK-KNKFHAVSIYKADFSTKCLPNKTP--ATTSNGETKEGIEMNENYEF
VDK-KNKFHAVSIYKADFSTKCLPNKTP--ATTSNGETKEGIEMNENYEF
VDK-KSKFHAVPIYKADFSTKQLPNKTP--AAISNGKIKEGVEMNENYEF
VDK-KSKFHAVPIYKADFSTKQLPNKTP--AAISNGKIKEGVEMNENYEF
VDK-KSKFHAVPIYKADFSTKQLPNKTP--AAISNGKIKEGVEMNENYEF

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C_jejuni_Cas9
C_coli_Clade1a_Cas9
C_coli_Clade1b_Cas9
C_coli_Clade1c_Cas9
C_coli_Clade2_Cas9
C_coli_Clade3_Cas9
C_jejuni_ICE1_Cas9
C_coli_ICE1_Clade1a_Cas9
C_coli_ICE1_Clade1c_Cas9
C_coli_ICE1_Clade2_Cas9
C_coli_ICE1_Clade3_Cas9

CFSLYKDSLILIQTKDMQEPFVYNAFTSSTVSLIVSKHDNKFETLSKN
CFSLYKDSLILIQTKDMQEPFVYNAFTSSTVSLIVSKHDNKFETLSKN
CFSLYKDSLILIQTKDMQEPFVYNAFTSSTVSLIVSKHDNKFETLSKN
CFSLHKDDLVL IQKQDMQEPFAFYNGFDISNSSICVEKHNDNKFENLTDN
CFSLHKDDLVL IQKQDMQEPFAFYNGFDISNSSICVEKHNDNKFENLTDN
CFSLHKDDLVL IQKQDMQEPFAFYNSFDISNSSICVEKHNDNKFENLTDN
CFSLYKNTPI SVKIKGMKEPIICYHGFNTSGSKI TYKKHDNNYNLSED
CMSLYKNTPI SVKIKGMKEPIICYHGFNTSGSKI TYKKHDNNYNLSED
YISLYKNTPI SVKIKGMKEPIICYHGFNISGSQI IYKKHDNNYNLSDK
YISLYKNTPI SVKIKGMKEPIICYHGFNISGSQI IYKKHDNNYNLSDK
YISLYKNTPI SVKIKGMKEPIICYHGFNISGSQI IYKKHDNNYNLSDK

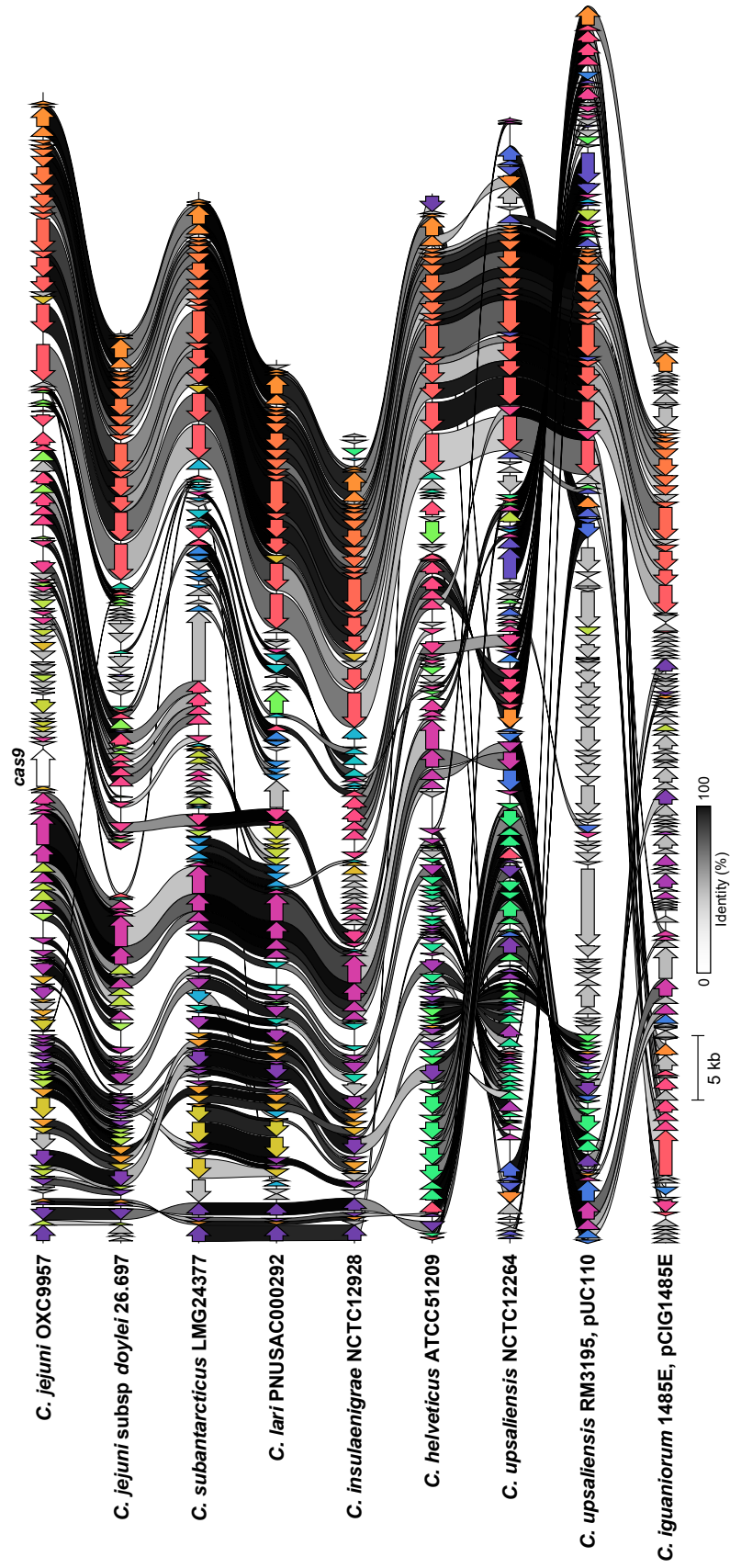
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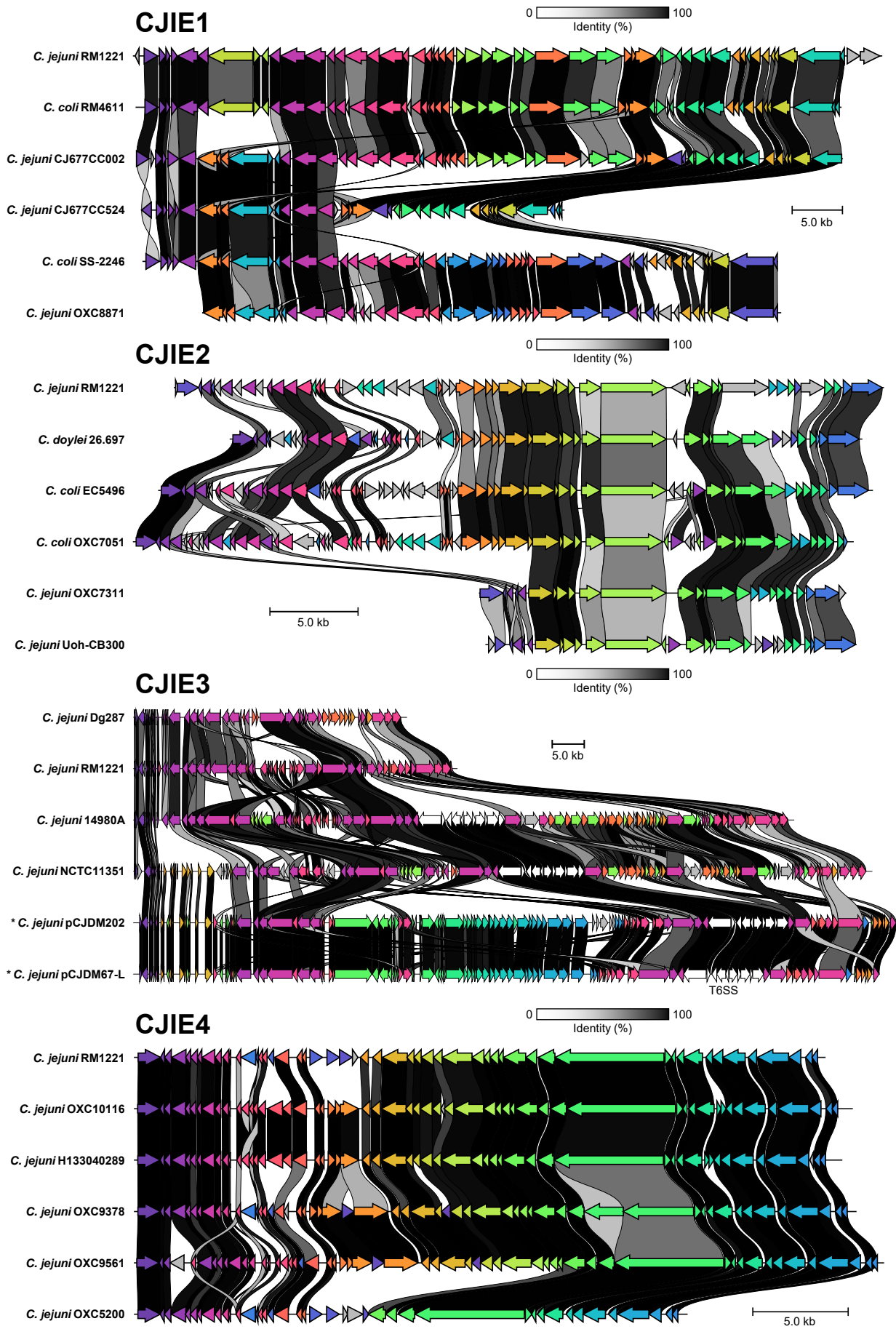
C_jejuni_Cas9
C_coli_Clade1a_Cas9
C_coli_Clade1b_Cas9
C_coli_Clade1c_Cas9
C_coli_Clade2_Cas9
C_coli_Clade3_Cas9
C_jejuni_ICE1_Cas9
C_coli_ICE1_Clade1a_Cas9
C_coli_ICE1_Clade1c_Cas9
C_coli_ICE1_Clade2_Cas9

QKILFKNANEKEVIAK SIGIQNLKVFEKYIVSALGEVTKAEFRQREDFKK
QKILFKNANEKEVIAK SIGIQNLKVFEKYIVSALGEVTKAEFRQREDFKK
QKILFKNANEKEVIAK SIGIQNLKVFEKYIVSALGEVTKAEFRQREDFKK
QKLLFTNAEEGNVAKKIGIQGLKIFEKYIITPLGEKIKADFKPREDIAL
QKLLFTNAEEGNVAKKIGIQGLKIFEKYIITPLGEKIKADFKPREDIAL
QKLLFTNAEEGNVAKKIGIQGLKIFEKYIITPLGEKIKADFKLREDIAL
EMVVRKNDKE-----SIAVGKILEIKKYISIPSGELSLIENEERKWF--
EMVVRKNDKE-----SIVVGKILEIKKYISIPSGELSLIENEERKWF--
EMVVRKNDKE-----SIVVGKILEIKKYISIPSGELSLIENEERKWF--
EMVVRKNDKE-----SIVVGKILEIKKYISIPSGELSLIENEERKWF--

C_coli_ICE1_Clade3_Cas9	EMAIFRKGDK-----AIAIGRILEIKKYNISPSGELILIENEERKWF--
	: : * : .: : : : : : * * : . * : :
C_jejuni_Cas9	-----
C_coli_Clade1a_Cas9	-----
C_coli_Clade1b_Cas9	-----
C_coli_Clade1c_Cas9	KTSKKHGL
C_coli_Clade2_Cas9	KTSKKHGI
C_coli_Clade3_Cas9	KTSKKHGL
C_jejuni_ICE1_Cas9	-----
C_coli_ICE1_Clade1a_Cas9	-----
C_coli_ICE1_Clade1c_Cas9	-----
C_coli_ICE1_Clade2_Cas9	-----
C_coli_ICE1_Clade3_Cas9	-----

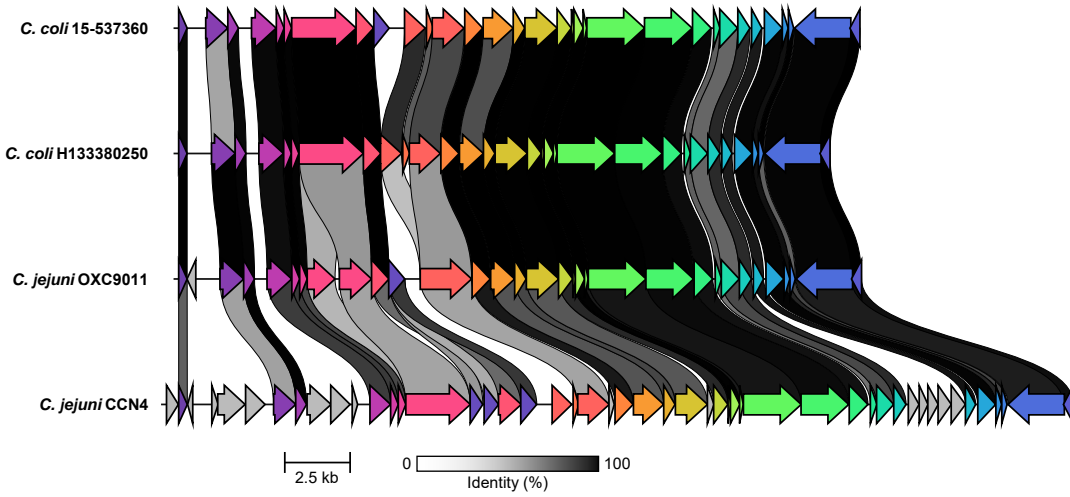
ICE1-like elements in *Campylobacter*



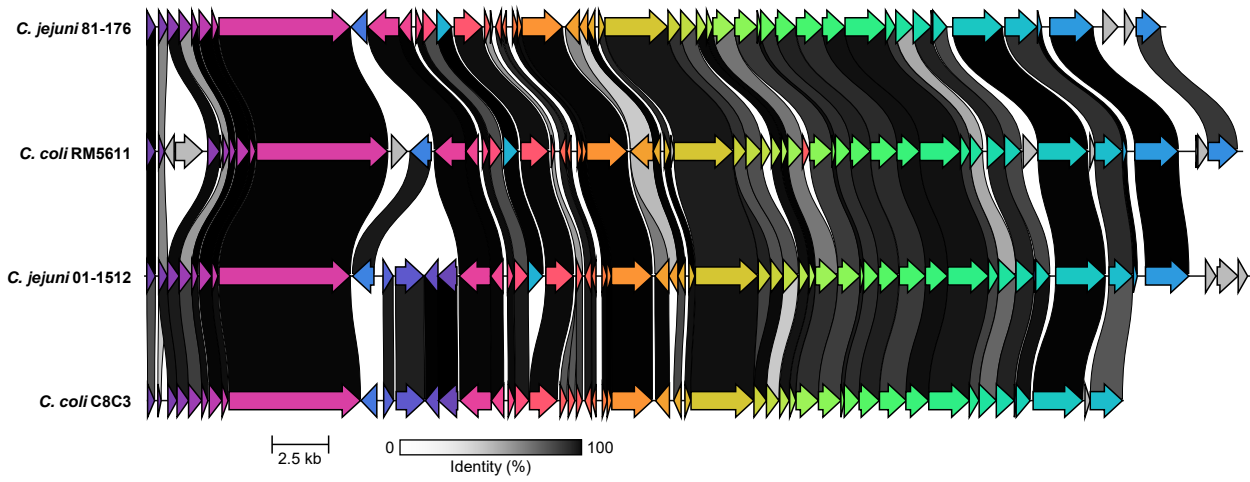


Van Vliet et al, Figure S3

pCC42



pTet



pVir

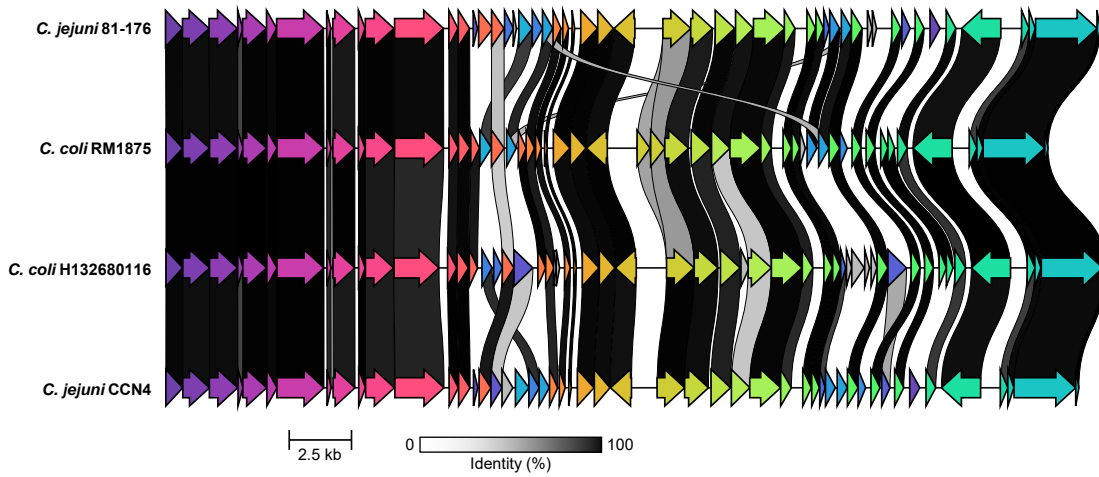


Table S4. Distribution of CampyICE1 plasmid-specific CRISPR-spacers and pVir, pTet and pCC42 plasmids in CampyICE1-positive *C. jejuni* and *C. coli*.

plasmid spacer ^a	no plasmid		plasmid present		
	absent	matched ^b	absent	Δ Cas9+mismatch ^b	matched ^b
<i>C. jejuni</i> (n=133)					
pVir	115	16	2	0+0	0
pTet	11	105	2	2+5	8
pCC42	22	97	3	0+4	7
<i>C. coli</i> (n=81)					
pVir	27	50	3	1+0	0
pTet	8	58	3	1+11	0
pCC42	2	57	0	2+9	11

a. Plasmid spacers identified by CRISPRfinder, CRISPR Recognition Tool CRT and manual searches were screened for matches with *Campylobacter* plasmids using CRISPRtarget.

b. CampyICE1-positive genomes positive for pVir, pTet and pCC42 were searched with the plasmid-targeting spacers using BLAST, and recorded for perfect matches and imperfect matches. This was to allow for possible sequence differences with the reference pVir, pTet and pCC42 plasmid sequences, or alternatively to detect mutations introduced to escape CRISPR-Cas functionality. In addition, the presence of a full-length *cas9* gene was checked, as this is required for CRISPR-Cas9 functionality.