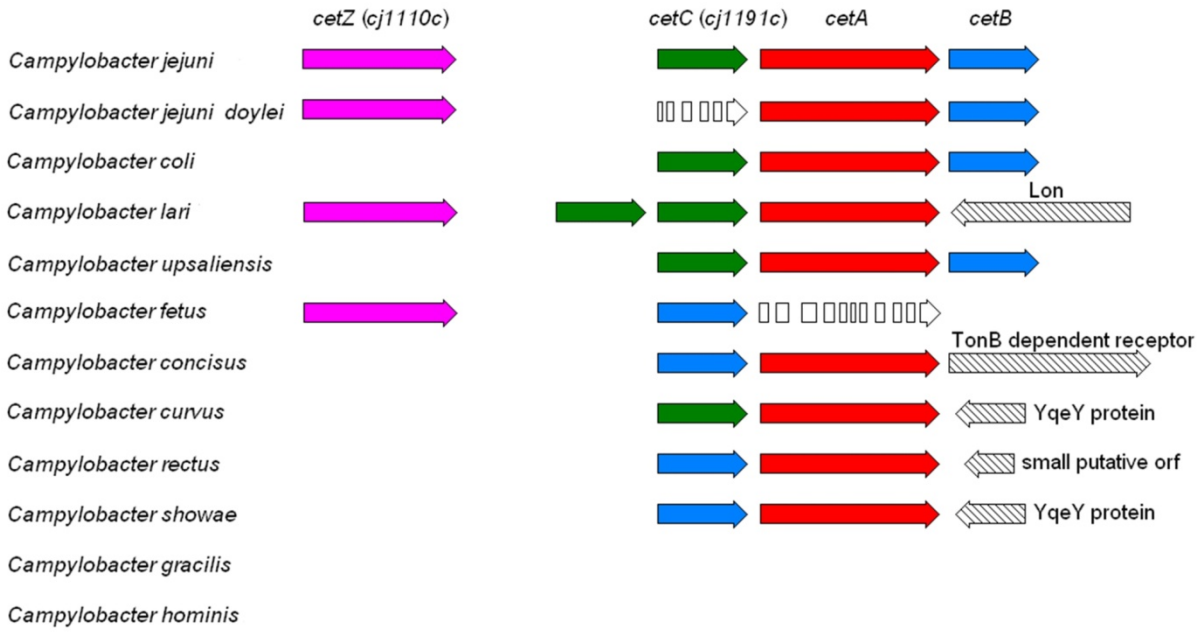

Figure S2.

Genetic organization of the *cetABCZ* loci in the *Campylobacter* genus based on available genome sequences. Genes are drawn roughly to scale and additional flanking genes are hashed. Pseudogenes are shown by interrupted boxes. The protein sequences encoded by the *cet* genes were searched against a FASTA file containing all open reading frames for each genome using a local BLAST search, using both BLASTP and TBLASTN (BioEdit - http://www.mbio.ncsu.edu/bioedit/bioedit.html). Homologs of the Cet proteins were then re-checked against the NCTC 11168 sequences to confirm the match and gene order confirmed using Artemis. In *C. jejuni* subsp. *doylei* strain 269.97, an *aer1* ortholog is present but interrupted by several stop codons and therefore considered to be a pseudogene. The *cetABC* genes are conserved in the *jejuni* species of the *Campylobacter* genus, with the exception of *C. jejuni* subsp. *doylei*, where *cj1191c* is present as a pseudogene, suggesting functional redundancy. Other species from the *Campylobacter* genus show variations of this gene arrangement: *C. coli* and *C. upsaliensis* are most similar to *C. jejuni* with similarly arranged loci. *C. concisus*, *C. curvus*, *C. rectus*, and *C. showae* have genes encoding proteins with a single PAS domain upstream of a gene encoding a CetA homolog, and no gene encoding a

CetZ homolog; while *C. lari* contains two genes encoding CetC homologs upstream of genes for CetA and a CetZ homolog. The *C. fetus* genome encodes a CetB homolog upstream of a *cetA* pseudogene, and a number of genes encoding other proteins that contain PAS domains, including a CetZ homolog (Cff8240_0322) and two proteins that contain PAS, GGDEF, and EAL domains that may be involved in cyclic di-GMP signalling [1]. A full description of chemotaxis proteins in *C. fetus* is described in [2]. *C. gracilis*, and *C. hominis* appear to lack both the *cetABC* and *cetZ* loci entirely. Interestingly, the *cet* loci are absent in the *Helicobacter* species *H. pylori, H. acinonychis*, and *H. hepaticus*. A chemotaxis protein, ChePep, has recently been identified in *H. pylori* lacking any similarity to known chemotaxis proteins except for a CheY-like receiver domain [3,4]. Moreover, *H. pylori* employs three CheV proteins, each with a distinct role in chemotaxis [5], and lacks CheR and CheB. These differences may reflect host adaptation in *H. pylori* [6,7] where both energy and pH taxis systems appear to be important for colonization of their particular niche [8,9].

References

1. Romling U, Gomelsky M, Galperin MY (2005) C-di-GMP: the dawning of a novel bacterial signalling system. Mol Microbiol 57: 629-639.
2. Fahmy D, Day CJ, Korolik V (2012) Comparative in silico analysis of chemotaxis system of *Campylobacter fetus*. Arch Microbiol 194: 57-63.
3. Howitt MR, Lee JY, Lertsethtakarn P, Vogelmann R, Joubert LM, et al. (2011) ChePep controls *Helicobacter pylori* Infection of the gastric glands and chemotaxis in the *Epsilonproteobacteria*. MBio 2: e00098-00011.
4. Sweeney EG, Guillemin K (2011) A gastric pathogen moves chemotaxis in a new direction. MBio 2: e00201-00211.
5. Lowenthal AC, Simon C, Fair AS, Mehmood K, Terry K, et al. (2009) A fixed-time diffusion analysis method determines that the three cheV genes of Helicobacter pylori differentially affect motility. Microbiology 155: 1181-1191.
6. Gilbreath JJ, Cody WL, Merrell DS, Hendrixson DR (2011) Change is good: variations in common biological mechanisms in the epsilonproteobacterial genera Campylobacter and Helicobacter. Microbiol Mol Biol Rev 75: 84-132.
7. Lertsethtakarn P, Ottemann KM, Hendrixson DR (2011) Motility and chemotaxis in *Campylobacter* and *Helicobacter*. Annu Rev Microbiol 65: 389-410.
8. Schweinitzer T, Mizote T, Ishikawa N, Dudnik A, Inatsu S, et al. (2008) Functional characterization and mutagenesis of the proposed behavioral sensor TlpD of *Helicobacter pylori*. J Bacteriol 190: 3244-3255.

9. Croxen MA, Sisson G, Melano R, Hoffman PS (2006) The Helicobacter pylori chemotaxis receptor TlpB (HP0103) is required for pH taxis and for colonization of the gastric mucosa. J Bacteriol 188: 2656-2665.