

Role of a novel pilus protein in DNA uptake and natural transformation of *Campylobacter jejuni*

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Campylobacter jejuni is a major food-borne pathogen causing acute gastroenteritis and occasionally severe long-term complications. The diverse population structure, particularly caused by natural transformation, is considered the basis for adaptation and survival. To visualize natural transformation capacity, *C. jejuni* were incubated with fluorescently labelled DNA and treated with DNase. Imported DNA in single cells was detected and quantified. Around 35 % of cells took up DNA, visible as distinct foci in single bacteria. Since the mechanism of uptake is not fully understood, we created mutants lacking proteins with potential roles in uptake. The outer membrane pore PilQ was essential for DNA uptake and the inner membrane channel ComEC for natural transformation. The periplasmic DNA binding protein ComE was negligible for uptake. Intriguingly, a mutant lacking the unique pilin-like protein Cj0683 was nearly abolished for DNA uptake. However, the rare observed DNA uptake events contained similar amounts of DNA than those of the wild-type. We identified Cj0683 as novel pilus-like protein, essential for the efficient initialization of DNA uptake. It is tentative to speculate that Cj0683 might be part of the competence (pseudo)-pilus, grabbing external DNA, thereby initializing DNA import events over the outer membrane in *C. jejuni*. Unravelling features important in natural transformation might lead to target identification, reducing the adaptive potential of pathogens.

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Yes, I am a Junior Scientist.

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