

**Primary isolation strain determines both phage type and receptors recognised by *Campylobacter jejuni* bacteriophages**

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## **Abstract**

In this study we isolated novel bacteriophages infecting the zoonotic bacterium *Campylobacter jejuni* that may be used for phage therapy of colonized poultry to prevent spreading of the bacteria to meat products causing disease in humans. Many *C. jejuni* phages have been isolated using NCTC12662 as indicator strain, which may have biased the selection of phages. A large group of phages rely on the highly diverse capsular polysaccharide (CPS) for infection and recent work identified the *O*-methyl phosphoramidate modification (MeOPN) of CPS as a phage receptor. We therefore chose *C. jejuni* expressing different CPS structures as indicator strains in a large screening for phages in samples collected from free-range poultry farms. A total of 43 phages were isolated using *C. jejuni* NCTC12658, NCTC12662 and RM1221 as indicator strains, and 20 phages were included in a further analysis. Phages with different host range, genome size and DNA restriction profile were isolated from the same farm, but from different indicator strains, indicating that indicator strain strongly influences which phages are selected for. Most phages were isolated using *C. jejuni* NCTC12662 and RM1221 and genome size (145 kb vs. 194 kb), host range and morphological appearance correlated with isolation strain. Furthermore,  $\Delta$ kpsM and  $\Delta$ MotA mutants showed that phages isolated on NCTC12658 and NCTC12662 both expressing the MeOPN moiety were dependent on the capsule for infection, whereas phages isolated on RM1221 relied on motility for successful infection. Thus, the bacteriophage isolation strain affected both the isolated phage type as well as the receptors recognised by these phages.

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