Microencapsulation of *Clostridium difficile* specific bacteriophage using glass microcapillary devices and pH dependent controlled release for colon targeted delivery

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The global threat to human health from antimicrobial resistance in infection causing bacteria has led to renewed interest in the potential of phages as therapeutic agents. In *Clostridium difficile* infections of the colon, targeted delivery of viable phages to the site of infection is important. The punitive environment of the gastrointestinal tract can potentially render free phages inactive prior to reaching the site of infection. The actual phage load delivered at the site of infection is typically much lower than the ingested dose. The variability of phage load delivery may impact on the outcomes of any phage therapy trials. This may be an important reason for some historic failures in trials aimed at evaluating efficacy of phage therapy. Here, we describe the encapsulation and release kinetics *in vitro* of a model *C. difficile* specific phage, Phi9CD-KM. In the absence of encapsulation, phages were rendered inactive within minutes upon exposure to a pH 2 solution. Release kinetics of the encapsulated phage was studied in different pH solutions. A burst release of phage occurred at pH 7. Slow controlled release over several hours was observed at pH 6.