

Preparation of monodisperse PEGDA-organoclay composite hydrogel particles for *E. coli* encapsulation using microfluidic device

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We propose an effective strategy for *E. coli* encapsulation in polyethylene glycol diacrylate (PEGDA)-organoclay composite microdroplets using a microfluidic device and self-gelation process. PEGDA is well known polymer for highly porous structure used in biological researches because of its biocompatibility and hydrophilic properties. As the organoclay solution introduced to the PEGDA solution, PEGDA chains are spontaneously crosslinked with each other and formed a hydrogel type polymer matrix. Microfluidics can offer a sophisticated platform to produce the uniform sized spherical PEGDA-organoclay droplets of micron size in a single-step process. This unique process is successfully applied to entrap *E. coli* inside of PEGDA and organoclay composite matrix. Green fluorescent protein (GFP) is efficiently expressed inside the microdroplet after introduction of iso-propyl- β -D-thio-galactopyranoside (IPTG). Our results have shown that PEGDA /organoclay composite possesse non-toxic, porous and high biocompatible properties.