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## Cu-crosslinked carboxymethylcellulose/naproxen/graphene quantum dot nanocomposite hydrogel beads for naproxen oral delivery

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### Highlight

- Copper acetate was used as a novel CMC crosslinker.
- NPX was successfully pre-loaded and coated with the Cu-CMC and Cu-CMC/GQD.
- Cu-CMC/GQD/NPX drug release performance was optimized in comparison with Cu-CMC/NPX.
- Cu-CMC/GQD/NPX showed a pH-sensitive oral delivery property.
- Caco-2 cells viability showed that the Cu-CMC/GQD/NPX could be a safe carrier.

### Abstract

In this work, copper acetate was used as a new physical crosslinker to prepare carboxymethylcellulose (CMC) based hydrogel nanocomposite beads. Due to the characteristics of the prepared CMC-based hydrogel nanocomposite beads such as mildness, simplicity, and the creation of small and uniform shapes, the presented procedure could attract great consideration in the field of controlled release of drugs. Naproxen (NPX) as a model drug was pre-loaded during the preparation of hydrogel beads. The prepared Cu-crosslinked carboxymethylcellulose/NPX/graphene quantum dot nanocomposite hydrogel beads (Cu-

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