Hydrogel Dressing With Controlled Ion Release Properties for Wound Healing

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Technology description

Short Description

Novel material for hydrogel wound dressings that can incorporate therapeutic metal ions

Abstract

Northwestern researchers have developed a novel hydrogel wound dressing that can slowly deliver therapeutic concentrations of copper ions to speed up wound healing. While copper has been known to aid wound healing, it has been difficult to incorporate into hydrogel-based dressings as it can destabilize their structure. In addition, high copper concentrations can be toxic, so it is imperative to devise a method for it to be slowly released from the hydrogel, while maintaining their stability. To address these problems, Prof. Ameer's group designed copper-based metal organic framework (CMOF) nanoparticles that can be dispersed within thermoresponsive polydiolcitrate hydrogel. This synergistic composite material can be used to safely deliver copper or other ions, like silver, to wounds to promote healing or inhibit bacterial infections. The ability to incorporate other metal ions into the same hydrogel material could expand the range of applications for this invention to include inflammation control and treatment of autoimmune disorders.

Application area

Wound healing

Inflammation and autoimmune disease

Slow-release of therapeutic ions

Advantages

Controlled delivery of metal ions without hydrogel destabilization

Biocompatible and non-toxic

Institution

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