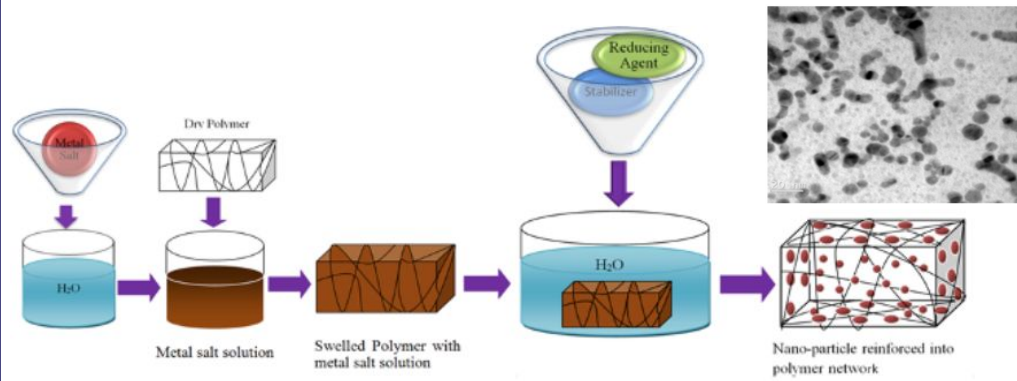


GRANTED

(IN455508)

Nanoparticles reinforced hydrogel composite



NEED

Infection rates after surgery still reach 20% globally due to poor antimicrobial coatings. Traditional hydrogels degrade quickly or release toxic byproducts, risking patient safety and \$4B annual healthcare losses. Current solutions lack safe, light-activated antimicrobial functions.

MARKET ANALYSIS

The global hydrogel market will reach \$27.3 billion by 2033, growing at a CAGR of 7.8%, driven by regenerative medicine, wound care, and drug delivery innovations. [Source: Market Research Future, 2024]

TECHNOLOGY OVERVIEW

This invention presents a nanoparticle-reinforced hydrogel combining a carbohydrate-vinyl polymer matrix with gold nanoparticles and safe antibiotics. It creates light-sensitive, non-toxic materials ideal for wound healing, drug delivery, and tissue scaffolding, avoiding harmful chromophores or degradation products.

Target Industries

Regenerative Medicine, Advanced Wound Care, Controlled Drug Delivery, Biomaterials developers, healthcare R&D platforms, wound healing product innovators.

TECHNOLOGY KEY FEATURES

Light-activated healing, gold nanoparticle reinforcement, safe antibiotic integration, non-toxic response, 21 nm particle control, 3.94–19.69% nanoparticle concentration, enhanced hydrogel stability and biocompatibility.

AT A GLANCE

- SDG 3 (Good Health and Well-being), SDG 9 (Industry, Innovation and Infrastructure), SDG 12 (Responsible Consumption and Production)

[Read more here](#)

Technology is available for licensing/ co-development.

Reach out to Prof. Deepak Chitkara, Coordinator, BITS Technology Enabling Centre,

BITS Pilani Contact Details: tec.bits@pilani.bits-pilani.ac.in, 91 1596-255913