

An Antimicrobial Nanocomposite and a Green Process to Synthesize the Nanocomposite



Intellectual Property: 558412

Inventor: K N K Square Private Limited

Category: •Nanotechnology
•Biotechnology
•Green Chemistry
•Medical and Dental Applications
•Antimicrobial Materials

Application:

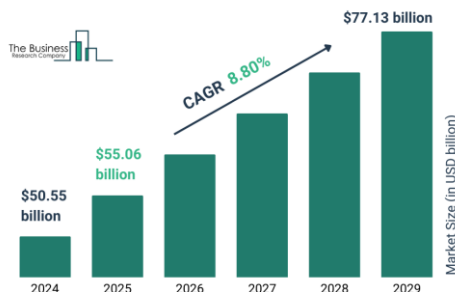
1. Medical Device Coatings
2. Dental care (eg. integrated into toothpaste, mouthwashes, and dental coatings)
3. Water Purification & Coating as Antimicrobial Surfaces
4. Drug delivery systems

Technology:

The invention is a green-synthesized antimicrobial nanocomposite of cerium oxide (CeO_2) and graphene oxide (GO), prepared using *Calotropis gigantea* floral extract or bacterial extract, designed for effective antibacterial and antibiofilm action against *Streptococcus mutans*.

Market Forecast

Oral Care Global Market Report 2025



Ref: thebusinessresearchcompany.com

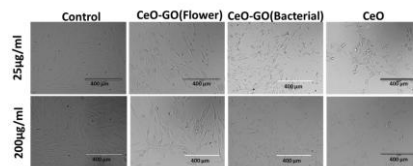


Fig.1: Optical Micrographs Showing Adherence Loss in NH-3T3 Cells Treated with Nanoparticles

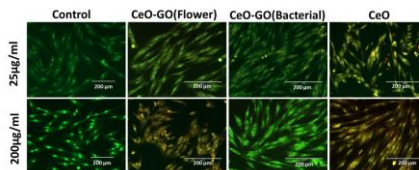


Fig 2: Fluorescent images of NH-3T3 cells treated with GO, GO-CeO NP, and CeO NP nanoparticles

Problem Addressed

Rising Antimicrobial Resistance (AMR): Traditional antibiotics are becoming less effective; the nanocomposite provides a non-antibiotic solution via ROS generation.

Toxicity of Conventional Nanomaterials: Existing nanoparticles like AgNO_3 have cytotoxic effects; the green synthesis method improves biocompatibility and minimizes toxicity.

Dental and Medical Biofilm Formation: The nanocomposite inhibits *S. mutans* biofilm formation, reducing bacterial resistance.

High Production Costs: The eco-friendly synthesis process lowers costs by using plant extracts and bacterial media.

Advantage

1. Green Synthesis: Environmentally friendly, using plant and bacterial extracts instead of toxic chemicals.
2. Higher Biocompatibility: Reduces cytotoxicity and enhances compatibility with human tissues.
3. Superior Antimicrobial Effectiveness: Targets *S. mutans* effectively, making it ideal for dental applications.
4. Cost-Effective & Scalable: Lower production costs due to eco-friendly synthesis methods.
5. Multi-functional Applications: Can be used in medical, dental, environmental, and industrial fields.

USP:

Green Synthesis Process
Superior Antimicrobial Action
Cost-Effective & Scalable
Versatile Applications

Reach Us:

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