Patent Search

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Inventor

Name	Address	Country	Nat
Dr. Athare Anil Eknath	Associate Professor, Department of Chemistry, New Arts Commerce and Science College, Parner, Ahmednagar, Maharashtra, India, Pincode: 414302	India	Indi
Dr. S. Devaraj	Assistant Professor, Department of Aeronautical Engineering, Institute of Aeronautical Engineering, Hyderabad, Telangana, India, 500043	India	Indi
Dr. Pattisam Venkata Prasad	Assistant Professor, Department of Physics, Adikavi Nannaya University, Tadepalligudem Campus, East Godavari, Andhra Pradesh, India, Pincode: 534101	India	Indi
Dr. Nellore Manoj Kumar	Independent Researcher, Founder & CEO, Infinite-Research Organization, B.O, 15-225, Gollapalem, Venkatagiri, Tirupati District, Andhra Pradesh, India, Pincode: 524132	India	Indi
Dr. Ashok Kumar S L	HOD & Associate Professor, Department of Chemistry, GRT Institute of Engineering and Technology, Tiruttani, Tamilnadu, India, Pincode: 631209	India	Indi
Dr. Sarathi N	Professor, Department of Chemistry, GRT Institute of Engineering and Technology, Tiruttani, Tamilnadu, India, Pincode: 631209	India	Indi
Dr. G. Nageswara Rao	Assistant Professor, Department of Chemistry, Telangana University, Dichpally, Nizamabad, Telangana, India, Pincode:503322	India	Indi
Dr. Santosh Kumar Nathsharma	Lecturer in Chemistry, Department of Chemistry, Stewart Science College, Cuttack, Odisha, India, Pincode: 753001	India	Indi
Dr. Shailendra Badal	Assistant Professor, Department of Applied Science and Humanities, Rajkiya Engineering College, Banda, Uttar Pradesh, India, Pincode: 210201	India	Indi
Dr. S. Rama	Assistant Professor, Department of Physics, St.Joseph's College of Engineering, Chennai, Tamilnadu, India, Pincode: 600119	India	Indi
Dr. Y. Sushma Priya	Assistant Professor, Department of Physics, Adikavi Nannaya University, Rajamahendravaram, East Godavari District, Andhra Pradesh, India, Pincode: 533296	India	Indi

Applicant

Name	Address	Country	Nat
Dr. Athare Anil Eknath	Associate Professor, Department of Chemistry, New Arts Commerce and Science College, Parner, Ahmednagar, Maharashtra, India, Pincode: 414302	India	Indi
Dr. S. Devaraj	Assistant Professor, Department of Aeronautical Engineering, Institute of Aeronautical Engineering, Hyderabad, Telangana, India, 500043	India	Indi
Dr. Pattisam Venkata Prasad	Assistant Professor, Department of Physics, Adikavi Nannaya University, Tadepalligudem Campus, East Godavari, Andhra Pradesh, India, Pincode: 534101	India	Indi
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Dr. Y. Sushma Priya	Assistant Professor, Department of Physics, Adikavi Nannaya University, Rajamahendravaram, East Godavari District, Andhra Pradesh, India, Pincode: 533296	India	Indi

Abstract:

The proposed invention pertains to the utilization of platinum nanoparticles as potent antibacterial agents for combating antibiotic-resistant bacterial infections. These nanoparticles exhibit exceptional physicochemical properties, including a high surface area-to-volume ratio and catalytic activity, enabling them to effectively penetrate ba cell membranes and induce bacterial cell death through multiple mechanisms. The invention encompasses methods for synthesizing platinum nanoparticles with precise over their size, shape, and surface properties, as well as formulations optimized for antibacterial efficacy and biocompatibility. Preclinical studies demonstrate the ability o platinum nanoparticles to inhibit bacterial growth, eradicate biofilms, and overcome multidrug resistance, offering promising prospects for clinical applications. Furthermo invention encompasses strategies for enhancing the safety, stability, and delivery of platinum nanoparticles for therapeutic use, paving the way for innovative approaches combating antibiotic-resistant infections and improving public health outcomes.

Complete Specification

Description:The proposed system falls within the field of nanotechnology and biomedical engineering, specifically focusing on the application of platinum nanoparticles potent antibacterial agents. These nanoparticles exhibit unique physicochemical properties that enable them to effectively combat bacterial infections. By leveraging the small size and high surface area, platinum nanoparticles can penetrate bacterial cell membranes, disrupting essential cellular processes and leading to bacterial cell deat This innovation holds promise for addressing antibiotic resistance, a growing global health concern. Moreover, the use of platinum nanoparticles offers a targeted and efficient approach to bacterial eradication, potentially reducing the side effects associated with conventional antibiotic therapies. This research intersects with materials science, biochemistry, and microbiology, paving the way for novel therapeutic strategies in combating infectious diseases.

Background of the proposed invention:

The proposed invention centers around the utilization of platinum nanoparticles as potent antibacterial agents, representing a groundbreaking advancement in the field nanotechnology and biomedical engineering. This innovation stems from a pressing global need to address the escalating threat of antibiotic-resistant bacteria, which po significant challenges to public health worldwide.

Antibiotic resistance has emerged as a critical issue due to the overuse and misuse of conventional antibiotics, leading to the evolution of bacteria that are impervious to these drugs. This phenomenon jeopardizes the efficacy of existing treatments for bacterial infections, rendering once-manageable illnesses increasingly difficult to contr In the absence of effective antibacterial agents, common infections could become life-threatening, and routine medical procedures such as surgeries and chemotherapy could carry heightened risks of complications.

The rise of antibiotic resistance has spurred intensive research efforts to identify alternative strategies for combating bacterial infections. Nanotechnology has emerged

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