

NANOPARTICLES AND THE PROCESS FOR PREPARATION THEREOF FOR FIXED COMBINATION MONOTHERAPY

IITM Technology Available for Licensing

Problem Statement

- Current **glaucoma treatments face challenges** in achieving sustained drug release & maintaining consistent **Intraocular Pressure (IOP) Control**.
- **Conventional eye drops** may result in limited **bioavailability** and **patient compliance**, leading to **suboptimal treatment outcomes**.

There is a need for innovative **drug delivery systems** that can provide **controlled & prolonged drug release** for better glaucoma management while **minimizing the side effects & increasing the patient adherence**.

The instant patent addresses the above given issues by disclosing a **process for preparation of nanoparticles** for fixed combination Monotherapy.

Technology Category/ Market

Categories: Medical & Surgical Devices, Biotechnology & Genetic Engineering

Industry: Pharmaceutical Industry, Ophthalmic Drug Development, Biotechnology, R&D, Regulatory/ Compliance Services, Medical Device Manufacturing

Applications: pharmaceutical and ophthalmic industries, offering improved drug delivery for glaucoma treatment; to boost drug efficacy, reduced side effects, medical device Mfg, investment sectors.

Market: The global novel drug delivery systems in cancer therapy market size was valued at **USD 4.31 B in 2016**. It is projected to reach **USD 26.61 B by 2025**, growing at **22.9% CAGR during 2017-25**.

Technology

- The present patent discloses **Nanoparticles** and the **Process** for Fixed Combination Monotherapy.
- This patent is about **using small particles to deliver drugs for treating glaucoma**.
- These particles have a **unique structure** that allows for **controlled drug release**. Special materials and methods are used to enhance treatment effectiveness, and Betacyclodextrin is used to improve **drug absorption in the eyes**.

Intellectual Property

IITM IDF No: 2404; IP Grant Number: 449238

Image

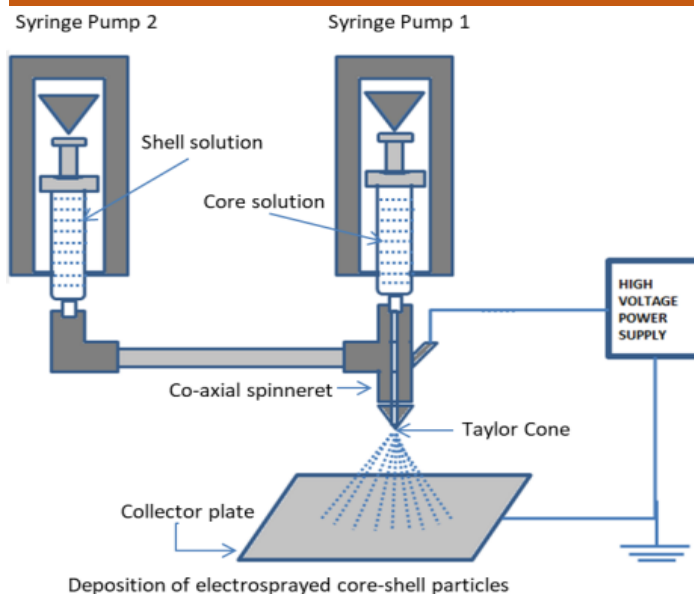


Fig 1: shows a schematic diagram of drug loaded core-shell delivery system & electrospaying system.

Key Features / Value Proposition

❖ *User Perspective:*

- **Effective Glaucoma Treatment:** Provides better glaucoma treatment with controlled drug release.
- **Enhanced Patient Adherence:** Reduces dosing frequency, improving patient compliance.
- **Improved Quality of Life:** Potential for better management of intraocular pressure.

❖ *Industrial Perspective:*

- **Innovative Drug Delivery:** Demonstrates advanced technology in pharmaceutical manufacturing.
- **Market Expansion:** Opens new opportunities for pharmaceutical companies.
- **Diverse Product Portfolio:** Allows for the development of novel glaucoma therapies.

❖ *Technological Perspective:*

- **Advanced Nanoparticle Design:** Core-shell nanoparticles enable combination therapies.
- **Fine-tuned control of particle characteristics.**
- **Enhanced Drug Absorption:** Functionalization improves drug delivery through ocular tissues.

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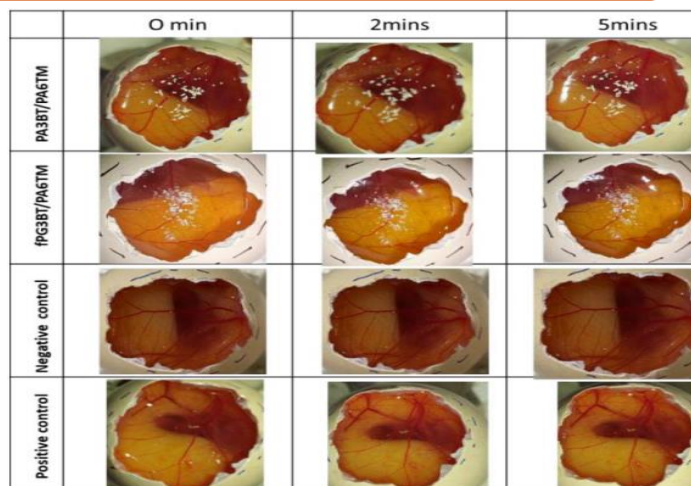
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It is a process to create tiny drug-delivery particles with a core and shell for better eye treatment.

- **Nanoparticle Creation:** The process begins by making tiny core-shell nanoparticles.
- **Core Solution:** A mixture is made for the core. It includes a polymer, a drug, and a liquid (acetonitrile).
- **Shell Solution:** Another mixture is created for the shell. It has a polymer, a drug, and a mix of liquids.
- The core and shell mixtures are **sprayed** through a special needle with high voltage, to small particles.
- **Collecting and Drying:** These particles are collected on a metal plate, then dried to fine powder.
- **Functionalization:** The drug-carrying powder is mixed with a substance to help it penetrate the eyes better.
- **Freeze-Drying:** The final product, spherical nanoparticles, is made by freeze-drying.

Fig. 2. HET-CAM Assay of PG3BT/PA6TM & fPG3BT/PA6TM



TRL (Technology Readiness Level)

TRL - 3, Experimental proof of concept.

Research Lab

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