

Modified Porous Polymers with Enhanced Biocompatibility for Implants and Tissue Engineering Applications

EXECUTIVE SUMMARY

Surface modified porous polyethylene biomaterial which promotes cell growth and prevents microbial infections for applications in biomedical implants and tissue engineering.

BACKGROUND

Porous polyethylene (pPE) biomaterials are widely used for making biomedical implants. The pores in these implants facilitate growth of cells and blood vessels. Enhancing cell growth can significantly increase compatibility of the implant and reduce its rejection by the body. Implant rejection can also occur due to development of infection. Recent studies have reported high infection rates in marketed pPE implants requiring revision surgeries¹. Adding an anti-infective feature to these implants can help in solving this issue.

¹[Common nose implant has high infection rate: study.](#)

TECHNOLOGY DESCRIPTION

A novel surface modification process developed by NCL scientists resulted in a pPE biomaterial that promotes cell growth in implants and increases its compatibility in the body. This novel material provides sustained anti-microbial action which helps in reducing the risk of infection development. This material can also function as a reservoir and can be used in making implants with drug eluting features.

MARKET POTENTIAL

- The Indian market for pPE biomaterial products is estimated at Rs. 40-50 lakhs per year*.

- The world bio-implants market is estimated to be \$94.1 billion in 2012. This market is expected to grow at 7.3% CAGR# in the next 5 years.

*Internal estimate.

#[Marketandmarkets.com Report, September 2012.](#)

VALUE/ADVANTAGES

- This novel biomaterial promotes cell growth.
- Biomedical implants made from this material have increased compatibility in the body.
- Anti-microbial action of this biomaterial reduces risk of infection and implant rejection.
- This material functions as a reservoir and can be used for making drug eluting implants.

APPLICATIONS

- Biomedical implants for non-load bearing applications namely craniofacial, ophthalmic, nasal, auricular and dental reconstructions.
- Implants for volume filling applications such as orbital reconstruction, i.e. repairing lower eyelid retraction, fracture of eye socket etc.
- Drug eluting implants.
- Skin grafting and scaffold applications in tissue engineering.

TECHNOLOGY STATUS

- Demonstrated at the lab scale.
- On the lookout for potential partners for spin-off and licensing.
- Patent application filed in India 535/DEL/2010; PCT [IN2011/000158](#); Favorable patentability report (IPRP) received.

CSIR-National Chemical Laboratory, Pune, India

