



Project Proposal for Ph.D.

Project Details

Project Title

Functional fiber-based composites for tissue engineering and therapeutic applications.

Project Summary

(Minimum 500 and maximum 2000 characters)

Cellulose based materials are looked upon as sustainable alternatives over fossil fuel based synthetic polymers like poly(e-caprolactone), poly(lactic acid) etc. which have been used conventionally for fabricating scaffolds and membranes for tissue engineering and therapeutic applications. The current proposal aims at developing cellulose fibrous composites for functional tissue engineering applications. Cellulose-based biomaterials hold several benefits attributed to their exceptional properties of non-toxicity, biocompatibility, biodegradability, availability through renewable resources, and the low cost of preparation and processing. Cellulose based fibrous composites are to be designed by addition of a biodegradable polymer and the formed composites will be evaluated on basis of their degradation rate, mechanical properties, and bioactivity performance. In addition, a correlation between fiber composition, physical properties and surface area will be established in relation to the expected functional properties. Designed fibrous scaffolds will be evaluated for their efficacy in for targeted drug delivery for potential cancer treatment process and as functional membranes for transdermal patches.

Ph.D. Supervisors

Role	Faculty	Academic Unit in IITD/Institute/University	Email ID (Official)
Supervisor 1	Prof. Ritu Kulshreshtha	Biochemical Engineering and Biotechnology, IIT Delhi	ritu@dbeb.iitd.ac.in
Supervisor 2	Prof. Archana Samanta	Textile and Fiber Engineering, IIT Delhi	archana@iitd.ac.in

Project requirements (Student qualifications, experience required, etc)

- M.Tech/M.Sc in material science, chemistry, polymer technology, polymer chemistry, biotechnology, bioscience, pulp and paper, physics, Textile Engg .

Source of fellowship/funding

(CSIR/UGC/DBT/ICMR/ICAR/NEET-PG/DST-INSPIRE/IRD/FITT Project details, if any)

Candidate with his/her own fellowship /institute assistantship

Role of Faculty Members involved:

Prof. Archana Samanta will be involved in developing fiber-based scaffolds for functional applications.
Prof. Ritu Kulshreshtha will be involved in assessing the cancer biology, drug delivery and biocompatibility, cytotoxicity assessments of the formed composites.