



Indian Institute of Technology Delhi

School of Interdisciplinary Research (SIRe)



SIRe Project Number

2023-01-21

Project Proposal for Ph.D.

(will be assigned by SIRe)

Project Details

Project Title	Development of High-Entropy alloys for Biomedical Applications
Project Summary (Minimum 500 and maximum 2000 characters)	High entropy alloys (HEAs) are a relatively new class of alloy that consist of five or more elements in roughly equal quantities. They are designed to impart a wide range of properties such as strength, ductility, wear and corrosion resistance, and biocompatibility for biomedical applications. HEAs have received great interest from the biomedical research community due to their exceptional durability, chemical and biomechanical stability. This makes them attractive for applications in artificial joints and other implantable medical devices. HEAs also offer unique biocompatibility, allowing them to be used in contact with tissue and fluids without causing adverse reactions. Furthermore, they are able to withstand high temperatures, making them suitable for use in hot medical instrument sterilization processes. Overall, HEAs provide a promising platform for biomedical research due to their wide range of advantageous properties. These features make them suitable for a variety of applications, ranging from implants and devices for artificial joints, to orthotics and prosthetics, to dental and orthopedic implants.

Ph.D. Supervisors

Role	Faculty	Academic Unit in IITD/Institute/University	Email ID (Official)
Supervisor 1	Prof. Dinesh Kalyanasundaram	Biomedical Engineering (CBME)	dineshk.iitdelhi@gmail.com, dineshk@cbme.iitd.ac.in
Supervisor 2	Prof. Deepak Kumar	Automotive Research and Tribology (CART)	dkumar@iitd.ac.in

Project requirements (Student qualifications, experience required, etc.)

- Bachelors or Masters in Mechanical or Metallurgy or Production or Manufacturing or Materials Science and Engineering or Materials & Design or Design Engineering

Source of fellowship/funding

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

- Institute Fellowship (from CBME)

Role of Faculty Members involved:

Dinesh Kalyanasundaram: Biomechanical and Biomedical Assessment Deepak Kumar: Materials Design and Manufacturing