Statement of Research Achievements, if any, on which any Award has already been Received by the Applicant. Please also upload brief citations on the research works for which the applicant has already received the awards

Currently my research group in nanobiotechnology laboratory at IIT Roorkee is working on the development of various polymer based nanocarriers for the delivery of several anticancer agents and also exploring the possibilities of different biocompatible imaging agents for cancer diagnosis. We have also developed various nanomaterials for biomedical applications.

1. Very recently, I was selected for the prestigious **TATA Innovation Fellowship 2023-24 Session**, by Department of Biotechnology, Govt. of India. (Yet to receive the fellowship).
2. My research group has developed a nanofiber scaffold and an apparatus for 4D tissue engineering for which a **patent has been filed and technology transfer** has been done. This is the first licensing of a patented technology from IIT Roorkee. Using our 4D tissue engineering apparatus and nanofiber scaffold, we can overcome the **experimental errors in biotech and pharma industry due to 2D cell culture methods.** Our technology will also reduce the need for **animal trials as our scaffold closely mimic the in vivo conditions**. For this work, my team has been selected for **"BIRAC-SRISTI-Gandhian Young Technological Innovation (GYTI-2019) award" (Grant of Rs. 15 lakh, citation and certificate)**. I have also received the prestigious **Virendra Nath Malti Mital Award 2018** for this work. The Annual Award of Rs. 1,00,000/- is given to an eminent Engineer for Innovative and Creative Work with patent in the field of Engineering in India in any discipline to an Indian National for the work done in India.

3. Received the prestigious "ICMR-prize for Biomedical Research-2019" (Citation, Medal and Cash prize Rs. 50,000/=) by Indian Council of Medical Research (ICMR), New Delhi, India.
   We have synthesised fluorescent carbon dots from rosy periwinkle plant leaves that can be used as nanotags for detecting and killing cancer cells. This is an economical and green way to produce fluorescent carbon dots from the leaves of a common medicinal plant. This work has huge theranostic (Therapy & diagnostic) potential for cancer diagnosis and therapy.

4. Received the prestigious "ILSI-India Young Scientist Award 2021 for *Improving Public Health in the Areas of Food Safety, Nutrition and Wellbeing*" (Citation, and Cash prize Rs. 50,000/=) by International Life Sciences Institute-India (ILSI-India), New Delhi, India on 8th March 2021.
   We have developed edible coating for enhancing the shelf life of horticulture products to overcome the drawbacks associated with wax coating (Indian Patent filed).

5. Received the prestigious "AMI-Alembic Award-2020" (Citation, Medal and Cash prize Rs. 25,000/=) by THE ASSOCIATION OF MICROBIOLOGISTS OF INDIA (AMI) on 02 Feb 2021.
   The need for novel nanomaterials with antibacterial activity arises due to antibiotic resistance developed by most of the bacteria. We have developed several antibacterial nanomaterials and studied their antibacterial mechanism using *Staphylococcus aureus* as a Gram-positive model and antibiotic resistance Green Fluorescent Protein (GFP) expressing *Escherichia coli* as a Gram-negative model system.