



Project Proposal for Ph.D.

Project Details	
Project Title	Detection of micronutrients in fortified foods using optical tools
Project Summary (Minimum 500 and maximum 2000 characters)	Scaling up of food fortification programs faces many challenges in terms of maintaining quality and standards as per the guidelines. As the fortification processes are decentralized with various stakeholders involved, ensuring consistent quality standards at the processing levels has become challenging. Limited analytical lab facilities for quality checks at the primary processing level stance additional obstacles. Confidence in the quality of fortified food remains low, necessitating appropriate quality assurance, quality control, and monitoring checks throughout the fortification process. Currently, testing of micronutrients is conducted at multiple levels for kernels, premix, and fortified foods in labs as notified by the FSSAI with NABL accreditation. A specific challenge in food fortification is the lack of rapid analytical testing techniques/ kits to assess the quality of fortified foods at platform level. Existing analytical techniques or protocols suffer from drawbacks like lack of reproducibility, repeatability, sensitivity, cost economics, and human error. To address these issues and encourage innovative analytical solutions, we plan to develop rapid testing techniques/kits for fortified foods using optical based techniques and integrated machine learning algorithms. This project aims to develop promising innovations and technologies to advocate and/or demonstrate scalable real-time solutions to key stakeholders in the rice fortification space. The proposed project is yet another unmet need in the food industry and we believe this technique developed will have immense potential to be translated into industrial product

Ph.D. Supervisors			
Role	Name of Faculty	Academic Unit in IITD/Institute/University	Email ID (Official)
Supervisor 1	Soumik Siddhanta	Chemistry	soumik@chemistry.iitd.ac.in
Supervisor 2	J K Sahu	CRDT	jksahu@iitd.ac.in

Project requirements (Student qualifications, experience required, etc) *The candidate will be shortlisted based on common shortlisting criteria decided by ScRC (SIRe)
- M Tech/ MSc in Chemistry/ Analytical Chemistry/Food Chemistry (Prior experience in spectroscopy/optical instrumentation or machine learning will be appreciated) - Other criteria as per the SIRe requirements

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:	
Supervisor-1	Dr. Siddhanta’s research has led to multiple collaborative projects on biomedical and pharmaceutical applications of fluorescence, Raman, surface-enhanced Raman spectroscopy and other analytical techniques. Dr. Siddhanta’s research experience in the broad field of analytical chemistry will be critical in measuring and detection of the micronutrients in a completely label-free, robust and user-friendly manner.
Supervisor-2	Dr. J K Sahu: Dr. Sahu is an expert in food process engineering, food standards, safety and regulations, food analysis and the allied field. Currently, his lab works on food-to-food fortification, micronutrient detection kits, monitoring of trans fats in fried foods, and 3D food printing.