

Indian Science Technology and Engineering facilities Map

(I-STEM)

Invites application for

1. Partial financial support for using R&D facilities in other institutions through the I-STEM web portal to Users from Academic Institutions and Start-ups (Format-1)

Format for requesting support for accessing and using facilities through the I-STEM web portal.

(i) Details of the Personal Information

- a. Name of the Researcher/~~Faculty Member~~: Supriya Vaish
- b. Name of the Institution/~~Start-up~~: Central University of Gujarat
- c. Name of the Department: School of Environment and Sustainable Development
- d. Degree registered for/Product being developed (for start-up): Ph.D.

(ii) Project/Research topic Details:

a. Project Title/Research Title: Bionanotechnological approaches for degradation of textile effluents

b. Sub area: Bionanotechnology

c. Area Description: Textile industries and mangrove ecosystems (effluent discharge point) in South Gujarat and Central Gujarat Region.

Adsorption technology for textile effluent may be an attractive method and Identification of more efficient nanoparticles, with higher adsorption capacity for selected dyes to eliminate selected dyes discharged from various industries could be degraded by natural bio-nano absorbent. Bio Nano adsorbents may contribute to future prospective water treatment process.

d. Aims & Objective (in Bullets):

Aim

- Degradation of textile effluents by employing biological and nano technological Approaches

Objectives

- Physico-chemical and microbial characterization of textile waste effluents (Industry Effluents).

- Assessment of bio-adsorbent from natural resources at discharge point
- Synthesis and Characterization of bio-adsorbent and bio-nano adsorbent.
- Remediation of textile effluents by synthesized bio-nano materials.

e. Duration (MM/YYYY): 3 years

f. Project Summary (1000 words): Gujarat is the home to the largest number of dye and textile industries. Effluents from these industries always remain a concern and major environmental issues for our ecosystem. The effluent emitting from industry including dye and its intermediate has very high concentration of BOD COD TDS and heavy metals including undesired pH. Treatment technologies also resulted in the release of large number of natural and synthetic hazardous effluents like chemicals dyes and heavy metals .Gujarat is a state with high industrial activities and agricultural production and thus proposed study will provide information for the current and future significance of wastewater treatment from textile industries. Azo dyes which are directly dumped into waterbodies which will help in degradation of complex dyes through advanced BioNanotechnological approaches at state and national level. Further the study will suggests the way to adapt most innovative technologies .BioNanotechnology is the first major worldwide research initiative of the 21st century and probably is the solution vector in the economic environment as well as environmental issues. Also innovation is widely recognized as a key factor in the economic development of nations and is essential for the competitiveness of the industrial firms as well Policy and management of innovation are necessary in order to develop innovation and it involves processes .It is essential to develop new methods for nanotechnology development for better understanding of nanotechnology based innovation. Nanotechnologies reveal commercialization processes from start-ups to large firms in collaboration with public sector research and environmental benefits. The output of the project will suggest that the effectiveness of bio Nano technological approaches will led to decolorization of textile dyes through natural adsorbent and chemically treated bionano adsorbent. These micro level technologies are adopted to innovate for sustainable use from lab to industrial and industrial to local peoples .There are bio-nano technologies are easily available to environment Policy and management of innovation are necessary in order to develop innovation and it involves processes. It is essential to develop new methods for nanotechnology development for better understanding of nanotechnology based innovation.

(Separate page may be attached to justify the requirements)

a. **Technical Details**

a. TRL:TRL 2

b. Methodology: Proposed work intimately tied with fieldwork followed by experimental work.

Sl. No.	Objective/Target	Proposed time period to achieve the given objective months/years
1.	(A) Physico-chemical and microbial characterization of textile waste effluents. (Gujarat Region) (B) Synthesis of bio-adsorbent and bio-nano adsorbent by mangrove plants. (Gujarat Region)	12 Months
2.	(C) Characterization of synthesized bio-adsorbent and bio-nano adsorbent. (D) Remediation of textile effluents by synthesized bio-nano materials.	12 onths

c. Design & development: NA

d. Facilities and Instrumentation required: FTIR, PSA, DLS, SEM, TEM, BET, TGA

e. Consumables (Scientific materials) : NA

13. Expected output and outcome

- Development of an efficient and effective Bio-nano material by mangrove resource (plant waste materials -bark, fallen leaves, Roots etc.) for the degradation and decolorization of complex azo dyes.
- Method development for effective bio encapsulated nanomaterial from bacteria, algae, fungi, actinobacteria.
- Bio-nanomaterial and bio-nano remediation technologies as a cost-effective and sustainable technologies for industries.

14. Industry/Institute Collaboration

If, yes

(i) Name of the Collaborating Industry/Institute

(ii) Collaboration Details

(iii) Additional Details if any

15. Funding required from I-STEM (with justification:

Details of Requirements & Mode of the Engagement: (Attach the quotation for the consumables)

(i) Short term Engagement:

a. Usage of testing/characterization facilities across the country (Characterization Mode)

i. Testing Charges

ii. Consumable charges

iii. Travel Cost (Boarding and Lodging, if any)

b. Usage of fabrication and testing facilities across the country (Fabrication Mode)

i. Fabrication and testing Charges

ii. Consumable charges (if any)

iii. Travel Cost (Boarding and Lodging, if any)

(ii) Medium term Engagement:

a. Execution of project in any one of the Host Institution (Project Mode)

a.Fabrication and or testing Charges

b.Consumable charges (if any)

c.Travel Cost (Boarding and Lodging, if any)

b. Execution of project in Multi Host Institutions (Project Mode)

a.Fabrication and or testing Charges

b.Consumable charges (if any)

c.Travel Cost (Boarding and Lodging, if any)

(Round-trip to the Host Institution by 2nd class (Non-AC) railway via the nearest route)

Details of User's Bank Account: 5999101001109

(Please send a copy of the cancelled cheque/copy of the passbook carrying all the information needed)

Beneficiary Name (User's name): Supriya Vaish

PAN:AZNPV8930E

Bank Account No. 5999101001109

Name of the Branch: Canara Bank, sector 29, Central University of Gujarat

IFSC Code: CNRB0005999

Note: Proposed proposal must be executed within stipulated duration (max. 6 month) to avoid fund availability issues. Travel form will be provided by the I-STEM office. The users will submit the technical report, original invoice (duly signed by the Head of the Institution) raised by the Host Institution through I-STEM portal only along with a copy of the travel forms and original tickets through post to the Nodal Officer, I-STEM, Indian Institute of Science, Bangalore. A scan copy of all the documents may be sent in advance.