

Curriculum Vitae

Sagar Pal, PhD

Professor, Department of Chemistry & Chemical Biology
IIT(ISM), Dhanbad
Jharkhand, India-826004.

Tel: +91-326-2235769 (O); +91-9471191529 (M)

Email: sagarpal@iitism.ac.in; sagarpal129@gmail.com

Webpage: <https://people.iitism.ac.in/~sagarpal/>



Personal details

Date of Birth: 10th June, 1977
Mother's name: Renuka Panda Pal.
Father's Name: Late Shyamapada Pal.
Permanent Address: Vill+P.O. – Bahurupa, Dist. – Paschim Medinipur, West Bengal, India - 721437.
Official address: Sagar Pal, PhD
Professor, Department of Chemistry & Chemical Biology
IIT(ISM) Dhanbad
Jharkhand, India– 826004
Nationality: Indian
Religion: Hinduism
Sex: Male
Family Status: Married, with two sons.
Language Known: English, Hindi and Bengali.

Educational Qualification:

• Secondary	WBBSE	1993	73.55 %
• Higher Secondary	WBCHSE	1995	67.8 %
• BSc Chem (Hons)	Midnapore College (VU)	1998	62.25 %
• MSc (Organic Chem)	Vidyasagar University	2000	76.1 %
• PhD	IIT Kharagpur	2006	--

Title of PhD thesis

Synthesis, characterization, flocculation and rheological characteristics of cationic polysaccharides.

Professional career:

• Professor	IIT(ISM) Dhanbad	12.04.2021 to date
• Associate Professor	IIT(ISM) Dhanbad	12.08.2012 - 11.04.2021
• Assistant Professor	IIT(ISM) Dhanbad	12.08.2009 - 11.08.2012
• Lecturer	BIT Mesra, Ranchi	01.11.2006 - 11.08.2009
• Scientist (R&D)	Hindustan Gum & Chemicals Ltd. Bhiwani, Haryana.	17.11.2004 - 30.09.2006

Awards & honours

- **MRSI Medal**, 2023.
- **Professor R. D. Desai 80th Birthday Commemoration Award-2021**, Indian Chemical Society, Kolkata.
- **Fellow, The Royal Society of Chemistry (FRSC)**.
- **Council Member**, International Council on Materials Education (ICME), USA.
- **Visiting Scientist**, National Centre for Nanostructured Materials, Council for Scientific and Industrial Research (CSIR), Pretoria, South Africa, **2017**.
- **DAAD Fellow**, University of Siegen, Germany, **2012**.
- **Young Scientist** (under DST FAST-TRACK Scheme), Department of Science & Technology, New Delhi, Govt. of India, **2010**.
- **Fellow**, Indian Chemical Society, **2009**.

Administrative Responsibilities

- **Dean (Research & Development)**, IIT(ISM) Dhanbad. 16th August, 2022 to date.
- **Associate Dean: R&D-Research Infrastructure**, IIT(ISM) Dhanbad. 1st April, 2020 to 18th October, 2023.
- **Head**, Central Research Facility, IIT(ISM) Dhanbad. 6th September, 2018 to 15th August, 2022.
- **Faculty-in-Charge**, Central Research Facility, IIT(ISM) Dhanbad. 1st July, 2014 – 5th September, 2018.
- **Faculty Coordinator**, Concetto-2017, IIT(ISM) Dhanbad.
- **Faculty Co-coordinator**, Concetto-2016, IIT(ISM) Dhanbad.
- **Faculty Coordinator - PhD**, Department of Chemistry, IIT(ISM) Dhanbad. 1st July, 2018 to 30th June, 2021.

Membership of professional bodies

- **Life Member**, The Society for Polymer Science, India.
- **Life Member**, Materials Research Society of India.
- **Life Member**, Chemical Research Society of India.
- **Life Member**, Indian Chemical Society

Research interest

- Polymeric gels, amphiphilic copolymers and their biomedical applications.
- Polymeric flocculants, photocatalysts towards environmental remediation.

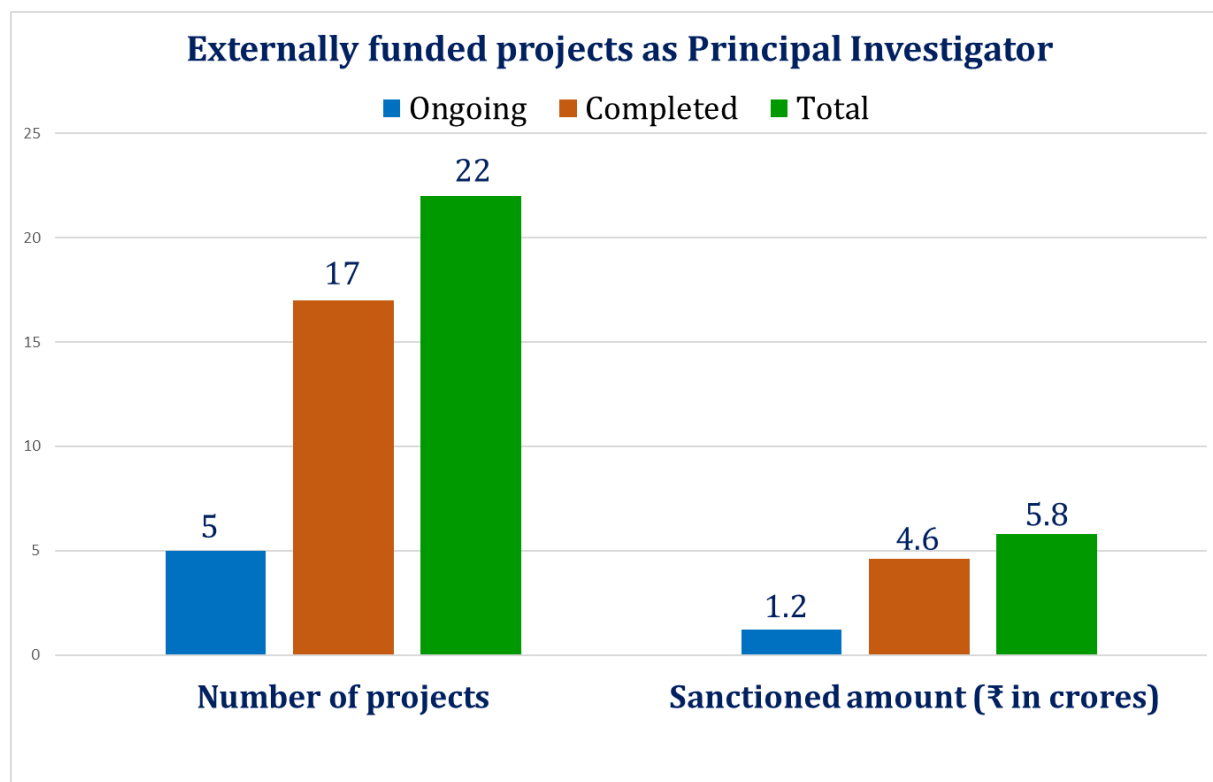
Research Records & Citations

Publications: 112 (Articles/Communications)
Patents: 12 (Granted: 7, Filed: 5)
Book chapters: 05
h-index: 48 (google Scholar)
i10-index: 100 (google Scholar)
Citations: >7200 (google Scholar)
ORCHID ID: 0000-0002-3425-7010

Coordinator/PIC in the Externally Funded CoEs

- **Coordinator & Head**, "Wadhvani Innovation Network-Centre of Excellence (WIN CoE)", IIT(ISM) Dhanbad. 21st October, 2024 to 20th October, 2029 (**Sanctioned budget: ₹ 42.0 Crores**).
- **Professor-in-Charge**, "Tata Steel Innovation Centre on Mining and Mineral Research", IIT(ISM) Dhanbad. 2nd March, 2023 to 1st March, 2028 (**Sanctioned budget: ₹ 23.15 Crores**).

Externally Sponsored Projects as Principal Investigator



R&D Projects as Principal Investigator

Ongoing: 04

- (4) **Title:** Development of novel high-performance polymeric admixture for concrete and thereof
JSW Cement Limited, Mumbai.
 Sanctioned amount: Rs. 1575300/-. Duration: 1st Sep, 2024 to 30th November, 2025.
- (3) **Title:** Effective utilization and life enhancement of tailing pond at West Bokaro.
Tata Steel Ltd., Jamshedpur
 Sanctioned amount: Rs. 2726484/-; Duration: 1st June, 2024 to 30th Sept, 2025.
- (2) **Title:** AI-driven synthesis of green flocculant and its application towards the treatment of mine process effluent.
TEXMiN Foundation, IIT(ISM) Dhanbad
 Sanctioned amount: Rs. 1994000/-. Duration: 24th April, 2024 to 23rd April, 2025.
- (1) **Title:** Polysaccharide based copolymeric hydrogels for biomedical applications.
SERB, DST, New Delhi.
 Sanctioned amount: Rs. 2622400/-; Duration: 9th May, 2023 to 8th May, 2026.

Completed: 16

- (16) **Title:** STUTI IIT(ISM) Dhanbad - 2021.
DST, New Delhi.
Sanctioned amount: Rs. 22447000/-; Duration: 9th Feb, 2022 to 31st August, 2023.
- (15) **Title:** Novel polymeric flocculants towards selective removal of iron ore particles with enhanced efficiency.
Tata Steel Ltd., Jamshedpur.
Sanctioned amount: Rs. 944000/-; Duration: 19th Oct, 2020 to 31st March, 2023.
- (14) **Title:** Modification of polysaccharides for various commercial applications.
Hindustan Gum & Chemicals Ltd., Bhiwani, Haryana.
Sanctioned amount: Rs. 1080000/-; Duration: 26th Nov, 2019 to 25th Nov, 2022.
- (13) **Title:** Novel Organic Binder Synthesis and Characterization for Iron Ore Palletization.
Tata Steel Ltd., Jamshedpur.
Sanctioned amount: Rs. 885000/-; Duration: 19th Oct, 2020 to 18th Oct, 2022.
- (12) **Title:** Rational design of amphiphilic self-assembled graft copolymers as drug carriers: experimental and theoretical approach.
SERB, DST, New Delhi.
Sanctioned amount: Rs. 2787400/-; Duration: 12th March, 2019 to 11th March, 2022.
- (11) **Title:** Studies on different flocculants for solid-liquid separation processes of coal preparation plant Tailings.
Tata Steel Ltd., Jamshedpur.
Sanctioned amount – Rs. 1150000/-; Duration: Aug, 2018 to March, 2021.
- (10) **Title:** Titanate nanosheet/cationically modified dextrin through in-situ exfoliation: Development and application towards enhanced dye adsorption and photodegradation property.
CSIR, New Delhi.
Sanctioned amount – Rs. 1100000/-; Duration: 15th July, 2017 to 14th July, 2020.
- (9) **Title:** Development of ternary nanocomposite hydrogel derived from functionalized biopolymer amylose/TiO₂-AgNPs and its potential application towards treatment of wastewater.
DST, New Delhi (Under Water Technology Initiative).
Sanctioned amount – Rs. 2390520/-; Duration: 18th March, 2017 to 30th June, 2020.
- (8) **Title:** Selection, detailed characterization and optimization of commercial flocculants towards the treatment of major water consuming unit of steel plant.
Tata Steel Ltd., Jamshedpur.
Sanctioned amount – Rs. 1265000/-; Duration: April, 2017 to Dec, 2018.
- (7) **Title:** Novel modified biopolymer-based hydrogels and nanogels: synthesis, characterization and application.
SERB, DST, New Delhi (Under EMR scheme).
Sanctioned amount – Rs. 3526000/-; Duration: 22nd June, 2015 to 21st June, 2018.
- (6) **Title:** Detailed Characterization and Analysis of Commercial Flocculants for Flocculation of Iron Ore.
Tata Steel Ltd., Jamshedpur.
Sanctioned amount – Rs. 800000/-; Duration: May, 2016 to March, 2017.
- (5) **Title:** High performance multifunctional guar gum for wastewater and industrial effluent treatment.
DST, New Delhi (Under WTI Scheme).
Sanctioned amount – Rs. 2847600/-; Duration: 20th June, 2013 to 19th June, 2016.

- (4) **Title:** Polyacrylamide grafted hydroxypropyl methyl cellulose (HPMC-g-PAM): Development and application as an efficient polymeric flocculant and viscosifier.
DST, New Delhi (Under Young Scientist Scheme).
Sanctioned amount – Rs. 1775000/-; Duration: 21st Sept, 2010 to 20th March, 2014.
- (2) **Title:** Amphoteric xanthan gum (AXG): Synthesis, characterization and application as a novel polymeric flocculant for the treatment of industrial wastewater.
DST, New Delhi (Under TSD PROGRAMME).
Sanctioned amount – Rs. 1545360/-; Duration: Oct, 2010 to 31st Mar, 2014.
- (2) **Title:** Synthesis and application of a novel polymeric biomaterial based on polyacrylamide grafted carboxymethyl guar gum (CMG-g-PAM).
UGC, New Delhi (Major Research Project).
Sanctioned amount – Rs. 226000/-; Duration: May, 09 to April, 2012.
- (1) **Title:** Development and applications of hydrolyzed and unhydrolyzed polyacrylamide grafted tamarind kernel powder (TKP) as flocculants for wastewater treatment.
DST, New Delhi (Under TECHNOLOGY SYSTEM GROUP).
Sanctioned amount – Rs. 810120/-; Duration: 30th April, 2008 to 11th August, 2009.

Consultancy Projects as Consultant-in-Charge

Ongoing: 01

- (1) **Title:** Synthesis of Graphene Quantum Dot from Coal Tar using Microwave Irradiation.
Tata Steel Ltd., Jamshedpur.
Sanctioned amount: 22,71,500/-. Duration: Oct, 2023-Sept, 2025.

Completed: 01

- (1) **Title:** Detailed analysis and in-depth interpretation of various polymeric and inorganic materials.
Tata Steel Ltd., Jamshedpur.
Sanctioned amount: 590000/-. Duration: Oct, 2023-Sept, 2024.

PhD Guidance: ongoing - 7

- **Mr. Kalipada Manna**, SRF, Institute Fellow
M. Sc. (Chemistry): Vidyasagar University, India.
Joining: April, 2019.
- **Mr. Shaon Dey**, SRF, Institute Fellow
M. Sc. (Chemistry): Vidyasagar University, India.
Joining: May, 2019.
- **Mr. Padmapani Pradhan**, JRF, Institute Fellow
MSc (Chemistry): Vidyasagar University, India.
Joining: Aug, 2022.
- **Mr. Sanjib Ghosh**, JRF, Project Fellow
MSc (Chemistry): Vidyasagar University, India.
Joining: May, 2023.
- **Mr. Subha Samanta**, JRF, Institute Fellow
MSc (Chemistry): IIT(ISM) Dhanbad, India.
Joining: January, 2024.

- **Mr. Sourav Batabyal**, JRF, Institute Fellow
MSc (Chemistry): Burdwan University, India.
Joining: July, 2024
- **Mr. Suvamay Maity**, JRF, Institute Fellow
MSc (Chemistry): Vidyasagar University, India.
Joining: December, 2024

PhD Guidance: completed - 15

15. **Dr. Kaushik Singha (2017-2024)**
Thesis title: Rational design of polymeric materials for wastewater remediation in a sustainable manner.
Degree received: November, 2014.
14. **Dr. Abanindra Nath Sarkar (2017-2023)**
Thesis title: β -Cyclodextrin based biocompatible hydrogels/nanogels and their application in controlled/targeted drug delivery.
Degree received: June, 2023
Present Status: Assistant Manager (R&D), Black Rose Industries Ltd., India.
13. **Dr. Arpita Roy (2016-2022)**
Thesis title: β -Cyclodextrin based biocompatible hydrogels/nanogels and their application in controlled/targeted drug delivery.
Degree received: July, 2022
Present Status: Post-Doctoral Research Fellow, University of California, Los Angeles.
12. **Dr. Puja Das Karmakar (2016-2022)**
Thesis title: Synthesis of amphiphilic graft and graft-block copolymers and their potential applications.
Degree received: February, 2022.
Present status: Post-Doctoral Research Fellow, National Institute for Materials Science, Ibaraki, Japan.
11. **Dr. Priyapratim Patra (2014-2020)**
Thesis title: Novel modified biopolymer-based hydrogels and nanogels: synthesis, characterization and application
Degree received: August, 2020
Present status: Deputy Manager (R&D), JSW Cement Ltd., Vijaynagar Works, Karnataka.
10. **Dr. Lipi Midya (2014-2019)**
Thesis title: Polymeric Nanocomposites derived from functionalized chitosan: Development and Application
Degree received: December, 2019.
Present status: Registering Authority (FSSAI) & Food Safety Officer, West Bengal General Service, Govt of West Bengal, India.
9. **Dr. Barun Mandal (2014-2018)**
Thesis title: Nanofillers incorporated crosslinked carboxymethyl cellulose: Development and application in sustained transdermal drug delivery.
Degree received: March, 2018.
Present status: Post Doc Fellow, Presidency University, Kolkata, India.

8. **Dr. Abhay Shankar Patra (2013-2018)**
Thesis title: Multifunctional guar gum derivatives/SiO₂ hybrid nanocomposites: Synthesis, characterization and application as flocculants as well as adsorbents.
Degree received: February, 2018.
Present status: Principal Researcher, Raw Materials Research group, Research & development, Tata Steel Ltd.

7. **Dr. Amrita Biswas (2013-2018) (as co-guide)**
Thesis title: Studies on some grafted or modified natural polymers as corrosion inhibitor for mild steel in acidic medium.
Degree received: August, 2018.
Present status: Assistant Professor, Manipal University Jaipur, India.

6. **Dr. Aniruddha Pal (2013-2018)**
Thesis title: Development and applications of graft and block copolymers using ATRP/RAFT techniques.
Degree received: January, 2018.
Present status: JSPS fellow at National Institute of Advanced Industrial Science and Technology, Japan.

5. **Dr. Dipankar Das (2012-2016)**
Thesis title: Development and applications of functionalized dextrin-based hydrogels/nanogels towards controlled/targeted drug delivery.
Degree received: August, 2016.
Present status: Assistant Professor, NIPER, Mohali, India.

4. **Dr. Amit Kumar Sarkar (2012-2016)**
Thesis title: Polymeric nanocomposites derived from functionalized amylopectin and layered titanate/nano TiO₂: Development and application.
Degree received: July, 2016.
Present status: Senior Scientist, PACT, Cambridge, UK.

3. **Dr. Raghunath Das (2011-2015)**
Thesis title: Hydroxypropyl methyl cellulose based graft copolymers/nanocomposite: Development and application in the field of controlled drug release.
Degree received: April, 2015.
Present status: Assistant Manager (R&D), Oriental Carbon & Chemicals Limited, Rewari (Haryana), India.

2. **Dr. Soumitra Ghorai (2010-2015)**
Thesis Title: Modified xanthan gum/silica hybrid nanocomposite: Synthesis, characterization and application.
Degree received: March, 2015.
Present status: Principal Researcher (R&D), Tata Steel Ltd., Jamshedpur.

1. **Dr. Gautam Sen (2006-2010)**
Thesis title: Synthesis and characterization of hydrolyzed and unhydrolyzed polyacrylamide grafted carboxymethylstarch (CMS-g-PAM) and their applications.
Degree received: August, 2010.
Present status: Assistant Professor, Birla Institute of Technology Mesra, Ranchi, India.

Post-doc guidance: 02 (ongoing); 03 (Completed)

MPhil project guidance: 02

MTech (Pharmaceutical Science Engg.) project guidance: 05

MSc project guidance: 43

Reviewer of Journals

Advanced Materials; ACS Applied Bio Materials; ACS Applied Polymeric Materials; ACS Applied Materials & Interfaces; ACS Applied Energy Materials; ACS Applied Electronic Materials; ACS Omega; ACS Sustainable Chemistry & Engineering; Acta Biomaterialia; Biomacromolecules; Bioresource Technology; Carbohydrate Polymers; Carbon; Cellulose; Chemical Communications; Chemical Engineering Journal; Chemical Society Review; Chemosphere; Colloids and Surfaces A: Physicochemical and Engineering Aspects; Industrial & Engineering Chemistry Research; International Journal of Biological Macromolecules; Journal of Applied Polymer Science; Journal of Hazardous Materials; Journal of Materials Chemistry A; Journal of Materials Chemistry B; Journal of Molecular Liquids; Journal of Physical Chemistry; Langmuir; Macromolecular Symposia; Materials Science and Engineering B; New Journal of Chemistry; Polymer Bulletin; Polymer Chemistry; Polymer Engineering and Science; RSC Advances; Scientific Reports; Starch; Water Research.

Invited Lectures/Guest Lectures/Technical Talks/ Session chair

- **Delivered an Invited talk** on “Polymeric Gels and Micelles: An Overview from Synthesis to Applications” in International Conference on Advances in Materials and Chemical Sciences (AMCS-24) during Dec 18-20, 2024 at BIT, Mesra, Ranchi on 18th December, **2024**.
- **Delivered an Invited talk** on “*Biopolymeric Materials: From Development to Applications in Environmental Remediation*” in AICTE-VAANI sponsored seminar on RA2M-SD 2024 during August 7-9, 2024 at HIT, Haldia on 8th August, **2024**.
- **Chairperson of Technical Session 4**, International Conference on Materials and Membranes for Water and Energy (ICMMWE-2024), CSMCRI, Bhavnagar, during July 10-12, **2024**.
- **Delivered an Invited talk** on “*Biopolymeric Gels and Micelles for Biomedical Applications*” in International Conference for Functional Materials and Polymer Technology (ICFMPT-2024) during March 14-16, 2024 at ICT-Mumbai, IOC Bhubaneswar campus on 16th March, **2024**.
- **Delivered MRSI Medal Lecture** on “*Polysaccharide-based Copolymeric Gels and Micelles for Biomedical Applications*” in 34th AGM of MRSI during December 12-15, 2023; 2023 at IIT(BHU), Varanasi on 14th December, **2023**.
- **Delivered an Invited talk** on “*Polysaccharide-Based Reagents for the Treatment of Mine Process Water*” in 4th International Conference on Emerging Smart Materials in Applied Chemistry (ESMAC-2023) during November 18-20; 2023 at KIIT-DU, Bhubaneswar on 18th November, **2023**.

- **Delivered an Invited talk** on “*Polysaccharide/oligosaccharide based copolymeric gels for various biomedical applications*” in a National Conference on the theme "Science & Technology for Sustainable World" during March 14-15; 2023 at KIIT-DU, Bhubaneswar on 14th March, **2023**.
- **Delivered an Invited talk** on “*Biopolymeric materials towards treatment of industrial wastewater*” in conference on “Emergent Materials for Energy and Environment (EMEE-2023)” during March 04-05, 2023; Organized by IIT Roorkee on 4th March, **2023**.
- **Delivered an Award Lecture** on “Biopolymeric flocculants: Development and applications” in an International Seminar Recent Trends in Chemical Science-2022 (RTCS-2022) on 18th December, 2022; organized by Indian Institute of Technology (ISM) Dhanbad in collaboration with Indian Chemical Society, Kolkata During 16-18 December, **2022**.
- **Chairperson of Technical Session 3**, International Seminar on Advance Research in Molecular & Material Science - 2022 (ARM2S - 2022) during March 01 – 02, **2022**; Jointly Organized by Department of Chemistry, Sitananda College, Purba-Medinipur, West Bengal & Sikkim Manipal Institute of Technology, Majhitar, Rangpo, Sikkim in collaboration with Indian Chemical Society, Kolkata.
- **Delivered an Invited talk** on “*Polysaccharides/oligosaccharide-based gels as drug carriers*” in an International Seminar (Platform: Google meet) on Recent Advances in Chemistry & Material Sciences - 2020 (RACMS-2020) in Commemoration of the birth anniversary of Acharya Prafulla Chandra Ray, organized by Indian Chemical Society, in collaboration with American Chemical Society, on 8th August, **2020**.
- **Delivered a talk as Resource Person** on “*Modification of biopolymers and their potential applications*” in the One-day National WEBINAR on Recent Development of Chemistry, RDC 2020, organized by Kharagpur College on 20th June, **2020**.
- **Invited Lecture** on “*Modified Polysaccharides as Drugs Carrier*”, at POLY-CHAR 2019 [Kathmandu], Polymer for Sustainable Development, 19th – 23rd May, **2019** at Park Village Resort, Kathmandu, Nepal.
- **Technical Talk** on “*Functionalized polysaccharides towards treatment of wastewater*”, in the International Conference “Application of Supramolecular Chemistry in Water Treatment” An Innovative approach; during 4th - 5th Feb, **2019** at Tata Steel, Jamshedpur.
- **Invited Lecture** on “*Development and applications of biopolymeric hydrogels towards controlled release of model drugs*”, at SPSI MACRO-2018, 19th – 22nd December, **2018** at IISER, Pune.
- **Invited Lecture** on “*Modified Biopolymeric Composites: Efficient Photocatalysts towards Degradation of Toxic Organic Contaminants*”, at Innovation in Materials Science & Technology, (IMST-2018), 14th – 16th December, **2018**, at Amity University, Kolkata.
- **Invited Lecture** on “*Biopolymeric hydrogels/nanogels/composites: Development and applications*”, at National Centre for Nano-structured Materials, CSIR, Pretoria, South Africa on 9th June, **2017**.

- **Technical Talk** on “*Functionalized Biopolymer: Development and Applications*”, in Workshop on “Synthesis and Characterization of Additives”, Organized by Tata Steel R&D, Jamshedpur on 16th January, **2017**.
- **Invited Lecture** on “*Biopolymeric hydrogels/nanogels: application towards controlled/targeted drug delivery*”, in RECENT ADVANCES IN LIFE SCIENCE IN THE LIGHT OF CHEMISTRY, Organized by Dept. of Chemistry, Bethune College, Kolkata in collaboration with Royal Society of Chemistry (Eastern India Section), on 9th September, **2016**.
- **Invited Lecture** on “*Biopolymer dextrin-based hydrogels/microgels: Application in controlled/targeted drug delivery*”, in an International Conference on Energy, Functional Materials and Nanotechnology (ICEFN – 2016), held at Kumaun University, Nainital, during 27th – 29th March, **2016**.
- **Guest Lecture** on “*Modified Polysaccharides: Development, characterization and applications*” at TATA STEEL R&D on 9th January, **2015**.
- **Invited Lecture** on “*Modified xanthan gum/SiO₂ hybrid nanocomposite: Efficient adsorbent for removal of toxic dyes and metal ion*” in an International Conference and Expo on Recent Advances in Polymer & Rubber Science & Technology (RAPT – 2014), held at University of Calcutta, during 22nd – 24th January ‘**2014**.
- **Guest Lecture** on “*Modified polysaccharides: Application in wastewater treatment*” in One Day National Seminar on “Recent Trends in Macromolecular Science and composite Technology” held at VIT, Chennai on **17.03.2012**.
- **Invited Lecture** on “*Synthesis, macromolecular characterization and rheological applications of hydrolyzed and unhydrolyzed polyacrylamide grafted carboxymethyl starch (CMS-g-PAM)*” in the International Conference ICPPC – 2010 in Kottayam, Kerala, India during 15th – 17th January, **2010**.