ADITYA KUMAR KAR (Ph.D)
Assistant Professor-II
Adamas University, Kolkata
Postdoctoral Research Fellow
Karolinska Institute, Sweden
M.Sc. (Forensic Science)
UGC-NET JRF 2014
Contact: +91-7987421668
Email: adi4658kar@gmail.com, aditya3.kar@adamasuniversity.ac.in
Google Scholar: https://scholar.google.com/citations?user=93OQ76wAAAAJ&hl=en

Broad Work and Research experience –

1. *Crime Scene Investigation*
2. *Handwriting and Signature analysis.*
3. *Fingerprint analysis is solving Criminal and Civil cases.*
4. *Lip Print examination in Personal Identification.*
5. *Synthesis, Characterization, and toxicity assessment (in-vitro, in-vivo) of nano formulations.*
6. *Blood grouping from dried blood stains, found on different objects at SOC.*
7. *Development of natural polymer based effective hydrogel system with synergistic activity of silver NPs and EGCG towards* Critical Bone Defects and Wound Healing.
8. *Regenerative Medicine for Critical Bone Defects and Wound Healing.*
9. *Liposomes based drug delivery system for treatment of Alzheimer's disease.*

Professional/Research experience –

Sept. 2023 – till date:
Assistant Professor-II
Department of Forensic Science
Adamas University, Kolkata, West Bengal, India

Sep. 2023- August 2025:
Postdoctoral Research Fellow
Dept. of Neurobiology, Care Sciences and Society,
Karolinska Institute, Sweden

April 2021- Aug. 2023:
Assistant Professor
Department of Forensic Science
Adamas University, Kolkata, West Bengal, India

Aug. 2015- March 2021 (Ph.D): (Chemical Sciences)
Junior and Senior Research Fellow
Nanotherapeutics and Nanomaterial Toxicology Group,
CSIR-Indian Institute of Toxicology Research, Lucknow (UP), India
Thesis Title- "Development of Effective hydrogel systems for wound healing in normal and diabetic condition"
Award date – 11/11/2021.

Oct. 2014- July 2015:
Research Fellow
Dept. of National Centre for Natural Resources (NCNR), funded by DST, at Pt. Ravishankar Shukla University, Raipur, Chhattisgarh, India
Project entitled- "Socio-demographic and Autoimmune disease survey among rural population of Chhattisgarh."

April 2013- Oct. 2014: **Junior Forensic Expert**
Dhenge Forensic Consultancy, Raipur, Chhattisgarh, India.

Research Funding Obtained as Main Applicant-

1) Research grant for alderssjukdomar vid KI 2024 – 250000 SEK **(21,25000 INR)**
2) Research grant For Gamla Tjänarinnor – 85000 SEK **(722500 INR)**
3) Gun och Bertil Stohnes research grant – 40000 SEK **(340000 INR)**
4) Loo och Hans Ostermans research grant 2024 – 200000 SEK **(1700000 INR)**

TRAININGS AND INTERNSHIPS

- **PG Level**
  Techniques learnt-
  1. Crime Scene Investigation (Investigation, Sketching, Photography)
  2. Collection, Preservation, Packaging and Forwarding of Forensic evidence
  3. Analysis of Biological (Blood and Semen) evidence
  4. Report writing after analysis.

- Field investigation as a Trainee under Dr. B. P. Maithil, SSO, Crime Scene Unit Durg, Chhattisgarh from 16th May 2012 to 31st May 2012.

- Sample analysis in Toxicology and Biology branch as Trainee for PG project work at State Forensic Science Laboratory, Raipur (CG) from 01st January 2013 to 31st March 2013.

  Project entitled "Sensitivity of absorption elution technique in blood grouping of dried blood stain."
  Summary - The project involved the study of the effect of surface bearing blood stains on origin of species examination. Along with it, the determination of the sensitivity of Absorption-Elution technique on five-year-old dried blood stains on different substrates. Further there was assessment with other factors that dried blood stains encountered after possession.

- **UG level**
  Key techniques learnt-
  1. DNA Isolation from blood
  2. PCR and Gel Doc

  Project entitled "Genotyping for investigating Human mtDNA and Y- chromosomal variation among Tribal Population in India" in Anthropological Survey of India, Mysore, and Karnataka from 1st February 2012 to 1st May 2012.

SUMMARY OF SKILLS

- Accented with the latest trends and techniques of the field having an inborn quantitative aptitude & determination to carve a successful career in the industry or academia
- Exposure of handling various analytical instruments like **HPLC, FT-IR, DLS, UV Spectrophotometer, PCR, Gel Doc, Electrophoretic System, BET, TGA, XRD etc.**
- Familiar with nanomaterial synthesis & their biomedical application

- Exposure of cell culture facilities
- Excellent in working in both *in vivo* and *in vitro* systems
- Mice handling (oral gavages feeding, intraperitoneal and subcutaneous injections), dissection.
- Induction of *type I* and *type II* diabetic model in mice
- *In vivo* wound healing assays
- Hematology and bio-chemistry, histo-pathology examination
- Light/fluorescence microscopy, and immunofluorescence (immunohistochemistry & immunocytochemistry), various enzyme activity assays
- Image processing software (Image J, Adobe Photoshop), analysis software (Omnic, BMG LabtechFluoStar Omega, BelMaster) and statistical analysis software (GraphPad Prism)
- Self-motivated and goal-oriented with a high degree of flexibility, creativity, resourcefulness, commitment, and optimism.

PUBLICATIONS

1. **Kar AK,** Singh A, Dhiman N, Purohit MP, Jagdale P, Kamthan M, Singh D, Kumar M, Ghosh D, and Patnaik S**.** Polymer assisted in situ synthesis of silver nanoparticles with epigallocatechin gallate (EGCG) impregnated wound patch potentiate controlled inflammatory responses for brisk wound healing. [International Journal of Nanomedicine, 2019, DOI: 10.2147/IJN.S228462]
2. Dogra S, **Kar AK**, Girdhar K, Daniel VP, Chatterjee S, Choubey A, Ghosh S, Patnaik S, Ghosh D, Mondal P. Zinc oxide nanoparticles attenuate hepatic steatosis development in high-fat-diet fed mice through activated AMPK signaling axis. [Nanomedicine: Nanotechnology, Biology, and Medicine, 2019] DOI: 10.1016/j.nano.2019.01.013. (**Equal First authorship**)
3. Dwivedi SK, Ali R, Singh M, Ali R, **Kar AK**, Ved prakash, Anbumani S, Patnaik S, Mishra A, A simple naphthalimide based PET probe for Fe3+ and selective detection of pyrophosphate through displacement approach: Cell imaging studies and logic interpretation. [Journal of Photochemistry & Photobiology A: Chemistry, 2020, DOI: 10.1016/j.jphotochem.2020.112854]
4. Singh A, Dhiman N, **Kar AK,** Purohit MP, Singh D, Ghosh D, and Patnaik S. Advances in controlled release pesticide formulations: Prospects to safer integrated pest management and sustainable agriculture. [Journal of Hazardous Material 2020, DOI:10.1016/j.jhazmat.2019.121525]
5. Choubey A, Girdhar K, **Kar AK,** Chattopadhyay T, Dogra S, Kushwaha S, Medhi B, Bhansali A, Mantri CK, Seetharam UK, Ghosh D, Mondal P. Low dose naltrexone rescues inflammation and insulin resistance associated with hyperinsulinemia. [Journal of Biological Chemistry, 2020 DOI: 10.1074/jbc.RA120.013484]
6. Verma N, Purohit MP, Equbal D, Dhiman N, Singh A, **Kar AK**, Shankar J, Tahlan S, Patnaik S. Targeted smart pH responsive N,O-Carboxymethyl Chitosan Conjugated Nanogels for Enhanced Therapeutic Efficacy of Doxorubicin in MCF‐7 Breast Cancer Cells. [ACS, Bioconjugate Chemistry, 2016 DOI: 10.1021/acs.bioconjchem.6b00366]
7. Purohit MP, Verma N, **Kar AK,** Singh A, Ghosh D, and Patnaik S. Inhibition of thioredoxin reductase by targeted selenopolymeric nanocarriers synergizes the therapeutic efficacy of doxorubicin in MCF7 human breast cancer cell lines. [ACS Appl. Mater. Interfaces, 2017 DOI: 10.1021/acsami.7b07056]
8. Dhiman N, Singh A, **Kar AK,** Purohit MP, and Patnaik S. Comprehensive Array of Ample Analytical Strategies for Characterization of Nanomaterials in CRC Press, Taylor & Francis Group commissioned book entitled "Functionalized Nanomaterials I: Fabrication" [DOI: 10.1201/9781351021623-1, 2020]**(Book Chapter)**

9. Sinha M, **Kar AK**, Mitra M. Extent of lip print pattern variation among people of Raipur, metal Chhattisgarh, India. [International Journal of current research, Vol. 08, Issue, 04, pp. 28965-28970, April, 2016.]
10. Singh A, **Kar AK**, Singh D, Verma R, Shraogi N, Zehra A, Gautam K, Sadashivam A, Ghosh D, and Patnaik S. pH-responsive eco-friendly chitosan modified cenosphere/alginate composite hydrogel beads as carrier for controlled release of Imidacloprid towards sustainable pest control. [Chemical Engineering Journal, 2021 DOI: 10.1016/j.cej.2021.131215]
11. Verma N, **Kar AK**, Singh A, Jagdale P, Satija NK, Patnaik S, Ghosh D, Patnaik S. Control Release of Adenosine Potentiate Osteogenic Differentiation within a Bone Integrative EGCG-g-NOCC/Collagen Composite Scaffold toward Guided Bone Regeneration in a Critical-Sized Calvarial Defect. [Bio-Macromolecules, 2021 DOI: 10.1021/acs.biomac.1c00513]
12. Ahmadi Z, Yadav S, **Kar AK**, Jha D, Gautam HK, Patnaik S, Kumar P, Sharma AK, An injectable self-assembling hydrogel based on RGD peptidomimetic β-sheets as multifunctional biomaterials. (Material Science and Engineering C, 2021, DOI: 10.1016/j.msec.2021.112633)
13. **Kar AK**, Singh A, Singh D, Verma R, Shraogi N, Saji J, Jagdale P, Ghosh D, and Patnaik S. Biopolymeric composite hydrogel loaded with silver NPs and epigallocatechin gallate (EGCG) effectively manages ROS for rapid wound healing in type II diabetic wounds. (International Journal of Biological Macromolecules, 2022, DOI: 10.1016/j.ijbiomac.2022.06.196)
14. Rai P, Mehrotra S, Gautam K, Kar AK, Saxena A, Patnaik S, Anbumani S, Pandey A, Priya S, Sharma SK, Polylactic acid/tapioca starch/banana peel-based material for colorimetric and electrochemical biosensing applications. [Carbohydrate Polymer, 2023, DOI:10.1016/j.carbpol.2022.120368]
15. Purohit MP, **Kar AK**, Kumari M, Ghosh D, Patnaik S- "Heparin Biofunctionalized Selenium Nanoparticles as Potential Antiangiogenic–Chemotherapeutic Agents for Targeted Doxorubicin Delivery" (ACS Appl. Mater. Interfaces, 2023, DOI: 10.1021/acsami.3c00219)
16. **Kar AK,** A review on nanomaterials for developing latent fingerprints (International Journal of Forensic Sciences, 2022, DOI: 10.23880/ijfsc-16000268)
17. Bhattacharjee R, Singha TK and **Kar AK**- "Psycho-Criminological Profiling of Juvenile Serial Killers". (Gradiva Review Journal (ISSN NO : 0363-8057), 2023, volume 9 issue 3, page no. 547-559)
18. Sarkar D, Patel R, **Kar AK**- "Occurrence of major white-collar crimes in West Bengal (India) from 2001-2022: a comprehensive study" (Gradiva Review Journal (ISSN NO : 0363-8057), 2023, volume 9 issue 2, page no. 795-806)
19. Chatterjee S, Patel R, **Kar AK**- "Crime against women: survey of crimes committed against women in west Bengal in the recent time" (Gradiva Review Journal (ISSN NO : 0363-8057), 2023, volume 9 issue 5, page no. 90-102)
20. Bhattacharjee R, **Kar AK**- "Cheiloscopy: A crucial technique in forensics for personal identification and its admissibility in the Court of Justice" (Elsevier, Morphologie, 2024, DOI:10.1016/j.morpho.2023.100701)
21. Singh A, Shraogi N, Verma R, Saji J, **Kar AK**, Tehlan S, Ghosh D, and Patnaik S Challenges in current pest management practices: Navigating problems and a way forward by integrating controlled release system approach (Chemical Engineering Journal, 2024, DOI: 10.1016/j.cej.2024.154989)
22. **Kar AK**, Patel R., Nandi T. Introduction to Sweat and Its Forensic Analysis, Springer book entitled "Fundamentals of Forensic Biology", 2024 (DOI: 10.1007/978-981-99-3161-3_11) **(Book Chapter)**
23. **Kar AK**, Patel R., Debnath A. Introduction to Saliva and Its Forensic Analysis, Springer book entitled "Fundamentals of Forensic Biology", 2024 (DOI: 10.1007/978-981-99-3161-3_8) **(Book Chapter)**

24. **Kar AK**, Chakraborty C., Uppal P. Introduction to Vomitus and Its Forensic Analysis, Springer book entitled "Fundamentals of Forensic Biology", 2024 (DOI: 10.1007/978-981-99-3161-3_13) **(Book Chapter)**
25. Shraogi N, Verma R, Saji J, Singh A, Singh D, **Kar AK**, Tehlan S, Ghosh D, and Patnaik S Phyto-nanotherapeutics: An emerging frontier in advancing Phytopharmaceuticals: Challenges and Opportunities, 2026, Sustainable Materials and Technologies (DOI: 10.1016/j.susmat.2026.e01923).
26. **Kar AK,** Shraogi N, Saji J, Verma R, Singh D, Singh A, Ghosh D, and Patnaik S, Comparative study on green versus chemical synthesis for metallic NPs with respect to physicochemical characterization and toxicity, Next Materials, 2025 (DOI: doi.org/10.1016/j.nxmate.2025.101184)

PAPERS/ ABSTRACTS PRESENTED/ PUBLISHED IN CONFERENCES/ SEMINARS/ SYMPOSIA

1. Environmentally friendly ZnO/SiO2 based nanopesticide formulation for sustainable agriculture. Amrita Singh, Aditya K Kar, Divya Singh, Nitesh Dhiman, Debabrata Ghosh, Satyakam Patnaik, 6th International Conference on Advanced Nanomaterial and Nanotechnology (ICANN2019), Centre for Nanotechnology, Indian Institute of Technology Guwahati (IITG), India, December 18- 21, 2019.
2. Silver NPs-EGCG Impregnated Natural Polymer-based Hydrogel Potentiate Controlled Inflammatory Responses for Brisk Wound Healing. Aditya K Kar, Amrita Singh, Nitesh Dhiman, Mahaveer P Purohit, Divya Singh, Debabrata Ghosh, Satyakam Patnaik, 6th International Conference on Advanced Nanomaterial and Nanotechnology (ICANN2019), Centre for Nanotechnology, Indian Institute of Technology Guwahati (IITG), India, December 18-21, 2019.
3. Polymer matrix mediated green synthesis of bimetallic (Au/Ag) nanoparticle for synergistic antibacterial and catalytic effects. Nitesh Dhiman, Aditya K Kar, Mahaveer P. Purohit, Amrita Singh, Debabrata, Ghosh, Satyakam Patnaik, 24th CRSI National Symposium in Chemistry (CRSI-NSC-24), CSIR-CLRI, Chennai, February 8 to 10, 2019.
4. Doxorubicin loaded Selenopolymeric nanocomposites: A smart tool to achieve synergistic cancer cell death. Mahaveer P. Purohit, Neeraj K. Verma, Aditya K. Kar, Amrita Singh, Debabrata Ghosh, Satyakam Patnaik, Oral Talk, International Conference on "Cell Death in Cancer and Toxicology (CDCT-2018), CSIR-IITR, India, February 20-22, 2018.
5. Nature Inspired Hydrogel based Wound Patch infused with Antimicrobial and Antioxidant agents for accelerated Wound Healing. Aditya K. Kar, Amrita Singh, Pankaj Jagdale, Mahaveer P. Purohit, Neeraj K. Verma, Nitesh Dhiman, Mohan Kamthan, Dhirendra Singh, Mahadeo Kumar, Debabrata Ghosh, Satyakam Patnaik, 24th ISCB International Conference (ISCBC 2018) "Frontier Research in Chemistry & Biology Interface", Manipal University, Jaipur, India, January 11-13, 2018.
6. Controlled Release of Insecticide Using Eco-Affable Cenospheres-Alginate Microbeads. Amrita Singh, Aditya K. Kar, Monika Seth, Nitesh Dhiman, S. Anbumani, Satyakam Patnaik, 24th ISCB International Conference (ISCBC 2018) "Frontier Research in Chemistry & Biology Interface", Manipal University, Jaipur, India, January 11-13, 2018.
7. Temperature Controlled pH Stimulated Drug Releasing Nanogels for Targeting MCF7 Breast Cancer Cells. Neeraj K Verma, Mahaveer P. Purohit, Nitesh Dhiman, Aditya K. Kar Amrita

Singh and Satyakam Patnaik, 21st CRSI-IICT-ACS joint International Symposium in Chemistry, CSIR-IICT, Hyderabad, India, July 13-16, 2017

8. Inhibition of Thioredoxin Reductase by Targeted Selenopolymeric Nanocarriers Synergizes the Therapeutic Efficacy of Doxorubicin in MCF7 Human Breast Cancer Cells. Mahaveer P. Purohit, Neeraj K. Verma, Danish Equbal, Aditya K. Kar, Debabrata Ghosh, and Satyakam Patnaik, 2nd International Toxicology Conclave (ITC-2016) organized as part of the Golden Jubilee Celebrations at CSIR-IITR, November 15-16, 2016.
9. Reagent free green synthesis of silver nanoparticles using modified guar gum and their bio-evaluation. Nitesh Dhiman, Aditya K. Kar, Neeraj K. Verma, Mahaveer P. Purohit, Mohan Kamthan and Satyakam Patnaik, 36th Annual Conference of Society of Toxicology (India) (STOX-2016) "International Conference on New Insights & Multidisciplinary Approaches in Toxicological Studies" August 3-5, organized by Amity University Campus, Noida, 2016.
10. Controlled release of insecticides using eco-friendly cenospheres-alginate based microbeads. Amrita Singh, Nitesh Dhiman, Faimy Fatima, Aditya K. Kar, Neeraj K. Verma, Mahaveer P. Purohit, and Satyakam Patnaik, 36th Annual Conference of Society of Toxicology (India) (STOX-2016) "International Conference on New Insights & Multidisciplinary Approaches in Toxicological Studies" August 3-5, organized by Amity University Campus, Noida,2016

EDUCATIONAL CREDENTIALS

Year	Education	Board/University	Marks Obtained
2015-2021	Ph.D.	Academy of Scientific and Innovative Research, New Delhi / CSIR- Indian Institute of Toxicology Lucknow (UP)	-
2011 – 13	M.Sc. (Forensic Science)	Pt. Ravishankar Shukla University Raipur, Chhattisgarh	75.56 %
2008-11	B.Sc. (H.) (Forensic Science)	Pt. Ravishankar Shukla University Raipur, Chhattisgarh	70.44 %
2013	Post Graduate Diploma in Computer Application (PGDCA)	Indira Gandhi National Open University, New Delhi	66.85 %
2008	Higher Secondary Certificate Examination (XII) with PCB	Chhattisgarh Board of Secondary Education (CGBSE), Raipur	74.60 %
2006	Secondary School Certificate Examination (X)	Chhattisgarh Board of Secondary Education (CGBSE), Raipur	73.83 %

SEMINARS ATTENDED

- Presented poster at Annual Strateneuro conference organized by Karolinska Institutet Sweden, dated 27–28 May 2025

- Presented research work at AD/PD 2025 International Conference on Alzheimer's and Parkinson's Diseases, Vienna, Austria, April 1-5, 2025.
- Gave Oral presentation at 30th Mayo clinic USA-Karolinska Institute Annual Scientific Research conference organized by Karolinska Instituted on 16-17 Oct.2024 at Stockholm, Sweden.
- Presented poster at Annual KI collaboration in science conference organized by Karolinska Institute Sweden, dated 21–22 November 2024.
- Presented poster at Annual Strateneuro conference organized by Karolinska Institutet Sweden, dated 4–5 June 2024.
- Presented research work at 59th Annual Meeting, and ToxExpo (SOT-2020), Anaheim, California, USA, March 15-19, 2020. **(Student Travel Award from CSIR)**
- 6th International Conference on Advanced Nanomaterial and Nanotechnology (ICANN2019), Centre for Nanotechnology, Indian Institute of Technology Guwahati (IITG), India, December 18-21, 2019.
- "4th International Toxicological Conclave 2018 (ITC-2018)" CSIR-IITR, Lucknow. **(Best Poster Presentation Award)**
- 24th ISCB International Conference (ISCBC 2018) "Frontier Research in Chemistry & Biology Interface", Manipal University, Jaipur, India, January 11-13, 2018.
- "18th INDO-US workshop, Flow Cytometry in Nanomaterial Toxicology, 2017" CSIR-IITR, Lucknow India.
- "An Advanced Cell Analysis Workshop involving hands-on experience on Flow Cytometry and High Content Imaging 2017" CSIR-IITR in support with Thermo Fisher Scientific from August 30th to September 1st, 2017 Lucknow, India.
- Participated in the International Conference namely as **"ITC conclave – 2016"** organized by CSIR- Indian Institute of Toxicology Research Lucknow, Uttar Pradesh.
- International Toxicology Conclave-2015 (ITC-2015) organized as part of the Golden Jubilee Celebrations at CSIR-IITR, November 05-06, 2015.
- Participated in the National Seminar on **"Digital Forensic – A tool for IT Security"** organized by Sam Higginbottom Institute of Agriculture, Technology & Sciences; 24th – 25th February 2011.
- Participated in the National Conference on **"Latest Technologies & Their Applications in Forensic Science"** organized by Government of Maharashtra Institute of Forensic Science Mumbai, Aurangabad and Nagpur; 6th to 7th March 2012.

Mentorship and Guidance-

- Guided master's student during Ph.D (For completion of their masters project)**- 03**
- Guided master's student (For completion of their master's project)- **05**
- Guided bachelor's student (For completion of their bachelor's project)**- 16**

AFFILIATION

- Lifetime Member of Forensic Science Society Raipur Chhattisgarh since sep.2020.
- Lifetime Member of Indian society of chemists and biologists, CDRI, Lucknow (UP) since April 2023.

CO-CURRICULAR ACCOLADES

- Participated in CSIR SSBMT tournaments (Cricket, Volleyball)
- NSS 'B' Certificate from Pt. Ravishankar Shukla University, Raipur, Chhattisgarh.
- Participated in University level NSS camp, Pt. RSU, Raipur C.G.
- Participated in State Chess Championship Organised by Sport & Youth Development Department Chhattisgarh from 28th – 29th Sep. 2006.
- Represented Azad Hostel, Pt. Ravishakar Shukla University as a Junior Prefect from August 2010 to June 2012.

PRESONAL DETAILS

Current Address	: Karolinska Institute, Sweden
Permanent address	: Adarsh Nagar, Basna, Dist- Mahasamund, Chhattisgarh pin- 493554, India
Date of Birth	: 10th January 1991
Languages known	**:** English, Hindi, Oriya, and Chhattisgarhi.
Hobbies	**:** Singing, Playing Cricket, Volleyball, Badminton, Kabbadi

REFERENCES

1. **Dr. Satyakam Patnaik,**
   Senior Scientist, Nanomaterial toxicology group
   CSIR - Indian Institute of Toxicology Research, Lucknow, (UP), India
   E-mail: satyakampatnaik@yahoo.com, satyakampatnaik@iitr.res.in
2. **Maria Eriksdotter, Ph.D.**
   Professor/Senior Physician | Docent
   Department of Neurobiology, Health Sciences and Society
   Karolinska institute, Sweden
   E-mail: maria.eriksdotter@ki.se

DECLARATION

I hereby state the authenticity of the information provided above and bear the responsibility for the correctness of the information.

Date: 19/02/2026
Place: Kolkata

Dr. Aditya Kumar Kar