

# Department of Chemistry

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## Research Groups

### Group 1

#### Organic synthesis and nano catalysis

1. Dr. Prabal Pratap Singh
2. Prof. P. Pramanik

### Group 2

#### Nanotechnology Group

1. Prof. P. Pramanik
2. Dr. Abhishek Sharma
3. Dr. DK Das
4. Dr. Vivek Srivastava

### Group 3

#### Nano-drugs in treatment and prevention of cancer

1. Prof. Manju Ray
2. Prof. P. Pramanik
3. Dr. Prabal Pratap Singh

## Facilities Available

Name of the instrument	Specification of the Instrument	Test	Contact info
Particle Size analyzer	Refurbished Zetasizer Nano ZS 4 mW 633 nm He-Ne Laser <ul style="list-style-type: none"><li>• Size range maximum (dia): 0.3 nm to 10 microns</li><li>• Size range for zeta potential: 3.8 nm to 100 microns</li><li>• Size measurement for angles: 12.8° and 175°</li><li>• Conc. min for size: 0.1 ppm, 0.1 mg/mL, 15 kDa protein</li><li>• Zeta potential Range; no effective limitation</li><li>• Mobility range: min zero, no effective maximum</li></ul>	Measurement of: <ul style="list-style-type: none"><li>• Particle Size,</li><li>• Molecular weight,</li><li>• Zeta potential</li></ul> of dispersed particles and molecules in solution	For sample analysis may contact to <b>Mr. Yogendra Kumar</b> Ph. 8923226600; Email: yogendra.sharma@gla.ac.in *Charge Rs. 300 per half an hour (per sample)

	<ul style="list-style-type: none"> <li>Min vol for zeta potential: 150 ml</li> </ul>		
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**Patent Filed**

S.No.	Title	Name of Inventors	Patent application no	Date of filling
1	A CATALYST FOR THE SYNTHESIS OF HETEROCYCLIC COMPOUNDS	Prof P Pramanik Prof D K Das Dr Prabal P Singh Mr Yogendra Sharma Ms Shobha Bansal	201611036741	26 <sup>th</sup> October 2016

**Research Projects completed/ ongoing/ submitted**

SNo	Project title	Funded by	Amount	Year of commencement	Year of completion	Outcome/status
1	Design and Development of Molecular Organic Frameworks for Anion Sensing	GLA University, Mathura (Seed money)	2.5 lakh	2012	2015	Completed and one research paper communicated
2	Synthesis and Characterization of Novel Bis-heterocycles using Greener Approach and Evaluation of Biological Activities	GLA University, Mathura	2.0 lakh	2016		Ongoing
3	Commercial Synthesis of Nano particles methylglyoxal and use for cancer prevention	DBT	51.6 lakh			Under review by the funding agency

**Memorandum of Understanding (MoU) Department of Chemistry, GLA University & Jadavpur University Kolkata**

**Selected Publications**

**Year 2017**

1. Anuj Kumar, Vinod Kumar Vashistha, Prashant Tevatia, and Randhir Singh, Electrochemical studies of DNA interaction and antimicrobial activities of Mn<sup>II</sup>, Fe<sup>III</sup>, Co<sup>II</sup> and Ni<sup>II</sup>Schiff base tetraazamacrocyclic complexes, *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy*; 176 (2017) 123–133.

**Year 2016**

1. Anuj Kumar, Vinod Kumar Vashistha, Prashant Tevatia, Sweety and Randhir Singh Antimicrobial studies of tetraazamacrocyclic complexes of Fe(III) and Co(II), *Der Pharma Chemica*, 8 (2016) 146-151.
2. Anuj Kumar, Vinod Kumar Vashistha, Prashant Tevatia, and Randhir Singh, Voltammetric determination of molecular Modeling parameters for pentaazamacrocyclic complexes of Mn(II) and Co(II), *Anal. Bioanal. Electrochem.* 2016 (8) 848-861.
3. **Vivek Sharma**, and Abhishek Srivastava, A Study of Ultra-Violet Irradiation on Epithelial, Tissue of Fresh Water Fish, “Puntius Sphore”, *Orient. J. Chem.*, Vol. 32(4), (2016) 2171-2178.
4. Arindam Pramanik, Dipranjan Laha, Sandeep Kumar Dash, Sourav Chattopadhyay, Somenath Roy, Dipak Kumar Das, **Panchanan Pramanik**, Parimal Karmakar, An in-vivo study for targeted delivery of copper-organic complex to breast cancer using chitosan polymer nanoparticles *Materials Science & Engineering C*, 68 (2016) 327-337.

**Year 2015**

1. Manasmita Das, Debarati Bandyopadhyay, Debasish Mishra, Satyajit Datir, Prasanta Dhak, Sanyog Jain, Tapas Kumar Maiti, Amit Basak, Panchanan Pramanik, Retraction of Clickable, Trifunctional Magnetite Nanoparticles and Their Chemoselective Biofunctionalization, *Bioconjugate Chem.*, 2015, 26, 1981–1981
2. Dipranjan Laha, Arindam Pramanik, Sourav Chattopadhyay, Sandip kumar Dash, Somenath Roy, Panchanan Pramanik, Parimal Karmakar, Folic acid modified copper oxide nanoparticles for targeted delivery in in vitro and in vivo systems, *RSC Adv.*, 2015, 5, 68169-68178
3. Sabyasachi Sen, Narendar Gogurla, Pallab Banerji, Prasanta K. Guha, Panchanan Pramanik, Synthesis and characterization of  $\beta$ -phase iron silicide nano-particles by chemical reduction, *Materials Science and Engineering: B*, 200, 2015, 28–39
4. Sudip Biswas, Dipanjan Chakraborty, Rashmita Das, Rajib Bandyopadhyay, Panchanan Pramanik, A simple synthesis of nitrogen doped porous graphitic carbon: Electrochemical determination of paracetamol in presence of ascorbic acid and p-aminophenol, *Analytica Chimica Acta*, 890, 2015, 98–107
5. Arindam Pramanik, Dipranjan Laha, Sourav Chattopadhyay, Sandeep Kumar Dash, Somenath Roy, Panchanan Pramanik, Parimal Karmakar, Targeted delivery of copper carbonate nanoparticles to cancer cells in vivo, *Toxicol. Res.*, 2015, 4, 1604-1612
6. Sangeeta Tantubay, Sourav K. Mukhopadhyay, Himani Kalita, Suraj Konar, Satyahari Dey, Amita Pathak, Panchanan Pramanik, Carboxymethylated chitosan-stabilized copper nanoparticles: a promise to contribute a potent antifungal and antibacterial agent, *J Nanopart Res*, 2015, 17:243

7. Sourav Chattopadhyay, Sandeep Kumar Dash, Satyajit Tripathy, Balaram Das, Debasis Mandal, Panchanan Pramanik, Somenath Roy, Toxicity of cobalt oxide nanoparticles to normal cells; an in vitro and in vivo study..Chemico-Biological Interactions, 226, 2015, 58–71.
8. Sourav Chattopadhyay, Sandeep Kumar Dash, Satyajit Tripathy, Panchanan Pramanik, Somenath Roy, Phosphono methylimino diacetic acid-conjugated cobalt oxide nanoparticles liberate Co<sup>++</sup>ion-induced stress associated activation of TNF- $\alpha$ /p38 MAPK/caspase 8-caspase 3 signaling In human leukemia cells, , J BiolInorgChem 20, 2015,123–141.
9. Santanu Rana, Kaberi Datta, Teegala Lakshminarayan Reddy, Emeli Chatterjee, Preeta Sen, Manika Pal-Bhadra, UtpalBhadra, Arindam Pramanik, Panchanan Pramanik, Mamta Chawla-Sarkar, Sagartirtha Sarkar, A spatio-temporal cardiomyocyte targeted vector system for efficient delivery of therapeutic payloads to regress cardiac hypertrophy abating bystander effect, , Journal of Controlled Release, 2015, 167–178.
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11. Rashmita Das, Rajib Bandyopadhyay, Panchanan Pramanik, Efficient detection of volatile aromatic hydrocarbon using linseed oil–styrene–divinylbenzene copolymer coated quartz crystal microbalance, RSC Adv., 2015, 5, 59533-59540
12. Arindam Pramanik, Dipranjan Laha, Sandeep Kumar Dash, Sourav Chattopadhyay, Somenath Roy, Dipak Kumar Das, Panchanan Pramanik, Parimal Karmakar An in-vivo study for targeted delivery of copper-organic complex to breast cancer using chitosan polymer nanoparticles Materials Science & Engineering C (In Press) DOI: doi:10.1016/j.msec.2016.05.014
13. Ravi Bhushan, Vinod Kumar Vashistha, Synthesis of variants of Marfey's reagent having D-amino acids as chiral auxiliaries and liquid-chromatographic enantioseparation of (*RS*)-Mexiletine in spiked plasma: Assessment and comparison with L-amino acid analogues, J. Chromatogr. A, 1379 (2015) 43-50.
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16. Vinod Kumar Vashistha, Ravi Bhushan, Bioanalysis and enantioseparation of DL-Carnitine in human plasma by derivatization approach, Bioanalysis 7 (2015) 2477-2488.

#### **Year 2014**

1. Iron(II), Nickel(II), Copper(II) and Zinc(II) Complexes of 2,4-dinitro-6(pyridine-2-yl methyl amino) methyl phenolate : Synthesis, characterization and Antimicrobial Activities, Neeraj Sharma and Kshama Chaturvedi, Int. J. Curr. Microbiol. App. Sci (2014) 3(4): 65-74.
2. Lanthanide (III) Nitrate Complexes with 2, 4-dinitro-6 (pyridine-2-ylmethylamino) methylphenolate: Importance, Synthesis, Antimicrobial, Spectral and Thermodynamic studies, Neeraj Sharma, International Journal of Engineering and Technical Research (IJETR) , Special Issue, 2014, p-348-350.
3. mesoporous silica-coated superparamagnetic manganese ferrite nanoparticles for targeted drug delivery and MR imaging applications, Banalata Sahoo, K. Sanjana P. Devi, Sujan Dutta, Tapas K. Maiti, Panchanan Pramanik, Dibakar Dhara, Journal of Colloid and Interface, 431, 2014, ,31–41.

4. Sourav Chattopadhyay, Sandeep Kumar Dash, Santanu Kar Mahapatra, Satyajit Tripathy, Totan Ghosh, Balaram Das, Debasis Das, Panchanan Pramanik, Somenath Roy, Chitosan-modified cobalt oxide nanoparticles stimulate TNF- $\alpha$ -mediated apoptosis in human leukemic cells, *JBIC Journal of Biological Inorganic Chemistry*, 19, 2014, , 399-414.
5. Sourov Chandra, Saheli Pradhan, Shouvik Mitra, Prasun Patra, Ankita Bhattacharya, Panchanan Pramanik, Arunava Goswami, High throughput electron transfer from carbon dots to chloroplast: a rationale of enhanced photosynthesis, *Nanoscale*, 6, 2014, 3647-3655.
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### Year 2011

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#### **Workshops/Seminars Conducted by the Department**

##### **Year 2011**

1. A workshop on “Green Chemistry: A Solution to Chemical Pollution” 24 April, 2011, GLA University, Mathura

##### **Year 2013**

1. A workshop on “Pollution: Danger to blue planet”, 03 Feb, 2013, GLA University, Mathura

##### **Year 2015**

1. A workshop on “Applications of nanomaterials in modern technology”, 12 April, 2015, GLA University, Mathura
2. A workshop on “Nanoparticles: Characterization and Introduction to dynamic light scattering”, 31 Oct, 2015, GLA University, Mathura
3. National Seminar on “Detection and treatment of cancer using nano and conventional technologies”, 28-29th Nov, 2015, GLA University, Mathura

##### **Year 2016**

1. A workshop on “Applications of NMR & IR Spectroscopy in Characterization of compounds, 29-30th April, 2016, GLA University, Mathura
2. National Seminar on “Prevention and Treatment of Cancer by Nanomaterials and other Molecules”, 12-13 Nov, 2016, GLA University, Mathura

**Books Published**

<b>S. No.</b>	<b>Name of Faculty</b>	<b>Number of books</b>
1.	Dr. Vivek Sharma	Engineering Chemistry, (ISBN: 81-225-0493-0, Kitab Mahal, Allahabad)
2.	Dr. Prabal Pratap Singh	Fundamentals of Engineering Chemistry: (ISBN: 978-93-82122-32-6UDH Publishers & Distributors (P) Ltd. New Delhi. First edition 2015.