

## Dr. Himanshu, *PhD*

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### Designation

Assistant Professor, Department of Chemistry  
Hansraj College  
University of Delhi. Delhi 110007

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### Research Interest

Multi-step Organic Synthesis, Biocatalysis, Parallel synthesis, Polymer Chemistry and Natural Product Chemistry.

### Education

**PhD** (Organic Chemistry, **2001**), University of Delhi, India, Supervisor: Prof. VS Parmar  
*Title of the thesis:* "Synthetic and Biotransformation Studies on *N*-Heterocyclic Compounds and Development of Novel Bioemulsifiers."

**MSc** (Organic Chemistry, **1996**) 1<sup>st</sup> division, University of Delhi, India.

**BSc** (Chemistry, **1994**) 1<sup>st</sup> division, Miranda House, University of Delhi, India.

### Examinations Passed

- Qualified UGC NET/JRF examination for lecturer-ship held on 21<sup>st</sup> December 1997.
- Certified Project Management Professional from PMI, USA.

### Orientation/Refresher/FDP Attended

1. Attended 4-weeks Orientation Course (General and Subject Specific) Code, **OR-36** conducted by CPDHE, University of Delhi from March 19 to April 16, 2001.
2. Attended 3-weeks Refresher Course in Contemporary Studies (Natural Sciences, Education, Biological Science, Environmental Demography & Sociology) from 07 June 2016 to 27 June 2016.
3. Attended Online Refresher Course in Chemistry for Higher Education Faculty offered by Sri Guru Tegh Bahadur Khalsa College, Delhi in 2019.

### Skills

**Organic Synthesis:** Multi-step synthesis organic synthesis and polymer synthesis.

**Biotransformation:** Activity and protein content determination of the crude enzyme. Enzyme and whole cell catalyzed reactions on carbohydrates. Biocatalyst stabilization by immobilization and use of enzymes in polymer synthesis.

**Phytochemical Investigation:** Extraction, Isolation, Purification and Characterization of pure compounds using modern spectroscopic techniques

**Instrumental Techniques and Handling:** Spectroscopic techniques like <sup>1</sup>H & <sup>13</sup>C NMR, IR, MS, UV Spectrophotometer. Expertise in handling analytical instruments like GC (Hewlett-Packard), GPC (Waters). Used parallel reactors for process development and parallel synthesis.

**Computer:** Sound knowledge of computer applications in chemical structure drawing and word processing.

## Research Experience

### University of Alberta, Edmonton, Alberta

Research Associate, Dept of Chemicals and Material Engineering Mar2007-Aug 2007.

- Chemical modification of cationic polymers *e.g.* Polyethyleneimine (PEI) and Poly-L-Lysine (PLL) and study their ability as gene carriers.

### Polytechnic University, Brooklyn, NY 11201

June 2002- June 2005

#### Post Doctoral Fellow

- Synthesis of enantiomerically pure single component oligomers of [R]-3-hydroxybutyrate by de-polymerization of Poly(PHB). The acylation of various polyols with PHB oligomers using enzymes for synthesis of ketone bodies was also carried out (these compounds are currently being tested *in-vitro* by British Technology Group for potential application as anti-epileptic agents).
- Ring opening polymerization and co-polymerization of lactones like para-dioxanone, pentadecalactone *etc.* for the synthesis of biodegradable suture materials for biomedical applications. Since these are synthesized using lipases as catalyst the products are free from harmful metals which are used as catalyst in conventional chemical synthesis of polymers.
- Use of enzymes in polyester synthesis under solvent-less conditions: Green Chemistry. Synthesis of biodegradable polyesters/polyamide under mild and solvent less condition. Polymerization of thermally sensitive monomers like silicon diamine (used as fire retardants), silicon diacids/diols *etc.*

## Teaching Experience

### Hansraj College, University of Delhi, Delhi

Assistant Professor (Organic Chemistry)

December 2014 – till date

### Miranda House, University of Delhi, Delhi

Assistant Professor (Organic Chemistry)

July 2011-Dec 2014

### Dyal Singh College, University of Delhi, Delhi

Lecturer (Organic Chemistry)

July 2000-June 2002

### Tufts University, MA, USA

Visiting Researcher in group of Prof. DL Kaplan

April 1999-Dec 1999

## Administrative Assignments

- Member; Student Welfare Committee
- Member; Academic Affairs Committee
- Convenor Life Science Society of Hansraj College 2015-1016
- Convenor; Spic Macay Hansraj Chapter 2016-2017

### Workshop/Symposia Attended

- Member Organizing Committee for the workshop on “Computational Chemistry for Chemistry Educators” organized by DS Kothari Centre for Research & Innovation in Science Education, Miranda House. 23-24 November 2011.
- Attended workshop on Theory & Practical Course “Biochemistry & Environmental Chemistry” held by Department of Chemistry, University of Delhi. 2-7 July 2012.
- Member Organizing Committee for the workshop on “Mimicking Nature: Using Plant and Animal Extracts for Chemical Reaction” organized by DS Kothari Centre for Research & Innovation in Science Education, Miranda House. March 5 2013.
- Coordinator for workshop on “Nature at Work: Studying Biomolecules” organized by Department of Chemistry, Miranda House under the aegis of DS Kothari Centre for Research & Innovation in Science Education, Miranda House. 25 September 2013.
- Resource Person for the workshop “Application of Analytical Techniques in Biochemistry” organized by Department of Chemistry, Hansraj College. 15-17 July 2015.
- Attended workshop organized by Commission for Scientific and Technical Terminology, MHRD at Hansraj College. 23 July 2017.
- Attended workshop on “Computational Chemistry and Bioinformatics” organized by Department of Chemistry, Miranda House. 26-28 August 2015.
- Resource Person for one day workshop on “Chemistry Laboratory Working Skills and Safety Education” organized by IQAC & Department of Chemistry Hansraj College.

### List of Publications

1. Enzymatic Synthesis and Solid-state Properties of Aliphatic Polyesteramides with Polydimethylsiloxane blocks. B Sharma, A Azim, **Himanshu**, RA Gross. *Macromolecules*, 40; **2007**; 7919-7927.
2. Lipase-catalyzed co-polymerization of  $\omega$ -pentadecalactone with p-dioxanone and characterization of polymer thermal and crystalline properties. Z Jiang, **Himanshu**, RA. Gross, ML Focarte and M Scandola. *Biomacromolecules* 8; **2007**; 2262-2269.
3. *Candida antarctica* Lipase B-Catalyzed Synthesis of Poly (butylene succinate): Shorter Chain Building Blocks Also Work. **Himanshu**, A. Dekhterman, Z. Jiang and RA Gross. *Biomacromolecules*, 7; **2006**; 3093-3097.
4. Lipase-Catalyzed Synthesis of Silicon Polyamides. Himanshu Azim, A. Azim and RA Gross *Polymeric Materials: Science & Engineering* 93, **2005**,458.
5. Lipase-catalyzed Oligoamide Synthesis. A. Azim, Himanshu Azim, B. Sahoo and RA Gross. *Polymeric Materials: Science & Engineering* 93, **2005**,743.
6. *Candida antarctica* Lipase B catalyzed Synthesis of Poly (butylenes succinate). Himanshu, A. Dekhterman and RA Gross *Polymeric Materials: Science & Engineering*, 93, **2005**, 456.

7. Highly efficient and selective biocatalytic acylation studies on triazolylsugars. A. Bhattacharya, AK Prasad, J. Maity, **Himanshu**, Poonam, CE Olsen, RA Gross and VS Parmar. *Tetrahedron*, 59, **2003**, 10269-10277.
8. Selective reactions on ( )- aryl alkyl ketones, ( )- benzoxazines and D-arabino and - threo- hydroxyalkyl triazoles. Raunak, AK Prasad, NA Shakil, Himanshu, VS Parmar. *Pure and Applied Chemistry*, 73, **2001**, 167-174.5.
9. Synthesis and antiviral activity evaluation of 2- phenyl-4-(D-arabino-4'- cycloamino-3'- hydroxybutyl) triazoles: acyclonucleosides containing unnatural bases. **Himanshu**, R. Tyagi, CE Olsen, W Errington, VS Parmar and AK Prasad. *Bioorganic and Medicinal Chemistry*, 10, **2002**, 963-968.
10. Novel lipase catalyzed highly selective acetylation studies on D-arabino and D-threo-polyhydroxy alkyl triazoles. AK Prasad, **Himanshu**, A. Bhattacharya, CE Olsen and VS Parmar. *Bioorganic and Medicinal Chemistry*, 10, **2002**, 947-951.
11. Mechanism of biochemical action of substituted 4-methylbenzopyran-2-ones. Part I: Dioxygenated 4-methylcoumarins as superb antioxidant and radical scavenging agents. HG Raj, VS Parmar, SC Jain S Goel, Poonam, **Himanshu**, S Malhotra, A Singh, CE Olsen, J Wengel. *Bioorganic and Medicinal Chemistry*, 6, **1998**, 833-839.
12. Synthesis and anti-invasive activity of novel 1, 3-diarylpropenones. VS Parmar, SC Jain, KS Bisht, NK Sharma, **Himanshu**, S Gupta, AK Prasad, A Jha, Poonam, S Malhotra, SK Sharma, ME Bracke, W Errington, CE Olsen, J Wengel. *Indian Journal of Chemistry*, 37B, **1998**, 628-643.
13. Lipase-catalyzed selective deacetylation of phenolic/enolic acetoxy groups in peracetylated benzyl phenyl ketones. VS Parmar, HN Pati, A Azim, R Kumar, **Himanshu**, KS Bisht, AK Prasad and W Errington *Bioorganic and Medicinal Chemistry*, 6, **1998**, 109-118.