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## Professional Profile

- Currently working as Assistant Professor in Organic Chemistry at M. U. C. Women's College under University of Burdwan.

### Area of Research :

1. **Synthesis of pyrimidine and dipyrimidine derivatives as anti malarial agent.**
2. **Synthesis of asymmetric biphenyl derivatives by Suzuki coupling.**
3. **Use and mechanism of oxidation by IBX (2-iodoxybenzoic acid) in organic reaction.**

- Around 4 years' experience in the area of synthetic organic and medicinal chemistry Research & Development in Pharmaceutical Industry.
- *Worked with ProCetius Research at Chennai as a Manager – R & D* for around 1.5 years.
- Previously worked for 2.5 years with *Chembiotek Research International Pvt. Ltd, Calcutta as Senior Research Scientist.*
- 4 Years of Post Doctoral Research experience, 2 years at IBMS, Academia Sinica, Taipei, Taiwan and 2 years at College of Pharmacy, The Ohio State University, Columbus, Ohio, USA.
- Expertise in the Synthesis of organic building block by custom organic synthesis and biological evaluation of novel biologically active compounds and their SAR & Organic Synthesis.
- Adept at studying the enzyme active site and design of substrates for enzymatic reactions and inhibition of enzyme.
- Well versed with instrumental methods like UV-VIS, IR, NMR (1D, 2D), Mass spectroscopy, GC.
- First hand experience in handling of N.M.R. (90 MHz, Varian, 200, 400, 500 MHz, Bruker), IR (Perkin Elmer), UV (Shimadzu), GC (Chrompack, Neucon) & Air Sensitive Reagents.
- Proficiency in Biotechnological techniques like Gel Electrophoresis & Enzyme Isolation. Exposure in process optimisation & control and enhancing chemical lab practices. Have a flair for keeping abreast with the latest technologies.
- Holds distinction of possessing CSIR-NET Individual Fellowship & GATE Fellowship.

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## Academic Credentials

- ❖ **Ph.D. (Synthetic and Bio-organic Chemistry)** from IIT, Kharagpur, India in 1998.
- ❖ **M. Sc. (Organic Chemistry)** from IIT, Kharagpur, India in 1992 with C.G.P.A. (7.54/10)
- ❖ **B. Sc (Chemistry)** from Calcutta University in 1989.

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## Organisational Experience

Since January 2007, as Assistant Professor in Organic Chemistry at M. U. C. Women's College.

December 05 to January 2006 with ProCetius Research, Chennai, as Manager R&D

Apr'03 to 05 December with Chembiotek Research International at Salt Lake, Kolkata as a Senior Research Scientist and Lab in Charge.

### Key Functional Areas;

#### Research & Development

- ♦ Synthesis of organic building block by custom organic synthesis and medicinal chemistry.
  - To develop methods for different organic reactions.
  - To synthesize different organic compounds for international companies following developed method.
- ♦ To find structure of organic compounds by analytical methods like NMR, LC-MS, GC, HPLC.
- ♦ Development of analytical methods for impurity profiling using LC-MS and NMR.
- ♦ Separation & isolation of impurities / compounds by preparative HPLC & of chiral compounds by HPLC.
- ♦ To find a Structure Activity Relationship of newly found drug and to find lead from them.

#### Process Management & Enhancement

- ♦ To mentor Scientist and assign their jobs and to provide them inputs from different sources like Beilstein, Scifinder and literature data.
- ♦ To communicate with clients for their job requirement and effectively furnish that.
- ♦ Routine maintenance, calibration and troubleshooting for organic reactions on a regular basis for higher productivity and efficiency.
- ♦ Foreseeing performance bottlenecks and taking corrective measures to avoid the same.
- ♦ Responsible for investigating the unusual / unacceptable results.
- ♦ Develop economical ways to find necessary molecules.
- ♦ Provide expertise and guidance to scientist in designing experiments.

- ♦ To take all the safety measures for laboratory and take responsibility for cleanliness of laboratory.

#### *Documentation/ Quality Compliance*

- ♦ Writing chemistry manufacturing & control section of IND for regulatory submission and writing reports for the process for the clients.
- ♦ Reviews technical specifications, stability/ validation protocols, validation reports and other quality documents.
- ♦ Ensuring compliance of various quality measures by maintenance of appropriate requisite documentation/ records.

### **Academic Projects/ Researches Handled**

#### Under M. Sc Curriculum, IIT Kharagpur, India (1991-92):

Project Title : Biodegradation of Phenol and Thiocyanates.  
 Scope : The biodegradation of the toxic chemicals were studied using microbes.

#### Under PhD. Curriculum, IIT Kharagpur, India (1992-97):

Project Title : Chemo, Regio and Stereoselective Transformations Mediated by Enzymes and Small Molecules as Catalysts.  
 Scope : The research was directed towards the synthesis of novel side chain variants of taxol, tabtoxin. The synthesis of chiral  $\beta$ -lactams, the precursor of these drugs was achieved by enzymes and organic catalysts. Other aims were to synthesize novel thromboxane synthetase inhibitors and study the active sites of PLE and PPL, and synthesis of benzo and naphthodioxanes by catalyst.

#### Under Post PhD. Fellowship Curriculum:

⇒ *IIT, Bombay, India (1997-1998).*

⇒ Project Title : To carry out Fries rearrangement using zeolites as catalyst.

⇒ *IIT, Kharagpur, India (1998).*

⇒ Project Title : To synthesize antiinflammatory drugs ibuprofen and their analogue stereo selectively using catalysts and enzymes.

⇒ *Institute of Biomedical Sciences, Academia Sinica, Taipei, Taiwan. (1999-2001).*

Project Title : To design and synthesis of novel biologically active molecule and to find out their structure activity relationship (SAR studies).

Scope : The research includes synthesis of anticancerous drugs isodiospyrin and camptothecin and their analogues. Design of novel synthetic methodologies was a part of it this includes synthesis of DNA alkylating agents & topoisomerase inhibitors.

⇒ *College of Pharmacy, The Ohio State University, USA (2001 – 2003).*

⇒ Project Title : To synthesize compounds with novel biological activity and test them against Leishmanial tubulin or malarial LDH enzyme & parasite.

Scope : The research includes synthesis of cis and trans-Combretastatins A-4 to find its tubulin binding property. Novel antileishmanial drugs were synthesized targeting Leishmanial tubulin. Amidine & Diamidine salts were synthesized targeting malarial parasite which turned out to be more potent than lead compounds.

### **Conferences Attended/Paper Published**

- I. International Symposium on Perspective in Bio-Organic Chemistry A Poster Presentation in Dec'94, New Delhi, India.
- II. Indo-German Symposium on Organic Synthesis – Growing Interface with Adjacent Sciences, Poster presentation from IICT, Hyderabad, India in Sept'96.
- III. PCST Medicinal Chemistry Symposium, Sun Moon Lake, Taiwan in 1999.
- IV. PCST Medicinal Chemistry Symposium, Pintong, Taiwan in 2000.
- V. 34th Graduate Student Symposium in Medicinal Chemistry, The Ohio State University, Columbus, Ohio, USA. Poster presentation on Synthesis of Substituted N-Phenyl Acetamides as Candidate Inhibitor of Malarial Lactate Dehydrogenase in Jun'01, Columbus, Ohio, USA.
- VI. 35th Graduate Student Symposium in Medicinal Chemistry, Lecture presentation, Antileishmanial Dinitroaniline Sulfonamides with Activity Against Parasite Tubulin, University of Toledo, Toledo, Ohio, USA in Jun'02.
- VII. Molecular Parasitology Meeting XII, 2002, Lecture presentation, Werbovetz Karl A., Bhattacharya G. Salem M., Sackett D., Lopez-Sanchez M., Rottandi D., Bacchi C., Lecture presented by Karl A. Werbovetz, Potent and selective Antimicrotubule Activity of the Synthetic Dinitroaniline Sulfonamide GB-II-5 Against Kinetoplastid Parasites, 2002.

- VIII. American Society of Tropical Medicines and Hygiene 52<sup>nd</sup> Annual Meeting, Werbovetz Karl A., Salem M., Barszcz T., Delfin D., Lecture presented by Karl A. Werbovetz, Selective Antimitotic Agents Against Kinetoplastid Parasites, 2003.
- IX. UGC-Sponsored Seminar on Advanced Spectroscopy, Theoretical Chemistry, Synthesis, Reactivity and Structure Evaluation in April 25<sup>th</sup> to 27<sup>th</sup>, 2008, University of Burdwan, Burdwan.
- X. 2<sup>nd</sup> UGC-Sponsored Seminar on Advanced Spectroscopy, Theoretical Chemistry, Synthesis, Reactivity and Structure Evaluation in February 20<sup>th</sup> to 22<sup>th</sup>, 2009, University of Burdwan, Burdwan.
- XI. XVI- West Bengal, Science Congress, Poster Presentation, Synthesis and biological activity of New Tetracyclic 9H,10H-Indolizino[1,2-b]indole-one, February 28<sup>th</sup> to March 1<sup>st</sup>, 2009, University of Burdwan, Burdwan.
- XII. XVII- West Bengal, Science Congress, Lecture Presentation, A comparative study of oxidation of alcohol to aldehyde by IBX with some other oxidizing agents, March, 2010, Kolkata.
- XIII. Frontier in Chemistry, Seminar organized by Department of Chemistry, A comparative study of oxidation of alcohol to aldehyde by IBX with some other oxidizing agents, December 5 to 6, 2013 Burdwan.
- XIV. Seminar organized by Department of Chemistry, North Bengal University, Synthesis, Mechanism of Autooxidation and Biological Activity of New Tetracyclic 9H, 10H-Indolizino [1, 2-b] indole-1-one Derivatives,

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#### List of Publications

- 1) Selectivity in Enzyme Catalysed Reaction: Preferential Hydrolysis of Saturated Methyl Ester over the Corresponding Unsaturated Methyl Ester by Pig Liver Esterase, Basak. A., Nag. A., Panchal, S., Bhattacharya. G., *Biotechnology Letters*, 15, 1993, pp 19-22.
- 2) Selectivity in Enzyme Catalysed reactions: Preferential Hydrolysis of Phenolic Ester in the Presence of an Aromatic Ester by Pig Liver Esterase, Basak. A., Bhattacharya. G., Nag. A., *ibid*, 15, 1993, pp 469-470.
- 3) Aromatic vs Aliphatic Esters: Preferential Hydrolysis of Latter by Pig Liver Esterase, Basak. A., Bhattacharya. G., Mallik. U., *ibid*, 16, 1994, pp 1303-1304.
- 4) Palladium Mediated Regio and Stereoselective Synthesis of Exomethylene Benzo- and Naphthodioxanes, Basak. A., Bhattacharya. G., Khamrai. U., Mallik. U., *Synthetic Communication*, 27, 1997, pp367-373.
- 5) Differential effects of Stereochemistry and C-4 Substituents on the Enantioselectivity of PLE and PPL Catalysed Hydrolysis of 3, 4-disubstituted b-lactams, Basak. A., Mahato. T., Bhattacharya. G., Mukherjee. B., *Tetrahedron Letters*, 38, 1997, pp 643-646.
- 6) Novel Regioselective Ester Hydrolysis by Pig Liver Esterase, Basak. A., Bhattacharya. G., Palit. S. K., *Bulletin of Chemical Society of Japan*, 1997, 70, pp 2509-2511.
- 7) An Enantioselective Cycloaddition Route to 3-Hydroxy 2-Azetidinones, Basak. A., Bhattacharya. G., Bdour. H. M., *Tetrahedron Letters*, 1997, 38, pp 2535-2538.
- 8) PPL- Catalysed Hydrolysis of 1, 3- disubstituted b-lactams: Effects of Chain Length & Stereochemistry on the Enantioselectivity, Basak. A., Bhattacharya. G., Bdour. H. M., *Tetrahedron*, 54, 1998, pp 6529-6538.
- 9) Chemoenzymatic Synthesis of Antiinflammatory Drugs in Enantiomerically Pure Form, Basak. A., Nag. A., Bhattacharya. G., Mandal. S., Nag. S., *Tetrahedron Asymmetry*, 11, 2000, 2403-2407.
- 10) Synthesis and Autoxidation of New Tetracyclic 9H, 10H-Indolizino [1, 2-b] indole-1-one, Bhattacharya. G., Su. T. -L., Chen. K. -T., Chia. C. -M., *J. Org. Chem.*, 66, 2001, 426-432.
- 11) Active Site Mapping of Pig Liver Esterase (PLE) and Pig Pancreatic Lipase (PPL): Stereo and Regiochemical Outcome of Conformationally Constrained Esters, Basak. A., Bhattacharya. G., Rudra. K., *Ind. J. Chem. Sect. B. Chem. Incl. Med. Chem.*, 40B, 2001, 974-980.
- 12) Antileishmanial Dinitroaniline Sulfonamides with Activity Against Parasite Tubulin. Bhattacharya. G., Salem. M. S., Werbovetz. K. A., *Biorg. Med. Chem. Lett.*, 12, 2002, 2395-2398.
- 13) Selective Antimicrotubule Activity of N1-Phenyl-3, 5-dinitro-N4, N4-di-n-propylsulfanilamide (GB-II-5) against Kinetoplastid Parasites. Werbovetz K. A., Sackett D. L., Delfin D., Bhattacharya Gautam, Salem M., Obrzut T., Rattendi D., Bacchi C., *Molecular Pharmacology*, 64, 2003, 1325-1333.
- 14) Synthesis and Antitubulin Activity of N1- and N4- Substituted 3,5-Dinitro Sulfonamides against African Trypanosomes and Leishmania. Bhattacharya G., Herman J., Delfin D., Salem M. M., Barszcz T., Mollet M., Riccio G., Brun R., Werbovetz K. A., *J. Med. Chem.*, 12, 2004, 1823-1832.
- 15) Activity of Amidine – Containing Diphenylureas against *P. falciparum*. Bhattacharya G., Gerena L., Jiang S., Werbovetz K., *Letts. In Drug Design & Discovery*, 2, 2005, 162 –164.
- 16) Malaria – The Parasite, Drugs and Few New Approaches for New Drugs, The Quest, *Journal of M.U.C. Women's College*, 2013, 112 - 113
- 17) A Comparative Study of Oxidation of Alcohol to Aldehyde by IBX With Some Other Oxidizing Agents, *Journal of OP-85 of UGC sponsored Academic Staff College, University of Calcutta*, 2010, 154 - 157.
- 18) A Comparative Study of Oxidation of Alcohol to Aldehyde by IBX With Some Other Oxidizing Agents, *Proceeding of Seminar on Frontier in Chemistry, M.U.C. Women's College, Burdwan*.
- 19) Stereoselective Synthesis of Intermediates of Important Drugs by Kinetic Resolution Using Green Chemistry in a Step. Accepted for publication in the journal for International Conference on Mother Earth, December 10 to 12, 2014.

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### Patent

Antileishmanial dinitroaniline sulfonamides with activity against parasite tubulin, Gautam Bhattacharya, Dan Sackett, Manar M Salem, Karl Werbovetz, WO 2003090678 A2 S- A3, CA 2483725A1, EP1560574A2, EP1560574A4, US7211696, US 20050227982.

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### Laurels & Awards

- ⇒ **CSIR-NET Individual Fellowship** from CSIR, India in 1992.
  - ⇒ **GATE Fellowship** with 15th ranking in 1992.
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### Personal Details

Permanent Address : 22B, Telipara Lane, Calcutta – 700004.  
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Date of Birth : January 21, 1968,

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### References

1. Dr. A. Basak, Faculty, Department of Chemistry, IIT, Kharagpur, India.
  2. Dr. Dipak K. Mal, Department of Chemistry, IIT, Kharagpur, India.
  3. Dr. Karl A. Werbovetz, College of Pharmacy, Ohio State University.
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Gautam Bhattacharya