Meenakshi Sharma
F-241 Laxmi Nagar
Mangal Bazaar
Delhi- 110092
Tel: 91-11-2241 5361
E-mail
m.sharma@lycos.com

Educational Qualification

Doctorate in **Biomedical Sciences (Bio-organic and medicinal chemistry)** from Dr. B. R. Ambedkar Centre for Biomedical Research, University of Delhi, India.

M.Sc. **Toxicology** from Hamdard University (1998) Delhi, India. First Division. Subjects studied included Principles in toxicology, Heavy metals toxicology, Occupational toxicology, Environmental toxicology, Cosmetics toxicology, Carcinogensis, Neuro-behavioral toxicology, Nutrition toxicology, Petroleum toxicology, Forensic toxicology, Predictive toxicology, Pesticides toxicology, Analytical toxicology, Biochemistry, Immunology, Genetics, Pharmacology, Biostatistics.

B.Sc (Hons.) **Zoology** from Delhi University (1996),Delhi, India. First Division. Subject studied included Cell Biology, Genetics, Biochemistry, Ecology, Vertebrates, Invertebrates, Comparative anatomy, Histology, Physiology, Embryology , Botany and chemistry.

Research Experience

Working on project entitled **"Development of homocysteine-induced atherosclerotic rat model and its possible mode of action for causing atherosclerosis."** DST Project, April 2005 onwards.

Worked on **"The synthesis of novel diallyldisulphide compounds having antilipidemic and antioxidant activity."** Aug 1998- Dec. 2002,.

Worked as summer trainee on the project **"Approaches for predicting the carcinogenic potential of Mineral Base oils"** in Indian Oil Corporation, Faridabad, India, for 4 months.

Worked on summer project **"The impact of leather industries on the environment"** in Jamia Hamdard, Delhi.

Work Experience

Worked as **Teaching Assistant** of **Organic Chemistry in M.Sc.–Ph.D. Program** in Dr. B. R. Ambedkar Center for Biomedical Research from Feb 2001-July2001.

Worked as **Teaching Assistant** of **Toxicology in M.Sc.–Ph.D. Program** in Dr. B. R. Ambedkar Center for Biomedical Research from **July 2001-Jan2002**.

Worked as **Teaching Assistant** of **Genetics in M.Sc.–Ph.D. Program** in Dr. B. R. Ambedkar Center for Biomedical Research from **Feb 2002-July2002**.

Worked as **Teaching Assistant** of **Toxicology in M.Sc.–Ph.D. Program** in Dr. B. R. Ambedkar Center for Biomedical Research from **July 2002-Jan2003**.

Worked as **Teaching Assistant** of **Immunolgy in M.Sc.–Ph.D. Program** in Dr. B. R. Ambedkar Center for Biomedical Research from **Feb 2003-July2003**.

Worked as a **Research Associate** in Dr. B. R. Ambedkar Center for Biomedical Research from **Aug 2003-Apr2005**.

Working as **Principal Investigator** in project entitled **"Development of homocysteine-induced atherosclerotic rat model and its possible mode of action for causing atherosclerosis.**" in Dr. B. R. Ambedkar Centre for Biomedical Research, University of Delhi, Delhi-110007 from **Apr 2005 till now**.

Patents and Publications

1. Two patents have been filed by our laboratory on this work.

(i) "A process for the preparation of novel diallyldisulphide compounds having antilipidemic and antioxidant activity".

(ii) "Novel diallyldisulphide compounds having antilipidemic and antioxidant activity".

Patent application Nos. 1155/DEL/2001 and 1154/DEL/2001(Inventors; Manisha Tiwari, **Meenakshi Sharma** and Prof. Ramesh Chandra)

A PCT application (for filing international patent) has also been submitted on Novel Diallyldisulphide compounds with antilipidemic and antioxidant activity (July 2003)

International PCT application No PCT/IN 03/00250

2. Bis[3-(4'-substituted phenyl)prop-2-ene]disulphides as a New Class of antihyperlipidemic Compounds.
Bioorg. Med. Chem. Lett, 2004, 14, 5347-5350.
Meenakshi Sharma, Manisha Tiwari and Ramesh Chandra

3. The treatment of skin carcinoma induced by UVB radiation, using 1-oxo-5β, 6β-epoxy with-2-enolide isolated from the roots of Withania somnifera in a rat model.
***Phytomedicine* 2004,** Jul;11(5):452-60.
Sheenu Mathur, Parvinder Kaur, **Meenakshi Sharma**, Manisha Tiwari & Ramesh Chandra

4. Effect of 1-oxo-5β, 6β-epoxy-with-2-ene-27-ethoxy-olide isolated from the roots of *Withania somnifera* on stress indices in wistar rats.
***J. Alt. Compl. Med*. 2003**, 9(6), 897-907.
P.Kaur, **M.Sharma**, S.Mathur, M.Tiwari, H. M. Divekar, R.Kumar, K.K.Srivastava, R Chandra.

5. A Biologically active constituent of *Withania somnifera* (ashwagandha) with anti-stress activity.
Indian journal of Clinical Biochemistry, **2001**, 16(2), 195-198.
Parvinder Kaur, Sheenu Mathur, **Meenakshi Sharma**, Manisha Tiwari, K. K. Srivastava & Ramesh Chandra.

6. Metalloporphyrins – Applications and Clinical Significance.
Indian Journal of Clinical Biochemistry, **2000**, 15 (suppl), 183-199.
Ramesh Chandra, Manisha Tiwari, Parvinder Kaur, **Meenakshi Sharma**, Ritu Jain and Sujata Dass.

Workshop/Symposia

Participated in *Current Status of Oral and Implantable Contraceptives Agents*, ACBR.

Participated in *1st Annual Symposium in Biomedical Sciences* ACBR, 2001.

Membership

Student Membership of "Society of Toxicology (SOT), US.

Conferences/ Symposiums Attended and Paper/Poster Presented

Participated in **Chemistry Biology Interface- Synergistic New Frontiers-2004**, **Nov 21-26,** New Delhi, India

Participated and poster presented in "**Gordon Research Conference**" at Plymouth, New Hampshire, US, 10-16th July 2004.

Participated in an *International Conference on Recent Advances in Biomedical and Therapeutic Sciences* 13th-15th January 2004, Bundelkhand University. Jhansi.

- Attenuation of KBrO3 induced Oxidative stress by the prophylactic treatment of rats with the thiosulfinate fraction of garlic
  Manisha Tiwari, Sujata K. Dass, **Meenakshi Sharma**, Parvinder Kaur, Sheenu Mathur, and Ramesh Chandra

- Effect of Gossypol in conjugation with Metalloporphyrins on Hepatic Phospholipase A_2 activity *in Vivo* in rats.
  Manisha Tiwari, Sujata K. Dass, **Meenakshi Sharma**, Ritu Jain, and Ramesh Chandra

- Antioxidant Effect of 1-oxo-5β, 6β-epoxy-witha-2-ene-27 -ethoxy-olide and 1-oxo-5β, 6β-epoxy-witha-2-enolide Isolated from the roots of *Withania somnifera* and its Mechanism of Action in Enhanced Thermogenesis
  Manisha Tiwari, Sujata K. Dass, Parvinder Kaur, **Meenakshi Sharma,** Narendra.N.Ghosh Kaushal.K. Srivastava and Ramesh Chandra.

Participated in " Annual Symposium in Biomedical Sciences" at Dr. B. R. Ambedkar Center for Biomedical research, University of Delhi (13-15th April **2003**).

Participated in "National Conference on Emerging Areas in Biomedical Sciences", Bundelkhand University Campus, Jhansi (28th – 30th December, **2002**)

Participated in *2nd Annual symposium in Biomedical Sciences* ACBR, 11 - 12th April 2002.

"Attenuation of $kBrO_3$ induced Oxidative stress by the prophylactic treatment of rats with thiosulfinate fraction of garlic". (P7)

Biochemical and Toxicological Techniques Learned

Biochemical studies

Well trained in performing in-vivo studies in rats and mice and Biochemical estimations

Spectrofluorimetry

Spectrophotometry

Nuclear Magnetic Resonance spectroscopy

Infrared spectroscopy

High Performance Liquid Chromatography

Molecular Biology techniques

Electrophoresis SDS page

RT-PCR

Western Blot

Preparation of tissue slides for histological studies using microtome

Neurobehavioral Toxicological Studies

Traction Test

Pentobarbitone induced Sleeping time

Haloperidol induced Catalepsy

Conditioned and Unconditioned Avoidance Response using Techno-Jumping Box

Treatment of Acute poisoning by Arsenic in Rabbit using Gastric Lavage.

Environmental Toxicological studies

Chemical Oxygen Demand

Biological Oxygen Demand

Total Solids

Total Suspended Solids

Total Dissolved Solids

Cosmetics Toxicological studies

Skin Irritation Test

Draize Test

Analytical Toxicological studies

Estimation of Lead & Mercury in animal tissue by Atomic Absorption Spectrophotometer

Research Interest

My basic research interest primarily focused in field of biology-chemistry interface. This interface between biology and chemistry has grown steadily as biology has abjured its traditional 19th century reliance on descriptive logic concerning responses and interactions of organisms and has begun attempts to examine levels of organization underlying those at the organizational level. After doing Graduation in Zoology and Post-graduation in Toxicology, I have done my Ph. D in Bio-organic chemistry. Both these fields help me to understand basic sciences.

The molecular description of life processes has attracted many trained in the rigors of chemistry into the working terrors of biology. The sharp and definitive edges that the notions of biological quantization and causality acquired were major gifts from chemists. Similarly the increasing reliance of the biologist on chemically based methods and technologies is another gift

Natural Products and its medicinal use

More than 45,000 different natural products are known many of them having important economical importance. Modern genomic, biotechnological and molecular methodologies have been applied to study the biologically active principle present in the complex structural configuration of a plant.

Medicinal chemistry is a rapidly maturing discipline. The study of how structure and function are related is absolutely essential to understanding the molecular basis of life. Current Topics in Medicinal Chemistry aims to contribute to the growth of scientific knowledge and insight, and facilitate the discovery and development of new therapeutic agents to treat debilitating human disorders. I am keenly interested in getting knowledge focused on Medicinal Chemistry which covers all areas of medicinal chemistry, including current developments in rational drug design, synthetic chemistry, bioorganic chemistry, high-throughput screening, combinatorial chemistry, compound diversity measurements, drug absorption, drug distribution, metabolism, new and emerging drug targets, natural products, pharmacogenomics, and structure-activity relationships.

Fundamental Molecular Research for Drug discovery

In recent years a breakthrough has occurred in our understanding of the molecular pathomechanisms of human diseases whereby most of our diseases are related to intra and intercellular communication disorders. The concept of signal transduction therapy has got into the front line of modern drug research, and a multidisciplinary approach is being used to identify and treat signaling disorders.

I would like to understand the fundamental molecular mechanisms of disease pathogenesis, the development of molecular-diagnosis and/or novel approaches to rational treatment completely. A basic research area that shows promise to advance our understanding of the molecular mechanism(s) of a disease or has potential for clinical applications.

As the discovery, identification, characterization and validation of novel human drug targets for anti-infective drug discovery continues to grow, I would like to do essentials involved in drug discovery and development.

In-depth knowledge of all areas of the field from pre-clinical to clinical research, including related areas such as genomics, proteomics, target discovery, bioinformatics and novel diagnostics helps to make me a perfect scientist.

Research Experience

1. Worked as summer trainee on the project **"Approaches for predicting the carcinogenic potential of Mineral Base oils"** in Indian Oil Corporation, Faridabad, India under the supervision of Dr. M. P. Singh.

Untreated lubricating oils have been associated in the past with the development of human skin cancer. With the development of new refining procedures and improvements in the industrial hygiene there is reduced skin cancer incidence in recent years, however there is a continued need for some means of assessing the skin carcinogenic potential of oils. To give better understanding of these health effects, industry has conducted an extensive range of long term dermal carcinogenicity studies as well as short term carcinogenicity studies with the objective of identifying the influence of different types of refinery processing and to establish the important base oil compositional factors. These studies have led to improved refining techniques and to the development of simple markers for control purposes based on standard analytical tests.
Worked on Aug 1998- Dec. 2002,.

2. Ph.D. thesis entitled **"The synthesis of novel diallyldisulphide compounds having antilipidemic and antioxidant activity."** at Dr. B. R. Ambedkar Center for Biomedical Research, University of Delhi under the supervision of Dr. Manisha Tiwari, Research Scientist (Lecturer).

Garlic has been in use since the beginning of recorded history as a therapeutic agent. Garlic has been proved to elicit antimicrobial, antihypertensive, hypolipidemic, hepatoprotective, antidiabetic and insecticidal properties. Immunomodulation and antitumor activities of garlic have also been reported.

Allicin is an active principle of garlic, It has considerable hypolipidemic activity, but due to its unstable nature, Allicin readily gets converted into diallyldisulphide, which is highly volatile. Our aim was to synthesize substituted derivatives of diallyldisulphide having greater stability and greater hypolipidemic

activity as compared to diallyldisulphide. To achieve our aim we synthesized derivatives of diallyldisulphide containing both electron withdrawing and electron releasing groups and investigated their antilipidemic and antioxidative activity. The activities of the synthetic derivatives were compared with Lovastatin, a known HMG-CoA inhibitor and the thiosulphinate fraction of aqueous garlic extract.

In our investigation, we synthesized the following derivatives namely: (1) bis [4-nitrophenyl-allyl] disulphide (2) bis [4-aminophenyl-allyl] disulphide (3) bis [4-methoxyphenyl-allyl] disulphide (4) bis [phenyl allyl] disulphide. (5) bis [4-methoxyphenyl-allyl]disulphide(6)bis[4-hydroxy-3-methoxyphenyl-allyl] disulphide

Our investigations showed that of the six compounds synthesized bis (4-nitrophenyl-allyl) disulphide proved to be an efficacious drug for lowering lipid levels. This drug also inhibited HMG-CoA reductase activity significantly, as well as enhanced the activities of the various enzymes involved in combating oxidative stress. Our studies showed that the administration of single and five doses of the synthesized compounds did not lead to hepatic and renal toxicity. Thus bis(4-nitrophenyl allyl)disulphide can be potentially used as a drug to lower lipid levels in the body and enhance the body's ability to deal with oxidative stress.

3. Summer Undergraduate Research Projects co-supervised

- Effect of metalloporphyrins in modulating malaria-induced hepatotoxicity in mouse model submitted by Ms. A. Preeti B.Sc(II) Biochemistry, Sri Venkateshwara College, Unversity of Delhi, Delhi, India (2005).

- Role of metalloporphyrins in modulating malaria induced oxidative stress in mouse model submitted by Swati Puranik M. Sc. (final)Biomedical Sciences, Bundelkhand University, India.(2005)

Reference:

1) Dr. Manisha Tiwari
Research scientist (lecturer)
Dr. B.R. Ambedkar for Biomedical sciences
University of Delhi
Delhi-110007
e-mail manisha_07@hotmail.com
91-11-27666272

2) Prof. Ramesh Chandra
Founder Director
Dr. B.R. Ambedkar for Biomedical sciences
University of Delhi
Delhi-110007.
e-mail acbrdu@hotmail.com
91-11-27666272

3) Prof. Vani Bharamchari
Director
Dr. B.R. Ambedkar for Biomedical sciences
University of Delhi
Delhi-110007.
e-mail v_brahmachari@hotmail.com
91-11-27666272

4) Dr.Chandra Prakash
Senior Research Scientist
Pfizer, Connecticut
USA
e-mail- prakashc1@hotmail.com
chandra_prakash@groton.pfizer.com
Ph. No. 860-464-6402