

Dr. SHEERIN BANU LIAQUAT ALIKHAN M.Sc., M.Phil., Ph.D.

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Academically well-qualified candidate with a strong passion for teaching and research who is looking for a platform to utilize my academic skills in tutoring graduates and postgraduates and to grow my career in an educational organization

AREAS OF TEACHING AND RESEARCH INTEREST

Biochemistry, Reproductive Endocrinology, Molecular Biology, Endocrine Disruptors, Oncology, Stem cell Biology

ACADEMIC CHRONICLE

2021: Ph.D. (Interdisciplinary: Medical Biochemistry-Endocrinology) - Highly commendable

Department of Endocrinology, Dr. A.L.M. PG Institute of Basic Medical Sciences, University of Madras, India.

2005–2006: M.Phil. (Endocrinology) - First Class.

Course work - Hormones: Structure, synthesis, secretion, transport and metabolism; Physiological and Molecular Mechanism of actions; Pathophysiology and Research Methodology.

Department of Endocrinology, Dr. A.L.M. PG Institute of Basic Medical Sciences, University of Madras, India.

2001-2003: M.Sc. (Medical Biochemistry) - First Class.

Course work – 1st Semester: Human Anatomy, Biopolymers, Analytical & Cellular Biochemistry;

2nd Semester: Food Science and Nutrition, Immunology, Molecular Physiology, Bioinformatics;

3rd Semester: Oncopathology, Macromolecular Biosynthesis, Enzymology, Metabolic and Gene Regulation, Biostatistics;

4th Semester: Hormonal Biochemistry, Biomedical Technology, Molecular Basis of Diseases.

Department of Medical Biochemistry, Dr. A.L.M. PG Institute of Basic Medical Sciences, University of Madras, India.

1997-2000: B.Sc. (Biochemistry) - First Class

Course work – Course work: Biochemistry (Core subject) with Chemistry and Mathematics as Ancillary subjects.

Department of Biochemistry, Justice Basheer Ahmed Sayeed College for Women (formerly SIET), University of Madras, India.

RESEARCH EXPERIENCE

November 2008 - March 2014:

Title of Ph.D. Dissertation: *Molecular mechanism underlying the toxic effects of transient postnatal exposure to hexavalent chromium on the structure and function of rat Sertoli cells*

Supervisor: **Dr. M. Michael Aruldhas**, Professor & Head, Department of Endocrinology, University of Madras, Chennai, India.

MAJOR FINDINGS OF THE STUDY:

- ❖ *This nature of molecular work is the first of its kind to document the cytotoxic effects of CrVI on Sertoli cell tight junctional proteins in pre-puberal Wistar rats, given the importance of the critical time and duration of CrVI exposure which is in concordance with Sertoli cell proliferation followed by its differentiation and blood-testis barrier formation.*
- ❖ Studied the endocrine disruptive effect of CrVI on the classical hormonal regulators of reproduction namely, follicle stimulating hormone, testosterone, estradiol, thyroid hormones along with analyzing the expressions of their respective receptors in the Sertoli cells of experimental animals.
- ❖ Observed elevated levels of FSH and LH accompanied by subnormal levels of testosterone and estradiol, which pointed out the possibility of hypergonadotrophic hypogonadism in pre-puberal rats with lactational exposure to CrVI.
- ❖ *Reported for the first time that transient lactational exposure to CrVI decreases the expression of crucial proteins (occludin, claudin-11 and JAM), adaptor proteins (ZO-1 and ZO-2) which constitute Sertoli cell tight junctions and are important for blood-testis barrier formation and function.*
- ❖ Demonstrated that CrVI exposure resulted in disorderly arrangement of germ cells, sloughing of germ cells from the basal epithelium and atrophy of the seminiferous epithelium of rat testes.
- ❖ Using transmission electron microscopy, it was clearly documented that the testes of CrVI-exposed animals displayed regressive changes such as accumulation of vacuoles and lipid droplets in Sertoli cell cytoplasm and degeneration of seminiferous tubules. Leydig cells showed features of collapsed mitochondrial cristae, multinucleated pachytene spermatocytes. **The most important findings was the disruption of both Sertoli-Sertoli and Sertoli-germ cell junctional networks in CrVI-exposed animals.** *All these structural alterations strongly attest the disruption of blood-testis barrier in experimental animals as a result of transient lactational exposure to CrVI.*

To summarize, data evolved from the histopathological, biochemical, hormonal and gene/protein expression studies of the above dissertation strongly point out testicular toxicity and blood-testis-barrier disruption in animals exposed to CrVI during the specific period of Sertoli cell proliferation and differentiation, which in turn might impair spermatogenesis at adulthood.

August 2008 - March 2011:

Worked as a **Junior Research fellow**, Department of Endocrinology, University of Madras, in a DST-sponsored project entitled “*Molecular mechanism underlying male reproductive toxicity of chromium: Study on Sertoli cell structural proteins and hormone receptors*”.

January 2006 - September 2006

Title of M.Phil. Dissertation: *Effects of PCB (Aroclor 1254) and Vitamin E supplementation on the mRNA expression of androgen and estrogen receptors in the ventral prostate of adult albino rats.*

Supervisor: **Dr. J. Arunakaran**, Assistant Professor, Department of Endocrinology, University of Madras, Chennai, India.

January 2003 - June 2003

Title of M.Sc. Dissertation: *Effect of 7,12-dimethyl benz(a)anthracene (DMBA) induced buccal pouch carcinoma in hamsters with reference to enzymic and non-enzymic antioxidants.*

Supervisor: **Dr. D. Sakthisekaran**, Professor & Head, Department of Medical Biochemistry, University of Madras, Chennai, India.

May 2002 - June 2002: Summer Training Programme

Title of the work: *Production and partial purification of fungal protease.*

Supervisor: **Dr. G. Suseela Rajkumar**, Scientist & Head, Department of Microbiology, Central Leather Research Institute (CLRI), Chennai, India.

AWARDS/FELLOWSHIPS

- ❖ **Senior Research Fellow (SRF):** Wrote a research proposal entitled “*Mechanisms involved in the disruption of spermatogenesis by CrVI exposure: A molecular study on the expression patterns of Sertoli cell proteins*” to the government funding agency (Council of Scientific and Industrial Research, New Delhi, India) which was approved and I was selected as a SRF during 2013-2014.
- ❖ **Junior Research Fellow (JRF):** Selected as a JRF during 2008-2011 for a DST-sponsored project entitled “*Molecular mechanism underlying male reproductive toxicity of chromium: study on Sertoli cell structural proteins and hormone receptors*”.

- ❖ **Teaching cum Research Fellow (TRF):** Selected as a TRF during my research period at the Department of Endocrinology, Dr. A.L.M. PG Institute of Basic Medical Sciences, University of Madras.
- ❖ Received monetary awards for being the **school topper** in my 10th and 12th board examinations.

TECHNICAL SKILLS

- ❖ *Laboratory animal handling:* Monitoring of estrous cycle, breeding, conducting rodents/murine surgeries (experience in prostatectomy, hepatectomy, ovariectomy, orchidectomy), dissections, injecting the drug(s) to rodents
- ❖ Biochemical assays (enzymatic/non-enzymatic/biomarkers)
- ❖ Gel filtration chromatography, Ion exchange chromatography
- ❖ Transfection studies
- ❖ Zymography
- ❖ *Genotoxicity assays:* Chromosomal aberration, sister chromatid exchange test (*in vivo* and *in vitro*), micronucleus test, Ames test, Comet assay
- ❖ *Molecular biology:* Isolation of RNA and DNA, Primer designing, cDNA synthesis, Real-Time PCR, Agarose gel electrophoresis, SDS-PAGE, Western blotting by Chemiluminescence. Gel documentation
- ❖ Hormonal assays: Radioimmunoassay of peptide and steroid hormones, ELISA
- ❖ Isolation of seminiferous tubules, Sertoli cells and Leydig cells from rat testis
- ❖ Primary cell culture of Sertoli cells
- ❖ *Histopathology:* Histology, Immunohistochemistry
- ❖ Experience in handling basic instruments such as ultracentrifuge, spectrophotometer, thermal cycler, real time PCR instruments (Bio-Rad) and light microscope.
- ❖ Proficient in experimental design, statistical data analysis (SPSS, Graphpad Prism), EndNote, compiling the results, interpretation and generation of technical report/data.
- ❖ Well-experienced in writing articles to journals, research proposals, consolidated reports to research funding authorities.
- ❖ Good at computer skills (MS Office suite), Internet usage.

TEACHING EXPERIENCE

- ❖ **September 2008 – March 2013: *Teaching cum Research Fellow***, Department of Endocrinology, University of Madras

Job description: Handling theoretical classes in Biochemistry for M.Sc. (Biomedical Sciences) students; Training the post graduate (M.Sc. & M.Phil.) and summer internship students on various laboratory techniques and assisting them in their dissertation.

- ❖ **November 2006 - July 2008: *Lecturer in Biochemistry*** at SIVET College, Gowrivakkam, Chennai, India.

Job description: Conducting theoretical lectures and practical classes in Biochemistry for both undergraduate and postgraduate students.

Papers taught: Metabolism of carbohydrates, lipids and proteins, Molecular biology, Enzymology, Food and Nutrition

- ❖ **February 2007 - November 2007: *Online English Tutor*** at Tutors World Wide Pvt. Ltd., Chennai, India.

Job description: Trained in tutoring US children on grammar, reading and writing skills.

E-PUBLISHING EXPERIENCE

September 2003 - August 2005: Employed as a copy-editor at Scientific Publishing Services Private Limited, Chennai, India.

Job description: Proof-reading, editing and formatting of scientific articles for grammatical/typesetting errors and resolving them to be published in Elsevier journals.

- Freelance Copy Editor at SPS from 2005 to 2007

Membership in Scientific Societies

Life member of Society for Reproductive Biology and Comparative Endocrinology (SRBCE), India.

LIST OF RESEARCH PUBLICATIONS

1. Shobana N, Aruldas MM, Tochwang L, Loganathan A, Balaji S, Kumar MK, **Banu LAS**, Navin AK, Mayilvanan C, Ilangovan R and Balasubramanian K (2017). Transient gestational exposure to drinking water containing excess hexavalent chromium modifies insulin signaling in liver and skeletal muscle of rat progeny. *Chem. Biol. Interact.* 277: 119-128. ISSN: 0009-2797.
2. Kumar KM, Aruldas MM, **Banu SL**, Sadasivam B, Vengatesh G, Ganesh KM, Navaneethabalakrishnan S, Navin AK, Michael FM, Venkatachalam S, Stanley JA, Ramachandran I, Banu SK and Akbarsha MA (2017). Male reproductive toxicity of CrVI: In-utero exposure to CrVI at the critical window of testis differentiation represses the expression of Sertoli cell tight junction proteins and hormone receptors in adult F1 progeny rats. *Reprod. Toxicol.* 69: 84-98. ISSN: 0890-6238.
3. Kannan Annapoorna, Maria Joseph Michael Aruldas, Maharajan Chandrasekaran, Jone Arulrajadurai Stanley, Ramalingam Neelamohan, Esakky Suthagar, **Liaquat Alikhan Sheerin Banu**, Narasimhan Srinivasan and Sakhila K Banu (2015). Can the expression pattern of estrogen receptor alpha and beta proteins in papillary thyroid carcinoma be of prognostic value? *JIMSA* 28: 79-82. ISSN: 0971-071X.
4. **Sheerinbanu LA**, Sharmila S and Aruldas MM (2013). An update on human thyroid hormone receptors in health and disease: Chemistry, physiology and pathophysiology. *J. Endocrinol. Reprod.* 17: 57-78 (Review). ISSN: 0971-913X.
5. Selvakumar K, **Sheerin Banu L**, Krishnamoorthy G, Venkataraman P, Elumalai P and Arunakaran J (2011). Differential expression of androgen and estrogen receptors in PCB (Aroclor 1254)-exposed rat ventral prostate: impact of alpha-tocopherol. *Exp. Toxicol. Pathol.* 63:105-112. ISSN: 0940-2993.

WORKSHOPS/TRAINING PROGRAMMES ATTENDED

1. Assisted in organizing and served as a **Resource Person** in the National workshop on “**Techniques in Molecular and Cellular Endocrinology**” held at Department of Endocrinology, Dr. A.L.M. PG Institute of Basic Medical Sciences, University of Madras during 4th - 13th January 2010.
2. Participated in hands-on training programme on the “**Isolation of Sertoli cells from Wistar rats**” offered by the Cellular Endocrinology Laboratory at the National Institute of Immunology, New Delhi, India during 21st - 26th March 2009.
3. Participated and underwent training in the “**National Workshop on Genetic Toxicology**” organized by the National Center for Preclinical Reproductive & Genetic Toxicology, National Institute for Research in Reproductive Health (NIRRH), Parel, Mumbai, India during 7th - 14th January 2008.

SEMINARS/CONFERENCES ATTENDED

1. Attended the “**National Seminar on Endocrine Disruptors**”, conducted by Department of Endocrinology at Dr. ALM. PG Institute of Basic Medical Sciences, Chennai on 15th March 2014.
2. Attended the “**International Conference on Cancer Biology: Molecular Mechanisms and Novel Therapeutics, CANCERCON 2014 (An interface between clinicians and scientists)**”, held at Indian Institute of Technology, Madras from 30th January to 1st February 2014.
3. Attended the “**National Seminar on Endocrine and Metabolic Disorders**” organized by the Department of Endocrinology, Dr. ALM. Post Graduate Institute of Basic Medical Sciences, University of Madras, Chennai, India on 9th March, 2012.
4. Presented a paper entitled “**Transient exposure of pregnant rats to CrVI alters the expressions of specific cell surface and nuclear receptors in Sertoli cells of adult progeny**” in “National Conference on Novel Aspects and Emerging Trends in Reproduction and Endocrinology and 30th Annual Symposium of the Society for Reproductive Biology and Comparative Endocrinology” held at Mohanlal Sukhadia University, Udaipur, Rajasthan during 30th January - 1st February 2012 (**Oral presentation**).
5. Presented a paper entitled “**Transient gestational exposure to CrVI alters the mRNA expressions of steroid/thyroid receptors in Sertoli cells of pre-puberal rats**” in “International symposium on current trends in Endocrine and Reproductive health and 29th Annual Meeting of the Society for Reproductive Biology and Comparative Endocrinology” held at University of Mysore, Manasagangothri, Mysore, during 10th - 12th February 2011 (**Poster presentation**).
6. Presented a paper entitled “**Impact of transient neonatal exposure to CrVI on the tight junctional proteins of Sertoli cells of adult rats**” in “International symposium on Endocrinology and Reproduction: Molecular mechanisms to Molecular medicine and 28th meeting of the Society for Reproductive Biology and Comparative Endocrinology” held at

Jawaharlal Nehru University, New Delhi, during 4th - 6th February 2010 (**Poster presentation**).

7. Attended the “*International Conference on Novel Updates in Reproductive Biology and Comparative Endocrinology and the 27th Annual Meeting of the Society for Reproductive Biology and Comparative Endocrinology*” held at University of Hyderabad, Hyderabad, India during 19th - 21st January 2009.
8. Presented a paper entitled “*Androgen and estrogen receptors mRNA expression in the ventral prostate of adult Wistar rats – Impact of PCB and vitamin E supplementation*” in the XXV National Symposium on Reproductive Biology and Comparative Endocrinology (SRBCE) – “*Translational Endocrinology & Reproductive Biology*” held during 15th - 17th January 2007 at the Department of Zoology, University of Kerala, Thiruvananthapuram, India (**oral presentation**).
9. Participated in XXIV Symposium on Reproductive Biology and Comparative Endocrinology (SRBCE) – “*Therapeutic and Diagnostic Products for Reproductive Health: Recent Trends and Future Prospects*” held during 14th - 16th February 2006 at the Department of Biotechnology, IIT Roorkee, Uttaranchal, India.

PERSONAL PROFILE

Name: **SHEERIN BANU LIAQUAT ALIKHAN**

Date of Birth: 8th March 1980

Father's name: (Late) R.S. Liaquat Alikhan

Mother's name: Mrs. L. Fathima

Languages known: English, Urdu, Hindi, Tamil, German (basic level), Sanskrit

Medium of Instruction: English

Citizenship: Indian

Marital status: Married

DECLARATION

I hereby declare that the above furnished information is true to the best of my knowledge.

Yours truly,

(L. Sheerin Banu)

REFERENCES

1. Dr. M. MICHAEL ARULDHAS (Ph.D. Supervisor)

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