

CURRICULUM VITAE

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Research Scholar

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EDUCATION:

1999-2005. **Ph.D. Biochemistry.** Department of studies in Biochemistry, University of Mysore, India. (Thesis will be submitted in May 2006)

Doctoral Thesis: “**Comparative characterization of the representative acidic and basic PLA₂ from *Naja naja naja* venom.**”

1993-1995. **M.Sc. Biochemistry,** Department of studies in Biochemistry, University of Mysore, India.

1990-1993. **B.Sc. Biochemistry,** Botany and Microbiology, University of Mysore, India.

RESEARCH EXPERIENCE:

1. **1999-Till date:** Working as a Resarch Fellow in the Department of Studies in Biochemistry, University of Mysore, India, for the Ph.D, in Biochemistry with the title “**Comparative characterization of the representative acidic and basic PLA₂ from *Naja naja naja* venom**”. Work involved isolation and purification of PLA₂s from Indian cobra venom. . PLA₂s from snake venom show high degree and homology and hence separation of individual PLA₂ poses a difficult task. This work has thus, made me confident in designing and carrying out experiments, enabled me to develop my skills in isolation procedures and handling animals. This has given me opportunity to work in collaboration in different laboratories. The details of study carried out,
 - **Purification and characterization** of snake venom enzymes (such as PLA₂s, Three finger toxins and PLA₂ inhibitor.) by using various purification techniques like Column chromatography (gel filtration as well as ion exchange chromatography) and RP-HPLC

- **N terminal sequencing** of purified proteins; Acidic PLA₂ and cyto/cardiotoxin
- **Interaction studies** with inhibitors (Aristolochic acid and endogenous PLA₂ inhibitor NN Ic from Indian cobra venom.) and studying the nature of inhibition by employing both biochemical as well as biophysical parameters such as IC₅₀, enzyme inhibition constant k_i, and interaction monitoring by following fluorescence quenching
- **Protein modification studies** were carried out to determine the active site residues by modifying histidine residue using pBPB (bromophenacylbromide) in PLA₂s. In modifying the tryptophane residue in three finger toxin to study the role of it in lethality.
- **Pharmacological activities** like PLA₂ activity, neurotoxicity, myotoxicity, cytotoxicity, edema inducing activity, proteolytic activity, hemorrhagic activity
- **Platelet aggregation** activity inhibition was tested for acidic D IV PLA₂ and aggregate Ag III PLA₂. Effect of aspirin on platelet aggregation
- **Toxicity assays** including, LD₅₀, isolation of sciatic nerve gastronemius muscle from frogs were carried out to determine the mode of toxin interaction.
- **Raising and purifying antibody from chick.** The effect of IgY prepared against the venom and purified toxin on the pharmacological properties and cross reactivity and neutralization of venom toxicity, efficacy of IgY.
- **Animal experiments:** Experience in handling mice, rats, frogs and rabbits. Determination of LD₅₀, myotoxicity, neurotoxicity and hemorrhagic activity using mice. Mouse paw model for edema inducing activity.

MAJOR FINDINGS OF MY RESEARCH:

- Isolation and characterization of unique toxic acidic PLA₂ enzyme from cobra (*Naja naja naja*) venom, its effect on platelet aggregation activity, its interaction with inhibitors and N terminal sequence.
 - Isolation of hetero trimeric NNXI (PLA₂) a post synaptic complex a first report .Its contribution to the venom toxicity.
 - First report of unusual behavior of PLA₂s upon separation of basic PLA₂s from the peptide pool. Report of a artificially formed PLA₂ complex devoid of pharmacological activities
 - Isolation and characterization of three finger toxins from *Naja naja naja* venom .Interaction of cardiotoxin with different cell line (EAT and leukocytes), chemical modification leading to loss of lethality. First report of non interaction of cardiotoxin with leukocytes indicating the presence of recognition site for cardiotoxin action. Also N terminal sequence done to show its uniqueness.
 - Raising and purifying antibody from chick. The effect of IgY prepared against the venom and purified toxin on the pharmacological properties and cross reactivity and neutralization of venom toxicity, efficacy of IgY for possible therapeutic use.
2. **Project work** carried out during Masters Degree (Biochemistry) Course (1993-1995) entitled “**Partial purification of a PLA₂ from *Vipera russelii* venom**”. This work first exposed me to the world of proteins. I had partially purified a PLA₂ from the venom of *Vipera russelii*, by chromatographic techniques such as gel filtration and ion exchange chromatography. Followed by PAGE show its partial purification from the venom.

TEACHING EXPERIENCE AND OTHER ASSIGNMENTS:

1. Teaching assignment carried out (from 1999 to date) along with research work for postgraduate and graduate students in both chemistry and biochemistry. I have taught bioorganic chemistry, Biochemical Techniques, Nutrition, Protein Biochemistry, Enzymology, Metabolism, Cell biology and Molecular biology.
2. Experienced in guiding more than 20, M.Sc., students for their project work during my research period in different topics of biochemistry.

PUBLICATIONS:

- C.T.Sadashiva, J.N.Narendra Sharat Chandra, **K.C.Ponnappa** T.Veerabasappa Gowda and K.S.Rangappa Synthesis and efficacy of 1-[bis(4-fluorophenyl)-methyl] piperazine derivatives for acetylcholine esterase inhibition, as a stimulant of central cholinergic neurotransmission in Alzheimer's disease. (**Accepted** for publication in **Bioorganic and Medicinal Chemistry Letters** on 27/04/06)
- **Ponnappa.K.C**, Krishnakantha.T.P, Kini.R.M and Veerabasappa Gowda A novel toxic acidic PLA₂ from the venom of *Naja naja naja*: isolation, purification and Charecterization. (Communicated to Biochimie)
- Basavarajappa B.S; **Ponnappa K.C**; Veerabasappa gowda.T Isolation and characterization of a naturally occurring novel α toxin composed of PLA₂ isomers from Indian cobra *Naja naja naja* venom. (Communicated to Toxicon)
- **K.C.Ponnappa** and T.Veerabasappa Gowda The contribution of peptides and low molecular weight components in the venom towards PLA₂ stability and lethality of south Indian cobra (*Naja naja naja*) venom. (Manuscript under preparation)

BOOK CHAPTERS:

- “Indian Cobra *Naja naja naja* venom:Composition enzymes and toxins”. **K.C.Ponnappa** and T.Veerabasappa Gowda -a full length chapter for the book “**The great mystic cobra**” Edited by Dr N.S.Leela, Indian Institute of Science (to be published shortly)

TECHNICAL EXPERTISE:

Protein purification	: Gel permeation, Ion exchange and affinity Chromatography, TLC, HPLC and RP- HPLC.
Protein analysis	: Acrylamide gel electrophoresis, Western blotting. Spectroscopy and Spectrofluorophotometry .
Radio labeling	: Can handle radioactive material and label <i>E.coli</i> and other cells with radioactive chemicals.
Immunological techniques	: Immunization and development of antibodies in Rabbit, development of Hen’s egg yolk IgY antibodies. ELISA and Immunodiffusion.
Microbiological techniques	: Preparation of culture media (liquid and agar plates), Isolation of pure culture, Identification of bacteria by staining methods & sensitivity analysis of biological samples.
Animal experiments	: Experience in handling mice, rats and rabbits. Determination of LD ₅₀ , myotoxicity, & hemorrhagic activity using mice. Mouse paw model for edema inducing activity. Antibody (polyclonal) production using chick and Rabbit as animal model.
Enzyme kinetics	: PLA ₂ assay, Protease assay, Fibrin (ogen) olytic assay, Hyaluronidase assay, Gelatinolytic assay (Zymogram),

Acetylcholine esterase assay, Procoagulant and anticoagulant assays, their kinetic & interaction studies with activators and inhibitors.

**Modification studies of Enzyme
Catalytic sites**

: Chemical modification of amino acid residues of histidine and tryptophan

Other qualifications

: Good computing experience in Word, Excel, Power point and Image processing. Sequence Homology by BLAST search

HONORS AND AWARDS:

1. **Recipient of Senior Research fellowships** from the University Grants Commission, Government of INDIA.
2. **Recipient of Junior Research fellowships** from the University Grants Commission, Government of INDIA.
3. **Eligible for lectureship** by passing State Level Entrance Test conducted by Government of Karnataka, INDIA

Participation in scientific meetings and symposiums:

- 1) National symposium on Proteins in Biochemistry: Structure, Function, Expression and specificity of action organized by Biochemistry Alumni Association, University of Mysore, India. November 15 –16 (1999).
- 2) National Symposium on “Control of Animal experiments through Alternative approaches” Organized by CPCSEA, Ministry of Social Justice and Empowerment .Government of India. Defence Food Research Laboratory, Mysore, India. March 25 (2000).
- 3) “Contribution of PLA₂ towards the lethal toxicity of Indian cobra venom” Ponnappa.K.C and Veerabasappa Gowda presented at 3rd National Symposium on Venoms and Toxins, organized by Biochemistry Alumni Association, University of Mysore, Mysore, India. December 23-24, 2003.

MEMBER TO SCIENTIFIC BODIES:

- ◆ Society of Biological Chemists, India.
- ◆ Society of Applied Botany and Biotechnology, India.
- ◆ Association of Carbohydrate Chemist and Technologist, India.

PERSONAL:

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REFERENCES:

- 1. Prof.T.Veerabasappa Gowda.** (Ph.D supervisor)
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