

CURRICULUM VITAE

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OBJECTIVE:

To obtain a post doctoral position in Proteomics / Biological mass spectrometry that will utilize my expertise in mass spectrometry and chromatography while strengthening my analytical skills.

Father's Name: M. Suryanarayana **Nationality:** Indian

Date of Birth: 20th August 1976 **Sex:** Male

ACADEMIC QUALIFICATIONS

Degree	University	Year	Subject	Division
Ph.D	Jiwaji University, Gwalior, India	2002	Chemistry	By Thesis
M.Sc	Andhra University, Visakhapatnam, India	1998	Chemistry	Distinction
B.Sc	Andhra University, Visakhapatnam, India	1996	Mathematics, physics, chemistry	First class

ACADEMIC ACHIEVEMENTS:

- Awarded Gold Medal at the 68th Convocation of Andhra University being topper in the Specialization (Chemistry and Analysis of Foods, Drugs and Water)
- Qualified in the All India exam for Chemistry-GATE 98 (Graduate Aptitude Test in Engineering), Secured 83.14 percentile.

EMPLOYMENT STATUS:

Presently at **CCMB**, Hyderabad, working as a Research Associate in a project entitled New Millennium Indian Technology Leadership Initiative (**NMITLI**) with the aim for the development of “**New targets and markers for cancer using Genomics and Proteomics**”, sponsored by Council of Scientific Industrial Research (**CSIR**), New Delhi.

RESEARCH AREAS OF INTEREST: Biological Mass Spectrometry, Proteomics, Biomarkers, Analytical Biochemistry, Analytical Toxicology and Organic chemistry.

HANDS ON EXPERIENCE:

- Mass Spectrometry: GC/MS, LC/MS, EI, CI, NCI, DIP, FAB, MALDI, ESI, Nanospray and MS/MS
- Chromatography: GC, HPLC, FPLC, Gel filtration
- Protein biochemistry: SDS-PAGE, IEF, 2D Gels, Western transfer and N-terminal analysis of proteins.
- Biological Samples Analysis: Analysis of Urine, Blood, DNA and Proteins for Biomarkers
- Organic Chemistry: Synthesis of Organosulfur, Organophosphorous compounds and their adducts to nucleic acid bases & amino acids.

PROFICIENCY IN HANDLING ANALYTICAL INSTRUMENTS:

- Finnigan Mat TSQ 7000, triple quadrupole mass spectrometer, GC/MS & LC/MS/MS
- Hewlett-Packard HP-5973 MSD
- Thermo Finnigan Trace GC/MS
- Applied Biosystems MALDI-TOF/MS, Voyager DETM- STR Biospectrometry workstation.
- PE Sciex Q-Star/Pulsar Nanospray -MS/MS

ABSTRACT OF PH.D THESIS:

TITLE: “ANALYSIS OF TOXICANTS AND THEIR METABOLITES IN BIOLOGICAL SAMPLES”

Rationale: Biomarkers of exposure indicate whether exposure to an agent has taken place. They include measurement of specific metabolites or adducts formed by reaction of the compound or its metabolites with macromolecules such as DNA and proteins. Measurement of such adducts in biological samples is a suitable monitoring for toxicants exposure. Sensitive Mass spectrometric methods like GC/MS and LC/MS are found to be useful for unequivocal identification of these adducts at trace levels. Synthetic standards play a very important role in these methods.

My Ph.D work is mainly focused on identifying reliable and facile analytical methods for qualitative and quantitative detection of toxicant-induced adducts *in-vitro* and *in-vivo* samples. Towards achieving the objective, we synthesized and characterized various adducts using all the available analytical techniques like UV, IR, NMR and Mass Spectrometry.

Significant findings of my work include synthesis and characterization of N7-Guanine adduct, which is a novel DNA biomarker. We developed a method to detect this adduct in the biological samples using HPLC and LC/MS. We synthesized cysteine, glutamic acid and valine adducts and developed various methods to detect these adducts in biological samples. We found NCI-GC/MS was the most sensitive method for the detection and analysis of these adducts in derivatized forms.

We developed a GC/MS method for the analysis of amino acids and successfully applied this method to the hydrolysates of proteins isolated from blood. A mass spectrometric method for the detection of phosphorylated tyrosine in plasma has also been one of my significant findings. A femto mole assay using NCI-GC/MS was developed for the determination of Malondialdehyde (MDA) in biological samples.

CURRENT RESEARCH WORK AT CCMB:

Being a member of the NMITLI project, I am working in the Proteomics group, which is aimed to identifying markers for cancer. To fulfill this, we receive samples of cancerous tissues from various Cancer hospitals in India for analysis.

We use cut margins as controls and compare the results with that of cancer cells at different stages. I do protein purification by HPLC, FPLC and Gel filtration, analysis of 1D and 2D gels, and optimized in-gel digestion of proteins stained with silver or coomassie blue using trypsin. This is followed by interpretation of MALDI-Mass spectra that are very important in the Peptide Mass Finger Print (PMF) for the Identification of proteins. Using data base searches we identify proteins and further confirmation of these proteins is carried out by generating sequence tags by ESI-MS/MS. I also do experiments using post source decay (PSD) to obtain sequence information on some of the selected peptides.

Biochemical characterization of the proteins from Ehrlich ascites carcinoma cells, obtained from Indian Association for the Cultivation of Science (IACS), Kolkata, is also one of my regular duties. Early studies revealed that rapidly growing malignant cells have high rate of glycolysis and this was considered to be a fundamental feature of malignancy. Recent studies in several laboratories have clearly shown that Glyceraldehyde-3-phosphate dehydrogenase (GAPDH) was an important enzyme of the glycolytic pathway and may play an important role in glycolysis of malignant cells. In this connection an enzyme similar to GAPDH was identified in Ehrlich ascites carcinoma cells by one of our research collaborator. We have been attempting to characterize and identify this enzyme using proteomics. (Manuscript under preparation)

ACADEMIC SOCIETY MEMBERSHIPS:

Life Member in Indian Society for Mass Spectrometry (**ISMAS**) since 1999

PUBLICATIONS:

1. **Mula Kameswara Rao**, Pinaki S. Bhadury, Mamta Sharma, Rajinder S. Dangi, Appanabhotla S. B. Bhaskar, Syed K.Raza and Devendra K. Jaiswal., "A facile methodology for the Synthesis and Detection of N7-Guanine adduct of Sulfur mustard as Biomarker", *Canadian Journal of Chemistry*, 80, 504 (2002)
2. **M. Kameswara Rao**, M. Sharma, S. K. Raza and D. K. Jaiswal. "Synthesis, Characterization and Mass Spectrometric Analysis of Cysteine and Valine adducts of Sulphur mustard". (In Press: *journal of phosphorus, sulfur, silicon*)
3. **M. Kameswara Rao**, K. Sugendran, R. Jain and S. K. Raza. "Analysis of Trimethylsilyl Derivatives of Amino Acids by Gas Chromatography Mass Spectrometry: Application to Protein Hydrolysates. (*Communicated to Journal of Chromatography*)
4. **M. Kameswara Rao**, K. Sugendran and S. K. Raza., "Mass spectrometric identification of Sulfur mustard adducts to DNA and proteins." Received Best paper presentation award at the 10th ISMAS workshop at Puri, during Feb 25-March1, 2002.
5. **M. Kameswara Rao**, A. K. Gupta, and S. K. Raza., "Retrospective Detection of Phosphonyl Tyrosine Biomarker in Sarin treated Plasma by Mass Spectrometry". Received Best paper award at ISMAS Silver Jubilee Symposium at NIO, Goa, during Jan 27-31, 2003.

POSTER:

1. **Kameswara Rao M**, Sugendran K and Raza SK, " Analysis of MDA in SM treated Rat liver by Gas Chromatography (GC)-Mass Spectrometry (MS). Presented at the XXXV Annual Conference of Indian Pharmacological Society at DRDE, Gwalior during Nov26-29, 2002.

PARTICIPATION IN CONFERENCES AND ACADEMIC SHORT COURSES:

1. 8th ISMAS Symposium on Mass Spectrometry, December 7- 9, 1999, at ICT, Hyderabad.
2. Continuing Education Programme (CEP) Course on “Recent Developments in Mass Spectrometry”, September 25-29, 2000 at DRDE, Gwalior.
3. 9th ISMAS Workshop on “ Mass Spectrometry in the New Millennium: Instrumentation and Applications”, December 12-16, 2000 at NIO, Goa.
4. 10th ISMAS Workshop on Mass Spectrometry, February 25-Mar1, 2002, at IOP, Bhubaneswar.
5. CCMB Silver Jubilee Symposium on “Current Excitement in Biology”, November 24-29, 2002.
6. ISMAS Silver Jubilee Symposium on Mass Spectrometry, January 27-31, 2003, at NIO, Goa

REFERENCES:

1. Dr. Ravi sirdeshmukh
Scientist, Head Proteomics
CCMB, Uppal Road
Hyderabad- 500007
AP, India.
2. Dr. S.K. Raza
Scientist, Deputy Director
VERTOX Laboratory,
Synthetic Chemistry Division,
DRDE, Gwalior-474002,
MP, India.
3. Prof. Rajeev Jain,
School of Studies in Chemistry,
Jiwaji University,
Gwalior-474011,
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