

## BIO-DATA

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### Educational Qualifications:

Sl. No.	Degree	Institution	Field/Subject(s)	Year
1.	B.Sc	Bangalore University	Physics, Chemistry, Maths	1990
2.	M.Sc	Bangalore University	Chemistry, Organic chemistry	1992
3.	Ph.D	Indian Institute of Science	Molecular Biophysics	2000

### Research /Training Experience:

Duration	Institution	Nature of work
04.08.2013 - to date	C.F.T.R.I Mysore	Senior Scientist
04.08.2009 - 03-08-2013	C.F.T.R.I Mysore	Scientist
06.10.2008 - 03.08.2009	C.F.T.R.I Mysore	Research Associate
05.10.2005 - 04.10.2008	C.F.T.R.I Mysore	Scientist Fellow
15.02.2003 - 31.03.2005	Drexel University College of medicine, Philadelphia	Post-doctoral Fellow
1.09.2001 - 14.02.2003	University of Pennsylvania, Philadelphia	Post-doctoral Fellow
20.09.1999 - 31.08.2001	The Scripps Research Institute, San Diego	Post-doctoral Fellow

## Research specialization achieved

- Establishment of a laboratory to study satiety peptides and their mimetics to counter obesity.
- Broad experience in protein chemistry, which includes protein interaction analysis, synthesis of proteins via native chemical ligation approach, solution and solid-phase peptide synthesis and introduction of ester bonds in synthetic proteins.
- Extensive experience in incorporation of novel conformationally constrained unnatural amino acids (Aib, Pip) into peptides and evaluation of their conformation in de novo designed peptides and fungal antibiotics using CD and NMR.
- Hands-on experience in techniques and methods for folding/unfolding proteins and peptides using CD and fluorescence spectroscopy.
- Working experience in interaction analysis using Surface Plasmon Resonance.

## Research area during Doctoral and Post-doctoral studies

1. **Graduate Student**, Molecular Biophysics Unit, Indian Institute of Science, Bangalore, India  
Advisor: Prof. P. Balaram  
**Goal:** Studies on the biochemical origin of efrapeptin, a fungal peptide isolated from *Tolypocladium niveum*.
2. **Postdoctoral Research Fellow**, Department of Cell Biology, The Scripps Research Institute, La Jolla, CA.  
Advisor: Prof. Philip E. Dawson  
**Goal:** Synthesis of mini proteins and ester-incorporated mini proteins, studies on the mechanism of protein folding and estimation of the energy of individual hydrogen bonds.
3. **Postdoctoral Research Fellow**, Rheumatology, College of Medicine, University of Pennsylvania and Biochemistry, Drexel University College of Medicine, Philadelphia, PA  
Advisor: Prof. Irwin M. Chaiken

- Goals:** 1. Synthesis and interaction studies on CD4 mimetics as a tool for understanding inhibition of HIV entry into CD4+ cells.
2. Mutants of Scyllatoxin (a scorpion toxin peptide) were synthesized by solid phase peptide synthesis, folded using glutathione and purified via reverse phase chromatography
3. Determination of affinity of these synthetic peptides to HIV-1 gp120 and their effect on HIV-1 gp120 and 17b (a CCR5 surrogate) interaction using Surface Plasmon Resonance

### **List of Projects implemented**

#### **1. Grant-in aid projects (GAP) - 02**

- DBT sponsored: Evaluation of fragments and analogs of obestatin as potential drug candidates against obesity and their effect on the mice genome to understand the complexity of the interaction of these peptides on the body as a whole.
- DBT sponsored: Evaluation of obestatin and its fragment analog Nt8U on obese mice to counter obesity and the effect of these peptides on the mouse brain at the genomic level.

#### **2. Major Laboratory projects (MLP) – 03**

- Arginine for use against angina, high blood pressure and claudication.
- Functional ingredients of therapeutic value from protein rich products.
- Rational engineering for designer lipases.

#### **3. Supra intuitional 11<sup>th</sup> five year plan project(SIP) – 01**

- Improving the bioavailability of iron by peptide chelation.

#### **4. Biological science cluster (BSC) – 02**

- Studies on the effect of obestatin/Nt8U pairwise, with capsaicin, genistein and quinoa saponins on diet-induced obese C57BL/6J mice.
- Towards a protease resistant synthetic peptide and its antimicrobial activity.

#### **5. Other laboratory project (OLP) – 01**

- Inspiration for high school children through scientific innovations-an outreach initiative of CSIR-CFTRI.

## Publications

1. Govardhan Singh R S and **Uma V. Manjappara**. Selective reduction of fat accumulation by soyasaponins A and B in high fat fed C57BL/6J mice. *Journal of Functional Foods*. 2016, 27, pp. 95-103.
2. Nagaraj S, **Manjappara UV**. Studies on the influence of CCK-8 on the ability of obestatin to reduce food intake, gain in body weight and related lipid parameters. *Biochimie*. 2016 June; 125:126-30.
3. Nishita, T. S. Shilpa, **Uma V. Manjappara**, Shylaja R. Dharmesh and H. K. Manonmani. Hexapeptide Fragment of Azurin Induces Apoptosis in Human Colon Carcinoma (Hct 116) Cell Line. K. P. *International Journal of Current Research and Academic Review*. 2015 Vol 3 No. 12 pp. 17-30.
4. ShreeRanga Nagaraja., Angad V. Raghavan., Sudha N. Rao. & **Uma V. Manjappara**. Obestatin and Nt8U influence glycerolipid metabolism and PPAR gamma signaling in mice. *The International Journal of Biochemistry & Cell Biology*. 2014; 53, 414-422.
5. Krishnarjuna B, Ganjiwale AD, **Manjappara UV** and Raghothama. S. NMR structure implications of enhanced efficacy of obestatin fragment analogs. *International Journal of Peptide Research and Therapeutics*. 2011 ; 17:259-270.
6. Nagaraj S, Peddha MS, **Manjappara UV**. Fragment analogs as better mimics of obestatin. *Regulatory Peptides*. 2009; 158: 143-148.
7. Nagaraj S., Peddha, M.S., **Manjappara U.V**. Fragments of obestatin as modulators of feed intake, circulating lipids and stored fat. *Biochemical and Biophysical Research Communications*. 2008; 366, 731-737.
8. Leavitt, S. A., Schon A, Klein, J. C., **Manjappara, U. V.**, Chaiken, I. M., Freire, E. Interactions of HIV-1 proteins gp120 and Nef with cellular partners define a novel allosteric paradigm. *Current Protein & Peptide Science*. 2004; 5, 1-8.
9. **Manjappara U. V.**;Savinov, S. N.;Cox, J. M.;Zurawski, J. A.;Smith, A. B.;Chaiken, I. M. Towards high-throughput chemical modification and screening of miniprotein mimetics of CD4 . *Biopolymers* 2003; 71, 357-358.
10. Smith, A. B. III, Savinov, S. N., **Manjappara, U. V.**, Chaiken, I. M. Peptide small molecule hybrids via orthogonal deprotection-chemoselective conjugation to cysteine anchored scaffolds. A model study," *Organic Letters*. 2002; 4, 4041-4044.

11. **Manjappara, U. V.**, Sudha, R., Balaram, P. Spermidine as a potential biosynthetic precursor to the 1, 5-diazabicyclo [4:3:0] nonene residue in the efrapeptins, *Journal of Peptide Research*, 2001; 58, 375-379.
12. Nagaraj, G., **Manjappara, U. V.**, Shivayogi, M. S., Balaram, P. "Antimalarial activities of peptide antibiotics isolated from fungi. *Antimicrobial Agents and Chemotherapy*, 2001; 45, 145-149.
13. Datta, S., **Manjappara, U. V.**, Shamala, N., Balaram, P. Stereochemistry of the Schellman motifs in peptides: crystal structure of a hexapeptide with a C-terminus 6 $\pi$ 1 hydrogen bond. *Biopolymers*, 1999; 50, 13-22.

#### **Ph.d students guided/ing**

1. Completed – 01 Student (University of Mysore)
2. Ongoing – 03 Student (University of Mysore – 02, AcSIR-01)

#### **M.Sc. Dissertations guided**

1. "Synthesis, characterization and purification of a 23 residue peptide". Rajini K, Applied Botany and Biotechnology, University of Mysore, Mysore.
2. "Characterization and determination of solution state conformation of a thirteen residue peptide". Roopa S, Applied Botany and Biotechnology, University of Mysore, Mysore.
3. "Purification and characterisation of Aib containing peptides". Divya Keshavan, Applied Botany and Biotechnology, University of Mysore, Mysore.
4. "Estimation of total proteins, cholesterol and triglycerides in mice plasma". Supraja Prasad, B.tech Biotechnology, VIT, Vellore.
5. "Studies on chelation of iron by glycine rich peptides". Neha Singh, School of studies in Biochemistry, Jiwaji University, Gwalior.
6. "Enzyme degradation studies on fluorescent Aib containing peptides". Freddy Jose, B. Tech Electronics and Instrumentation and M.Sc Chemistry, BITS Pilani, Goa campus.
7. "Comparative Study of Obesity Related Peptides". N.Puneeth, B.Tech-Bioinformatics, VI-Semester, Amity University Rajasthan, Jaipur. June 28<sup>th</sup> to July 29<sup>th</sup> 2011.
8. "Effect of phlebotomy on glucose, protein and cholesterol levels in rats". Pradeep Kumar K., M.Sc Organic Chemistry, University of Mysore. 30<sup>th</sup> January to 30<sup>th</sup> March 2012.

9. "Analysis of differential regulation brought about by OB-23". Angad V Raghavan, BITS Pilani, Rajasthan. 21<sup>st</sup> May, 2012 – 13<sup>th</sup> July, 2012.
10. "Effect of folic acid on bioavailability of iron from a peptide chelate" Poonam Yadav, Gautam Buddha University, Noida. 7<sup>th</sup> Jan 2013- 15<sup>th</sup> June 2013.
11. "Quantification of mRNA using qPCR". Haritha D, Dept. of Molecular Biology, Dr.P.K.Rajan memorial campus, Kannur University. 4<sup>th</sup> April-5<sup>th</sup> July, 2016.
12. "Synthesis, characterization and purification of a 13 residue peptide". Vani Venugopal, Dept. of Biotechnology, Acharya Institute of Technology, February-May, 2017.

### INSA Summer Research Fellows guided

1. "Angiotensin Converting Enzyme inhibitory activity of a synthetic peptide". Aishwarya S., Yuvaraja's college, Mysore. 19<sup>th</sup> June -19<sup>th</sup> Aug 2013.
2. "Purification of antimicrobial peptides from insects". Dr.Jayappa J., Asst.Professor, K.R.C. College of Horticulture, Arabhavi. 23<sup>rd</sup> May – 23<sup>rd</sup> July 2014.
3. "Synthesis and characterization of a tripeptide designed to inhibit Glucose oxidase". Aquib Ehtram., Aligarh Muslim University. 26<sup>th</sup> May – 26<sup>th</sup> July 2014.
4. "Synthesis, characterization and assay of tripeptides designed to inhibit  $\alpha$ -glucosidase". Greeshma K.P., PES Institute of Technology, Bangalore. 1<sup>st</sup> June-31<sup>st</sup> July, 2015.

### Foreign visitor

1. Mr. Attawut Khantavong, a Ph.D scholar from Faculty of Fisheries, Kasetsart University Thailand was on a 6 months deputation (Feb-Aug 2012) to our laboratory to assay seaweed protein hydrolysates for ACE inhibitory activity.

### Presentations

1. "Obestatin as revealed by nutraceuticals". **Uma V Manjappara**, 85<sup>th</sup> Annual Meeting of SBC (I) held at CSIR-CFTRI, Mysore from 21<sup>st</sup>-24<sup>th</sup> November, 2016.
2. "Effect of Nt8U and Soyasaponins on the expression of genes involved in lipid metabolism". Govardhan Singh RS & **Uma V Manjappara**. 85<sup>th</sup> Annual Meeting of SBC (I) held at CSIR-CFTRI, Mysore from 21<sup>st</sup>-24<sup>th</sup> November 2016.
3. "Effect of Obestatin and its fragment analog Nt8U on High Fat fed C57BL/J mice". Shilpa T S & **Uma V Manjappara**, 85<sup>th</sup> Annual Meeting of SBC (I) held at CSIR-CFTRI, Mysore from 21<sup>st</sup>-24<sup>th</sup> November 2016.

4. "Co-administration of obestatin with PPAR $\gamma$  ligands to alleviate the symptoms of obesity in DIO C57BL/6J mice". Mallikarjuna B.G. & **Uma V Manjappara**, 85<sup>th</sup> Annual Meeting of SBC (I) held at CSIR-CFTRI, Mysore from 21<sup>st</sup>-24<sup>th</sup> November 2016.
5. "In vivo and in vitro effects of Obestatin and Capsaicin in countering obesity". Suneel Kumar Reddy M, and **Uma V Manjappara**, 85<sup>th</sup> Annual Meeting of SBC (I) held at CSIR-CFTRI, Mysore from 21<sup>st</sup>-24<sup>th</sup> November 2016.
6. "Evaluation of capsaicin and obestatin as probable partners to counter obesity". Suneel Kumar Reddy M. and **Uma V. Manjappara**, 84<sup>th</sup> annual meeting of the Society of Biological Chemists(India) and 14th FAOBMB congress symposium 27-30<sup>th</sup> November 2015, BITS pilani Hyderabad campus.
7. "Combined effect of obestatin and rosiglitazone in obese C57BL/6J mice". Mallikarjuna B. G. and **Uma V. Manjappara**, 7<sup>th</sup> Peptide Engineering Meeting (PEM7-2015), 05<sup>th</sup>-07<sup>th</sup> December, 2015 at IISER, Pune.
8. "Combined effect of Nt8U with different concentrations of soyasaponins A in high fat fed mice". Govardhan Singh RS and **Uma V. Manjappara**, HERBESCON, 2016, 17-18<sup>th</sup> Feb, at Sri Ramachandra University, Chennai.
9. "Combined effect of Nt8U and soyasaponins in high fat fed mice". Govardhan Singh RS and **Uma V Manjappara**. ICFOST XXIII 13-14 Dec 2014. NIFTEM Kundli, Hariyana. Best Poster Award in New product development and entrepreneurship category.
10. "Stand-off between an Iron peptide chelate and folic acid". Suneel Kumar Reddy M , Govardhan Singh R S,Poonam Yadav & **Uma V Manjappara**, 2<sup>nd</sup> International Conference on "Agriculture, Food Technologies and Environment-New Approaches" (AFTENA-2013) on October 19-20,2013 organized by Krishi Sanskriti at Jawaharlal Nehru University (J.N.U), New Delhi.
11. "PPAR $\gamma$  : Central to the activity of Obestatin, its N-terminal fragment and N-terminal fragment analog Nt8U" ; **Uma V Manjappara** & Shreeranga N , 3<sup>rd</sup> International Conference on "Biotechnology, Bioinformatics and Bioengineering" organized by Society for Applied Biotechnology at Tirupathi, Andhra Pradesh from 28<sup>th</sup>-29<sup>th</sup> June, 2013.
12. "Enhancement appetite suppression by Obestatin upon co-administration with cholecystokinin-8"; Shreeranga N & **Uma V Manjappara** in 82<sup>nd</sup> Annual Meeting of The Society of Biological Chemists (India) and Inetrnational Conference on Genomes : Mechanism and Function held at School of Life Sciences, University of Hyderabad from December 2-5,2013.

13. "Mimicking Proteinaceous Iron" ; Govardhan Singh R S, Suneel Kumar Reddy M, Shreeranga N & **Uma V Manjappara** , 7<sup>th</sup> International Food Convention-2013 (IFCON-2013) held at CSIR-CFTRI, Mysore from 18th-21st December, 2013.
14. "Towards a protease resistant synthetic peptide and its antimicrobial activity" Shilpa T S, ShreeRanga N & **Uma V Manjappara**, 7<sup>th</sup> International Food Convention-2013 (IFCON-2013) held at CSIR-CFTRI, Mysore from 18th-21st December, 2013.
15. "NMR Spectroscopic Analysis of Obestatin peptide Analogs" Krishnarjuna.B, **Uma.M.V**, Raghothama.S Recent Developments & Applications of Biomedical Magnetic Resonance CBMR Lucknow, Feb 21-24, 2010.
16. "NMR spectroscopic analysis of obesity control peptide obsetatin and its fragments" Krishnarjuna. B, **Uma. M.V**, Raghothama. S, Symposium on Magnetic Resonance & Biomolecular Mimetics, IICT Hyderabad, Feb 02-05 2009.
17. "Fragment analogs of obestatin as lead candidates against obesity" N. ShreeRanga, S.P. Muthukumar and **Uma V. Manjappara**. SBC-2008, IIT Madras, Dec-18-20 2008.
18. "Deciphering the bioavailability code" N. Shree Ranga and **Uma V. Manjappara**. IFCON-2008, CFTRI Mysore, Dec-15-19 2008.
19. "Towards peptides that counter obesity" ShreeRanga N., Muthukumar S. Pedha and **Uma V. Manjappara**. ICFOST 2008, Dec 31-2 Jan 2008, IIT Kharagpur, India.
20. "Towards high-throughput chemical modification and screening of miniprotein mimetics of CD4." **Manjappara, U. V.**, Savinov, S. N., Cox, J. M., Zurawski, J. A., Smith, A. B. III, Chaiken, I. M. 18<sup>th</sup> American Peptide symposium. July 19-23, 2003, Boston, Massachusetts, USA.
21. "Conformational heterogeneity in leucine rich peptides containing a single Aib residue". **Uma, M. V.**, Balaram, P. Special Symposium on Liquid Crystal NMR and National Symposium on Magnetic Resonance. February 4-7, 1998, Indian Institute of Science, Bangalore, India.
22. "Crystal structure of Boc-GLUL-OMe." Banumathi, S., **Uma, M. V.**, Ravikumar, K., Velmurugan, D., Balaram, P. Molecular Biophysics Unit Silver Jubilee Symposium and 24th Annual Meeting of the Indian Biophysical Society. December 9-12, 1996, Indian Institute of Science, Bangalore, India.

## **Awards:**

1. **Best Poster Award in Basic sciences.** “Towards peptides that counter obesity” ShreeRanga N., Muthukumar S. Pedha and **Uma V. Manjappara**, ICFOST 2008, Dec 31-2 Jan 2008, IIT Kharagpur, India.
2. **Best Poster Award in New product development and entrepreneurship category.** “Combined effect of Nt8U and soyasaponins in high fat fed mice”. Govardhan Singh RS and Uma V Manjappara. ICFOST XXIII 13-14 Dec 2014. NIFTEM Kundli, Hariyana.
3. **Annual Institute Award for the year 2014-15 for the “Best Research paper by staff for Basic Research”** for the publication “Obestatin and Nt8U influence glycerolipid metabolism and PPAR-gamma signaling in mice”. ShreeRanga Nagaraja., Angad V. Raghavan., Sudha N. Rao. & **Uma V. Manjappara**. *The International Journal of biochemistry & Cell Biology*, 2014; 53, 414–422.