HASMIK SARGSYAN

***Present Position*: Associate Professor of Biochemistry at the Armenian Medical Institute**

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Education:

1982 **Ph.D. in Chemistry / Bioorganic Chemistry**. Shemyakin Institute of Bioorganic Chemistry, Academy of Sciences, Moscow.
Thesis:"The Synthesis and Investigation of Delta Sleep Inducing Peptide (DSIP) and its analogues".

1976 **Diploma with honor in Chemistry/Bioorganic Chemistry**
Department of Chemistry, Yerevan State University, Armenia,

Teaching Experience

2009- 2016 **Associate Professor ,**
Chair of Chemistry Department (since 2014)
Teaching Biochemistry (in English, Armenian)
Yerevan Haybusak University

2007- 2009 **Associate Professor**
Department of Pharmaceutical Chemistry,
Yerevan State Medical University after M. Heratsi;
Teaching Medicinal Chemistry in English

2005-2006 **Adjunct Assistant Professor**,
Department of Chemistry, College of Staten Island, City University of New York (CUNY), USA, Teaching General Chemistry)

1995-2001 **Senior Lecturer of Biochemistry**
Yerevan Haybusak University, Armenia

Teaching Interests:

- Biochemistry,
- General, Organic and Bioorganic Chemistry,
- Medicinal Chemistry,
- Peptide and Protein Chemistry,
- Drug Design

Research Interests

- Protein aggregation. Design and synthesis of compounds stabilizing alpha-helical conformation of amyloid β-peptide as a candidates for Alzheimer 's disease novel drugs. Design and synthesis of a new peptidomimetic inhibitors for β-secretase .

- Peptide and protein organic synthesis. Native Chemical Ligation: synthesis of peptides and receptor's fragments.

- Synthesis of HIV chemokine CCR5 and CXCR4 receptors inhibitors as a candidates for novel anti-HIV drugs.

- Synthesis of HIV chemokine CCR5 receptor fragments , containing Tyr (SO_3H).

Research Experience

2007 **Visiting Scientist**
Laboratory of Protein Chemical Synthesis, Institute of Human Virology, University of Maryland Biotechnology, Institute (UMBI), Baltimore, USA (Studying the methods of protein synthesis by native chemical ligation)

2005 – 2006 **Research Associate/ Adjunct Assistant Professor,**
Department of Chemistry, College of
Staten Island, City University of NewYork,(CUNY), USA
(Basic research on G Protein Coupled Receptor (GPCR), funded by NIH grant)**;**

2004 - 2005 **Postdoctoral Fellow**
Department of Medicinal Biochemistry and Biophysics, Karolinska Institute, Medical University, Stockholm/ Biomedical Center, Uppsala, Sweden (The project on Alzheimer disease: synthesis of peptoid ligands reducing aggregation of beta-amyloid peptide)

2001 – 2003 **Research Associate**
Department of Chemistry, College of
Staten Island, City University of NewYork, (CUNY), USA;
Basic research on G Protein Coupled Receptor (GPCR), funded by NIH grant)

1986-2001 **Leading Scientist** (Group Leader)
Department of Biochemistry, Research Institute

of Biotechnology, Yerevan, Armenia

1976-1986 **Postgraduate Study and Internship**
Department of Peptide and Protein Chemistry,
M.M. Shemyakin Institute of Bioorganic Chemistry, Acad. Sci. USSR, Moscow.

Selected Presentations

June 18-23, 2005 **19th American Peptide Symposium:** Understanding Biology Using Peptides, San Diego, USA,

July 19-23, 2003 **18th American Peptide Symposium**: Peptide Revolution: Genomics,Proteomics & Therapeutics, Boston, USA,

Membership of Professional Societies:

2003-2005 American Peptide Society:

2001 American Society of Neurochemistry

- Synthesized specific peptide ligands for amyloid β–peptide, the major component of toxic plaques found in the brain of Alzheimer disease patients. These ligands can bind and stabilize the discordant helix of amyloid β–peptide. Some of them are capable to reduce the amyloid fibril formation. Such compounds can be useful for treating of Alzheimer's disease.
- Developed a new effective method of peptide biotinylation in solution with a quantitative yield (86-90%) and high purity. Synthesized biotinylated, photoactivatable analogues of alpha-factor, ligands for the GPCR Ste2p from *Saccharomyces cerevisiae.* Crosslinking of these peptides to the binding sites of the Ste2p provides valuable information about the mechanism of action of this GPCR.
- Optimized the method of synthesis of peptide thioester's related to the double transmembrane domain (229-339) of GPCR Ste2p, which were used for the synthesis of proper receptor fragments through native chemical ligation.
- Developed a new efficient method of the synthesis of Tyr-sulfated peptides of high purity and yield. Synthesized 27-residue N-terminal peptides of chemokine receptor CCR5 (CCR5-27) with acid labile Tyr-sulfated (Tyr(SO_3H) residues. The sulfated N-terminus of CCR5 is important for the entry of HIV-1 into macrophages.

Research Interests:

- Design, synthesis and study of biologically active peptides and peptidomimetics
- Peptide and protein organic synthesis. Native chemical ligation: synthesis of proteins and receptor's fragments.
- Protein aggregation. Design and synthesis of compounds stabilizing alpha-helical conformation of amyloid β-peptide (Alzheimer's disease).
- Signal transduction and molecular recognition. Study of hormone-receptor interactions of the G-protein-coupled receptors (GPCRs). Synthesis of fluorescent, biotinylated and photoactivatable ligands. Identification of ligand binding sites on GPCRs through the usage of such ligands.
- Design and synthesis of HIV-1 entry inhibitors

Technical skills

- Peptide and Protein organic synthesis
- Peptide Synthesis both in the Solution and Solid Phase Approaches (Applied Biosystems 433).

- Synthesis of large peptides and proteins by native chemical ligation strategy.
- Modification of peptides in solution: synthesis of fluorescent and biotinylated derivatives.
- Methods of Peptide and Protein Purification and Analysis: Ion Exchange, Affinity Chromatography, SDS Electrophoresis, Spectrophotometric assays, CD, Fluorescence, NMR, LC-MS.
- HPLC (Reverse Phase, Size-Exclusion, Cation Exchange, Hewlett Packard 1050, 1090, analytical and preparative).
- Computer skills: Microsoft Word, Power Point, Excel, Sigma Plot 1.02; 5.0; NC, Laboratory software programs (HPLC- Agilent ChemStation, Peptide Synthesis-Applied Biosystem 433).

Selected publications:

1. C.D. Son, H. Sargsyan, F. Naider, J. M. Becker, "Identification of binding regions of the Saccharomyces cerevisiae alpha-factor pheromone receptor (Ste2p) by photo-affinity cross-linking", *Biochemistry, Vol. 43, pp. 13193-13203 (2004)*
2. H. Sargsyan, C.D. Son, J. M. Becker, F. Naider, "Synthesis and crosslinking of photoactivateable, biotinylated ligands of a G-protein coupled receptor". *In: Peptide Revolution: Genomics, Proteomics & Therapeutics". Proceedings of the 18-th American Peptide Symposium. Ed-s: M. Chorev and T.K. Sawyer, Boston, pp. 635-636 (2004)*
3. F. Naider, C. Son, H. Sargsyan, J.M. Becker, " Biophysical and mutagenic analysis of a G-protein coupled receptor: photocrosslinking of the tridecapeptide alpha-factor into Ste2p of Saccharomyces cerevisiae reveals contact points between the peptide and its receptor binding site". *Proceedings of the 3rd International and 28th European Peptide Symposium, Prague, J.Pep.Science, Vol 10, S2, P105, (2004)*
4. C.D. Son, H. Sargsyan, G.B. Hurst, F. Naider, J.M. Becker, "Analysis of ligand-receptor cross-linked fragments by mass spectrometry", *J. Pept. Res., Vol. 65, pp. 418-426 (2005)*
5. A.M. Janiak., H. Sargsyan, J. Russo, F. Naider, M. Hauser, J.M. Becker, "Functional expression of the Candida albicans alpha-factor receptor in Saccharomyces cerevisiae", *Fungal Genet Biol., Vol. 42, pp. 328-338 (2005).*
6. J. Johansson, R. Stromberg, H. Sargsyan, C. Nerelius, H. Leijonmark. "Compounds for reducing aggregation of amyloid B-peptide", *International Patent Application, WO 2006/090289 A3-corr , Priority: US20050657339P, 28/02/2005 2007/48*
7. H. Sargsyan, B. Arshava, P. Cano, T. Inui, J. Anglister, F. Naider, "An efficient and facile synthesis of tyrosine-sulfate-containing peptides: synthesis of the N-terminal peptide of CCR5 and its analog". *In: Understanding Biology Using Peptides. Sylvie E. Blondelle (Ed-r), Proceedings of the Nineteenth American Peptide Symposium, pp. 172-173 (2006)*
8. T.Inui , H.Sargsyan , P.Cano , I. Ayzenshtat , B. Arshava , J.Anglister , F. Naider , Synthesis and NMR Analysis of CCR5 and CXCR4 N-Terminal Peptides Containing Tyrosine Sulfate, *Pept Sci (Japan) , Vol. 2005, pp.23-24,(2006).*

9. E. Mintzer, H. Sargsyan, R. Bittman, "Lysophosphatidic acid and lipopolysaccharide bind to the PIP (2)-binding domain of gelsolin", *Biochim Biophys Acta., Vol. 1758, pp. 85-89 (2006)*

10. R. Balambika, T. Inui, H. Sargsyan, B. Arshava, L.S. Cohen, F-X. Ding, J.M. Becker and F. Naider, "Synthesis of a Double Transmembrane Domain Fragment of Ste2p by Native Chemical Ligation", *International Journal of Peptide Research and Therapeutics. Bruce Merrifield Commemorative Issue, Vol. 13, N. 1–2, pp. 251–263 (2007)*

11. C. Nerelius, A. Sandegren, H. Sargsyan, R. Raunak, H. Leijonmarck, U. Chatterjee, A. Fisahn, S. Imarisio, D. A. Lomas, D. C. Crowther, R. Stromberg, J. Johansson, "Alfa-

Helix targeting reduces amyloid-beta-peptide toxicity", *Proc Natl Acad Sci U S A. Vol. 106, pp. 9191-9196 (2009)*

12. Mathew E, Bajaj A, Connelly SM, Sargsyan H, Ding FX, Hajduczok AG, Naider F, Dumont ME. " Differential Interactions of Fluorescent Agonists and Antagonists with the Yeast G Protein Coupled Receptor Ste2p". *J Mol Biol., Vol. 409, pp.513-528, (2011).*
13. Schnur E, Noah E, Ayzenshtat I, Sargsyan H, Inui T, Ding FX, Arshava B, Sagi Y, Kessler N, Levy R, Scherf T, Naider F, Anglister J. "The Conformation and Orientation of a 27-Residue CCR5 Peptide in a Ternary Complex with HIV-1 gp120 and a CD4-Mimic Peptide". *J Mol Biol. Vol.410(5),pp.778-97(2011).*
14. Schnur E, Noah E, Ayzenshtat I, Sargsyan H, Inui T, Ding FX, Arshava B, Sagi Y, Kessler N, Levy R, Scherf T, Naider F, Anglister J. Corrigendum to "The Conformation and Orientation of a 27-Residue CCR5 Peptide in a Ternary Complex with HIV-1 gp120 *and a CD4-Mimic Peptide"[J. Mol. Biol. 410/5 (2011) 778–797] J. Mol. Biol. Vol. 418, 2012, p.127*

References upon request