

CURRICULUM VITAE
Natalya Voloshchuk, Ph.D.

CONTACT INFORMATION

Address: Department of Biochemistry and Microbiology
School of Environmental and Biological Sciences
Rutgers, The State University of New Jersey
76 Lipman Drive
New Brunswick, NJ 08901-8525

Phone: 848-932-5607

Fax: 848-932-9530

Email: voloshchuk@aesop.rutgers.edu
nv158@rci.rutgers.edu

EDUCATION

Ph.D. Biochemistry (2004)
City University of New York, New York, NY
Thesis: "Mapping the DNA binding site of HIV-1 integrase using fluorescent oligonucleotides and fluorescence polarization"
Advisor: Professor Lesley Davenport

M. Ph. Biochemistry (2001)
City University of New York, New York, NY

B.S. Chemistry, *cum laude* (1998)
Brooklyn College of CUNY, Brooklyn, NY

ACADEMIC APPOINTMENTS

TEACHING

2013 - Present Teaching Instructor, Department of Biochemistry and Microbiology
Rutgers University, New Brunswick, NJ

2012 – 2013 Adjunct Lecturer, Biochemistry (lecture, lab), Chemistry Department
Wagner College, Staten Island, NY

2009 Adjunct Lecturer, Molecular Genetics (lecture, lab), Biostatistics (lecture)
Department of Chemical and Biomolecular Engineering
Polytechnic Institute of NYU, Brooklyn, NY

2005 - 2006 Adjunct Lecturer, Organic Chemistry (recitation, lab), General Chemistry
(recitation, lab), Chemistry Department
Brooklyn College of CUNY, Brooklyn, NY

1998 – 2004 Teaching Assistant, General Chemistry (recitation, lab), Organic Chemistry
(recitation, lab), Chemistry Department
Brooklyn College of CUNY, Brooklyn, NY

RESEARCH

2010 – 2012 Research Scientist (Laboratory of Dr. James Liang), Stevens Institute of Technology, Hoboken, NJ

- carried out therapeutic peptides modifications via transpeptidase and phospholipase enzymatic activities
- implemented expression and purification procedures for transpeptidase
- developed peptide expression in *E.coli* as an alternative procedure to peptide chemical synthesis
- trained, supervised, and advised research of high school, undergraduate, and graduate students

2006-2009 Postdoctoral Fellow (Laboratory of Dr. Jin K. Montclare), Polytechnic Institute of New York University, Brooklyn, NY

- implemented more efficient purification procedures of recombinant proteins
- improved sensitivity and optimized purified acetyltransferase activity assays and lysate based assays, and protein-protein interaction assays
- analyzed conformational stability of proteins using CD, DSC, and protease resistance
- allowed move forward several projects in the laboratory by modifying an expression vector for incorporation of structurally diverse amino acid analogs into proteins expressed in *E.coli*
- increased levels of unnatural amino acid analogs incorporation into recombinant proteins by optimizing expression media and media change procedures
- trained graduate students in CD spectroscopy experiments, fluorescence intensity enhancement assays, MALDI-TOF MS experiments, and data analysis
- supervised research of high school, undergraduate, and graduate students
- Co-advisor for the project designed for undergraduate students

Project: Machine learning protein design: optimization of tGCN5 acetyl transferase.

Funded by: Multidisciplinary Research Opportunities for Women (MRO-W) Program of the Committee on the status of women in computing research (CRA-W)

Final reports for 2007, 2008, and 2009 can be found at <http://www.cra-w.org/mrow>.

1998-2004 Research Assistant (Laboratory of Dr. L. Davenport), Brooklyn College of CUNY, Brooklyn, NY

- determined the importance of nucleotides at two positions in DNA substrate for binding by HIV-1 integrase through quantitative evaluation of binding by steady state fluorescence anisotropy
- developed binding assay
- responsible for maintenance of Fluorolog-tau3 spectrofluorometer

June, 2000 Visiting researcher (under guidance of Mary E. Hawkins), Pediatric Oncology Branch, National Cancer Institute, Bethesda, MD

- performed short oligonucleotides synthesis and purification

1997 – 1998 Undergraduate Research (Laboratory of Dr. L. Davenport), Brooklyn College of CUNY, Brooklyn, NY

- developed working purification protocol of amine oxidase from bovine plasma based on literature reports

PUBLICATIONS

Refereed research publications

N. Voloshchuk, L.Chen, Q. Li, J.F. Liang, Peptide oligomers from ultra-short peptides using sortase. *Biochemistry and Biophysics reports*, accepted February 3, 2017.

N. Voloshchuk, D. Liang, J.F. Liang, Sortase A mediated protein modifications and peptide conjugations. *Current Drug Discovery Technologies*, 2015, 12(4):205-13.

L. Chen, Z. Tu, **N. Voloshchuk**, J.F. Liang, Lytic peptides with improved stability and selectivity designed for cancer treatment. *Journal of Pharmaceutical Sciences*, 2011,101 (4): 1508-1517.

K.R. Menta, Y.M. Chan, C.Y. Yang, M.X. Lee, **N. Voloshchuk**, J.K. Montclare, Mutagenesis of tGCN5 core region reveals two critical surface residues F90 and R140, *Biochemical and Biophysical Research Communications*, 2010, 400 (3): 363-368.

N. Voloshchuk and J. K. Montclare, Incorporation of Unnatural Amino Acids for Synthetic Biology, *Molecular Biosystems*, 2010, 6(1):65-80.

J.S. Haghpanah, C. Yuvienco, D. E. Civay, H. Barra, P. J. Baker, S. Khapli, **N. Voloshchuk**, S.K. Gunasekar, M. Muthukumar, J. K. Montclare, Artificial Protein Block Copolymers Comprised of two Self-assembling Domains, *ChemBioChem*, 2009, 10(17): 2733-2735.

N. Voloshchuk, Y. Zhu, D. Snyder and J. K. Montclare, Positional Effects of Monofluorinated Phenylalanines on Histone Acetyltransferase Function and Stability, *Bioorganic and Medicinal Chemistry Letters*, 2009,19(18):5449-5451.

N.Voloshchuk, M.Lee, W. W. Zhu, I.C. Tanrikulu and J. K. Montclare, Fluorinated Chloramphenicol Acetyltransferase Thermostability and Activity Profile: Improved Thermostability by a Single-Isoleucine Mutant, *Bioorganic and Medicinal Chemistry Letters*, 2007,17:5907-5911.

Abstracts

N. Voloshchuk, M.E. Hawkins and L. Davenport. Mapping the DNA binding site of HIV-1 integrase using fluorescent oligonucleotides and fluorescence polarization, *Biophysical Journal*, Abstracts Issue (2005) 88, 406A.

N. Voloshchuk, M.E. Hawkins and L. Davenport. HIV-1 integrase binding to model oligonucleotide substrates, *Biophysical Journal*, Abstracts Issue (2001) 80, 294A.

N. Voloshchuk, M.E. Hawkins and L. Davenport. The Binding Properties of HIV-1 Integrase, *Biophysical Journal*, Abstracts Issue (2000) 78, 300A.

PRESENTATIONS

Research talks

Department of Chemistry and Physics Seminar
SUNY Old Westbury College, NY, April, 2012

Positional effects of fluorinated phenylalanine on histone acetyltransferase function and stability.

Liang Laboratory of Molecular Pharmacology Seminar
Stevens Institute of Technology, NJ, September, 2009
Nucleotide analogs and amino acid analogs in protein-DNA and protein studies.

Montclare Protein Engineering Laboratory Seminar
Polytechnic Institute of NYU, March 2006
Mapping the DNA binding site of HIV-1 integrase using fluorescent oligonucleotides and fluorescence polarization.

ACS the 46th annual undergraduate research symposium
New York University, NY, May, 1998
Isolation and Purification of Bovine Plasma Amine Oxidase (BPAO).

Selected research posters

Margaret Morales, Peter C. Kahn, **Natalya Voloshchuk**, Expression and purification of CelB2, β -1,4-endoglyconase, in *Escherichia coli*. The Aresty 11th annual undergraduate research symposium, Rutgers University (April, 2015).

Margaret Morales, Peter C. Kahn, **Natalya Voloshchuk**, Engineering of plasmid for the expression and purification of cellulase CelB2 as fusion protein His₆/MBP/CelB2 in *E.coli*.
1st place winner in Biochemistry category. William Paterson university 9th annual undergraduate research symposium (April 11, 2015).

Natalya Voloshchuk, Chen Long, and James Liang, Controlled peptide ligation and cyclization using Sortase A from *Staphylococcus aureus*. Research & Entrepreneurship Day, Stevens Institute of Technology (April, 2012).

Ching-Yao Yang, **Natalya Voloshchuk**, and Jin Kim Montclare. Preparation of the histone acetyltransferase, tGCN5, for fluorine NMR studies. 3rd annual advances in biomolecular engineering: protein design symposium, The New York Academy of Sciences, NY (June, 2009).

Jennifer S. Haghpanah, Carlo Yuvienco, Deniz E. Civay, Hanna Barra, Peter J. Baker, Sachin Khapli, **Natalya Voloshchuk**, Susheel K. Gunasekar, Murugappan Muthukumar, J. K. Montclare, Orientation and number of blocks influence structure and self-assembly of artificial protein copolymers. 3rd annual advances in biomolecular engineering: protein design symposium, The New York Academy of Sciences, NY (June, 2009).

Natalya Voloshchuk, Yuhua Zhu, David Snyder and Jin Kim Montclare. Positional Effects of Monofluorinated Phenylalanines on Histone Acetyltransferase Function and Stability. ASBMB annual meeting, New Orleans (April, 2009).

Natalya Voloshchuk, Yuhua Zhu, and Jin Kim Montclare. Characterization of stability and activity of fluorinated histone acetyltransferase, tGcn5. 236th ACS national meeting, Philadelphia (August 2008).

Natalya Voloshchuk, Yuhua Zhu, and Jin Kim Montclare. Effects of fluorinated phenylalanine incorporation on histone acetyltransferase, tGcn5. 2nd Annual Advances in Biomolecular Engineering: Protein Design Symposium, City College of the City University of New York (June, 2008).

Natalya Voloshchuk, Yuhua Anita Zhu, and Jin Kim Montclare. Characterization of fluorinated histone acetyltransferase, tGcn5. ACS 40th Mid-Atlantic regional meeting, New York (May 2008).

Man Xia Lee, Kinjal Mehta, Aye Sandar Moe, Susheel Kumar Gunasekar, Zhiqiang Liu, **Natalya Voloshchuk**, Phyllis Frankl and Lisa Hellerstein, Jin K. Montclare. Machine Learning Designs for Artificial Histone Acetyltransferases. *Frontiers of Nanotechnology & Biotechnology: Integration and Invention*. Hunter College of the City University of New York (January, 2008).

Natalya Voloshchuk, Man Xia Lee, Wan Wen Zhu, Ismet Caglar Tanrikulu & Jin Kim Montclare. Thermal stability and activity of fluorinated single-isoleucine mutants of chloramphenicol acetyltransferase. 234th Annual ACS meeting, Boston, MA (August, 2007).

Natalya Voloshchuk, Yuhua Zhu, and Jin Kim Montclare. "Engineering a therapeutic, fluorinated histone acetyltransferase: resistance to proteolysis and activity study." *Advances in Biomolecular Engineering: Protein Design Symposium*, Polytechnic Institute of New York University (May, 2007).

Natalya Voloshchuk, Yuhua Zhu, and Jin Kim Montclare. Engineering a therapeutic, fluorinated histone acetyltransferase. Drug Delivery and Translational Research meeting, Polytechnic Institute of New York University (December, 2006).

Natalya Voloshchuk, Mary E. Hawkins and Lesley Davenport. Mapping the DNA binding site of HIV-1 integrase using fluorescent oligonucleotides and fluorescence polarization. 49th Annual Biophysical Society Meeting, Long Beach, California (February, 2005).

Natalya Voloshchuk, Mary E. Hawkins and Lesley Davenport. Mapping the DNA binding site of HIV-1 integrase using fluorescent oligonucleotides and fluorescence. 5th Annual Science, Engineering and Mathematics Celebration, New York City (March, 2004).

Natalya Voloshchuk, Mary E. Hawkins and Lesley Davenport. HIV-1 integrase binding to model oligonucleotide substrates. 4th Annual Science, Engineering and Mathematics Celebration, New York City (March, 2003).

Natalya Voloshchuk, Mary E. Hawkins and Lesley Davenport. Mapping the DNA binding site of HIV-1 integrase using fluorescent oligonucleotides and fluorescence polarization. ACS 3rd metropolitan area poster program for graduate students in chemical sciences, New York City (February, 2003).

Natalya Voloshchuk, Mary E. Hawkins and Lesley Davenport. HIV-1 integrase binding to model oligonucleotide substrates. 45th Annual Biophysical Society meeting, Boston (February, 2001).

Natalya Voloshchuk, Mary E. Hawkins and Lesley Davenport. The binding properties of HIV-1 integrase. 14th annual meeting of the groups studying the structure of AIDS-related systems and their application to targeted drug design, NIH, Bethesda (June, 2000).

Natalya Voloshchuk, Mary E. Hawkins and Lesley Davenport. The binding properties of HIV-1 integrase. 44th Annual Biophysical Society Meeting, New Orleans (February, 2000).