

# MISAGH NADERI

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## Educations

Louisiana State University, Baton Rouge, Louisiana

Ph.D., Computational Biology

December 2017

Thesis title "Data driven approach to study bio-molecular interactions"

Course highlights: Computational biology, Lipids and membrane proteins, Virology,  
Cellular and molecular biology, Stem Cell, Microbiology, Parasitology, Statistical Analysis. (4.0/4.0 GPA)

Master of Science, Chemical Engineering

May 2012

Course highlights: Fluid Mechanics, Mathematical Methods in Ch.E., Thermodynamics,  
Heat and Mass Transport, Chemical Reactor Design, Genetic Engineering. (3.8/4.0 GPA)

Sharif University of Technology, Tehran, Iran

Bachelor of Science, Chemical Engineering

May 2008

Course highlights: Polymer, Computer Programing, Biochemistry,  
Electrical Circuit Theory, Applied Mathematics, Logic. (3.6/4.0 GPA)

## Experience

Louisiana State University, Graduate Student/Research Assistant

Since Jan 2010

### Department of Biological Sciences

#### Graduate Research Assistant

- ❖ Large-scale modeling of protein-ligand complexes
- ❖ *In silico* drug design
- ❖ Modeling of viral proteins
  - Utilize available computational biology tools including structure modeling, cheminformatics and phylogeny software.
  - Modify open source software for specific applications in each project.
  - Develop new algorithms, scripting codes and software tools.
  - Analyze data using Python, R and Perl utilizing high performance computing and Unix-based systems.
  - Generate hypothesis that can be tested using computational or experimental methods.
  - Collaborate with experimentalist to design and test hypotheses based on models.
  - Apply feedbacks from experiments to improve and refine computational models.

### Department of Pathobiological Sciences

#### Graduate Research Assistant

- ❖ Oncolytic Herpes Simplex Virus type 1 and Paclitaxel Synergistic cancer cell killing
- ❖ Herpes Simplex Virus type-1 glycoproteins and host protein interactions
  - Design and execute experimental protocols, both in vivo and in vitro
  - Culture and maintain mammalian cell lines, and viral stocks (Herpes Simplex Virus Type-1) in BSL-2
  - Familiar with drug combination mathematical models (Chou- Talalay method)
  - Optimize and perform: Flow Cytometry, Polymerase Chain Reaction (PCR), Gene sequencing, Artificial genetic recombination, Immunofluorescence and luminescence assays, Cell imaging, Confocal and Electron Microscopy,

Cell cytotoxicity assays, Cell cycle analysis, Virus titrating, In-vitro infectivity and spread assays, ELISA, SDS-PAGE, Immunohistochemistry, and Western blot.

- Proficient in presenting technical and scientific information in professional and scientific meetings
- ❖ **Targeting of Atherosclerosis Plaques with Influenza Hemagglutinin-Carrying Liposomes for drug delivery**
- Chemistry lab techniques: filter extrusion, Sephadex column separation, HPLC, and Dynamic Light Scattering
- Formulate and assemble stable bilayer fluorescent dye-encapsulating liposomes

## Louisiana State University, Department of Chemical Engineering

Graduate Research Assistant

January 2009 – 2010

- ❖ **Simulation of Reactive Distillation Unit (RDU) for Production of Methyl Tert-Butyl Ether (MTBE)**
- Computer simulation of reactive distillation unit (RDU) (Hysys) and calculate composition in different trays
- Simulate series of CSTRs (compare to RDU) to model stripping and rectifying processes (Hysys)
- ❖ **Parkinson's disease: study the role of heat shock proteins in development of the disease**
- Biological systems mathematical modeling (Dynamic and Stochastic processes)

## Sharif University of Technology

Undergraduate Researcher / Student Worker

May 2005 – April 2008

- ❖ **Enzymatic Synthesis of Amoxicillin with Immobilized Penicillin-G Acylase**
- ❖ **Kinetic Study of Nitrogen and Sulfate Removal in High Strength Waste Water Anaerobic Multistate Bioreactor**
- Build a moving bed biofilm reactor, prepare and maintain E-Coli cultures
- Perform and analyze Chemical oxygen demand (COD) and Biochemical oxygen demand (BOD) tests
- ❖ **Environmental Impact Assessment of Bandar Abbas Refinery**
- Collect and analyze environmental samples
- Determining and characterizing sources, dimensions and degree of impact of the air pollutant
- ❖ **Computer Simulation and Kinetic Modeling of Vis-Breaking Process (tar sands) (B.Sc. Thesis)**
- Proposed a model for possible reaction pathways and kinetics based on a particular feed composition
- Modeling of the visbreaker was conducted using MATLAB and Hysis
- Predict viscosity of products in different feed properties and operating temperatures
- ❖ **Two-phase flow transmission of Gas-Condensate from South Pars Gas Field**
- Design, Sizing, cost estimating and Hysis simulation of the two-phase flow (course project)

## Honors and Awards

3<sup>rd</sup> place award: Phi Zeta Research Emphasis Day, Basic science research poster presentation at LSU, September 2012

2<sup>nd</sup> place award: Annual Graduate Student Symposium, Department of Pathobiological Sciences, LSU, May 2012

Phi Kappa Phi membership awarded 2012

Ranked top 1% (1423 / 400,000 students) in the national university entrance exam, Iran, 2003

National champion in Canoe Polo and kayaking, Iran, 2002 - 2005

## Additional Experience

Student vice-president at the Phi Kappa Phi Honor Society at LSU

2013-2014

SC-13 high-performance computing conference, Denver, CO

Fall 2013

Interfaith Federation of Greater Baton Rouge, Intern

May - September 2013

Founder & Teacher of Enlighten Up Meditation / Yoga Group at LSU

March 2011 - Present

Panelist speaker at student forum on world peace day

October 2010

Science fair mentor at I<sup>3</sup> program, Baton Rouge magnet high school

Fall & Spring 2011

Volunteer Judge at Mentorship Academy Science fair

Fall & Spring 2011

## Publications

1. Liu T, **Naderi M**, Alvin C, Mukhopadhyay S, Brylinski M. Submitted. Break down in order to build up: Decomposing small molecules for fragment-based drug design with eMolFrag.
2. Chouljenko D, Jambunathan N, Chouljenko VN, **Naderi M**, Brylinski M, Kousoulas KG. In Press. Herpes Simplex Virus Type 1 UL37 protein tyrosine residues conserved among all alphaherpesviruses are required for interactions with glycoprotein K (gK), cytoplasmic virion envelopment, and infectious virus production. J Virol.
3. **Naderi M**, Alvin C, Ding Y, Mukhopadhyay S, Brylinski M. **2016**. A graph-based approach to construct target-focused libraries for virtual screening. J Cheminform. 8:14.
4. Jambunathan N, Charles AS, Subramanian R, Saied AA, **Naderi M**, Rider P, Brylinski M, Chouljenko VN, Kousoulas KG. **2016**. Deletion of a predicted  $\beta$ -sheet domain within the amino terminus of herpes simplex virus glycoprotein K conserved among alphaherpesviruses prevents virus entry into neuronal axons. J Virol. 90(5):2230-9.
5. Chowdhury S, Chouljenko VN, **Naderi M**, Kousoulas KG. **2013**. The amino terminus of herpes simplex virus type-1 (HSV-1) glycoprotein K (gK) is required for virion entry via the paired immunoglobulin-like type-2 receptor alpha (PILR $\alpha$ ). Virol J. 87(6):3305-13.
6. Chowdhury S, **Naderi M**, Chouljenko VN, Walker JD, Kousoulas KG. **2012**. Amino acid differences in glycoproteins B (gB), C (gC), H (gH) and L (gL) are associated with enhanced herpes simplex virus type-1 (McKrae) entry via the paired immunoglobulin-like type-2 receptor  $\alpha$ . Virol J. 9:112.
7. Chowdhury S, **Naderi M**, Chouljenko VN, Kousoulas KG. **2012**. Nucleotide sequence of herpes simplex virus type-1 (HSV-1) McKrae glycoproteins involved in virus entry and virus-induced cell fusion - gB, gC, gD, gH, gL, gK and UL20. GenBank.

## Presentations

1. "Targeting Virus DNA-packaging motor" Poster presentation at The 4th Annual LA Conference on Computational Biology & Bioinformatics, **February 2016**
2. "A graph-based approach to targeted drug discovery" Poster presentation at The 4th Annual LA Conference on Computational Biology & Bioinformatics, **April 2015**
3. "Synthetic Libraries of Drug-Target Complexes for Structure-Based Drug Design", Poster presentation at the High Performance Computing annual symposium at Louisiana State University Center of Computation and Technology, **November 2014**
4. "Synthetic Libraries of Drug-Target Complexes for Structure-Based Drug Design", Poster presentation at the annual Biological Sciences graduate research Symposium at Louisiana State university, **November 2013**
5. "Paclitaxel and Oncolytic Herpes Simplex Virus Type-1 Synergistic Treatment of Breast and Prostate Cancer Cells." Poster presentation at Phi Zeta research emphasis day, School of Veterinary Medicine, LSU, **September 25<sup>th</sup>, 2012** (Awarded Third Place)
6. "Paclitaxel Enhances Oncolytic Herpes Simplex Virus Type-1 Destruction of Breast Cancer Cells." Oral presentation, Department of Pathobiological Sciences 8th Annual Graduate Student Symposium, **May 2012** (Awarded Second Place)
7. "Oncolytic Herpes and Taxol Co-Therapy: The in vitro effects of Taxol on Oncolytic Herpes Virus OSVP.", **Misagh Naderi**, Jason D. Walker, Sona Chowdhury and Konstantin G. Kousoulas. Poster Presentation at Phi Zeta research emphasis day, by Tau chapter of Phi Zeta society, School of Veterinary Medicine, LSU, **September 2011**
8. "Effect of Taxanes on Herpes Simplex Type-1 Infectious Virus Production." Oral presentation, Department of Pathobiological Sciences 7th Annual Graduate Student Symposium, **May 2011**