Andrew Michaelson

http://www.Andrew-Michaelson.com
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617-719-2156 cell
sutak@aol.com

Education

Stony Brook University, Stony Brook, Long Island, NY
Ph.D. in Biomedical Engineering (expected) May 2020

Northeastern University, Boston, MA
Masters of Engineering in Bioengineering GPA 3.614 May 2013
Professional Science Master's in Bioinformatics GPA 3.667 May 2010
Post-baccalaureate B.S. in Physics May 2007
B.S. in Biology and Mathematics, with a minor in Chemistry May 2004

Work Experience

SUNY Farmingdale, Farmingdale, Long Island, NY Jan 2016 - Present
Adjunct Assistant Professor of the Biology Department

- Teaching students Introductory Biology
- Teaching students Advanced Bioinformatics
- Research Supervisor for Bioinformatics students and CSTEP students.
- Performing molecular modeling research for Polcycythemia Vera and nerve conduction studies for regeneration of nerves in my laboratory.

Stony Brook University, Stony Brook, Long Island, NY August 2014 - Present
Research Scientist with Distinguished Professor Miriam Rafailovich in Material Science

- Lecturer and Research Supervisor for Garcia Center for Summer 2015
- Prepare protocols and prepare plastic scaffolds to culture dental pulp stem cells on.
- Prepare proposals for working at Brookhaven National Laboratory.
- Prepare structures to be 3D printed in the Python based program Blender.
- Molecular Modeling of Polylactic Acid (PLA) and protein interactions.

Stony Brook University, Stony Brook, Long Island, NY August 2014 - Present
Research Scientist with Professor Marcia Simon at the Dental School

- Prepare protocols for culturing dental pulp stem cells and scaffolds.
- Prepared research plan for my research studies at Stony Brook University

Stony Brook University, Stony Brook, Long Island, NY Jan 2015 – May 2015
Head Teaching Assistant with Professor Danny Bluestein

- Taught students important concepts and equation in Biofluids (Basic continuity equations, Bernoulli's equation, Navier–Stokes, and Reynold's Transport Theorem)

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Work Experience

Stony Brook University, Stony Brook, Long Island, NY Sept 2014 – Dec 2014
Teaching Assistant with Professor Lilianne Mujica-Parodi

- Taught students how to use SPSS for Biostatistical Analysis of measurements taken with electrodes (ECG, EEG, EDA, EMG) and Transducers on the human body.
- Trained students on how to prepare independent research projects, choose proper statistical tests, write final papers, and prepare presentations.
- Taught independently several lab lectures

US Army NSRDEC/Natick Labs, Natick MA June 2014 – August 2014
Engineer in Pathways Program in Systems Equipment Engineering Team Combat Feeding Directorate for Team Leader Bob Bernazzani at the Natick Labs

- Conduct experiments to test food service equipment and prepare synthetic food from hydroxypropyl methylcellulose using equipment k-type thermocouples, omega OM-EL-USB data logger, extech power analyzer, and OM-EL-datapad.
- Wrote test plans for Big Dipper W-500-IS, Randell FX-1RE & Traulsen TE060HR
- Award of Certificate for The Future Workforce Poster Presentation
- Prepared Continuous Product Improvement grant for Heat Ailment Recovery Pack (HARP)

University Tutor, Boston MA August 2013 – August 2014
Independent Tutor for University Tutor

- Tutored students for the GRE and helped them achieve over the 90th percentile in both the quantitative and english sections of the GRE
- Helped students prepare the whole graduate school application and they were accepted into Ivy League Schools
- Prepared students for their courses, exams, homework assignments in Python, Bioinformatics, Molecular Biology, Pathophysiology, GRE, Calculus, and Physics.
- Mentored highschool students for the Massachusetts State Science Fair Competition at MIT in a study on 500 books published on Amazon. The students won an MIT award, a Biogen Idec award, and the distinguished Harvard Book Club award.

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Work Experience

Northeastern University, Boston, MA July 2011 – May 2014
Research Scientist with Professor Rebecca Carrier of the Chemical Engineering Department

- Conduct experiments to observe substrates: to quantify and qualify results of stem cell development and delivery of the retina using techniques such as: lyophilization, surgical dissection of Bovine, Salmon, Pig, and *Xenopus laevis* eyes, crosslinking, fluorescent staining, *in vitro* studies, SEM, BCA, Mammalian Cell Culture, and Confocal Microscopy
- Train postdocs, graduate students, master students, undergraduates, and high school students in proper cell techniques, safety, hazardous waste handling, and proper use of laboratory equipment
- Maintain stock and equipment in the lab, order new equipment, change gas tanks for incubators, clean filters on biological safety cabinet and -80^{o}C freezer, maintenance of water volume within water jacketed incubators
- Preparation of stock, working solutions, protocols, experimental setup, sterilization, and lab cleanup, and responsible for transport of materials from one lab to another
- Develop novel extracellular matrix substrates such as such as: crosslinked Interphotoreceptor Matrix (IPM) scaffolds, biopolymer IPM-PCL scaffolds, and decellularized retina from the retina for stem cell development and delivery
- Management of website and proteomics analysis

Harvard University, Boston, MA July 2011 – May 2014
Research Scientist with Dr. Petr Baranov, Dr. Caio Regatieri, and Professor Michael Young at the Schepens Eye Research Institute

- Develop novel extracellular matrix substrates for stem cell development and delivery
- Conduct experiments to observe substrates: to quantify and qualify results of stem cell development and delivery using techniques such as, Contact Angle Measurement in a Class 1000 cleanroom, Fluorescent Microscopy, immunoflourescent staining, and explant studies

Northeastern University, Boston, MA June 2009 – Sept 2011
Research Scientist with Professor Slava Epstein of the Biology Department

- Developed novel methods for 16s rRNA hereditary comparison using secondary and tertiary modeling, compared fasta sequences of primary level 16s rRNA

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Work Experience

Northeastern University, Boston, MA Aug 2010 – Jun 2011
Research Scientist with Professor Albert-László Barabási of the Physics Department

- Developed new methods of comparison for topological and functional analysis of proteomic databases for disease identification using Python, statistical analysis, and visualization of networks with Cytoscape
- Developed concepts in controllability of networks

Northeastern University, Boston, MA Dec 2008 – Sept 2010
Research Scientist with Professor Mary Jo Ondrechen of the Chemistry Department

- Identified secondary and allosteric active sites with Yasara and simulated molecular dynamics, and charges of residues on proteins
- Found catalytic sites within proteins using Thematics, and defined active sites with Qhull

Northeastern University, Boston, MA Feb 2008 – Jan 2010
Research Scientist with Professor Mikhail Malioutov of the Mathematics Department

- Prepared novel normalization techniques for microarray analysis
- Performed work for statistical studies of manuscripts to determine authorship

National Naval Medical Center, Bethesda, MD May 2008 – Aug 2008
Research Scientist with Professor Michael Daly at USUHS in the Environmental Biology and Pathology Departments

- Discovered how to achieve survival of *Shewanella putrefaciens* under acute and chronic levels of radiation without genetic engineering
- Cultured antibiotic free bacteria
- Tested bacteria growth and survival under conditions of radiation and media change

MIT, Cambridge, MA Jan 2007 – Jun 2008
Research Scientist with Dr. Maksym Kryvohuz in the Chemistry Department

- Developed protein interaction networks using kinetic models to describe the evolution of networks

Northeastern University, Boston, MA &
Children's Hospital Medical Research, Boston, MA Jan 2004 – Jan 2007
Research Assistant with Dr. Judah Folkman, Dr. Sui Huang, Professor Thomas Sherman and Mikhail Malioutov at Children's Hospital Medical Research and the Mathematics Department at Northeastern University

- Modeled the growth of protein interaction networks with differential equations

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Work Experience

Children's Hospital Medical Research, Boston, MA Jun 2003 – Aug 2003
Research Assistant with Dr. Judah Folkman and Dr. Sui Huang at Children's Hospital Medical Research

- Developed in the language of C a program to find clusters within protein interaction networks

Honors, Achievements, and Publications

NNMC/USUHS
Discovered how to achieve survival of *Shewanella putrefaciens* under acute and chronic levels of radiation without genetic engineering Summer 2008

SUNY Farmingdale
The only adjunct professor with the distinction of having my own laboratory to perform independent investigation (with my students) into new treatments for Polycythemia Vera and nerve conduction studies for repair of nerve damage.

Awarded **Certificate of Recognition** for my contribution to the Collegiate Science and Technology Entry Program (CSTEP) and for my dedication to my students Spring 2017

Andrew Michaelson*, Nara Michaelson, Melody Hermel, David Hermel, Ira Michaelson, John Mikhail, Ly Quoc Trung, Luis Espinoza: Resveratrol Treatment of Polycythemia Vera (Manuscript in preparation)

Andrew Michaelson†, Nathalie Larin, Jazmin Ruiz Marcello, Amelia Tisk, Z'Dhanne Williams, Alexa Victor: A Targeted Molecular Modeling Approach to Find Novel Treatments for Polycythemia Vera. 19th Annual STEP Statewide Student Conference (poster) Spring 2017

Chris Corbo, Laurie Nussbaum, Elaina Vessella, Jessica Molina, Matthew Brutus, Nick Brutus, Bernard Essuman, Juan Maldonado, John Mikhail, Jeenali Shah, Conrad Dobrowolski, Nara Michaelson, & **Andrew Michaelson PI**: Discovering small molecules as Alternative Treatments to Polycythemia Vera. The SUNY Undergraduate Research Conference (SURC) in Brentwood, New York (poster) Spring 2017

Stony Brook University
Cunlai Pu, Siyuan Li, **Andrew Michaelson**, Jian Yang
Iterative path attacks on networks. Physics Letters A (published) Spring 2015

Qiwei Li, **Andrew Michaelson**
Predicting the Next Amazon Bestseller (Manuscript in preparation)

Andrew Michaelson, Qiwei Li, David Feder, Marcia Simon, Miriam Rafailovich
Spincasting porous PMMA scaffolds for Dentin mineralization (Manuscript in preparation)

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Honors, Achievements, and Publications

Northeastern University

Joydip Kundu, **Andrew Michaelson**, Petr Baranov, Marco Chiumiento, Tom Nigl, Michael J. Young, Rebecca L. Carrier: Interphotoreceptor matrix based biomaterial: Impact on human retinal progenitor cell attachment and differentiation. Journal of Biomedical Materials Research Part B: Applied Biomaterials. (published)

Joydip Kundu, **Andrew Michaelson**, Kristen Talbot, Petr Baranov, Michael J Young, Rebecca L Carrier: Decellularized retinal matrix: natural platforms for human retinal progenitor cell culture. Acta Biomaterialia, 1742-7061(published)

Andrew Michaelson, Joydip Kundu, Petr Baranov, Michael J Young, Rebecca L Carrier: Interphotoreceptor Matrix Based Biomaterial for Retinal Repair. (Manuscript in preparation)

Joydip Kundu, **Andrew Michaelson**, Kristen Talbot, Petr Baranov, Michael J Young, Rebecca L Carrier: Decellularized retinal extracellular matrix (D-REM) based hydrogel for retinal tissue engineering. (Submitted)

Petr Baranov, **Andrew Michaelson**, Joydip Kundu, Michael J Young, Rebecca L Carrier: Interphotoreceptor matrix-grafted poly (ε-caprolactone) scaffolds for human photoreceptor differentiation. Journal of Tissue Engineering 5, 2041731414554139 (published) Spring 2014

Joydip Kundu, **Andrew Michaelson**, Petr Baranov, Michael J Young, Rebecca L Carrier: Decellularized Retinal Matrix: Biomimetic Substrate for Human Retinal Progenitor Cells. Tissue Engineering Part A 20, S21-S21 (published) Winter 2014

Joydip Kundu, **Andrew Michaelson**, Petr Baranov, Michael J Young, Rebecca L Carrier: Chapter 10 Approaches to Cell Delivery: Substrates and Scaffolds for Cell Therapy in the book "Cell-Based Therapy for Retinal Degenerative Disease" Developments in Ophthalmology, DOI: 10.1159/000357369 S. Karger AG | Medical and Scientific Publishers (Published) Spring 2014

Cun-Lai Pu, Wen-Jiang Pei, **Andrew Michaelson**: Robustness analysis of network controllability. Physica A: Stat. Mechanics Appl. 391, 4420–4425 (2012). (Published) Fall 2012

Andrew Michaelson, Joydip Kundu, Petr Baranov, Michael Young, Rebecca L Carrier: Interphotoreceptor Matrix based Biomaterial for Retinal Repair Presented at the American Institute of Chemical Engineers (AICHE, poster) in Florida Spring 2013

Joydip Kundu, **Andrew Michaelson**, Kristen Talbot, Petr Baranov, Michael J. Young, Rebecca L. Carrier (2013) Biomimetic substrates based on decellularized retinal extra-cellular matrix. 1st International Translational Nanomedicine Conference (ITNANO2013), July 26-28 in Boston, Massachusetts (abstract accepted, poster). Summer 2013

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Honors, Achievements, and Publications

Joydip Kundu, **Andrew Michaelson**, Kristen Talbot, Petr Baranov, Michael J. Young, Rebecca L. Carrier (2013) Decellularized retina as cell delivery vehicle for treatment of retinal diseases. Abstract submitted to The Biomedical Engineering Society (BMES) Annual Meeting, September 25-28, 2013 in Seattle, Washington (abstract accepted, poster). Fall 2013

Joydip Kundu, **Andrew Michaelson**, Kristen Talbot, Petr Baranov, Michael J. Young, Rebecca L. Carrier (2013) Decellularized retinal matrix as substrates for delivery of human retinal progenitor cells. TERMIS-Americas Conference, November 10-13 in Atlanta, GA (abstract accepted, poster). Winter 2013

Andrew Michaelson, Yujing Wang, Dana Brooks, Slava Epstein: Uncovering the Hidden Relationship Between Biological Organisms by Comparing Shapes of Ribosomal RNA" for work done with Professor Epstein, Presented at the Northeastern University Expo Spring 2010

Yujing Wang, **Andrew Michaelson**, Srinivas Somarowthu, Mary Jo Ondrechen: Software for Finding the Geometric Potential, Presented at the Northeastern University Expo Spring 2010

Won $500.00 Travel Grant to the International Conference on Biomolecular Engineering and AICHE Spring 2013

Received the Graduate Professional Student Association Community Enhancement Award for Excellence in Use of Media Spring 2009

Received the Faculty Undergraduate Research Institute Scholarship Spring 2004

Received the Faculty Undergraduate Research Institute Scholarship Fall 2004

Certificates

Advanced Science Research Center (CUNY), Manhattan NY Expires June 2019
Supervising non-production chemical laboratories

Social Activities in the Community

SUNY Farmingdale, Farmingdale, NY July 21st, 2016
Gave a lecture on the importance of doing research and directions research can take to incoming freshman

Long Island Science & Engineering Fair (LISEF), Woodbury, NY March 10th, 2016
Judge for the botanical component of the LISEF

- Judge of the botanical science fair posters
- Judge of the botanical presentations and explanations of highschool students

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Social Activities in the Community

Queens College, Queens, NY January 6th, 2016 & January 5th, 2017

Instructor for the Annual Science Open House for High School Students

- Demonstrated hand's on experiment of lemon and tangerine batteries to power LED
- Checked current level of batteries using voltmeter

Extracurricular Activities

- Founder of NUBOTS in 2001, a new extracurricular activity, approved by the Student Government Association at Northeastern University. NUBOTS comprised 162 students from different majors whose goal is to build combat robots. As President, I added an academic component to NUBOTS to work with Capstone groups of senior-level students in Electrical and Computer Engineering where we designed our robot components in Solidworks before implementation.
- NU Hillel: Served on the Social and Religious Committees for three years.
- Music: Studied classical and concert piano for nearly 20 years.
- Member of New York Academy of Sciences professional society
- Member of the American Association of Physicists in Medicine.
- Member of the Division of Medical Ethics through Harvard Medical School's Department of Social Medicine.
- Member of the New York Academy of Sciences
- Member of the American Association for the Advancement of Science

Languages

English, Hebrew

Additional Techniques, Databases, and Methods Used in the Classroom or Laboratory Listed by Subject Area:

Biology

ELISA
PCR
RT-PCR
Bacteria plating in liquid and agar media
Spectroscopy
Centrifugation
Gel-electrophoresis
Light Micrscopy (oil microscopy under high magnification)
Quantum Dots
Yeast two hybrid
DNA repair technology
Protein Repair technology
Sterilization

Mathematics

n-dimensinal calculus
sphereical coordinate system

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Additional Techniques, Databases, and Methods Used in the Classroom or Laboratory Listed by Subject Area:

Mathematics

- cylindrical coordinate system
- polar coordinate system
- derivatives
- partial derivatives
- cross product
- dot product
- Monte Carlo Method
- Queing Thoery
- Statistics
  - stemplots
  - histograms
  - boxplots
  - Bionomial Theoreom
  - Standard Deviation
  - Correlation
  - Normal Distributions

Physics

- Atomic Force Microscopy
- NMR
- Optical Tweezers
- Logic Gates
- Soldering
- Differental geometry
- Lagrangian
- Hamiltonian
- Calculus of variations
- Equations of Motion
- Optics
- Maxwell's Equations
- Tensors

Chemistry

- Spectroscopy
- High Pressure Liquid Chromatography
- Gas Chromatography
- Thin Layer chromatography
- Liquid chromatography
- Mass-Spectroscopy
- Titration
- Sand bath
- Water bath
- Distillation

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Additional Techniques, Databases, and Methods Used in the Classroom or Laboratory Listed by Subject Area

Chemistry

- Steam Distillation
- Vaccuum Distillation & Sublimation
- Crystallization

Bioinformatics

- mysql
- perl
- c
- Python
- HTML
- CSS
- MATLAB
- Mathematica
- Cytoscape
- Pairwise Seuquence Analaysis
- Multiple Sequence Analysis
- Yasara
- Unix
- Linux
- Friend
- Hidden Markov Model
- Rasmol
- BLAST
- Fasta
- PDBsum
- PDB
- SCOP
- CATH
- NCBI/Pubmed
- Protein Structual Alignment
- Modeller
- Swiss-Model
- Stanford Microarray Database
- Blosum62
- Pam250

Additional Techniques, Databases, and Methods Used in the Classroom or Laboratory Listed by Subject Area

Bioinformatics

- SWISS-PROT
- Chimera
- Autodock
- Chemsketch

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Additional Techniques, Databases, and Methods Used in the Classroom or Laboratory Listed by Subject Area

Bioinformatics

- All Microsoft Office applications.
- Working knowledge of Macintosh, Unix, Linux, and Windows operating systems.
- Phylogenetic tree construction methods
  - UPGMA
  - Neighbor Joining
  - Maximum Parsimony
  - Maximum liklihood

Bioengineering

- Systems Biology
  - Interaction Networks (PINs, GINs, …)
  - Scale Free Networks
- Vacuum Dehydration
- Centrifugation
- Dissecting Microscope
- Autoclaving
- Spectroscopy
- Sterile work under a Biohood
- Fluorescent Microscopy
- Preparation of Zero Length Crosslinkers (EDC/Sulfo-NHS)
- Preparation of Fluorescent Probes
  - Rhodamine Wheat Germ Agglutin
  - Flourescein Peanut Agglutinin
- Preparation of Fluorescent Probes
  - Hoescht
  - Phalloidin
- Preparation of Silane Compounds (APTS)
- Bicinchoninic Acid (BCA) Assay
- Mammalian Cell Culturing
- Hemacytometer
- Tissue Engineering of Extracellular Matrix (ECM)
- Decellularization
- Lyophilization
- Solubilization
- Coating of Culture Plates
- Scanning Electron Microscope
- Sample Preparation and usage of the machine
- Image Capture
- Media Preparation for Mammalian Cell Culturing
- Explant Studies
- Confocal Microscopy
- Tests for content within extracellular matrices

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Additional Techniques, Databases, and Methods Used in the Classroom or Laboratory Listed by Subject Area

Bioengineering

- Hydroxyproline Assay
- Collagen Assay
- BCA Assay
- Glycosaminoglycan Assay

Biomedical Engineering

- Castspinning
- Blender
- Autocad
- Micro-3D Printing