

Kevin J Freedman
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EDUCATION

Drexel University, Philadelphia, PA

B.S. in Biomedical Engineering – Graduated 2009

Drexel University, Philadelphia, PA

M.S. in Biomedical Engineering - Graduated 2009

Cumulative/Graduate GPA: 3.8/4.0

Drexel University, Philadelphia, PA

Ph.D. in Mechanical Engineering – In Progress

WORK AND RESEARCH EXPERIENCE

The Kim Research Group, Mechanical Engineering, Drexel University

Ph.D. Student (2009-present), Protein Biophysics using Nanopores (Dr. MinJun Kim)

- + Translocation and analysis of proteins (unfolding kinetics)
- + Development and experimental design of nanopore force spectroscopy
- + Transmission electron microscope for nanopore sculpting and imaging gold nanorods, flagella, and nanopores
- + Design of magnetic tweezers experimental setup

The Moxon NeuroEngineering Laboratory, Biomedical Engineering, Drexel University

Master's Student (2007-2009), Epilepsy, Seizure Detection and Prediction (Dr. Karen Moxon)

- + Neurological in-vivo experimentation and computational analysis
- + Seizure detection algorithm design and validation using support vector machine classification
- + Implementation and optimization of multiple signal processing algorithms (wavelet entropy, autocorrelation, fractal exponent, variance, mobility)
- + Design of novel seizure detecting measurements (phasejumps, autocorrelation-entropy, slope index)
- + Deep brain stimulation in rats to prevent seizures
- + Neural signal analysis toolbox development and GUI design (MATLAB)

Computational Modeling Research, Biomedical Engineering, Drexel University

Research Assistant (2008-2009), Biological Rhythms (Dr. Donald McEachron)

- + Development of models and simulations for Chronobiology book (publication in preparation)
- + Neuro-endocrine modeling, brain rhythm modeling

Mondialogo Engineering Award Competition Research, Biomedical Engineering, Drexel University

Research/Volunteer Engineer (2008-2009), Jaundice Phototherapy Device Design (Dr. Rosen)

- + Development of a low cost phototherapy device for under-developed countries
- + Optimize original patent design to increase efficiency and safety of LED array circuit

Merck and Co, Inc, RNA Therapeutics, West Point, PA

Research Scientist (Sept. 06/07- Mar. 07/08), In vitro and in vivo Molecular Biology

- + Transfection and assay optimization/trouble shooting
- + RNA and protein isolation, purification, and quantification
- + Targeted drug delivery and bio-distribution testing (pharmacokinetics and pharmacodynamics)
- + Collected data used to make go/no-go decisions about potential licensing contracts
- + Protocol development and validation for testing siRNA formulations

Arkema Inc, Altuglas Department, King of Prussia, PA

Research Engineer (Sept. 2005-Mar. 2006), Polymer Mechanics and Chemistry

- + Tensile, tear, dynatup/impact, hardness, chemical resistance, heat tolerance, and melt flow testing
- + Extrusion line controller and injection molding experience
- + Performed experimental design, requesting and procuring material, blending, extrusion, injection molding, sample preparation, testing, analysis, and technical report writing.
- + Design of Plexiglas objects for showcasing at conferences

PUBLICATIONS

1. W.Hesse, K. Freedman, M. Kim. The importance of bacterial nanofluidics on medicine and engineering. *Small*, Accepted 11/09.
2. R. Mulero, A. Prabhu, K. Freedman, M. Kim. Nanopore Based Devices for Bioanalytical Applications, *Journal of the Association for Laboratory Automation*, Invited Review, 11/09.
3. A. Prabhu, T. Jubery, K. Freedman, R. Mulero, P. Dutta, M. Kim. Chemically modified solid-state nanopores for high throughput nanoparticle separation. *Condensed Matter*, Invited Paper submitted 04/2010.
4. K. Freedman, D. Grasse, K. Moxon. (in prep.) Seizure detection using a novel multi-measurement support vector machine algorithm.
5. Acknowledgements: D. McEachron, ChronoEngineering, Morgan and Claypool Publishing (in prep.)

CONFERENCE PRESENTATIONS AND POSTER PRESENTATIONS

ASME International Mechanical Engineering Conference, 2009

Third author for associated work with Dr. MinJun Kim, Drexel University

+ Topic: High throughput nanofluidic architectures for nanoparticle separation, A. Prabhu, T. Jubery, K. Freedman, R. Mulero, P. Dutta, M. Kim, 10/2009

World Academy of Science, Engineering and Technology's International Conference on Behavioral, Cognitive, Educational and Psychological Sciences, 2009. First author, Drexel University

+ Topic: A Cognitive Model of Character Recognition Using Support Vector Machines, K. Freedman. Accepted 10/2009.

Neuroscience Conference 2009

Acknowledged for associated work with Dr. Karen Moxon, Drexel University

+ Topic: Methods for recording single-neuron activity in spontaneously seizing rats using wireless technology. D. Grasse, K. Moxon, 10/2009

Northeastern Bioengineering Conference, 2008

Poster presentation for associated work with Dr. Karen Moxon, Drexel University

+ Topic: Characterization of Acute Intrahippocampal Infusion of Kainic Acid in Rats: A model for Seizure Prediction and Intervention, K. Freedman, D. Grasse, K. Moxon, 04/2008

Drexel University Research Day 2008

Poster presentation for associated work with Dr. Karen Moxon, Drexel University

+ Topic: Characterization of Acute Intrahippocampal Infusion of Kainic Acid in Rats. K. Freedman, D. Grasse, K. Moxon, 06/2008

Drexel University Research Day 2008

Second Author for associated work with Dr. Karen Moxon, Drexel University

+ Topic: Using single neuron recording to understand seizure generation. D. Grasse, K. Freedman, K. Moxon, 06/2008

Drexel University College of Medicine Discovery Day 2008, Queenlane, PA

Poster presentation for associated work with Dr. Karen Moxon, Drexel University

+ Topic: Seizure Detection Using a Novel Multi-Measurement Support Vector Machine Algorithm. K. Freedman, D. Grasse, K. Moxon, 10/2008 *Outstanding Poster Award received.

Drexel University Biomedical Engineering Entrepreneur and Technical Showcase

Poster presentation for associated work with Dr. Karen Moxon, Drexel University

+ Topic: Seizure Detection Using a Novel Multi-Measurement Support Vector Machine Algorithm. K. Freedman, D. Grasse, K. Moxon, 10/2008

AWARDS AND HONORS

+ Fiserv 20th Anniversary Scholarship, 2008 (Awarded to outstanding students for academic achievement.)

+ KTE National Honors Society Invitation

+ Tau Beta Pi National Honors Society Invitation-awarded to top 5% of students in all engineering fields

+ Dean's List

+ **Outstanding Poster Award in Drexel University's College of Medicine Discovery Day (2008)**

+ **Best Poster Award in Computational Biology (Research Day 2009)**

+ **Best Paper Award at ASME IMECE 2009**

+ **Awarded NSF IGERT Fellowship (2009)**

+ **Awarded NSF Graduate Research Fellowship (2010)**

PROFESSIONAL AND STUDENT SOCIETIES

+ American Physics Society, 2009-present

+ Drexel University's Graduate Student Association, 2009-present

+ National Biomedical Engineering Society, 2008-2009

+ Drexel Biomedical Engineering Undergraduate Association

- Vice President, 2007-2009

+ Drexel Theta Chapter of Kappa Theta Epsilon, a National Cooperative Education Honor Society