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Citizenship: Canada

Education

- Engineering Research Associate**, Stanford Genome Technology Center *Dec 2007 – Present*
- Postdoctoral Fellow**, Stanford Genome Technology Center *Oct 2007 – Dec 2007*
- Advisor: Professor Ronald W. Davis
- Doctorate of Philosophy**, Electrical Engineering, Stanford University *Sept 2007*
- Advisor: Professor Ronald W. Davis (Biochemistry, Genetics, and Stanford Genome Technology Center)
 - Co-Advisor: Professor R. Fabian W. Pease (Electrical Engineering)
 - Dissertation Title: “Bioactivated Nanopores for Molecular Analysis”
- Master of Science**, Management of Science & Engineering, Stanford University *Jun 2007*
- Concentration: Organizations, Technology and Entrepreneurship
- Master of Science**, Electrical Engineering, Stanford University *Jun 2003*
- Concentration: Electronics Circuits
- Bachelor of Science**, Electrical Engineering, Sharif University of Technology *Sep 2000*

Research Interests

Low-cost integrated devices for rapid point-of-care diagnostics; Novel technologies for rare-cell isolation and characterization from patient blood; Electrical modeling of bioelectronics and biosensors

Research Experiences

Research Associate and Post-doctoral Fellow

- Stanford Genome Technology Center and Department of General Surgery** *Sept 2007 – Present*
- Electrical detection of HPV viruses and pregnancy protein biomarker with bioactivated nanopores in clinical samples
 - Purification and characterization of circulating tumor cells (CTCs) from blood samples of breast cancer patients
 - Development of nanopore charge sensors in collaboration with Bosch-RTC for PCR-free targeted DNA detection

Research Assistant

- Stanford Genome Technology Center and Electrical Engineering** *Dec 2002 – Sept 2007*
- Experimental
- Fabrication of a customized synthetic nanopore device for single molecule analysis
 - Electrical detection of single antibody-antigen interaction with nanopores
 - Electrical quantification of target proteins with array of nanopores bioactivated with antibodies
 - Electrical detection of target nucleic-acid biomarkers using nanopores bioactivated with DNA probes
- Modeling
- Prediction of protein orientation upon immobilization on biological and non-biological surfaces
 - Electrical impedance modeling of the bioactivated electrodes for integrated sensory systems
 - Electrical modeling of the bioactivated nanopore devices

Collaborator

- Prof. Jeffrey, General Surgery Department, Stanford University** *Dec 2005 – Present*
– Technology development for circulating tumor cell (CTC) separation from blood
- Prof. Howe, Electrical Engineering Department, Stanford University** *Jun 2007 – Present*
– Integrated nanopore charge sensors for PCR-free DNA detection
- Prof. Dutton, Electrical Engineering Department, Stanford University** *Dec 2005 – Present*
– Predictive electrical modeling of protein orientation upon immobilization on surfaces, electrical properties of bioactivated surfaces and nanopores
- Prof. Santiago, Mechanical Engineering, Stanford University** *Aug 2006 – Present*
– Real-time control of the surface charge of the synthetic nanopore devices

Research Assistant

- MSSTA Group, Physics Department, Stanford University** *Sep 2001 - Apr 2002*
– Designing and debugging the control board of the MSSTA NASA pilot, launched in April 2002.

Thesis Research Co-op

- Unistar Micro Technology** *July 2000 - Nov 2000*
– Simulating the GPS receiver baseband

Undergraduate Research Assistant

- Sharif University of Technology Electronic Research Center** *Apr 97 - July 97*
– Working as a C programmer

Mentorship Experiences

Stanford Genome Technology Center

- Leader and supervisor of the technology section of Stanford Genome Technology Center (consisting of 15 Ph.D. students and post-doctoral fellows) for NIH grant renewal *Jan 2008 – present*
- Supervisor of a biomedical engineer working on HCG detection and quantification with array of bioactivated nanopores *July 2006 – present*
- Supervisor of an undergraduate student working on DNA Methylation detection with biological nanopores *May 2006 - Sept 2006*
- Supervisor of an M.Sc. student working on electrical modeling of the protein immobilization *Jan 2005 - June 2005*

Teaching Experience

- Mechanical Engineering, Stanford University** *2007*
– Fluid Flow in Micro Devices
- Electrical Engineering, Sharif University of Technology**
- Communication Systems *2000*
 - Probability and Statistics *2000*

Industrial Experiences

- Sonitus Medical Inc., Palo Alto, CA** *Oct 2006 – Nov 2007*
– Consultant: Designing integrated bone conduction hearing aid devices
- National Semiconductor, Sunnyvale, CA** *June 2003 - Dec 2003*
– Summer intern and Circuit Design Contractor: Designed and tested the LNA block for UWB systems.
- Snowbush Inc., Toronto, Canada** *Sep 2002 - Nov 2002*
– Circuit Design Engineer: Worked as circuit design engineer for a power-line data communication chip.
- TDK Semiconductor Corp., Mountain View, CA** *June 2002 - Sep 2002*
– Summer Intern: Designed the receiver equalizer for 10Gbps serial link applications.
- IDS Corp., Tehran, Iran** *July 97 - Dec 97*
– Hardware Engineer: Worked with some test boards for industrial applications

Skills

- Extensive knowledge and experience in applications of engineering advancements to clinical needs
- Excellence in setting up multidisciplinary and collaborative teams
- Skilled project management and team leadership by training
- Strong presentation and communication skills

LIST OF PUBLICATIONS

Journal Papers:

J1. A. H. Talasaz, M. Nemat-Gorgani, Y. Liu, P. Stahl, R. W. Dutton, M. Ronaghi, R. W. Davis, "Prediction of protein orientation upon immobilization on biological and non-biological surfaces," *Proc. Natl. Acad. Sci. USA*, (2006), vol. 103, pp. 14773-14778.

This paper is highlighted in Nature Biotechnology - 24, 1367 (2006) & Nature Methods - 3, 963 (2006).

J2. M. Javanmard, A. H. Talasaz, M. Nemat-Gorgani, F. Pease, M. Ronaghi and R. W. Davis, "Targeted cell detection based on micro-channel gating," *Biomicrofluidics* (2007), vol. 1, pp. 044103-1-10

J3. S. Bigdeli*, A. H. Talasaz*, P. Ståhl, H. H. J. Persson, M. Ronaghi, R. W. Davis, M. Nemat-Gorgani, "Conformational flexibility of a model protein upon immobilization on self-assembled monolayers," *Biotechnology and Bioengineering*, (2008), vol. 100, pp. 19-27

** These authors contributed equally to this work*

J4. A. H. Talasaz, R. M. Aliabadi, C. Tropini, R. Dick, M. Nemat-Gorgani, M. Ronaghi, R. W. Davis, "Solid-state bioactivated nanopores for molecular analysis," submitted to *Nature Nanotechnology*

J5. A. Powell*, A. H. Talasaz*, H. Zhang, M. Mindrinos, F. R. Pease, S. R. Quake, R. W. Davis, S. J. Jeffrey, "Purification of live circulating tumor cells for single cell gene expression analysis," to be submitted to *Science*

** These authors contributed equally to this work*

Conference Papers:

C1. M. Javanmard, A. H. Talasaz, M. Nemat-Gorgani, F. Pease, M. Ronaghi and R. W. Davis, "Direct electrical detection of target cells on a microfluidic biochip," *Proc. of SPIE MEMS/MOEMS*, (2008).

C2. A. H. Talasaz, R. M. Aliabadi, B. Gharizadeh, S. Shokralla, M. Ronaghi, F. Pease, R. W. Davis, "Direct detection of biomolecular interactions with bioactivated nanopores," *Proc. of Micro Total Analysis Systems*, (2007).

C3. A. H. Talasaz, T. A. Zangle, C. Tropini, R. Dick, F. Pease, R. W. Davis, J. G. Santiago, "Real-time control of nanopore wall potential for single-molecule analyses," *Proc. of Micro Total Analysis Systems*, (2007).

C4. M. Javanmard, A. H. Talasaz, M. Nemat-Gorgani, F. Pease, M. Ronaghi and R. W. Davis, "Single bacteria detection based on micro-channel gating," *Proc. of Micro Total Analysis Systems*, (2007).

C5. A. A. Powell, A. H. Talasaz, M. Mindrinos, R. Carlson, F. W. Pease, R. W. Davis, S. S. Jeffrey, "MagSweeper: An automated system for high efficiency and specificity capture of live circulating tumor cells," *Proc. of San Antonio Breast Cancer Symposium*, (2007).

C6. A. H. Talasaz, Y. Liu, M. Ronaghi, R. W. Davis, "Modeling of bioactivated nanopore devices," *Proc. of 28th International Conference of IEEE Engineering in Medicine and Biology*, (2006).

C7. A. H. Talasaz, A. A. Powell, P. Stahl, M. Ronaghi, S. S. Jeffrey, M. Mindrinos, R. W. Davis, "Cell trapping in activated micropores for functional analysis," *Proc. of 28th International Conference of IEEE Engineering in Medicine and Biology*, (2006).

C8. B. Gharizadeh, M. Nemat-Gorgani, A. H. Talasaz, M. Ghaderi, A. Agah, S. Goel, P. Nyren, M. Ronaghi, "High-throughput pyrosequencing," *Proc. of the 4th International Forum on Post-genome Technologies*, (2006)

C9. A. H. Talasaz, A. A. Powell, M. Mindrinos, R. W. Carlson, F. W. Pease, R. W. Davis, S. S. Jeffrey, "Development of a new device for high throughput isolation of live circulating tumor cells," *Proc. of San Antonio Breast Cancer Symposium*, (2006)

C10. A. H. Talasaz, D. Pantelis, M. Ronaghi, F. W. Pease, R. W. Davis, "Fabrication of customized bioactivated nanopore devices," *Proc. of Micro Total Analysis Systems*, (2005).

- C11.** P. Boerner, D. Martinez-Galarce, T. Bay, T. Barbee, R. Kumar, **A. H. Talasaz**, “Coronal Differential Emission Measure Extraction Using EUV Images from the MSSTA Rocket,” *Geophysical Research Abstracts*, (2005)
- C12.** P. Boerner, D. Martinez-Galarce, T. Bay, T. Barbee, **A. H. Talasaz**, R. Kumar, P. Jain, N. Hakim, “Images of the solar atmosphere from the multi-spectral solar telescope array,” *Geophysical Research Abstracts*, (2003)
- C13.** P. Boerner, D. Martinez-Galarce, T. Bay, T. Barbee, **A. H. Talasaz**, R. Kumar, P. Jain, N. Hakim, “Results from the MSSTA III,” *American Astronomical Society 201st Meeting*, (2002)
- C14.** **A. H. Talasaz**, M. N. Kenari, “Peak-to-average reduction in MC-CDMA based on using different spreading and despreading codes,” *Proc. of IEEE WCNC’02*, (2002)

Patents

- P1.** R. Parsa, **A. H. Talasaz**, R. T. Howe, “NEMS Memory Having a Cantilever with Nanotip Ends,” U.S. Patent Application No. 11/516,432 Filed on 11/13/2006
- P2.** **A. H. Talasaz**, M. Ronaghi, R. W. Davis, “Array-Based Bioactivated Nanopore Devices,” U.S. Patent Application No. 11/904,345 Filed on 09/27/2007
- P3.** **A. H. Talasaz**, A. Powell, F. R. Pease, M. Mindrinos, R. W. Davis, S J. Jeffrey, “Method and Apparatus for Magnetic Separation of Cells,” U.S. Patent Application No. 61/013,238 Filed on 12/12/2007

Selected Presentations

- T1.** **A. H. Talasaz**, “Isolation of rare-circulating tumor cells with ideal purity for genomic analysis,” *Stanford Genome Technology Center Annual Retreat*, Feb 2008
- T2.** **A. H. Talasaz**, “Integrated Nanopores for Target DNA Detection,” *SBosch Reseach and Technology Center (RTC)*, Dec 2007
- T3.** **A. H. Talasaz**, “Bioactivated Nanopores for Metabolome Screening,” *Stanford Genome Technology Center Annual Retreat*, May 2006
- T4.** **A. H. Talasaz**, “Bioactivated Nanopores for (Bio)chemical Analysis,” *Biochemistry Department Annual Retreat*, Nov 2005
- T5.** **A. H. Talasaz**, “Bioactivated Nanopores for Metabolite Measurement,” *Stanford Genome Technology Center Annual Retreat*, May 2005
- T6.** **A. H. Talasaz**, “Nanosensor for Metabolite Screening,” *NIH Site Visit*, Dec 2004
- T7.** **A. H. Talasaz**, “Nanosensor for Metabolome Screening,” *Stanford Genome Technology Center Annual Retreat*, Sep 2004

LIST OF REFERENCES

Ronald W. Davis, Ph.D. (PhD Research Advisor)

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