MunJu Kim Ph.D. • 3501 Fifth Ave, Ste 3064 • Department of Computational & Systems Biology
University of Pittsburgh • Pittsburgh PA

May 24, 2011

Dr. Kristin R. Swanson
Department of Pathology & Department of Applied Mathematics
University of Washington
Seattle, WA, 98195

Dear Dr. Swanson

I am writing in response to your advertisement at science.org website. I am excited about the opportunity to apply for the Postdoctoral Research Position in mathematical modeling of brain tumor growth and response to therapy at Univ. of Washington and believe that my education and research background make me a strong candidate. I graduated Brown University with Ph.D. in Engineering and M.S. in Mathematics. Currently I am working as a computational/mathematical research associate in the Department of Computational and Systems Biology at the University of Pittsburgh.

Over the years, I have developed innovative modeling approaches to engineering and life science. During many multidisciplinary projects that I participated, I developed sophisticated models and numerical computation programs, and analyzed raw results to extract meaningful data. Furthermore, since I worked with people in other fields, I've been constantly developing better way to present results visually. Years of hard work has been rewarded with a series of publications in world prestigious journals. The works on E. coli flagella and on T-cell killing apparatus oscillation are my major accomplishments which were published in *Proc. Nat. Acad. Sci. USA* and *PLoS Comput Biol.*, respectively. Some of my research works are listed in in my youtube channel (http://www.youtube.com/mjkimatoffice). My education and research experience rendered me a skilled programmer and provided me with expertise in fluid dynamics, dynamical systems, ordinary differential equations, partial differential equations, stochastic calculus, numerical calculation methods, etc., and I always enjoyed facing new challenge, learning new things, and applying mathematical theories to solve problems. The advertised position and my background looked like an excellent fit, so please consider my application.

I would enjoy discussing this position with you in the weeks to come. In the meantime, I am enclosing my resume with the list of reference. If you require any additional materials or information, please contact me at 412-360-8181 or kimmunju@gmail.com. I will be happy to supply them. Thank you very much for your consideration. I look forward to hearing from you regarding my application.

Sincerely,

MunJu Kim, Ph.D.

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http://www.csb.pitt.edu/people/mjkim

Authorized to work for any employer in US

Education

- May 2004   Ph.D. in Engineering. Brown University, Providence RI USA
  Thesis Title: Hydrodynamics of bacterial flagella
- May 2000   M.S. in Mathematics. Brown University, Providence RI USA
  Admission to PhD Candidacy (Nov 1999)
- Feb. 1998   M.S. in Mathematics. Seoul National University, Seoul Korea
  Thesis Title: On the general position and 3-manifold topology

Career Experience

- **Department of Computational Biology and Systems Biology, School of Medicine, University of Pittsburgh   July 2006 ~ present**
  Research Associate

- **Department of Mathematics, University of Utah   July 2004 ~ June 2006**
  Scott Assistant Professor/Lecturer

Scientific Interests and skills

- Mathematical modeling
  - Computational biomechanics, Computational fluid dynamics, Dynamical system, Systems biology
- Scientific computing
  - GPU computing and Parallel computing (Matlab & C++)

Publications

- **MunJu Kim** and Ivan Maly, "Mechanism of MDCKII cell polarization during mitosis," *In preparation* (abstract link)*.
- **MunJu Kim** and Ivan Maly, "A Numerical Mechanical Model Integrating Actin Treadmilling and Receptor Recycling to Explain Selective Disengagement of Immune Cells." *In review* (abstract link1, link2).
- **MunJu Kim** and I.V. Maly. "Deterministic mechanical model of T-killer cell polarization reproduces the wandering of aim between simultaneously engaged targets," *PLoS Computational. Biology*, 5 (2009)
- **MunJu Kim**, S. Baek, S. Jung, and K. Cho, "Dynamical Characteristics of Bacteria Clustering by Self-Generated Attractants," *Computational Biology and Chemistry* 31 (2007) 328–334.
- **MunJu Kim** and Thomas R. Powers, " Deformation of a helical filament by flow and electric field or magnetic fields," *Phys. Rev. E* 71, 021914 (2005).

- M. J. Kim , **MunJu Kim**, J. C. Bird, J. Park, T. R. Powers, and K. S. Breuer, "Particle Image Velocimetry Experiments on a Macro-scale Model for Bacterial Flagellar Bundling," *Experiments in Fluids* 37 (2004).
- **MunJu Kim** and Thomas R. Powers, "Viscous Hydrodynamics of Rotating Helices," *Phys. Rev. E*. 69 161910   (2004).
- **MunJu Kim**, J. C. Bird, A. J. Van Parys, K. S. Breuer, and Thomas R. Powers, "A Macroscopic Scale Model of Bacterial Flagellar Bundling," *Proc. Natl. Acad. Sci. USA* ,vol.100 no.26 15481–15485 (2003).
- J. Cheon, **MunJu Kim**, K. Kim, J. Lee, and S. Kang, "Improved Impossible Differential Cryptanalysis of Rijndael and Crypton," Proc. of ICISC 2001, Lecture Notes in Computer Science, Vol. 2288, Springer-Verlag, pp.39-49 (2002). (cited in wikipedia)
- J. Cheon, **MunJu Kim**, and K. Kim, "Impossible Differential Cryptanalysis of Hierocrypt-3 Reduced to 3 Rounds," Proc. of New European Schemes for Signatures, Integrity, and Encryption 2nd Workshop (2001). (cited in wikipedia)
- Ph.D. Thesis. Hydrodynamics of Bacterial Flagella (2004)

Award
- William N. Findley Award *for Best Graduate Student Paper on the Mechanical Behavior of Materials*, Brown University, Division of Engineering 2004. 5

Volunteer Service
- Brown University volunteer interviewer in Western Pennsylvania for undergraduate admission (2006 ~).

Professional Activities
- Journal Referee
  - FEBS Letters
  - IEE Systems Biology
  - European Biophysical Journal
- Research Invitations
  - June 2007 Aspen Center for Physics Summer Workshop 2007. "Notion of Locomotion"
  - May ~ August 2005 Visiting Research Fellow, Systems Biology Lab, Korea Bio-MAX Institute, Seoul National University
  - Jul 2002 Summer School for Soft Condensed Matter Physics, Boulder, CO
- Invited Presentations
  - Oct 2009   The Pittsburgh Biophysics Theory Club, Pittsburgh PA
  - June 2006   Department of Mathematics, Seoul National University, Seoul Korea
  - Mar. 2006   University of Pittsburgh, Department of Computational Biology, Pittsburgh PA
  - Jan. 2006   University of Connecticut Health Center, Farmington, CT
  - Aug. 2005   Department of Mathematics, Seoul National University, Seoul Korea
  - July 2005   School of Computational Science, Korea Institute for Advanced Sciences, Seoul Korea
  - June 2005   Department of Mathematics, Konkuk University, Seoul Korea
  - May 2005   Department of Physics, Korea University, Seoul Korea
  - Mar 2005   Department of Mathematics, Brigham Young Univ., Provo, UT
  - Sept. 2004   Math Biology seminar, Univ. of Utah, Salt Lake City, UT
- Contributed Presentations
  - July 2010 SIAM Conference on Life Sciences, Pittsburgh PA

- o   Feb 2010 Biophysical Society Annual Meeting, San Francisco, CA
- o   Mar 2009 Cold Springs Harbor Laboratory Meeting-Computational Cell Biology, Cold Spring Harbor, NY
- o   Dec 2008 American Society for Cell Biology 48th Annual Meeting, San Francisco, CA
- o   Apr 2007 University of Pittsburgh, Department of Computational Biology, Pittsburgh PA
- o   Oct 2006   Math-bio seminar, Department of Mathematics, University of Pittsburgh
- o   Apr 2004   New England Complex Fluids Workshop, Brown Univ. Providence, RI
- o   Feb 2004   Biophysical Society Annual Meeting, Baltimore, MD
- o   Nov 2003   APS - Division of Fluid Dynamics Meeting, Meadowlands, NJ
- o   Mar 2003   APS March Meeting, Austin, TX
- o   Nov 2002   APS - Division of Fluid Dynamics Meeting, Dallas, TX
- o   July 2002   Summer School for Soft Condensed Matter Physics, Boulder, CO
- o   Apr 2002 New England Complex Fluids Workshop, Clark Univ. Worcester, MA

References

- Prof. Thomas Powers, Div. of Engineering, Brown University, Thomas_Powers@brown.edu

- Prof. Ivan Maly, Dept. of Computational and Systems Biology, Univ. of Pittsburgh, ivanmaly@pitt.edu

- Prof. Alex Mogilner, Dept. of Mathematics & Dept. of Neurobiology, Physiology and Behavior, Univ. of California, Davis mogilner@math.ucdavis.edu (530)554-9395

More references provided upon request