

# Anna Grosberg

## Curriculum Vitae

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## Education

- 2002–2008 **Ph.D. in Bioengineering.**  
California Institute of Technology, Pasadena, CA
- 1999–2002 **Bachelor of Biomedical Engineering,  
Bachelor of Chemical Engineering with a Minor in Chemistry.**  
University of Minnesota, Minneapolis, MN

## Experience

### Research

- 2008–Present **Postdoctoral Fellow**, *Harvard University, Harvard School of Engineering and Applied Sciences.*  
Engineering simple ventricular pumps *in vitro*
- 2002–2008 **Ph.D. Thesis Research**, *California Institute of Technology, Option of Bioengineering.*  
A bio-inspired computational model of cardiac mechanics: pathology and development.
- Summer 2002 **Fellow Researcher**, *University of Minnesota, Department of Pharmaceutics.*  
Modeling and developing a new drug delivery method (for diazepam)
- 2001–2002 **Student Researcher**, *University of Minnesota, Department of Pharmaceutics.*  
Mathematical modeling of assisted nerve regeneration
- Summer 2000 **Student Researcher**, *Ecole Normal Supérieure, Laboratoire de Physique Statistique, Paris, France.*  
Computational modeling of glass transition in polydisperse disks

### Teaching

- 2008 **Teaching Assistant**, *California Institute of Technology.*  
"Biofluid Mechanics" class
- Summer 2007 **Research Mentor**, *California Institute of Technology.*  
Creating and supervising a summer undergraduate research project (SURF)
- 2006–2007 **Teaching Assistant**, *California Institute of Technology.*  
"Physiology for Bioengineers" class
- 2004–2005 **Teaching Assistant**, *California Institute of Technology.*  
"Mechanics of Structures and Solids" class

### Other

- 2007–2008 **Seminar Assistant**, *California Institute of Technology, GALCIT.*  
Organizing and promoting the GALCIT seminar series
- August 2007 **Resident Assistant**, *California Institute of Technology, Freshman Summer Institute.*  
Serving as a mentor for students participating in the 2007 Freshman Summer Institute

- 2003–2004 **Seminar Assistant**, *California Institute of Technology, Bioengineering Option*.  
Organizing and promoting the bioengineering seminar series
- 2000–2001 **National relations officer**, *AIChE, University of Minnesota, Chemical Engineering* .

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## Publications

1. **Anna Grosberg**, Morteza Gharib, Arash Kheradvar. Effect of Fiber Geometry on Pulsatile Pumping and Energy Expenditure. *Bulletin of Mathematical Biology*, 2009. OnlineFirst.
2. **Anna Grosberg** and Morteza Gharib. A dynamic double helical band as a model for cardiac pumping. *Bioinspiration & Biomimetics*, 4(2): p. 026003, 2009.
3. **Anna Grosberg** and Morteza Gharib. Computational models of heart pumping efficiencies based on contraction waves in spiral elastic bands. *Journal of Theoretical Biology*, 257(3): 359-370, 2009.
4. **Anna Grosberg** and Morteza Gharib. Modeling the macro-structure of the heart: healthy and diseased. *Medical & Biological Engineering & Computing*, 47(3):301-311, 2009.
5. **Anna Grosberg** and Morteza Gharib. Physiology in Phylogeny: Modeling of mechanical driving forces in cardiac development. *Heart Failure Clinics*, 4(3):247-259, July 2008.
6. B.I. Rosner, R.A. Siegel, **A. Grosberg** and R.T. Tranquillo. Rational Design of Contact Guiding, Neurotrophic Matrices for Peripheral Nerve Regeneration. *Annals of Biomedical Engineering*, 31(11):1383-1401, 2003.

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## Presentations

- Anna Grosberg and Morteza Gharib. On the dynamics of the human heart myocardium. *5<sup>th</sup> World Congress of Biomechanics, Journal of Biomechanics*, 39(Supplement 1):S278, 2006.
- Anna Grosberg and Morteza Gharib. The functional double helix in the heart. *2007 BMES Annual Fall Meeting, Poster*, 2007.
- Anna Grosberg and Morteza Gharib. Helical contraction: an efficient mean for pulsatile ventricular assist devices. *ASAIO, 54th Annual Conference San Francisco, Poster*, 2008.

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## Patents

- Anna Grosberg, Arash Kheradvar, and Morteza Gharib. Method for reinforcing the cardiac pumping function. July 11 2007, patent pending.
- James C. Cloyd, Ronald A. Siegel, Anna Grosberg, and Hao Hou. Supersaturated Benzodiazepine Solutions and Their Delivery. **11/552,589** October 25 2006, patent pending.

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## Research Interests

- Computational Modeling of Biological Systems
- Biomechanics
- Cardiac Mechanics
- Cardiac Assist Devices

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## Honors

- June 2008 **The Hans G. Hornung Prize**, Awarded to a student advised by Aeronautics faculty for the best oral PhD defense presentation..
- June 2008 **The Ernest E. Sechler Memorial Award in Aeronautics**, Awarded to a student who has made the most significant contribution to the teaching and research effort of GALCIT..
- 2002–2003 **Rosen Fellowship for a California Institute of Technology graduate student.**
- 2001–2002 **UROP Award for University of Minnesota undergraduate research.**
- 1997 **Semi-Finalist in Westinghouse Competition..**

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## Computer Languages and Software

### **ABAQUS**

*Extensive experience with this finite element package (standard & CAE versions)*

### **Fortran**

*Employed in conjunction with ABAQUS*

### **Matlab**

*Used extensively to analyze and display computational results*

### **Mathematica**

*Utilized to create analytical models*

### **ADINA**

*An alternate finite element package*

### **Solid Works**

*CAD package*

### **C/C++**

### **Visual Basic**

### **Mathematica**