

# Stanca Mihaela Ciupe

## University Address

Laboratory of Computational Immunology  
Duke University Medical Center  
2424 Erwin Road, Suite G06, Hock Plaza  
Durham, NC, 27705

Telephone: 919-668 5895

Fax: (919) 668-5888

Email: [stanca.ciupe@duke.edu](mailto:stanca.ciupe@duke.edu)

Web: <http://www.duke.edu/~sc96>

## Home Address

501 Weeping Willow Dr  
Durham, NC, 27704

Tel: (734) 272-7453

## Education

- 2005 Ph.D University of Michigan, Ann Arbor, Applied and Interdisciplinary Mathematics  
Advisor: Dr. Patrick W. Nelson.  
Dissertation title: *Development and applications of mathematical tools in models of infectious diseases and biological phenomenon*
- 1998 M.S Babes-Bolyai University, Cluj-Napoca, Romania, Mathematics.
- 1997 B.A Babes-Bolyai University, Cluj-Napoca, Romania.

## Employment

- August 2006-current Postdoctoral research associate, Duke University Medical Center  
Laboratory of Computational Immunology  
Sponsor: Dr. Thomas B. Kepler.
- July 2005-July 2006 Postdoctoral researcher, Santa Fe Institute  
Los Alamos National Laboratory  
Sponsor: Dr. Alan S. Perelson.
- 2000 - 2005 Graduate Student Instructor, University of Michigan.  
Thesis advisor: Dr. Patrick W. Nelson.
- 1999 - 2000 Teaching Assistant, Ohio State University.

## Grants and Awards

- 2008 NSF Post-doc/ Early Career Travel Award
- 2008 Landahl travel grant
- 2007 Landahl travel grant
- 2005 Allen L. Shields Memorial Fellowship, University of Michigan
- 2003-2004 Graduate student Research Assistant, University of Michigan
- 2003 Landahl travel grant
- 2002 Department Fellow, University of Michigan
- 2001 Department Fellow

## Research Interests

Mathematical modeling; Mathematical Biology; Theoretical immunology; Delay differential equations; Model selection theory;

## Publications

- Stanca M. Ciupe, Blythe H. Devlin, M. Louise Markert, and Thomas B. Kepler. The dynamics of T-cell receptor repertoire diversity following thymus transplantation for DiGeorge Anomaly. submitted
- Stanca M. Ciupe, Blythe H. Devlin, M. Louise Markert, and Thomas B. Kepler. Using Kullback-Leibler divergence to quantify total T cell receptors diversity by flow cytometry. to be submitted
- Stanca M. Ciupe, Ruy M. Ribeiro, and Alan S. Perelson. Antibody responses during Hepatitis B viral infection. preprint, 2008

- Stanca M. Ciupe, Ruy M. Ribeiro, Patrick W. Nelson, Geoffrey Dusheiko, and Alan S. Perelson. The role of cells refractory to productive infection in acute hepatitis B viral dynamics. *Proc Natl Acad Sci USA*, 104:5050–5055, 2007
- Stanca M Ciupe, Ruy M Ribeiro, Patrick W Nelson, and Alan S Perelson. Modeling the mechanisms of acute hepatitis B virus infection. *J Theor Biol*, 247:23–35, 2007
- Stanca M. Ciupe, Benjamin de Bivort, David M. Bortz, and Patrick W. Nelson. Estimates of kinetic parameters from HIV patient data during primary infection through the eyes of three different models. *Math. Biosci.*, 200:1–27, 2006
- Timothy A. Kohler, Sarah Cole, and Stanca M. Ciupe. *Population and Warfare: A Test of the Turchin Model in Puebloan Societies*. University of California Press, Berkeley and Los Angeles, 2008. in press
- Stanca M. Ciupe. *Development and applications of mathematical tools in models of infectious diseases and biological phenomenon*. PhD thesis, University of Michigan, June 2005
- Stanca M. Ciupe and Patrick W. Nelson. An asymptotic analysis of the van der Pol delay differential equation. submitted

### Work in progress

- Stanca M. Ciupe, Blythe H. Devlin, M. Louise Markert, and Thomas B. Kepler. Modeling the development of naive and memory T cell populations following transplant in DiGeorge Anomaly. in progress.
- Stanca M. Ciupe, Anne Catlla, and David G Schaeffer. Bifurcation analysis of host-pathogen interaction during hepatitis B infection - what causes viral persistence? in progress.
- Stanca M. Ciupe and Thomas B. Kepler. Paradoxical suppression of broadly neutralizing antibodies in the presence of strain specific antibodies during HIV infection. in progress.
- PW Nelson, N Smith, SM Ciupe, W Zou, G S Omenn, and M Pietropaolo. Modeling dynamic fluctuations in type 1 diabetes progression. in progress

### Presentations

- 2008 Aug. SIAM Life Sciences minisymposium, Montreal, CA.  
 Jul. Annual Meeting for the Society of Mathematical Biology, Toronto, CA.  
 Apr. Duke University, Center for Computational Immunology Group meeting.  
 Feb. Division of Sleep Medicine, Brigham and Women's Hospital, Harvard Medical School.  
 Feb. University of Maryland Baltimore County, Department of Mathematics Colloquium.
- 2007 Oct. Duke University, Department of Immunology Work in Progress Seminar.  
 Sep. CHAVI Annual Meeting, Duke University.  
 Aug. Annual Meeting for the Society of Mathematical Biology, San Jose, California.  
 May Applications of Analysis to Mathematical Biology (in honor of Mike Reed), Duke University.  
 Apr. Duke University, Department of Mathematics, Applied Applied Mathematics and Analysis Seminar.  
 Feb. Duke University, Center for Computational Immunology Group meeting.
- 2006 Feb. University of Utah, Mathematical Biology Seminar.  
 Feb. Duke University, Center for Computational Biology Seminar.
- 2005 Sep. Working group-Human Frontiers in Science, Santa Fe Institute.  
 Jul. Annual Meeting for the Society of Mathematical Biology, University of Dresden, Germany.

- 2004 Aug. Annual Meeting for the Society of Mathematical Biology, University of Michigan  
 Jul. Michigan math and science Scholars MMSS Program.  
 Jun. Summer School in Cell Biology and Mathematical Modeling, Hvar, Croatia.
- 2003 Aug. Annual Meeting for the Society of Mathematical Biology, University of Dundee, Scotland.  
 Jan. University of Michigan, Applied and Interdisciplinary Mathematics Student Seminar.

### Teaching Interests

Introductory classes, Mathematical Modeling; Mathematical Biology; Delay Differential Equations; Asymptotic Analysis.

### Teaching experience

- 2006 - present Tutorials in Mathematical Biology, Duke University - Laboratory of Computational Immunology.  
 2004 Winter Calculus II, University of Michigan.  
 Summer Graduate Student Assistant, Michigan Math and Science Scholars Program.  
 Summer Graduate Student Assistant, Michigan Math and Science Scholars Program.  
 03-04 Summer Mathematical Modeling in Biology, University of Michigan.  
 01-03 Calculus I, University of Michigan (4 semesters).  
 2002 Spring Course Coordinator, Calculus I, University of Michigan.  
 2002 Winter Helped develop the course pack for Introduction to Math Biology, Math 563, University of Michigan.  
 00-01 Pre-calculus, University of Michigan (2 semesters).  
 2000 Calculus I, Ohio State University (2 semesters).  
 97-99 Algebra and geometry teacher, Cluj-Napoca, Romania.

### Professional activities

#### Member

American Mathematical Society  
 Society of Mathematical Biology  
 Association for Women in Mathematics

#### Reviewer

Bulletin of Mathematical Biology  
 Journal of Theoretical Biology  
 PLoS Computational Biology  
 Journal of Mathematical Biology  
 Journal of Mathematical Analysis and Applications

#### Participant and organizer

Banff International Research Station for Mathematical Innovation and Discovery, May, 2009.  
 AMS Special Session, Raleigh, April 2009.  
 Society of Mathematical Biology Annual Meeting, Toronto, CA, July-Aug 2008.  
 SIAM Life Sciences Meeting, Montreal, CA, Aug 2008.  
 Computational and Systems Immunology, Durham, June 2008.  
 Summer School *Biodefense Immune Modeling Summer School* Pittsburgh, 2007  
*Applications of Analysis to Mathematical Biology Conference* Duke 2007  
 Summer School *Cell Biology and Mathematical Modelling*, Hvar, Croatia, 2004.  
 VIGRE Working Group *Mathematical Biology*, 2003-present  
 Applied and Interdisciplinary Mathematics *AIM* seminar, 2001-present.  
 VIGRE Working Group *Complex Adaptive Systems*, 2004-present.

## References

Dr. Patrick W. Nelson Department of Mathematics University of Michigan 2074 East Hall 525 East University Avenue Ann Arbor, MI 48109-1109 Tel (734)763-3408 pwn@umich.edu	Dr. Alan S. Perelson Senior Fellow MS-K710, T-10 Los Alamos National Laboratory Los Alamos, NM 87545 USA Tel: 505-667-6829 FAX: 505-665-3493 asp@lanl.gov
Dr. Trachette L. Jackson Department of Mathematics University of Michigan 2074 East Hall 525 East University Avenue Ann Arbor, MI 48109-1109 tel (734)764-8537 tjacks@umich.edu	Dr. Thomas B. Kepler Department of Biostatistics and Bioinformatics Laboratory of Computational Immunology Duke University Medical Center 2424 Erwin Road, Suite G06, Hock Plaza Durham, NC, 27705 Tel (919) 681-0620 keple003@mc.duke.edu
Dr David G Schaeffer James B. Duke Professor Department of Mathematics Duke University 105 Physics Building Durham, NC, 27705 tel (919)660-2814 dgs@math.duke.edu	Karen Rhea(teaching) Department of Mathematics University of Michigan 2074 East Hall 525 East University Avenue Ann Arbor, MI 48109-1109 tel (734)936-9936 krhea@umich.edu