

Heiko Enderling, Ph.D. – Assistant Professor – Curriculum Vitae

Center of Cancer Systems Biology, CBR 119
St. Elizabeth's Medical Center
Tufts University School of Medicine
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Education

- Ph.D. in Mathematical Biology, Division of Mathematics, University of Dundee, 2006
Dissertation: '*Mathematical modelling of breast tumour development, treatment and recurrence*'
Advisor: Prof Mark AJ Chaplain, Dr Alexander RA Anderson, Dr Glenn W Rowe
- Diplom-Ingenieur for Computer Visualization, School of Computer Sciences, University of Magdeburg, Germany 2003
Dissertation: '*Automated tracking of moving cells in vitro using a modified SuperCorrelation algorithm*'
Advisor: Prof Dr Klaus D Toennies, Dr Walter Schubert

Positions Held

- 2010 – date: Associate Investigator, St. Elizabeth's Medical Center;
Assistant Professor, Tufts University School of Medicine
- 2009 – 2010: Senior Research Associate, St. Elizabeth's Medical Center;
Instructor, Tufts University School of Medicine
- 2007 – 2008: Research Associate, St. Elizabeth's Medical Center;
Postdoctoral fellow, Tufts University School of Medicine
- 2006: Postdoctoral researcher, University of Dundee Divisions of Mathematics and Surgery and Molecular Oncology
- 2005 – 2006: ICS (Information & Communication Services) HelpDesk Officer, Dundee, UK
- 2004 – 2006: Teaching assistant, University of Dundee, UK
- 1999 – 2003: Software Engineer (part time), MeITec GmbH, Magdeburg, Germany

Awards and Fellowships

- 2008-2011: American Association for Cancer Research Centennial Postdoctoral Fellowship
- 2010: Best poster prize, Annual meeting of the Society for Mathematical Biology
- 2007: British Oncology Association Young Investigator Award
- 2005-2006: Cancer Research UK Pilot Project Research Award
- 2004: Best poster prize, Annual meeting of the Society for Mathematical Biology
- 2003-2006: Dundee University Nicholl-Lindsay PhD Scholarship

Professional Affiliations

- American Association for Cancer Research
- Society for Mathematical Biology
- European Society for Mathematical and Theoretical Biology

Committee Assignments

- 2010-date: Board of Directors, Society for Mathematical Biology
- 2010-date: Co-Chair, NIH ICBP Outreach and Education Committee

Research Interests

- Mathematical modeling of tumor initiation, development and growth in irregular domains, radiotherapy strategies, and irradiation induced tumorigenesis
- Spatio-temporal evolution of cancer stem cells and self-metastatic tumor progression
- Modeling of the role of stem cells and tumor suppressor genes in tumorigenesis
- In-silico modeling of apoptosis, migration and proliferation in tumor dormancy
- Theoretical modeling of invadopodia formation and cellular feedback mechanisms
- Computational simulations and numerical schemes
- Visualization of 1D, 2D, and 3D solutions of mathematical models

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Conference / Symposium Organization

- Workshop on Systems Biology of Tumor Dormancy, Boston, USA, 2011 (workshop chair)
- SMB Conference, Krakow, Poland, 2011
- SMB Conference, Vancouver, Canada, 2009
- European Conference for Mathematical and Theoretical Biology, Edinburgh, UK, 2008
- Joint SMB-JSMB Conference, San Jose, USA, 2007
- Joint SMB-SIAM Conference on the Life Sciences, Raleigh, USA, 2006

Invited Lectures / Seminars

- Workshop on Systems Biology of Tumor Dormancy, Boston, MA, USA, 2011
- International Congress on Industrial and Applied Mathematics, Vancouver, Canada, 2011
- Annual Meeting of the Society for Mathematical Biology, Krakow, Poland, 2011
- Integrative Mathematical Oncology Seminar, Moffitt Cancer Center, Tampa, FL, USA, 2011
- Dartmouth College, Mathematics Colloquium, Hanover, NH, USA, 2011
- NIMBioS Investigative Workshop on Solid Tumor Modeling, Knoxville, TN, USA, 2011
- Bootcamp in Cancer Modeling, MBI, Ohio State University, Columbus, USA, 2010
- Mathematical Modeling of Cancer Growth and Treatment School, Dundee, UK, 2010
- Fourth Systems Radiation Biology Workshop, New York, USA, 2010
- Tufts University School of Medicine, Boston, MA, USA, 2010
- Merrimack Pharmaceuticals, Boston, MA, USA, 2010
- Dana Faber Cancer Institute, Boston, MA, USA, 2009
- Annual Meeting of the Society for Mathematical Biology, Vancouver, Canada, 2009
- SIAM Conference on Computational Science and Engineering, Miami, USA, 2009
- Cells, Circuits and Computation, Boston, MA, USA, 2009
- Systems Radiation Biology workshop, Rovaniemi, Finland, 2009
- European Conference on Mathematical & Theoretical Biology, Scotland, 2008
- PIMS Mathematical Biology Seminar, University of Alberta, Canada, 2008
- Boston Chaos Club, Boston, MA, USA, 2007
- Mathematics Analysis & Biomathematics Seminar, Vanderbilt University, USA, 2007
- Marie Curie Research Training Network, University of Dundee, Scotland, 2007
- International Congress on Industrial and Applied Mathematics, Zurich, Switzerland, 2007
- Vanderbilt University Integrative Cancer Biology Center, Nashville, TN, USA, 2005 & 2006

Publications

- [Enderling H](#), Hlatky L, Hahnfeldt P. The promoting role of a tumor-secreted chemorepellent in self-metastatic tumor progression. *Math Med Biol* in press, 2011
- [Enderling H](#), Chaplain MAJ, Hahnfeldt P. Quantitative modeling of tumor dynamics and radiotherapy. *Acta Biotheor* 58(4): 341-353, 2010
- [Enderling H](#), Hlatky L, Hahnfeldt P. Tumor morphological evolution: directed migration and gain and loss of the self-metastatic phenotype. *Biol Direct* 5:23, 2010
- [Enderling H](#), Anderson ARA, Chaplain MAJ, Beheshti A, Hlatky L, Hahnfeldt P. Paradoxical Dependencies of Tumor Dormancy and Progression on Basic Cell Kinetics. *Cancer Res* 69(22): 8814-8821, 2009
- [Enderling H](#), Hlatky L, Hahnfeldt P. Reply: Inflammatory breast carcinoma as a model of accelerated self-metastatic expansion by intra-vascular growth. *Br J Cancer* 101(6): 1030, 2009
- [Enderling H](#), Hlatky L, Hahnfeldt P. Migration rules: tumours are conglomerates of self-metastases. *Br J Cancer* 100(12): 1917-1925, 2009
- [Enderling H](#), Park D, Hlatky L, Hahnfeldt P. The importance of spatial distribution of stemness and proliferation state in determining tumor radioresponse. *Math Model Nat Phenom* 4(3): 117-133, 2009

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- Enderling H, Alexander NR, Clark E et al. Dependence of invadopodia function on collagen fiber spacing and crosslinking: computational modeling and experimental evidence. *Biophys J* 95(5): 2203-2218, 2008
- Enderling H, Anderson ARA, Chaplain MAJ. A model of breast carcinogenesis and recurrence after radiotherapy. *Proc Appl Math Mech* 7(1): 1121701-2, 2007
- Enderling H, Chaplain MAJ, Anderson ARA et al. A Mathematical Model of breast cancer development, local treatment and recurrence. *J Theor Biol* 246(2): 245-259, 2007
- Enderling H, Anderson ARA, Chaplain MAJ et al. Visualisation of the Numerical Solution of Partial Differential Equation Systems in Three Space Dimensions and its Importance for Mathematical Models in Biology. *Math Biosci Eng* 3(4): 571-582, 2006
- Enderling H, Anderson ARA, Chaplain MAJ et al. Mathematical Modelling of Radiotherapy Strategies for Early Breast Cancer. *J Theor Biol* 241(1): 158-171, 2006

Book Chapters

- M.J. Piotrowska, H. Enderling, U. an der Heiden et al. Mathematical modelling of stem cells related to cancer. In: Dittmar T and Zanker KS. *Stem cells and cancer*. Nova Science Publishers: 2008
- H. Enderling, J.S. Vaidya. Mathematical Modelling of Breast Carcinogenesis, Treatment with Surgery and Radiotherapy, and Local Recurrence. In: *Selected Topics on Cancer Modelling – Genesis, Evolution, immune competition, and therapy*. Birkhäuser, Boston: 337, 2008

Ad-hoc Peer Reviewer

- Cancer Research
- Physical Oncology
- Progress in Biophysics and Molecular Biology
- Integrative PLOS Computational Biology
- Biology Direct
- Frontiers in Bioscience
- Mathematical Biosciences
- Mathematics in Computers and Simulation
- Applied Mathematics and Computation
- Journal of Theoretical Biology
- Bulletin of Mathematical Biology
- Mathematical Medicine and Biology
- Journal of Mathematical Biology