CURRICULUM VITAE

DAPHNE MANOUSSAKI

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Education

June-Aug 2008	Cell Physiology Course, Marine Biology Laboratories, Woods Hole, MA
1996, August	**Ph.D.** in Applied Mathematics, University of Washington. Thesis advisor: J.D. Murray F.R.S., Acad. Sci. (Paris).
1995, February	**M.Sc.** in Applied Mathematics, University of Washington.
1991, June	**B.A.** Mathematics, University of Oxford, U.K.

Academic Positions

2010-	Assistant Professor (tenured), Department of Sciences, Technical University of Crete.
2006-10	Assistant Professor, Department of Sciences, Technical University of Crete.
2004-	Assistant Professor, Department of Mathematics, Vanderbilt University (on academic leave, 2006-2008).
2003-2004	Visiting Assistant Professor, Department of Sciences, Technical University of Crete, Hania, Greece.
2000-03	Visiting Assistant Professor, Department of Applied Mathematics, University of Crete, Heraklion, Greece.
1999-00	Postdoctoral Associate, Institute of Neuroradiology, University Hospital Zurich, Switzerland.
1997-99	Visiting Fellow, Section for Auditory Mechanics, NIDCD, National Institutes of Health, Bethesda, Maryland, USA.

Visiting Positions *(less than a year)*

Feb. – Aug. 2012	Visiting Scientist, NIDCD & NHLBI, National Institutes for Health, Bethesda
Aug.-Dec. 2004	Visiting Professor, Center for Cell Dynamics, University of Washington.
April-June 1993	Visiting Researcher, Institute for Theoretical Biology, Université d' Angers, France.
April-May 1992	Visiting Researcher, Center for Mathematical Biology, University of Oxford, U.K.

Prizes, Honors and Awards

- Finalist (top 3), The Bodossaki Award for Mathematics, Bodossaki Foundation, Athens 2008
- Bruce and Betty Alberts Award, Physiology Course, Marine Biology Laboratories, Woods Hole, MA 2008
- Chancellor's Award for Research, Vanderbilt University, 2007.
- Research Excellence Award, NIDCD, NIH, Bethesda, MD, USA, 1999.
- Pierre Delattre Prize of the French Society for Theoretical Biology, 1995.
- Collections Prize, Brasenose College, Oxford University, 1989.
- Top 10, National Chemistry Competition, Greece, 1987.
- Bronze medal, Greek National Mathematics Olympiad, 1986.
- 1st Prize, National Competition of the Greek Mathematical Society, 1984.

Grant and other support:

PHS – NIH#1P50CA113007-01, "Multiscale Mathematical Modeling of Cancer Invasion",
PI: Vito Quaranta. Co-investigator, 10% support.
October 2004 -September 2009
Amount awarded: $12+ million USD

Marie Curie Research Training Network (European 6th Framework Programme):
"Modelling, Mathematical Methods and Computer Simulation for Tumor Growth and Therapy",
Coordinator of the greek node of the network.
June 2004 - June 2008
Amount awarded to greek team: 241.555 euros.

Publications *(in reverse chronological order)*
Refereed Articles

1. "Waves on two strings coupled by springs having a smoothly decreasing stiffness", Richard S. Chadwick, Jessica S. Lamb, Daphne Manoussaki (submitted).

2. "Auditory mechanics of the tectorial membrane and the cochlear spiral", N. Gavara, D. Manoussaki and R.S. Chadwick, *Current Opinion in Otolaryngology & Head and Neck Surgery*, **19**(5), pp. 382-7 (2011).

3. "Prediction of Potential Locations of Focal Adhesions on the Contour of Adherent Cells", F. Jetzek, E. Mylona, D. Manoussaki, 5th IEEE International Symposium on Biomedical Imaging (2008).

4. "The Influence of Cochlear Shape on Low-Frequency Hearing", D. Manoussaki, R.S. Chadwick, D.R. Ketten, J. Arruda, E.K. Dimitriadis, J.T. O'Malley, *Proceedings of the National Academy of Sciences of the USA,* **105**(16), pp. 6162-66 (2008).

5. "Cochlea's graded curvature effect on low frequency waves", D. Manoussaki, E.K. Dimitriadis, R.S. Chadwick*, Physical Review Letters,* **96**, 088701 (2006).

6. "Effect of coiling on the micromechanics of the mammalian cochlea", H. Cai, D. Manoussaki and R.S. Chadwick. *Journal of the Royal Society: Interface*, 2(4), 2005, p. 341-349.

7. "A mechanochemical model of vasculogenesis and angiogenesis", D. Manoussaki, *ESAIM*

Math. Modelling and Numerical Analysis, 37(4), 2003, pp.581-599.

8. “Modeling and Simulation of the Formation of Vascular Networks”. D. Manoussaki. ESAIM: Proceedings, Vol. 12: MS4CMS 2002 - Modelling and Simulation for Computer-aided Medicine and Surgery (invited contribution).

9. “Effects of geometry on fluid loading in a coiled cochlea”. D. Manoussaki and R.S. Chadwick. *SIAM Journal of Applied Mathematics*, 61 (2), 2000, pp. 369-386.

10. “A mechanical model for the formation of vascular networks in vitro”. D. Manoussaki, S.R. Lubkin, R.B. Vernon, J.D. Murray. *Acta Biotheoretica*, 44(3-4), Nov. 1996, pp. 271-282.

11. “The Portable Parallel Implementation of Two Novel Mathematical Biology Algorithms". M.D.Dikaiakos, C. Lin, D. Manoussaki and D. Woodward. 9th ACM International Conference on Supercomputing, Barcelona, Spain, June 1995.

Contributions in books

12. “Cochlear coiling and low-frequency hearing”. R.S. Chadwick, D. Manoussaki, E.K. Dimitriadis, B. Shoelson, D.R. Ketten, J. Arruda, J.T. O’Malley. Cochlear coiling and low-frequency hearing. In: Auditory Mechanisms: Processes and Models. Portland, Oregon. Ed. A. Nuttall. World Scientific, Singapore pp. 417-23, 2006.

13. “Wave propagation in a complex cochlear micromechanics model with curvature”, H. Cai, R.S. Chadwick and D. Manoussaki. Wave propagation in a complex cochlear model with curvature. In: Auditory Mechanisms: Processes and Models. Portland, Oregon. Ed. A. Nuttall. World Scientific, pp. 498-499, 2006.

14. “Geometric wave amplification in a helicoidal version of the classical model of cochlear mechanics”. R.S. Chadwick and D. Manoussaki. In: *Recent Developments in Auditory Mechanics*, Sendai, Japan, H. Wada et al. eds., World Scientific, 1999.

15. J.D. Murray, D. Manoussaki, S.R. Lubkin and R.B. Vernon. “A mechanical theory of in vitro vascular network formation”, pp. 173-188. In: *Vascular Morphogenesis: In Vivo, In Vitro and In Mente*, C. Little, V. Mironov, H. Sage, eds., Birkhäuser, 1998.

Theses

Ph.D. Thesis: “Modelling the formation of vascular networks *in vitro*”, Dept. of Applied Mathematics, University of Washington, Seattle, USA, 1996.
Thesis Advisor: J.D. Murray, FRS, Acad. Sci. (Paris).

Invited conference talks

1. Women in Applied Mathematics, ACMAC & Dept. of Applied Mathematics, University of Crete, May 2011.
2. Nonlinear Science and Complexity summer school, University of Patras, 15-24 July 2009.
3. ESMTB Workshop on *Dynamical Systems in Biology*, Marseille, 20 March 2009.
4. Differential Equations and Applications in Life Sciences, Iasi, Romania, September 2008.
5. Special Semester on Quantitative Biology analyzed by Mathematical Methods, Workshop on Pattern Formation and Functional Morphology, January 7-11, 2008.
6. US National Congress on Computational Mechanics, minisymposium on Computational Methods in Bioengineering, San Francisco, CA July 2007.
7. Keynote speaker, 5th World Congress of Biomechanics, minisymposium on Computational Methods for Cochlear Mechanics, Munich, July 2006.
8. "Euroconference in Anogia: Which Mathematics for Biology?", Anogia, July 2006.
9. Cells and Materials: at the interface between Mathematics, Biology and Engineering: Workshop on Angiogenesis, Neovascularization and Morphogenesis, IPAM, UCLA, May 2006.
10. SIAM conference on Applications of Dynamical Systems , Snowbird, UT 2005.
11. Conference on Modelling Simulation for Computer-aided Medicine, INRIA, Paris, Nov. 2002.
12. 9th International Course on Neuroradiology, USZ, Zurich, 2000.
13. 1st meeting of the TMR programme on Interstitial Mechanics, Bergen, Norway, June 1998.
14. Symposium for Mechanical Models in Biology, IIMAS, UNAM, Mexico, June 1995.
15. Seminary of the French Society for Theoretical Biology, St. Flour, France, June 1995.

Seminars

1. Institut für Zellbiologie und Neurowissenschaft, Goethe University, Frankfurt, July 2011.
2. BEST Chania summer school, Technical University of Crete, Hania, July 2011.
3. Department of Production Engineering, Technical University of Crete, Nov. 2007.
4. 8th Annual Retreat of FO.R.T.H., Rithymna Beach, October 2007.
5. Department of Mathematics, Vanderbilt University, Nashville, TN 2006.
6. Vanderbilt Integrative Cancer Biology Center, Nashville, TN 2005.
7. Department of Mathematics, Vanderbilt University, Nashville, TN 2005.
8. Center for Cell Dynamics, Friday Harbor, WA, September 2004.
9. Department of Applied Mathematics, University of Crete, Heraklion, Greece, March 2004.
10. Biomathematics Study Group, Vanderbilt University, Nashville, TN, Feb. 2004.
11. Department of Mathematics, University of Pittsburgh, Pittsburgh, PA, Feb. 2004
12. Department of Sciences, Technical University of Crete, Hania, Greece, Oct. 2002.
13. Department of Mathematics, University of the Aegean, Karlovasi, Samos, Dec. 2001.
14. Department of Chemical Engineering, Princeton University, NJ, USA, March 2000.
15. Institute of Fluid Mechanics, ETHZ, Zurich, Switzerland, January 2000.
16. Department of Applied Mathematics, University of Crete, Heraklion, Greece, Dec. 1999.
17. Department of Mathematics, ETHZ, Zurich, Switzerland, Dec. 1999.
18. Department of Physiology, University of Bristol, University of Bristol, U.K., Nov. 1998.
19. Department of Radiation Oncology, Massachusetts General Hospital, Harvard Medical School, Boston, MA, USA, July 1996.
20. Department of Biomathematics, Medical School, UCLA, Los Angeles, CA, USA, 1995.

Published conference abstracts

1. R.S. Chadwick, J. Lamb, D. Manoussaki. "Acoustic Emissions from Coupled Strings", Assoc. for Research in Otolaryngology, Midwinter Meeting, 2013.

2. D. Manoussaki, W. Shin, N. Gavara, R.S. Chadwick, C. Waterman. "A hybrid confocal & atomic force microscope for probing biophysical properties of migrating cells", ASCB 2012, San Francisco, USA, 2012

3. D. Manoussaki and E. Mylona. "Characterizing cancer cell response", CancerSim2008: Euroconference on Modeling and Simulation of Cancer Growth and Therapy, Torino, ITALY, 2008.

4. F. Jetzek, D. Manoussaki, H.J. Kaiser, "Nucleus Morphology Correlates with the Distribution of Focal Adhesions and with the Alignment of the Cytoskeleton in Adherent HeLa Cells", ASCB-ECF Summer Meeting, Dijon, France, June 2007.

5. E. Mylona, D. Manoussaki, F. Jetzek, "Substrate Rigidity Regulates Multiple Responces of Tumor Cells", ASCB-ECF Summer Meeting, Dijon, France, June 2007.

6. US National Congress on Computational Mechanics, mini-symposium on Computational Methods in Bioengineering, San Francisco, CA July 2007.

7. D. Manoussaki, E.K. Dimitriadis, R.S. Chadwick, "Radial profile of the basilar membrane in a coiled cochlea: Results and biological implications", Journal of Biomechanics, Vol 39, Suppl. 1, 2006 (abstracts of the 5th World Congress of Biomechanics).

8. D. Manoussaki, "Mechanical forces during vascular morphogenesis", "Euroconference in Anogia: Which Mathematics for Biology?", Anogia July 2006.

9. D. Manoussaki, E.K. Dimitriadis, R.S. Chadwick, "The cochlear spiral and its effect on cochlear mechanics: analytical results", ARO Annual Midwinter Meeting, Baltimore, MD, 2006.

10. D.R. Ketten, J. Arruda, S. Cramer, M. Yamato, J. O'Malley, D. Manoussaki, E.K. Dimitriadis, J. Shoshani, J. Meng, R.S. Chadwick. "Great ears: Functional comparisons of land and marine leviathan ears", ARO Annual Midwinter Meeting, Baltimore, MD 2006.

11. D. Manoussaki, "A mathematical study of vascular network formation", SIAM conference on application of dynamical systems, Minisymposium on Angiogenesis, Snowbird, UT, 2005 (invited speaker).

12. D. Manoussaki, "A mathematical study of the forces during Vascular Network Formation", 3rd Symposium on Computational Cell Biology, Lenox, MA, 2005.

13. D. Manoussaki, "A mechanochemical model of angiogenesis and vasculogenesis", International Conference on Mathematical Biology 2003, Dundee, Scotland 2003.

14. D. Manoussaki, "Modelling and simulation for the formation of vascular networks", MS4CMS: Modelling and Simulation for Computer-Aided Medicine and Surgery, INRIA, Rocquencourt, Paris, France, November 2002 (invited talk).

15. R. Chadwick, D. Manoussaki, "Confirmation of inward-spiraling wave amplification using open channel water waves", Assoc. for Research in Otolaryngology, Midwinter Meeting, 2000.

16. R.S. Chadwick and D. Manoussaki, “Geometric wave amplification in a helicoidal version of the classical model of cochlear mechanics”, Symposium on Recent Developments in Auditory Mechanics, Sendai, Japan, 1999.

17. D. Manoussaki and R.S. Chadwick, “Some effects of geometry on the fluid mechanics of the cochlea”, Assoc. for Research in Otolaryngology, Midwinter Meeting, St. Petersburg, FL, USA, 1999.

18. D. Manoussaki and R.S. Chadwick, “The significance of coiling for cochlear mechanics”, NIH Research Festival, NIH, Bethesda, MD, USA, 1998.

19. D. Manoussaki and R.S. Chadwick, “The significance of coiling for cochlear mechanics”, Association for Research in Otolaryngology, Midwinter Meeting, St. Petersburg, FL, USA, 1998.

20. R.S. Chadwick and D. Manoussaki, “Distortions of pure tones by outer hair cell saturation”, NIH Research Festival, NIH, Bethesda, MD, USA, 1997.

21. D. Manoussaki, S.R. Lubkin, R.B. Vernon, J.D. Murray, “Mathematical modelling of in vitro network formation in endothelial cell cultures”, Symposium for Mechanical Models in Biology, IIMAS, UNAM, Mexico, 1995 (invited talk).

22. D. Manoussaki, “Mathematical models describing patterns formed in cell cultures”, Seminary of the French Society for Theoretical Biology, St. Flour, France, 1995 (invited talk).

23. D. Manoussaki, S.R. Lubkin, R.B. Vernon, J.D. Murray, “Modelling Cellular Network Formation in Cultures of Endothelial Cells on Basement Membrane Matrix”, Pacific Northwest Workshop in Mathematical Biology, Vancouver, Canada, 1995.

Conference contributions (no conference abstracts published)

24. D. Manoussaki, “A mathematical study of the forces during Vascular Network Formation”, NCI-ICBP, Berkeley, CA 2005

25. D. Manoussaki, “Haemodynamic study of an intracranial aneurysm”, Informatics and Mathematics Applied to Interventional Medicine (IM2IM’03) Workshop, Luxemburg, 2003.

26. D. Manoussaki, “Use of mathematics for the simulation of blood flow through cerebral aneurysms”, 9th International Course on Neuroradiology, USZ, Zurich, Switzerland 2000.

27. D. Manoussaki, “Mathematical modelling of the formation of vascular networks”, 1st meeting of the TMR programme on Interstitial Mechanics, Bergen, Norway, 1998 (invited talk).

28. D. Manoussaki and J. Cook, “Modelling the formation of parallel arrays in fibroblast cultures”, Mathematical Biology Training Program, Dept. of Zoology, University of Washington, USA, 1994.

Teaching

Courses Taught, 2000-present

Vanderbilt University:	course number – course name	(student rating – best is 5)
Spring 2006:	MATH 198 – Methods of Ordinary Differential Equations	(4.71/5)
Fall 2005:	MATH 226 / CS 255: Introduction to Numerical Mathematics	(3.96/5)
Fall 2005:	MATH 198 – Methods of Ordinary Differential Equations	(4.44 / 5)
Spring 2005:	MATH 198 – Methods of Ordinary Differential Equations	(4.58 / 5)

University of Crete:

3 semesters:	Introduction to Computing
1 semester:	Numerical Algorithms
1 semester:	Linear Algebra II
1 semester:	Topics in Mathematical Biology
1 semester:	Biomathematics I
1 semester:	Biomathematics II

Technical University of Crete:

Undergraduate:

11 semesters:	Ordinary Differential Equations
2 semesters:	Numerical Analysis
1 semester:	Introduction to Computing

Graduate:

Fall 2006:	Mathematical Biology: Population dynamics
Spring 2007:	Mathematical Biology: Pattern formation & tissue mechanics
Spring '08, Fall '10	
Fall '11:	Mathematical Biology
Spring, Fall 2009:	Partial Differential Equations (2 semesters).

Advisees:

1. Chrysanthi Kokkinaki (Master's student, Technical University of Crete, 2011-present).
2. Triantafyllia Kili (Master's student, Technical University of Crete, 2010- present).
3. Katerina Asimoglou (Diploma student, Technical University of Crete, 2008-10).
4. Fritz Jetzek (Ph.D. student, visiting from Hamburg University, 2007-08),
5. Kirsten Fagnan (Ph.D. student visiting from the University of Washington, 2006-07),
6. Eleni Mylona (postdoctoral researcher, 2005-2006, currently holds a Marie Curie IRG),
7. Samuel Bernard (postdoctoral researcher, 2006-07)
8. Sandro de Gruttola (Diploma student, Laboratory of Thermodynamics in Emerging Technologies, ETH Zurich, 2000).

Service

Referee / Reviewer

- French National Research Agency, Investments for the Future, Bioinformatics 2011 action, member of the review jury.
- National Science Foundation (USA) grants, review panelist, Mathematical Biology (2006, received invitations also for 2007, 2008).
- Referee for Journal of Theoretical Biology, Journal of the Acoustical Society of America, Journal of Fluids and Structures.

Editorial board

Member of the editorial board for two special issues of the journal Mathematical Modeling of Natural Phenomena (editor: Prof. Vitaly Volpert), titled:

1. Cancer Modeling
2. Cell migration

Organization of conferences:

1. Euroconference in Crete: "Which Mathematics for Biology"? Anogia, Crete, 2006.
2. MCRTN "Modelling, Mathematical Methods and Computer Simulation for Tumor Therapy and Growth", 2nd summer school, Kolymbari, Crete, 2006
3. "Setting up a local cancer registry". Chania, Crete, April 5th, 2008.

Committees

European Society for Mathematical and Theoretical Biology

- Board member, 2009-2014.
- Scientific Committee, 8th ECMTB conference Krakow, Poland, June 28-July 2, 2011 (jointly with the annual meeting of the Society for Mathematical Biology).

Society for Mathematical Biology

- Committee for nominating the president-elect and board members of the society, 2007.

EU

- Coordinator, Greek participation to the MCRTN "Modelling, Mathematical Methods and Computer Simulation for Tumor Therapy and Growth", 2004-2008.
- Coordinator, Greek participation to the ERCIM workgroup on "Informatics and Mathematics applied to Interventional Medicine" (2001-2003).

Vanderbilt

- Mathematics Department Colloquium committee, Vanderbilt University Fall 2005
- Organizer, Biomathematics & Analysis Seminar, Vanderbilt University 2005-06
- Teaching Committee, Mathematics Department, Vanderbilt University 2005-06

Technical University of Crete

- Committee on evaluating a recent draft of a government bill proposing new structures and organizations for research management in Greece, 2006-07.
- Committee for student welfare, 2007-08
- Initiative for a local Cancer Registry, Technical University of Crete, Greece, 2007 - present.

Other

Languages: Greek / English (fluent), German (very good), French (good), Spanish (some knowledge).