Hannah Callender, Ph.D.

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Education

- **Vanderbilt University** — Nashville, TN
  Ph.D. Mathematics, August 2007 — **2003-2007**
  - Advisor: Mary Ann Horn, Department of Mathematics
  - Co-advisor: Glenn F. Webb, Department of Mathematics
  - Co-advisor: H. Alex Brown, Department of Pharmacology
  - Thesis: *Mathematical Modeling of Species-Specific Diacylglycerol Dynamics in the RAW 264.7 Macrophage Following Receptor Activation by Uridine 5'-Diphosphate*
- **Vanderbilt University** — Nashville, TN
  M.S. Mathematics, May 2003 — **2001 - 2003**
  - Advisor: Mary Ann Horn
- **Wesleyan College** — Macon, GA
  B.A. Mathematics, May 2001 — **1997 - 2001**
  - Minors in Computer Science and Music
  - Graduated with Honors, Summa Cum Laude
  - Thesis Advisor: Stephen Curry
  - Thesis: *A Survey of Numerical Methods for Solving Ordinary Differential Equations*

Academic Positions

- **Department of Mathematics** — University of Portland
  Assistant Professor — **Aug. 2009 - Present**
- **Institute for Mathematics and its Applications** — University of Minnesota
  Postdoctoral Associate — **Sept. 2007 - Aug. 2009**
- **Department of Mathematics** — University of Minnesota
  Instructor — **Aug. 2008 - Dec. 2008**
- **Department of Pharmacology** — Vanderbilt University
  Research Assistant — **May 2004 - June 2007**
- **Department of Mathematics** — Vanderbilt University
  Graduate Teaching Assistant/Instructor — **Aug. 2001 - June 2007**
- **NAVY ROTC** — Vanderbilt University
  Mathematics Tutor — **Aug. 2004 - May 2004**
- **Cooperative Robotics** — Oak Ridge National Laboratories
  Summer Research Assistant — **June 2000 - Aug. 2000**

Teaching Experience

University of Portland

- **Department of Mathematics Assistant Professor** — **Aug. 2009 - Present**

Calculus I	5 sections
BioCalculus I	2 sections
Ordinary Differential Equations	4 sections
Partial Differential Equations	1 section
Sensitivity Analysis (Independent Study)	1 section
Real Analysis I	1 section

- **CURM Mini-Grant Project** — **Aug. 2010 - June 2011**
  Research mentor to three undergraduates in mathematics and biology
- **Mathematics Honors Program Mentor** — **Aug. 2010 - Present**
  Research mentor to junior mathematics major

University of Minnesota

- **Undergraduate Research Opportunities Program (UROP)** — **Feb. 2009 - July 2009**
  Research mentor to mathematics undergraduate
- **IMA Interdisciplinary Research Experience for Undergraduates** — **June 2009 - July 2009**
  Mentor to REU team working on Objective Molecular Dynamics
- **Department of Mathematics Instructor** — **Aug. 2008 - Dec. 2008**
  Linear Algebra and Differential Equations for IT students — 1 section

Vanderbilt University

- **Department of Mathematics TA** — **Aug. 2001 - Dec. 2006**

Calculus I	1 section
Calculus II	1 section
Calculus for Engineers II	2 sections

- **Department of Mathematics Instructor** — **Aug. 2002 - June 2007**

Calculus I	2 sections
Calculus for Engineers I	3 sections
Calculus II	1 section

- **NAVY ROTC Tutor** — **Aug. 2002 - June 2007**
  Algebra II
  Calculus I, II, and III
  Calculus for Engineers I and II

Other Research Experience

- **Department of Curriculum and Instruction** — University of Minnesota
  Conduct research on Model Eliciting Activities (MEAs) — **Sept. 2008 - Present**
- **Workshop on Mathematical Aspects of Computational Biology** — Mathematical Sciences Research Institute
  Workshop Participant — **June 2006**

Publications

- Moore, T. J., Roehrig, G. J., Guzey, S. S., Stohlmann, M. S., Park, M. S., Kim, Y. R., Callender, H. L., Teo, H. J. 2011. Faculty Change: A Longitudinal Study Exploring Instructional Beliefs while Implementing Model-Eliciting Activities. Submitted.
- Callender, H. L. and Othmer, H. G. Slipping and gripping: A microscopic model of focal adhesion dynamics. In preparation.
- Callender, H. L. and Horn, M. A. 2010. Mathematical modelling and analysis of cellular signalling in macrophages. J. Biol. Dynamics. 4 (1) 12-27.
- Callender, H. L., Horn, M. A., DeCamp, D. L., Sternweis, P. C., Brown, H. A. 2009. Modeling Species-Specific Diacylglycerol Dynamics in the RAW 264.7 Macrophage. J. Theor. Biol. 262 (4) 679-690.
- Callender, H. L., Forrester, J. S., Ivanova, P., Preininger, A., Milne, S., Brown, H. A. 2007. Quantification of diacylglycerol species from cellular extracts by electrospray ionization mass spectrometry using a linear regression algorithm. Anal. Chem. 79 (1) 263-272.
- Callender, H. L. Mathematical Modeling of Species-Specific Diacylglycerol Dynamics in the RAW 264.7 Macropages Following $P2Y_6$ Receptor Activation by Uridine 5-Diphosphate. 2007. Ph.D. Thesis, Vanderbilt University.
  URL http://etd.library.vanderbilt.edu/ETD-db/available/etd-06212007-223551/

Presentations and Organizational Roles

Presentations at International, National, and Sectional Meetings

July 2011	What My Biology Students Taught Me About Teaching Mathematics, *Annual meetings of the European Conference on Mathematical and Theoretical Biology and the Annual meeting of the Society for Mathematical Biology*, Krakow, Poland.
June 2011	Mathematical Modeling of Stochastic Processes in Cell Motility, *Pacific Northwest Sectional Meeting of the MAA*, Juneau, Alaska.
May 2011	Modeling Signaling Pathways in Macrophages, *SIAM Conference on Applications of Dynamical Systems*, Snowbird, Utah.
Mar 2011	Mathematical Modeling of Integrin Dynamics in Cell Movement: Part I. A Numerical Analysis, Part II. Theoretical and Sensitivity Analyses (Undergraduate Presentation), *Center for Undergraduate Research in Mathematics Spring Research Conference*, Provo, UT.
Jan 2011	Mathematical Modeling of Integrin Dynamics in Cell Movement, *Student Poster Session (Joint work with undergraduates), Joint American Mathematical Society (AMS)/Mathematical Association of America (MAA) Meetings*, New Orleans, LA.
Sep 2010	Mathematical Modeling of Integrin Dynamics, *Symposium on Biomathematics and Ecology Education and Research*, Normal, Illinois.
Apr 2010	A Biomathematician's Journey into Novel Signaling Pathways, *Pacific Northwest Sectional Meeting of the MAA*, Seattle, Washington.
Jan 2010	Integrin Dynamics in Motile Cells: A Stochastic Approach, *Joint Mathematics Meetings*, San Francisco, California.

Oct 2009	Using Mathematical Models to Provide Insight into Early Focal Adhesion Dynamics, *Modern Math Workshop at the annual conference of the Society for the Advancement of Chicanos and Native Americans in Science*, Dallas, Texas.
July 2009	Modeling Integrin Activation in Initial Cell Movement, *AWM Minisymposium on Models in Mathematical Biology, in conjunction with SIAM Annual Meeting*, Denver, Colorado.
June 2009	A Mathematical Model of Integrin Clustering in Motile Cells, *Symposium on Biomathematics and Ecology Research and Education*, Izmir, Turkey.
Jan 2009	A Model of Cellular Motility: Focusing on the "Feet" of the Cell, *Joint Mathematics Meetings,* Washington, D.C.
Oct 2008	Modeling the Development of Nascent Focal Adhesions as a First Step in Understanding the Beginning Stages of Cell Motility, *AMS Sectional Meeting,* Huntsville, Alabama.
Nov 2007	Modeling Species-Specific Diacylglycerol Dynamics in the RAW 264.7 Macrophage, *AMS Sectional Meeting,* Murfreesboro, Tennessee.
Jan 2007	Purinergic Receptor Signaling in the RAW 264.7 Macrophage: Modeling Species-Specific Diacylglycerol Dynamics Following Receptor Activation by Uridine 5'-Diphosphate, *Joint Mathematics Meetings,* New Orleans, Louisiana.
July 2006	Mathematical Modeling of Cellular Signaling: Lipid Signaling Kinetics, *Joint SIAM Conference on the Life Sciences,* Raleigh, North Carolina.
July 2006	Mathematical Modeling of Cellular Signaling in Macrophages: Understanding the Pathways, *AWM workshop at annual SIAM meeting,* Boston, Massachusetts.
Nov 2005	Computational Lipidomics: Mathematical Modeling of the UDP Pathway in RAW 264.7 Cells, *Southeastern Regional Lipid Conference*, Cashiers, North Carolina.

Seminar Presentations

Oct 2010	Using Mathematics to Uncover Hidden Signals in Cells, *Belmont University School of Sciences Colloquium Series*, Nashville, Tennessee.
Feb 2010	Mathematical Models of cellular behavior: How Differential Equations can assist in the development of novel therapeutics, *Benedictine University - College of DuPage Biomathematics Seminar (Course Lecture)*, Lisle, Illinois.
Feb 2010	How a Mathematician Can Understand the Mixed Signals of Cells, *Benedictine University - College of DuPage Biomathematics Seminar (Public Lecture)*, Lisle, Illinois.
Apr 2009	Adventures in Biomath: From Cell Signaling to Motility, *University of Richmond Math & Computer Science Departmental Colloquium Series*, Richmond, Virginia.
Apr 2009	Opportunities in Mathematical Biology: Experiences and Aspirations of an IMA Postdoc, *University of Minnesota Undergraduate Math Club Seminar*, Minneapolis, Minnesota.
Nov 2008	Mathematical Modeling Leads to New Discoveries in Cellular Signaling Pathways, *UC Merced Applied Math Seminar,* Merced, California.
Apr 2008	Modeling Cell Motility: A Focus on Focal Adhesions, *NSF site visit to IMA,* Minneapolis, Minnesota.
Mar 2008	Math + Biology = Infinite Possibilities, *East Tennessee State University Seminar for STEP students,* Johnson City, Tennessee.
Dec 2007	Using Mathematical Modeling to Make Testable Predictions of Cellular Signaling Pathways, *IMA Postdoc Seminar,* Minneapolis, Minnesota.

May 2007	Mathematical Modeling of Species-Specific Diacylglycerol Dynamics in the RAW 264.7 Macrophage Following $P2Y_6$ Receptor Activation by Uridine 5'-Diphosphate, *Vanderbilt University Dissertation Defense,* Nashville, Tennessee.
Apr 2007	Using Mathematical Models to Predict the Future, *Vanderbilt University Undergraduate Seminar in Mathematics,* Nashville, Tennessee.
Jan 2007	Modeling Uridine 5'-Diphosphate Signaling Pathways in Macrophages, *Murray State University Biomathematics Seminar,* Murray, Kentucky.
Nov 2006	Modeling Small Molecule Dynamics in Macrophages Downstream Purinergic Receptor Stimulation, *Vanderbilt Analysis and Biomathematics Seminar,* Nashville, Tennessee.
Aug 2006	Mathematical Modeling of Cellular Signaling in Macrophages: Understanding the Pathways, *Vanderbilt Institute of Chemical Biology Retreat,* Nashville, Tennessee.
Feb 2006	Mathematical Modeling of the UDP Pathway in RAW 264.7 Cells, *Wesleyan College Math and Science Divisional Seminar Series,* Macon, Georgia.
Nov 2005	Mathematical Modeling of the UDP Pathway in RAW 264.7 Cells, *Vanderbilt Pharmacology Department Works in Progress Seminar,* Nashville, Tennessee.
Oct 2005	Computational Lipidomics: Mathematical Modeling of the UDP Pathway in RAW 264.7 Cells, *Vanderbilt Pharmacology Retreat*, Burns, Tennessee.
Apr 2005	Mathematical Modeling of Second Messenger Signaling, *Vanderbilt Graduate Student Research Day,* Nashville, Tennessee.

Organizational Roles

June 2011	Organizer: Inquiry Based Learning (panel), Project NExT Seminar at Pacific Northwest Sectional meeting of the MAA, Juneau, Alaska.
Sep 2010	Organizer: Two Sessions on Undergraduate Programs in Mathematical Biology and a panel session on Recent Issues in Interdisciplinary Education, Symposium on Biomathematics and Ecology Education and Research, Normal, Illinois.
Aug 2010	Organizer: Scholarship of Teaching and Learning (panel), Project NExT Seminar at Mathfest, the annual meeting of the MAA, Pittsburg, Pennsylvania.
Aug 2010	Facilitator: Breakout Session on Applied Mathematics, Mathematical Biology, and Operations Research, Project NExT Seminar at Mathfest, the annual meeting of the MAA, Pittsburg, Pennsylvania.
Apr 2010	Organizer: The Transition from High School to College Calculus (panel), Project NExT Seminar at Pacific Northwest Sectional meeting of the MAA, Seattle, Washington.
Jan 2010	Organizer: Designing and Implementing Your Own Upper Level Course (panel), Project NExT Seminar at AMS/MAA Joint Meetings, San Francisco, California.

Awards, Grants, & Honors

- Academy of Inquiry Based Learning (AIBL) – Recipient of AIBL Small Grant to support and foster the practice and development of inquiry-based approaches to mathematics instruction at American colleges and universities $2500, Summer 2011
- Association for Women in Mathematics (AWM) – Recipient of AWM travel award to attend SMB annual meeting in Krakow, Poland, $2000, Summer 2011

- University of Portland – Butine Faculty Development Grant Recipient, $5660, Summer 2011
- Center for Undergraduate Research in Mathematics (CURM) – CURM Grant Recipient, $16,450, 2010-2011
- Professional Enhancement Programs of the MAA – Travel grant to attend MAA PREP workshop on Mathematical Models in Population Biology and Epidemiology, $400, June 2010
- MAA Pacific Northwest Section NExT Fellow, 2009-present
- National Project NExT Fellow (Green '09 dot), 2009-2010
- Association for Women in Mathematics (AWM) – Recipient of travel award to attend AWM workshop held jointly with the Annual meeting of the Society for Industrial and Applied Mathematics held in Denver, CO, Summer 2009
- Symposium on Biomathematics and Ecology Research and Education (BERE) – Recipient of postdoctoral travel award to attend BERE symposium in Izmir, Turkey, Summer 2009
- Vanderbilt University – Bjarni Jonsson Award for Research in Mathematics, May 2007
- Vanderbilt Graduate School – Recipient of travel award to attend AMS National Meetings in New Orleans, LA, January 2007
- Association for Women in Mathematics (AWM) – Recipient of travel award to attend AWM workshop held jointly with the Annual meeting of the Society for Industrial and Applied Mathematics held in Boston, MA, Summer 2006
- Society for Mathematical Biology (SMB) – Recipient of travel award to attend the annual meeting for SMB held jointly with the Society for Industrial and Applied Mathematics Life Sciences conference held in Raleigh, NC, Summer 2006
- Vanderbilt University – College of Arts and Science Graduate Student Research Award, Summer 2006
- Summer research support from Vanderbilt professor's National Science Foundation grant, Summer 2002
- Phi Kappa Phi – Graduate Fellowship Recipient, May 2001
- Phi Kappa Phi – Lifetime membership, May 2001
- Wesleyan College – Lise Meitner Award in Physics, May 2001
- Wesleyan College – Division of Natural Sciences and Mathematics Outstanding Senior, May 2001
- Wesleyan College – Departmental Award in Mathematics and Computer Science, May 2001
- Wesleyan College – Monroe Scholar, Aug 2000 – May 2001
- Wesleyan College – Scholarship for Leadership, Aug 1998
- Dean's List, 1997 – 2001

Professional Training

Aug 2011	*Graduate*, Landmark Forum, Seattle, Washington
Sept 2010	*Mathematical Models for Systems Biology*, Workshop in conjunction with the Symposium on Biomathematics and Ecology Education and Research, Normal, Illinois
Sept 2010	*Excel Modules for Biocalculus*, Workshop in conjunction with the Symposium on Biomathematics and Ecology Education and Research, Normal, Illinois
June 2010	*Mathematical Models in Population Biology and Epidemiology*, MAA Professional Enhancement Program (PREP) workshop, Texas Tech University

June 2010	*Mentoring Undergraduates in Research*, CURM Faculty Workshop, Brigham Young University's Center for Undergraduate Research in Mathematics
May 2009	*Integrated Course Design*, Preparing Future Faculty Spring Retreat, University of Minnesota Center for Teaching and Learning
Apr 2009	*Career Options for Women in Mathematical Sciences*, IMA Special Workshop, University of Minnesota
Mar 2009	*Teaching with Technology for the First Time*, Preparing Future Faculty Workshop, University of Minnesota Center for Teaching and Learning
Fall 2008	*Research in Mathematics Education Seminar*, University of Minnesota Department of Curriculum and Instruction
Aug 2008	*Teaching Enrichment Series*, University of Minnesota Center for Teaching and Learning – *How (and Why) to Shift From Instructor-Centered to Student-Centered Teaching* – *Teaching With Technology* – *PowerPoint Reconsidered* – *Teaching Through Active Lectures* – *Diversity of Learners: Understanding Learning Styles to Improve Your Teaching* – *Pathways to a Successful First Day, First Month, First Semester at the U*
Spring 2005	*Professional Development Seminar*, Vanderbilt University Department of Mathematics
Jan 2003	*GradSTEP (Graduate Student Teaching Event for Professional Development)*, Vanderbilt University Center for Teaching
Aug 2001–May 2002	*Graduate Student Teaching Seminar*, Vanderbilt University Department of Mathematics
Aug 2001	*Teaching Assistant Orientation*, Vanderbilt University Center for Teaching

Community Involvement and Service

Mar 2011	*Review Editor*, SIAM Undergraduate Research Online (SIURO)
Mar 2011	*Chair*, Mathematical Biology Undergraduate Research Session, Center for Undergraduate Research in Mathematics (CURM) Spring Conference, Provo, Utah.
Jan 2011–Sep 2011	*Faculty Representative for Orientation*, University of Portland New Student Orienation 2011.
Jan 2011–Present	*Review Editor*, CBE – Life Sciences Education
Jan 2011–Present	*Programming Chair*, Mathematical and Computational Biology Special Interest Group of the Mathematical Association of America (BIO SIGMAA)
Jan 2011	*Judge*, Student Poster Session, Joint Mathematics Meetings, New Orleans, Louisiana.
Nov 2010–Present	*Review Editor*, Journal of Mathematical Modeling of Natural Phenomena
Aug 2010	*Panelist and Organizer*, How to Do Well in Calculus, UP Freshmen Orientation, Portland, Oregon.
Aug 2010	*Judge*, Student Paper Session, Mathfest, national meeting of the MAA, Pittsburg, Pennsylvania.

Jan 2010–Present	*Review Editor*, Frontiers in Systems Biology
Sep 2009–Present	*S.A.F.E. Advocate*, Faculty volunteer for the "Stop Assault for Everyone" program, University of Portland, Portland, Oregon.
Apr 2010	*Faculty Representative*, Office of Admissions Prospective Student Receptions in Denver and Salt Lake City, University of Portland, Portland, Oregon.
Apr 2010	*Judge*, Student Poster Session, Pacific Northwest Sectional meeting of the MAA, Seattle, Washington.
Sep 2009	*Volunteer*, Freshmen Day of Service, University of Portland, Portland, Oregon.
Feb 2008–Aug 2008	*Volunteer/Mathematics Tutor*, Minneapolis Neighborhood Involvement Program (NIP)
Aug 2003–May 2007	*Organizer*, Vanderbilt University Undergraduate Seminar in Mathematics
Aug 2001–May 2002	*Graduate Student Council Representative*, Department of Mathematics, Vanderbilt University

Professional Affiliations

- Member of the American Mathematical Society
- Member of the Mathematical Association of America
- Member of the Association for Women in Mathematics
- Member of the Society for Mathematical Biology
- Member of the Society for Industrial and Applied Mathematics
- Member of the Academy of Inquiry-Based Learning

Computer Skills

- MATLAB, SIMULINK, Mathematica, Maple, COPASI, COMSOL, URDME, LaTEX, and SPLUS
- Microsoft Word, Excel, Powerpoint, Outlook