

1015 Floyd Avenue
Department of
Mathematics and
Applied Mathematics
Richmond, VA 23284

Office: 804-828-1319
E-mail: areynolds2@vcu.edu

Angela Marie Reynolds

Education

2002-2008 University of Pittsburgh, Pittsburgh, PA

PhD in Mathematics

Advisor: Dr. G. Bard Ermentrout

Title: Mathematical Models of Acute Inflammation and a Full Lung Model of Gas Exchange with Inflammatory Stress.

1998-2002 Loyola College of Maryland, Baltimore, MD

B.S in Mathematics with a minor in Asian Studies and completed pre-med requirements

Academic Experience

Director of Graduate Studies

May 2015 –Present, Virginia Commonwealth University (VCU)
Department of Mathematics and Applied Mathematics

Associate Professor

August 2014 –Present, Virginia Commonwealth University (VCU)
Department of Mathematics and Applied Mathematics

Assistant Professor

August 2008 –August 2014, Virginia Commonwealth University (VCU) Department of Mathematics and Applied Mathematics

Virginia Commonwealth University Reanimation Engineering Shock Center (VCURES), Co-Leader of Computational Medicine, 2009-2011

Provost Development Fund Fellow

September 2007-April 2008 University of Pittsburgh

Research Assistant

Summer 2004, January 2005-August 2007, Summer 2008
University of Pittsburgh Medical School, *Department of Critical Care*, Pittsburgh, PA

Development of mathematical models for the inflammatory under Drs. G. Bard Ermentrout, Gilles Clermont and Jonathan Rubin.

Summer school in Systems Biology Dynamics from Genes to Organism

May 23-June 2, 2006 McGill University, Montreal, Canada.

The Center of Nonlinear dynamics in Physiology and Medicine.
Summer school in Systems Biology Dynamics from Genes to
Organism

Teaching Assistant

August 2002-January 2005 University of Pittsburgh, Department of
Mathematics, Pittsburgh, PA

Publications

Reynolds, A., Rubin, J., Clermont, G., Day, J., Yodovotz, Y.,
Ermentrout, G. B., 2006. *A reduced mathematical model of the acute
inflammatory response: I. Derivation of the model and analysis of
anti-inflammation.* J. Theor. Biol. 242, 220-236.
doi:10.1016/j.jtbi.20006.02.016.

Day, J., Rubin, J., Vodovotz, Y., Chow, C.C., **Reynolds, A.**, Clermont
G., 2006. *A reduced mathematical model of the acute inflammatory
response: II. Capturing scenarios of repeated endotoxin administratio*
J. Theor. Biol. 242, 237-256. doi:10.1016/j.jtbi.20006.02.015.

N.B. Menke, J.W. Cain, **A.M. Reynolds**, D.M. Chan, R.A. Segal,
T.M. Witten, D.G. Bonchev, R.F. Diegelmann, and K.R. Ward,
2009, *An In Silico Approach to the Analysis of Acute Wound
Healing*, Wound Repair and Regeneration. Vol 18, Issue 1, 105-113.

Reynolds, A., Ermentrout, G. B., Clermont, G, *A Mathematical
Model of Gas Exchange Under Inflammatory Stress*, 2010, J. Theor.
Biol. 264 (2), 161-173.

John W. Cain & **Angela M. Reynolds**, *Ordinary and Partial
Differential Equations*, an Introduction to Dynamical Systems, VCU
Mathematics Textbook Series, 2010

Segal, R., Diegelmann, R., Ward, K., **Reynolds A.**, *A Differential
Equation Model of Collagen Accumulation in a Healing Wound*, 2012
Bulletin of Mathematical Biology, DOI 10.1007/s11538-012-9751-z.

Reynolds, A., Koombua, K., Ward, K., Pidaparti, R., *Cellular Automa
Modeling of Pulmonary Inflammation*, MCB, vol 9, no 2, pp 141-156,
2012

Ramana M. Pidaparti, Matthew Burnette, Rebecca L. Heise, **Angela
Reynolds**, *Analysis for Stress Environment in the Alveolar Sac
Model*, J. Biomedical Science and Engineering, 2013, 6, 901-907,
<http://dx.doi.org/10.4236/jbise.2013.69110>

Racheal L. Cooper, Robert F. Diegelmann, Rebecca A. Segal,
Angela Reynolds, *Modeling the Effects of Systemic Mediators on
the Inflammatory Phase of Wound Healing*, Journal of Theoretical

Biology, Nov. 2014.

Grants

NSF- Conference Funding, March 2016: Funding for a conference that I am co-organizing to be held in May 2016 at VCU, \$10,000

Conference Title: BAMM!: Biology and Medicine Through Mathematics

NSF- Conference Funding, Summer 2013: Funding for a conference that I co-organized held in March 2014 in Pittsburgh, PA, \$31,800

Conference Title: Nonlinear dynamics and stochastic methods: from neuroscience to other biological applications.

R-01, National Institute of Aging (NIA), \$1,186,983, 08/12-05/16
Title: Age Dependent Mechanical Ventilator-Induced Inflammation: Modeling & Experiments

Jeffress Memorial Trust Fund Grant, \$31,250, 05/2011-06/2013
Title: Mathematical Modeling of the Effects of Systemic Cortisol and Estrogen on Wound Healing Treatments.

Editorial Board

Editorial Board for Letter in Biomath
<http://lettersinbiomath.org>

Review Editor for Frontiers in Systems Biology

Abstracts & Presentations

Biomedical Engineering Society Conference, October 2014

Title: Multiscale Model of Lung Inflammation (Podium Presentation)

Presented by Rebecca Heise

Biomedical Engineering Society Conference, October 2014

Title: Age Related Changes in Pulmonary Mechanics and Inflammatory Response to Experimental Ventilator Induced Lung Injury (Podium Presentation)

Presented by Joseph Herbert

SIAM- Life Sciences, August 2014

Title: The Effect of Systemic Estrogen and Cortisol on the Inflammatory Phase of Wound Healing (Contributed talk)

WCB: World Congress of Biomechanics Conference, July 6-11, 2014, Boston, MA

Title: Agent Based Modeling of Strain-Induced Lung Inflammation (Podium Presentation)
Presented by Racheal Cooper

The 10th American Institute of Mathematical Society (AIMS) Conference on Dynamical Systems, Differential Equations and Applications, Spain, July 2014

Title: The Effect of Systemic Estrogen and Cortisol on the Inflammatory Phase of Wound Healing (Mini-symposium talk, invited)

Mathematical Biology Workshop, Norfolk State University, April 2014

Title: An Introduction to Modeling Inflammation and computational tools for dynamical systems, (Workshop Presentation)

SIAM: South Eastern Atlantic Sectional Conference, March 2014

Title: Agent Modeling of Stretch-Induced Immune Cell Recruitment (Contributed talk)

Biomathematics Ecology: Education and Research Conference, October 2013

Title: Multi-Scale Modeling of Lung Inflammation (Mini-symposium talk)

Biomathematics Ecology: Education and Research Conference, October 2013

Title: A Mathematical Model for the Role of Macrophages and Neutrophils in Wound healing (Poster)
Presented by Racheal Cooper

Biomedical Engineering Society (BMES) Annual Meeting, September 25-28, 2013 in Seattle, Washington

Title: Agent Based Modeling of Stretched Induced Lung Inflammation (Poster)
Presented by Joseph Herbert

Gordon Research Conference, Lung Development, Injury & Repair, August 18-23, 2013

Title: Multi-Scale Modeling Framework for Lung Tissue Inflammation (Poster)

Loyola University of Maryland, April 10, 2013.

Title: Modeling the Inflammatory Response: Wound Healing and Mechanical Ventilation (Seminar Talk)

Virginia State University, Petersburg, VA, February 15, 2013.

Title: Modeling the Inflammatory Response: Wound Healing and Mechanical Ventilation (Seminar Talk)

Christopher Newport University, Newport News, VA, February 14, 2013.

Title: Modeling the Inflammatory Response: Wound Healing and Mechanical Ventilation (Colloquium Talk)

Cox High School, Virginia Beach, VA, December 12, 2013.

Title: Mathematical Model of Acute Inflammation (Seminar talk at their mathematical honors society meeting)

Multi-scale Modeling in Medicine and Biology Conference, University of Nottingham, Nottingham, England, September 3-5, 2013.

Title: Multi-scale Modeling Framework for Lung Tissue Inflammation (Poster)

Annual Meeting, Society for Mathematical Biology, Knoxville, TN, July 2012 (International)

Title: The dynamics of wound healing with elevated cortisol levels (Mini-symposium Talk, invited)

Annual Meeting, Society for Mathematical Biology, Knoxville, TN, July 2012

Title: A Subsystem Approach to Understanding the Inflammatory Response in a Wound (Poster)

Mathematical Biosciences Institute; Ohio State University, Columbus, Ohio, May 2012

Title: Effect of Cortisol on Wound Healing (Poster).

7th Annual Virginia Graduate Student Research Forum, University of Virginia, February 16, 2012

Title: Population Based Ordinary Differential Equation Model of Gonorrhea (poster)

Presented by Courtney Henry

Duquesne University, Pittsburgh, PA, October 2011

Title: Mathematical Models of the Acute Immune Response and Wound Healing (Seminar Talk)

Society of Applied & Industrial Mathematics- Dynamical System, Snowbird, Utah, May 2011 (International)

Title: An ODE Model of Wound Healing Collagen Accumulation (Mini-symposium Talk, Invited).

7th International Conference on Differential Equations and Dynamical Systems, Tampa, Florida December 2010 (International)

Title: An ODE Model for the Accumulation of Collagen During The Wound Healing Process (Mini-symposium Talk, Invited).

Society of Applied & Industrial Mathematics- Life Sciences, Pittsburgh, Pennsylvania, July 2010 (International)

Title: A Computational Model of the Spread of Inflammation Between Organs During Multiple Organ Failure (Mini-symposium Talk, Organizer).

U.S. Army Institute of Surgical Research, San Antonio, Texas, May 2010

Title: Multiscale Modeling of Acute Lung Injury (Seminar Talk).

Mathematical Biosciences Institute; Ohio State University, Columbus, Ohio, March 2009

Title: *In Silico* Approach to the Analysis of Acute Wound Healing. (Poster).

Mathematical Biosciences Institute; Ohio State University, Columbus, Ohio, March 2009

Title: Mathematical Models of Acute Inflammation and a Full Lung Model of Gas Exchange with Inflammatory Stress (Seminar Talk, Invited).

International Shock Congress 2008; Cologne, Köln, June 2008

Title: A Mathematical Model of Acute Inflammation, which Accounts for Blood and Tissue Interactions (Poster, Abstract published).

International Conference on Complexity in Acute Illness; Köln, Germany, June 2008

Title: A Closed Loop Model of Pulmonary Gas Exchange (Poster).

International Conference on Complexity in Acute Illness; Long Beach, CA, USA, October 2007

Title: Modeling the effects of acute inflammation on gas exchange in the lung (Talk).

Application of analysis to mathematical biology conference;

Durham, NC, May 2007

Title: A model of the acute inflammatory response containing separate compartments for blood and tissue (poster).

**International Conference on Complexity in Acute Illness;
Washington D.C., USA Oct 2006**

Title: Modeling the effects of acute inflammation on gas exchange in the lung (Poster, Abstract published).

Science 2006: Feel the Power; Pittsburgh, PA Sept 2006

Title: Modeling the effects of acute inflammation on gas exchange in the lung (Poster).

**International Conference on Complexity in Acute Illness; Köln.,
Germany Oct 2005**

Title: A reduced mathematical model of the acute inflammatory response. Derivation of the model and analysis of the anti-inflammation. (Poster; Abstract published)

**Professional
memberships**

Member of:

Pi Mu Epsilon- National Mathematics Honors society (PME)

Society of Mathematical Biology (SMB)

Society of Industrial and Applied Mathematics (SIAM)

Association for Women in Mathematics (AWM)

Beta Beta Beta- National Biology Honors society (Tri Beta)