

# MATHEMATICS AND THE HEART

## SPECIAL HIGH SCHOOL WORKSHOP

31 May 2011 – College of William & Mary



Dr. Amina Eladdadi

In this workshop we will present high school teachers with a variety of simple mathematical and biological concepts so that they might develop very simple mathematical models describing cardiovascular (heart) or cardiopulmonary (heart & lung) properties. These models will be such that they can be meaningfully explained to high school students with a minimum of both medical knowledge and mathematical background. This workshop is offered as part of the World Conference on Mathematical and Computational Modeling and Simulation of Cardiovascular and Cardiopulmonary Dynamics and is funded by a grant from NHLBI/NIH.



Dr. Jyoti Champanerkar

### Workshop Learning Objectives:

- (1) Participants will be able to value the importance of mathematical modeling in understanding some aspects of biology in general and of the heart dynamics in particular.
- (2) Participants will be motivated to develop innovative instructional modules linking biology and mathematics.
- (3) Participants will learn about the heart from both, the biological and the mathematical point of view.

We will focus on several properties of the heart and lung such as, excitability, arrhythmia and gas exchange.

**Eligibility:** Prospective or Current Math & Science High School Teachers

**Prerequisites:** High school Algebra and an interest in Biology.

**Attendance Letters:** Individuals who complete the workshop will receive attendance letters certifying that they attended the workshop.

**Date:** 31 May 2011

**Time:** 9am – 5pm (coffee, lunch, coffee provided)

**Location:** College of William & Mary, Conference Center, Williamsburg, Virginia

**Registration:** To register go to <http://www.vcu.edu/csbc/nhlbi/register.html>

**Financial Aid:** Some travel aid will be available to those who register as soon as possible.

**Questions:** Dr. Tarynn M. Witten → [tmwitten@vcu.edu](mailto:tmwitten@vcu.edu)

### ABOUT THE INSTRUCTORS

- Dr. Amina Eladdadi is an Assistant Professor of Mathematics at the College of Saint Rose. She received a PhD in Applied Mathematics from Rensselaer Polytechnic Institute, Troy NY in 2006. Her research interests are in Mathematical and Computational Modeling in Life Sciences, Cancer Modeling: in particular development of multi-scale cancer simulations, Numerical Methods and Simulation, Differential Equations and Dynamical Systems. She is also interested in Mathematics Education especially in integrating project-based-learning in the classroom. Dr. Eladdadi has conducted various undergraduate research projects in Applied Mathematics.
- Dr. Jyoti Champanerkar is an Assistant Professor of Mathematics at William Paterson University, Wayne, NJ. She received her PhD in Applied Mathematics from the New Jersey Institute of Technology. Her research interests are Dynamical Systems and Mathematical Biology, in particular in the areas of cardiovascular physiology and chemotherapeutic modeling. She is keenly interested in imparting quality mathematics education, especially to future mathematics teachers of the country. She has presented at many conferences and in three professional development workshops to mathematics high school teachers in Paterson, New Jersey.



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