Anita Layton, Karin Leiderman, and Michael Reed organized a one-week workshop, May 15-21, 2011, on “Applications of Mathematics to Physiology and Medicine” for ten non-Duke students. The purpose of the workshop was to interest the students in research and graduate school in the sciences. We particularly targeted students from small colleges in the Southeast. Anita made a poster and sent it via email to about 50 small colleges. We listed the workshop on www.mathprograms.org and students applied online submitting a transcript and writing about their scientific interests and saying why the workshop would benefit them. They also gave us the email of a local faculty member to contact. We had 31 applicants and selected ten:

Janki Gajera (rising junior, math major), Old Dominion University
Jordan Kokowski (rising senior, math and biochem), Old Dominion University
Qaadir King-McAlpin (rising junior, math or medicine), Morehouse College
David Sykes (rising sophomore, plans math major), UNC Greensboro
Anna Tuck (rising junior, biology and math), UNC Greensboro
Priyanka Nadar (rising senior, math or biology ), Mary Baldwin College
Jeremy Anthony (rising senior, math major), Augsberg College
Jeremiah Coleman (rising senior, math major), Appalachian State
Leslie Watkins (rising senior, math ), Meredith College
Timothy Wessler (rising senior, math), NC State

We planned the workshop with the assistance of the RTG graduate students Matt Bowen, Tiffany Kolba, Miles Crosskey, Sean Lawley, and Elizabeth Munch. Karin was responsible for the day to day logistics. We decided that the first day should consist mainly of the presentation of 10 possible projects. Each graduate student prepared a project and a presentation and AKM prepared 5 more. The students were told to discuss the projects among themselves Monday evening and to come in on Tuesday morning with their choices, at most 2 per project but individual projects were ok too. They did so, and all had faculty mentors and some had graduate student mentors in addition.

On Tuesday-Thursday the students met with mentors and worked on their projects. They attended tutorials on Matlab, eigenvalues, ODEs, and geometry and topology for mathbio. All but one tutorial was given by an RTG grad student. They attended the following lectures:

Laura Miller (Math, UNC), “How jellyfish can inspire mathematics.”
On Friday, each of the ten students delivered a 20 minute lecture on his or her project. Friday evening there was a reception at Reed’s house for the Workshop students and the Duke Summer REU students and all involved faculty members and graduate students.

The projects and mentors were:

Timothy Wessler & Qaadir King-McAlpin: Diabetes Dynamics
Mentor: Anita Layton

Janki Gajera & Anna Tuck: A Mathematical Approach to HIV
Mentor: Karin Leiderman

Jordon Kokowsi: Modeling Neuron Firing by Transitions in a Double-Well Potential
Mentor: Tiffany Kolba

Priyanka Nadar: Arsenic Poisoning in Bangladesh
Mentor: Sean Lawley

Leslie Watkins & David Sykes: Biochemistry and Public Health
Mentor: Mike Reed

Jeremy Anthony: Dimension Reduction
Mentor: Miles Crosskey

Jeremiah Coleman: Boolean Models of Gene Regulatory Networks
Mentor: Liz Munch