PROJECT TITLE: Mathematical modeling for Tuberculosis

Yanyu Xiao  
Department of Mathematical Sciences  
FRENCH-WEST 5420  
Cincinnati, OH 45221-0025  
Tel: (513) 556-1718  
Email: yanyu.xiao@uc.edu

Project Description

Worldwide, tuberculosis (TB) accounts for more deaths than all other diseases combined. The standard treatment for active tuberculosis is to give multiple drugs for at least 6 months. This therapy is effective if the person has drug-sensitive TB. Drug resistant strains of TB emerge when people do not complete the treatment.

The goal of this project and the possible questions it seeks to answer are:
1. Formulate a model for TB with drug-sensitive and drug-resistant strains of TB.
2. How would your model be changed to include improved compliance with drug therapy?

Requirements: The student should have completed MATH2073 or MATH2074 course, with a minimum grade of C.

Expected Research Tasks: 1. Literature reviews; 2. Basic modeling using differential equations; 3. Programming using Matlab or Maple or R to do numerical simulations; 4. Writing a scientific report; 5. Presentation.

Training and Support: I will meet regularly (weekly or bi-weekly) with the student, to provide training and support for the Expected Research Tasks 1 through 5.