

Analysis of Human Genetic Data

(Formerly the Rockefeller University Basic Association and Linkage Course)

**RUTGERS UNIVERSITY CENTER FOR DISCRETE MATHEMATICS AND THEORETICAL
COMPUTER SCIENCE (DIMACS), PISCATAWAY, NJ**

June 11-15, 2012

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Course Description

This course is mainly focused on strategies for genetic mapping of human disease genes. The course is for researchers with little or no experience in using statistical genetic analysis programs. A basic knowledge of association and linkage analyses is, however, required. The primary focus of the course will be association analysis methods and next-generation sequencing statistical analysis methods.

Topics include: Introduction to association and linkage analysis; practical aspects of data collection and analysis; basic statistics for performing population-based and family-based association analysis and linkage analysis; association analyses with real data; genetic heterogeneity; power and sample size calculations for population-based and family-based association; population stratification; genomic resources for gene mapping; introduction to computer simulation; and next-generation sequencing methods and practice analyses. The major part of the course will consist of carrying out exercises using various real and simulated data sets.

The course will take place in the DIMACS center at Rutgers University. Students are expected to bring their own laptops. The number of participants is limited to 20. We may increase that number to 25 depending upon demand. For additional information, please contact Katherine Montague, Midge Cozzens, or Derek Gordon.

Contact information:

Email: katherine.montague@rockefeller.edu

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(F): +1 (212) 327-7996.

Applications are accepted any time after the course announcement, however, participants are generally accepted on a "first come, first served" basis. We usually receive many more applications than we can accept, so you should apply as soon as possible. Since we sometimes have cancellations, we encourage you to apply at any time, but your chances are reduced if you apply late.

Operating systems for course

We will be using PCs running Windows XP for the course. We will also be using Cygwin (www.cygwin.org) (a Windows-based interface for running Unix/Linux commands) to run a

number of programs. For that reason, it is most helpful to have at least a rudimentary knowledge of such commands. You can find free documentation on an Introduction to Linux by going to the URL:

http://www.linux-books.us/linux_general_0003.php

In this download, you only need focus on Chapters 1 and 2. This introduction is one such example of freely available documentation.

An EXCELLENT book on teaching yourself Unix (which is the predecessor of Linux and for which many of the commands are the same) is: "Teach Yourself Unix in 24 Hours" (2005) by Dave Taylor.

The internet is replete with resources on introductions to Linux, and Linux basic commands "cheat sheets". With a little searching, you may find exactly what you are looking for! **Please familiarize yourself with the basic Linux commands before coming to class.** It will greatly facilitate your ability to use the computer programs when doing the exercises.

Finally, text editing will be performed using common programs such as Notepad and Wordpad.

Course Fee

The fee for the 5-day-course is \$1200 for researchers at an academic institution, and \$1600 for individuals from private (for profit) companies. Payment is required immediately after registration is submitted. You will be redirected to the payment page after registration. As there is presently no support for this course from sources other than the course fee, no reduction of the cost to applicants is possible. This fee covers tuition and course related expenses (handouts, etc.) but not room, board or meals. Course participants may find reasonably priced hotels in the the New Brunswick/Piscataway area by using software such as <http://www.kayak.com> or <http://www.priceline.com> (In Priceline, you can bid on prices for hotels). That is, participants will have to make their own travel and hotel arrangements (except foreign participants).

Course Instructors and Schedule

Each session will start with a theoretical introduction followed by practical exercises with several different computer programs. Instructors for the course will be (in alphabetical order): Marcella Devoto, Derek Gordon, Robert Klein, and Mark Levenstien. Be sure to bring a calculator, and a flash drive in case you wish to copy programs and course data files. Also, you may want to bring data sets for discussion and/or analysis.

The course starts at 9:00 am in the DIMACS Building on the Rutgers University Busch campus. **If you plan to drive to campus each day, we need to know in advance to arrange sufficient guest parking.**

Morning sessions will usually go from 9:00 am to 12:00 pm, and afternoon from 1:30 pm to 5:00 pm, but there may be slight variations (+/- ½ hour) in the time the morning session ends and the

afternoon session begins. We'll have a 1 to 1-1/2 hour break for lunch every day. We'll also take a 10-15 minutes coffee break every day in the morning usually between 10:15 and 11:15, and in the afternoon between 3:00 and 4:00.

Looking forward to seeing you!!

Sincerely,

A handwritten signature in blue ink, appearing to read "Derek Hudson". The signature is fluid and cursive, with the first name "Derek" and last name "Hudson" clearly distinguishable.

Course Organizer and Instructor