

## Group Testing Designs, Algorithms, and Applications to Biology

IMA Annual Thematic Program Workshop  
February 13-17, 2012

### Organizers:

**Yaniv Erlich** (Whitehead Institute for Biomedical Research)

**Anna C. Gilbert** (Mathematics, University of Michigan)

**Olgica Milenkovic** (Electrical and Computer Engineering, University of Illinois at Urbana-Champaign)

**Ely Porat** (Computer Science, Bar Ilan University)

### Description:

Group testing was originally designed for the Selective Service to test inductees for syphilis. It appears in many forms, including coin-weighing problems, experimental designs, and public health. The goal of the group testing design problem is to design an optimally efficient set of tests of items so that the test results contain enough information to determine a small subset of items of interest. With the emergence of new computational applications that monitor large volumes of streaming data or that acquire a reduced number of measurements of large data sets, both the design problem and its associated algorithmic problem are crucial for efficiently extracting a small amount of useful information from a voluminous data set, designing efficient high-throughput biological screens, and reducing the number of experiments necessary for identifying items of biological interest.

The aim of this workshop is to bring together researchers in a diverse mixture of theoretical computer science (including streaming and sublinear algorithms, property testing, lower bounds, and space complexity results), bio-informatics and analysis of large genetic data sets, information and coding theory, and high-throughput biological screening.

### Speakers:

**Amihood Amir** (Bar-Ilan University)

**Sharon Aviran** (University of California, Berkeley)

**Mahdi Cheraghchi** (Carnegie Mellon University)

**Ferdinando Cicalese** (Università di Salerno)

**Annalisa De Bonis** (Università di Salerno)

**James Diggans** (The Mitre Corporation)

**Yaniv Erlich** (Whitehead Institute for Biomedical Research)

**Dina Esposito** (Whitehead Institute for Biomedical Research)

**Anna Gal** (University of Texas at Austin)

**Anna Gilbert** (University of Michigan)

**David Golan** (Tel Aviv University)

**Michael Huber** (Universitaet Tuebingen)

**Olgica Milenkovic** (University of Illinois at Urbana-Champaign)

**Jelani Nelson** (Princeton University)

**Natasha Przulj** (Imperial College London)

**Sylvie Ricard-Blum** (Université Claude-Bernard, Lyon I)

**Atri Rudra** (University at Buffalo, SUNY)

**Vyacheslav Rykov** (University of Nebraska at Omaha)

**Alex Samorodnitsky** (Hebrew University)

**Alexander Schliep** (Rutgers University)

**Noam Shental** (Open University of Israel)

**Nicolas Thierry-Mieg** (Centre National de la Recherche Scientifique, CNRS)

**David Woodruff** (IBM Research Division)

**Or Zuk** (Broad Institute)

[www.ima.umn.edu/2011-2012/W2.13-17.12](http://www.ima.umn.edu/2011-2012/W2.13-17.12)