

Overview

The Istituto di Ricerca Genetica e Biomedica (CNR-IRGB) and the Centro di Ricerca, Sviluppo e Studi Superiori in Sardegna (CRS4) are organizing a Summer School on Next Generation Sequencing and Genome Wide Association Studies from **5 – 9 September 2011**.

The Sardinian population has long been of wide interest for human geneticists. Studies have examined and clarified the molecular bases of monogenic diseases including Thalassaemia and Wilson disease and, more recently, genetic factors associated with common complex traits and diseases.

Sardinia's population has been reasonably large-sized during its history (since its foundation during the last Ice Age). There is considerable evidence that a relevant part of Pre-Neolithic genetic variation has been retained with a lack of large-scale gene inflow from non-native populations: therefore Sardinia represents a unique site for comprehensive large sequencing efforts to detect genetic variation that is relevant to all human populations and to assess its influence on common complex traits and diseases.

The aim of this Summer School in Genomics is to cover state-of-the-art theory and practice of the approaches to the identification of the genetic bases of human diseases emphasizing the unique advantages of the Sardinian founder population.

Course Description

The programme consists of a series of lectures and practical sessions which are specific to the theme of the Summer School. The course is designed to encourage the maximum possible interaction among lecturers and students.

The lectures are intended to give conceptual overviews of modern approaches to study genetic variation and to apply this information to different areas of research, in particular the detection of genetic variants associated with complex and monogenic traits. Special emphasis will be given to recent progress resulting from massive parallel sequencing strategies and their integration with microarrays data. The practical sessions (workshops) are intended to give more applicative tools on the different topics covered during the course; in particular a discussion of different study designs, methods to analyse high flow microarray data for GWAS, analysis of low pass and deep coverage whole genome DNA sequencing data, methods for statistical imputation, analysis of exome sequencing data, quantitative and qualitative analysis of the transcriptome, epigenome and other related issues. The workshops will consist of theoretical demonstrations as well as practical tasks carried out using a variety of computer programs.

Course Scientific Directors: Francesco Cucca, Marcella Devoto

LECTURES

David Schlessinger	Introduction; historic perspective
Serena Sanna	Association studies including QTL
Gonçalo Abecasis	Low Pass Sequencing
Stephen Montgomery	Expression and eQTL
Marcella Devoto	GWAS Overview
Nicole Soranzo	Meta-Analysis
Stephen Lincoln	Deep Sequencing
Joseph Nadeau	Epigenetics
Zemin Zhang	Sequencing cancer transcriptome
Deborah Nickerson	Sequencing in the clinic
Stephen Sawcer	The Genetics of Multiple Sclerosis
Francesco Cucca	Sardinia as a model population
Round Table	Wrap up - what's next?

WORKSHOPS

Patricia Rodriguez-Tomé	Online databases and other resources
Marcella Devoto and Serena Sanna	Association studies: analysis and interpretation
Gonçalo Abecasis and Serena Sanna	Sequencing
Stephen Montgomery	RNASeq
Zemin Zhang	Topic tbd
Marcella Devoto and Serena Sanna	Study design; power analysis; QC
Cristen Willer and Serena Sanna	Imputation
Joseph Nadeau	Animal models

Who should attend

Post-graduate students, post-doctoral researchers, and clinical researchers who wish to learn more about or move into the complex genomics field. Attendees should have background knowledge on most of the topics presented during the course. The ability to work in a Linux environment is a prerequisite for attending the workshops. Applicants must be fluent in English. The course is funded by the Regional Sardinian government and will be free of charge for all attendees.

Summer School Hotel: IS MOLAS RESORT, S.S.195 Loc. Is Molas, 009010 Pula, Cagliari, Sardinia, Italy

Web: <http://www.ismolas.it/eng/index.html>

Local Organizing Committee: Chiara Rotondi, Roman Tirlir

For additional course information and course application please visit the course website.

LOCATION

Polaris Technology Park
Loc. Piscinamanna
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CONTACT

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WEBSITE

<http://www.crs4.it/SC2011>

