



The Faculty of IT and the Monash e-Research Centre
are proud to present the following seminar - part of the
High Definition interactive video links of
MURPA Seminar Series 2010

Mathematical Models of Cardiac Muscle Cells: Predicting Drug-induced Arrhythmias

Dr Ania Sher

Research Fellow, Oxford University (Currently visiting)

Many drugs fail to reach the market because of side effects on the heart. Cardiac toxicity (in particular, whether a new drug will have undesirable side effects by causing dangerous changes in heart rhythm – ‘arrhythmias’) is a principal factor leading to abandonment of otherwise promising drug candidates.

For instance, the level of inhibition of the hERG channel is one of the preclinical markers commonly used to predict the risk of a drug causing Torsade-de-Pointes (TdP) arrhythmia. Moreover, performing in vivo experiments and measurements is often difficult (e.g. for humans, sometimes very dangerous or even impossible), while mathematical modelling of the heart can provide insights into the physiological processes and potential biomarkers without any harm.

In order to improve the model fit to the experimental data and to identify the key parameters responsible for drug action at different frequencies, such tools as the Nimrod parameter sweep and optimization toolkit developed in Prof Abramson’s group could be used.

Further, I will discuss how computational models of heart muscle cells are being used to predict the effect of multi-channel drug action on cardiac cell dynamics, as well as on the risk of TdP development, and how modelling can be suited to TdP risk assessment.

Date: Friday 26 March
Time: 10am-11am
Location: Seminar Room 135, Building 26,
Clayton campus

Registration by 25 March: Rob.Gray@infotech.monash.edu.au

MURPA Seminar Series 2010

Monash Undergraduate Research Projects Abroad (MURPA) supports a unique summer mode placement in a leading research group overseas. It not only provides a research experience at the undergraduate level, but does this in an international context. Students are placed for a period of eight weeks allowing them to integrate into the research groups as team members.

MURPA also involves an advanced seminar scheme, in which students can attend seminars given by world leading experts before they leave. The seminar scheme is novel, because it uses a cutting edge High Definition interactive video links with the University of California - and often simultaneous links to Japan - making it feasible to attract some of the world’s best researchers “virtually” to Monash. These seminars also allow students to “meet” potential UCSD mentors and obtain information about possible projects.

<https://messagelab.monash.edu.au/MURPA/MURPA2010>