



Hamilton Institute

Event-Driven Automation in Laser-Scanning
Microscopy Applied to Live Cell Imaging

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in collaboration with the Royal College of
Surgeons in Ireland

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Abstract

Microscopy of living cells is heavily employed in biomedicine to understand the mechanisms of disease progression and to develop novel pharmaceuticals. In particular, confocal microscopy which relies on laser-based excitation of fluorescent cellular biomarkers is frequently used for understanding molecular actions of therapeutic drugs to abnormal cells. However, prolonged exposure to highly energetic laser radiation often leads to light induced cell death before any spontaneous effects can occur – an effect known as ‘photo-toxicity’. To address this problem we have developed an automated live-cell imaging system ‘ALISSA’ which employs online image processing and analysis to automatically detect biological events and then trigger appropriate changes in the image acquisition settings. This way we minimize the photo-toxicity, obtain higher quality of the imaging data and minimize direct user involvement by introducing more automation to the whole experimental process. So far, ALISSA has been used in studies on cancer cells and neurons at the Royal College of Surgeons in Ireland and it is currently under development aimed towards applications in commercial high content screening systems.

This is a joint work between the RCSI, Dublin (H. Huber, H. Duessmann, J. Prehn) and the Hamilton Institute, NUI Maynooth (J. Wenus, P. Paul, D. Kalamatianos, P. Wellstead) with involvement from Siemens and Carl Zeiss MicroImaging.

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Venue: Seminar Room, Hamilton Institute, Science Building,
NUI Maynooth

Time: 2.00 - 3.00pm (followed by tea/coffee)

Travel directions are available at www.hamilton.ie

