

Name: Irene Hatzinisiriou

Position: Imaging Facility Manager

Organisation: Dept Biochemistry & Molecular Biology, Monash University

Professional specialisation or role in organisation

- Imaging Facility Manager

Areas of expertise

- Flow Cytometry
- Live Cell fluorescence based assays
- Microscopy
- Teaching
- Fluorescence detection in living cells

Capabilities

- Management and develop and manage facility
- Teaching (undergraduates and postgraduates)
- Technical and research problem solving
- Optimisation of fluorescence detection
- Research and method development incl writing manuals for equipment
- Validation of new technologies associated with microscopy and flow cytometry

Field of application

- Research and development of Detection of Fluorescence techniques using a wide range of scientific equipment.
- Cancer Research, Apoptosis, Autophagy, Fluorescent Proteins, Cell Signalling, Nuclear Signalling, Protein Trafficking, Neurodegenerative Research, Serpins, Hyaluronan Research, Diabetes

Facilities

- Confocal/FLIM Microscopy
- EpiFluorescence microscopy
- TIRF microscopy
- Flow Cytometry
- Typhoon
- Fluostar Optima plate reader
- Gel Doc systems
- Real time PCR
- Live cell imaging system

Example of facilities

- Confocal Laser Scanning microscopy with FLIM capabilities
Instrument can be used to make images of cells where parts of cells are clearly visible and follow selected biochemical processes in cells. Probes microscopic size areas.
- Multifunctional Plate Reader
Instrument capable of measuring Fluorescence, Absorbance and Luminescence of solutions of samples, volumes ranging from 1ul – 6mls.
- Flow Cytometer (BD Biosciences)
A technique for counting, examining and sorting microscopic particles suspended in a stream of fluid. It allows simultaneous multiparametric analysis of the physical and/or chemical characteristics of single cells flowing through an optical and/or electronic detection apparatus.
- Epifluorescent Microscopes with Image Capture capabilities (Olympus, Nikon, SciTech)
A form of fluorescence microscopy. In this process, instead of transmitting the excitatory light through the specimen it is passed through the objective onto the specimen. Since only reflected excitatory light filters through, the transmitted light is filtered out, giving a much higher intensity. Specimens are usually stained with Fluorochromes, and their images are captured using highly sensitive cooled digital cameras.

- Typhoon Trio (GE Healthcare)
Fluorescence, Luminescence and Radio-Isotope scanner capable of handling a wide range of samples: Sandwiched gels, Agarose gels, Polyacrylamide gels, membranes, slides, microarrays, Phosphoscreens. Phospho screens for capturing radioactivity from gels or membranes, only requires one-tenth the exposure time of traditional autoradiography film. Image analysis software designed for one and two dimensional protein gel formats, and various other types of analyses.
- Refrigerated Cryotome (Reichert-Jung)
Cuts thin slices of tissues at temperatures below 20°C, for further staining and processing before imaging under a microscope.
- Real Time PCR (Corbett)
Simultaneously quantifies and amplifies a chosen part of a given DNA molecule. Fluorescent tags are added to the reaction mix and tracked over time by the instrument. The intercalated dye molecules with the hybridised DNA are fluorescent and thus quantified, determining how many DNA molecules of a specific sequence were present in the original sample.
- TIRF Microscopy (Olympus, SciTech)
Fluorescence TIRF microscope with which a thin region of a specimen, usually less than 200nm can be observed.
- Gel Documentation Systems (Scientifix, Quantum Scientific)
A scanner with digital cameras attached for digitising images of fluorescent gels and various other sample formats. Mainly used for fast detection of GFP expressing samples, and Ethidium Bromide detection in gels.
- Laser Tweezer Microscopy (Alphatec, Olympus, SciTech)
Fluorescence based microscope that uses a focused laser beam to provide an attractive or repulsive force, to physically hold and move microscopic dielectric objects ie in a vacuum without altering the object. Also known as Optical Tweezers. Can be used in biological systems where binding capabilities of cells can be studied.
- Live Cell Imaging System (Leica)
Automated fluorescence microscope capable of imaging multiple points in time lapse, with multi focal point imaging, with CO₂ and temperature regulated chamber.

Facility availability

- Upon request and collaborations accepted
- Training provided

Other benefits

- Hands on help

Publication track record

[Azari MF, Profyris C, Karnezis T, Bernard CC, Small DH, Cheema SS, Ozturk E, Hatzinisiriou I, Petratos S.](#) Leukemia inhibitory factor arrests oligodendrocyte death and demyelination in spinal cord injury.

J Neuropathol Exp Neurol. 2006 Sep;65(9):914-29.

[Hatzinisiriou I, Dezfouli S, Ralph SJ.](#)

Use of cytokines in cancer vaccines/immunotherapy: recent developments improve survival rates for patients with metastatic malignancy. Curr Pharm Des. 2005;11(27):3511-30. Review.

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Enhancing CTL responses to melanoma cell vaccines in vivo: synergistic increases obtained using IFN γ primed and IFN β treated B7-1+ B16-F10 melanoma cells. Immunol Cell Biol. 2003 Dec;81(6):459-71.

[Wong LH, Sim H, Chatterjee-Kishore M, Hatzinisiriou I, Devenish RJ, Stark G, Ralph SJ.](#)

Isolation and characterization of a human STAT1 gene regulatory element. Inducibility by interferon (IFN) types I and II and role of IFN regulatory factor-1.

J Biol Chem. 2002 May 31;277(22):19408-17.

[Esposti MD, Hatzinisiriou I, McLennan H, Ralph S.](#)

Bcl-2 and mitochondrial oxygen radicals. New approaches with reactive oxygen species-sensitive probes. J Biol Chem. 1999 Oct 15;274(42):29831-7.

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IFN- γ priming up-regulates IFN-stimulated gene factor 3 (ISGF3) components, augmenting responsiveness of IFN-resistant melanoma cells to type I IFNs. J Immunol. 1998 Jun 1;160(11):5475-84.

[Wong LH, Krauer KG, Hatzinisiriou I, Estcourt MJ, Hersey P, Tam ND, Edmondson S, Devenish RJ, Ralph SJ.](#) Interferon-resistant human melanoma cells are deficient in ISGF3 components, STAT1, STAT2, and p48-ISGF3 γ .

J Biol Chem. 1997 Nov 7;272(45):28779-85.

[Ralph SJ, Wines BD, Payne MJ, Grubb D, Hatzinisiriou I, Linnane AW, Devenish RJ.](#)

Resistance of melanoma cell lines to interferons correlates with reduction of IFN-induced tyrosine phosphorylation. Induction of the anti-viral state by IFN is prevented by tyrosine kinase inhibitors.

J Immunol. 1995 Mar 1;154(5):2248-56.

[Wines BD, Choe CC, Hatzinisiriou I, Devenish RJ, Linnane AW, Ralph SJ.](#)

A colourimetric dye assay to detect anti-viral activity of interferons: sensitivity for measuring cellular responsiveness to interferons. Biochem Mol Biol Int. 1993 Dec;31(6):1111-20.