Equipment Park

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The Equipment Park provides access to a range of state-of-the-art equipment and specialised technologies. The facility offers technical advice and support and appropriate staff training for all equipment currently housed in the Park. The range of equipment is constantly under review to ensure that the needs of the on-going research projects within the Institute are met. Equipment requests from research heads are encouraged.

The equipment available includes:

BiaCore T100 – this biosensor is capable of measuring molecular interactions, such as the specificity of interactions between molecules. It can also provide measurements of the affinity and kinetics of these interactions, as well as the thermodynamic properties underlying association and dissociation rates.

Plate Readers and Spectrophotometers – the Tecan Infinite 200 series measures absorbance, fluorescence and luminescence, and is compatible with 6-384 well plates, PCR plates or cuvettes. A BioTek Clarity dedicated luminometer can be used for a variety of different applications including gene expression assays utilising luciferase or Dual-Luciferase, ATP assays, DNA assays, aequorin calcium ion assays, reactive oxygen species assays and luminescence-based ELISAs. A UV-Visible single-cell spectrophotometer, the Cecil Super Aquarius 9500, provides high measurement accuracy of samples and can also measure kinetics.

Imaging Systems – Four imaging systems are available that produce images of a wide range of samples. The Typhoon Trio instrument uses three internal lasers to produce digital images of radioactive, fluorescent or chemiluminescent samples, while the Li-Cor Odyssey infrared imaging system can be used for more sensitive detection of proteins and DNA produced from a variety of different techniques including Western blots, cell-based assays and tissue imaging. The UVP ChemiDoc-IT chemiluminescence imaging system captures high-resolution chemiluminescent and bioluminescent images and converts them to digital images. The fourth imaging system, ImageScanner III, is a very high resolution flat-bed scanner for analysing stained gels, blots, membranes and slides. Together with the appropriate analysis software packages (VisionWorksLS, Odyssey 2.1 or ImageQuant TL), the DNA/protein bands or spots captured by each imaging system may be quantified.

Molecular Biology Applications – A range of molecular biology applications are available, including nucleic acid and protein sample preparations using the QIAcube which purifies a range of DNAs, RNAs and proteins as well as cleaning up DNA and RNA. The facility can also quantify the nucleic acids in a sample and has the capability for standard and real-time PCR.

2-D gel electrophoresis (2-D DiGE) – This is a state-of-the-art two-dimensional gel technique for accurate and reproducible quantification of protein expression. Protein samples are first labelled with one of three spectrally-distinct fluorescent dyes, before being separated by their isoelectric point and mass. By including an internal standard in the experiment, gel-to-gel variation is eliminated and many gels can be compared directly. DeCyder EDA v6.5 specialist software automatically detects proteins and applies statistical tests to the data. It will identify differentially expressed proteins and uncover patterns and relationships in expression data.

Liquid Chromatography – A BioCAD Sprint high-performance liquid chromatography system is capable of analytical, preparative and low-pressure chromatography as well as high-performance liquid chromatography. The instrument can operate at flow rates up to 20 ml/min at 3,000 p.s.i. and can document all critical chromatographic parameters including pH, conductivity, UV trace and pressure.