



Equipment Park

Head **Jane Gray**

The Equipment Park provides CRI scientists with access to a range of state-of-the-art equipment and specialised technologies. It offers technical and scientific advice, troubleshooting support and appropriate training for all the facility's equipment.

Many of the available instruments digitise data which improves accuracy, efficiency, cost-effectiveness and facilitates generation of results. For example, several CRI research groups are now utilising fluorescent Western blotting technologies which have time/cost benefits and enable accurate quantification of protein expression from multiple samples simultaneously. Over the next year, the facility aims to further optimise such technologies to maximise sensitivity and detection limits. The facility also keeps up-to-date with new technological developments to ensure that the best possible equipment is made available to CRI scientists.

The equipment currently available includes:

2-Dimensional Fluorescence Difference Gel

Electrophoresis (2-D DiGE) – This is a two-dimensional gel technique for accurate and reproducible quantification of protein expression. With specialist automated software (DeCyder EDA v6.5), differentially expressed proteins as well as patterns and relationships in expression data can be identified. This technique has already been used successfully in a collaborative pilot study (with the Carroll laboratory) aimed at identifying novel transcription factors associated with the oestrogen receptor. A full-scale study is now in progress.

Biosensor – The Biacore T100 measures molecular interactions in real-time. It provides label-free measurements of the affinity and kinetics of interactions, as well as the thermodynamic properties underlying association and dissociation rates. This instrument has proved pivotal in a number of research studies this year (with the Murphy, Neal

and Brindle laboratories) investigating the kinetics of protein-protein, protein-DNA and protein-phospholipid interactions. A one day intensive training programme in this technology is now available.

Plate readers and spectrophotometers – The Equipment Park provides access to two high specification plate readers: the Tecan Infinite 200 is a multi-mode plate reader capable of measuring absorbance, fluorescence and luminescence in a wide variety of sample formats and the BioTek Clarity is a dedicated plate luminometer. A third UV-visible cuvette spectrophotometer, the Cecil Super Aquarius 9500, is particularly suited to the determination of low-concentration samples.

Imaging Systems – Four imaging systems are available that produce digital images from a wide range of different samples. (i) The Typhoon Trio uses three internal lasers to produce images of radioactive, visible fluorescent or chemiluminescent samples. (ii) The Li-Cor Odyssey uses two lasers to image fluorescence specifically in the infra-red region. Both systems can be used in conjunction with Western blotting, cell-based assays and microarrays. (iii) The UVP ChemiDoc-IT is a dedicated chemiluminescence camera system and can be used to image Western, Northern and Southern blots. (iv) The ImageScanner III is a high resolution flat-bed scanner for imaging non-fluorescent stained gels, blots, membranes and slides. Using dedicated analysis software packages (VisionWorksLS, Odyssey v3.0 or ImageQuant TL), protein/DNA bands or spots captured by any of these imaging systems can be accurately quantified.

Molecular Biology Applications – The Equipment Park houses an 8-channel NanoDrop for quantification of small volume nucleic acid (and protein) samples and has the capability for both standard and real-time PCR. This year we have introduced a pulsed-field gel electrophoresis system, CHEF III, which separates large DNA molecules.

Liquid Chromatography – The BioCAD Sprint high-performance liquid chromatography system is capable of analytical, preparative and low-pressure chromatography as well as high-performance liquid chromatography.