Advertisement feature

Little and large

The latest in peptide and protein technology

As a result of their involvement in almost all biological processes proteins and peptides are important tools and targets in every area of life science research. Advances in protein and peptide technology have led to more complex or specialised proteins and peptides being made commercially available, and have led to improvements in protein expression and analysis techniques.

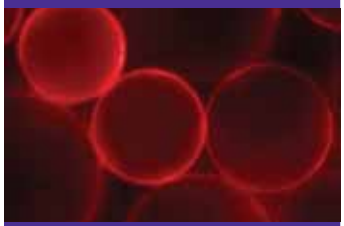

Image supplied by Integral Molecular

Proteins, peptides and protein expression

Chemokines comprise a family of small cytokines with a size range of 8-10 kDa and two conserved disulfide bonds, which stabilise their tertiary structure. **Bachem** has recently added several new chemokines to its list of over 9000 peptide, protein, and amino acid catalog products. Bachem's list of new products includes several analogues of RANTES (CCL5), a key protein in the recruitment of leukocytes to inflammation sites and an HIV-suppressive factor released by CD8+ T cells; and Stromal Cell-Derived Factor-1 (SDF-1), in both α and β isoforms (also known as CCL3 and CCL4), which is involved in the regulation of hematopoeiesis, lymphocyte homing, and angiogenesis. These products are among a wide range of structurally complex synthetic peptides that can also be provided with custom modifications (e.g., biotinylation, fluorescent labels or stable isotopes) for specialised applications.

Protein kinases are essential in intercellular communication, mediating signal transduction in development, transcription, immune response, metabolism, apoptosis and cell differentiation. Improper kinase function plays a role in many diseases, most notably cancer, and the study of these proteins and their functions may contribute to the discovery and development of new drug targets. **Sigma-Aldrich** has introduced **Precisio™ Kinases**, a new collection of high quality active kinases for protein phosphorylation and cell signaling studies that are optimised for high-throughput kinase screening and profiling.

For researchers concerned with experimental variables caused by trace animal components or mammalian pathogens **R&D Systems' Animal-Free™ Recombinant Proteins** are manufactured in a laboratory exclusively dedicated to the production and purification of recombinant proteins using all non-animal reagents. These products, generated under animal-free conditions, share the same biological activity as those produced in a typical laboratory environment.

Using its Phospho-Electrofusion™ technology **Rockland Immunochemicals** has created a range of **Phosphospecific monoclonal antibodies** including a panel of antibodies to the PI3 Kinase Pathway. These phosphospecific monoclonal antibodies are useful for the identification and quantification of biomarkers or surrogate biomarkers.

Beta-amyloid is one of the most investigated molecules in Alzheimer's disease research projects as a result of its involvement in the pathogenic process of the disease. **GenScript** has synthesised a comprehensive array of **human and rat beta amyloid peptide** fragments, using its FlexPeptide™ peptide synthesis platform, for use in studies aimed at elucidating the potential biological interactions of each specific fragment.

A new baculovirus vector for increased yield and improved quality of expressed protein is available from **Oxford Expression Technologies**. ***flash*BACULTRA™** is the latest addition to its *flash*BAC™ portfolio of products, which enable the production of multiple recombinant viruses in a onestep process. *flash*BACULTRA offers increased cellular stability and longevity; increased recombinant protein yield, including difficult-to-express secreted and membrane-targeted proteins; increased recombinant protein quality and reduced timelines for protein expression. "Our new system allows scientists to produce proteins faster, more easily and cost-effectively using automated and high-throughput methods — aiding the development of new drugs and more targeted research for understanding how

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The flashBACULTRA™ expression system from Oxford Expression Technologies


GE Healthcare's Äkta™ avant HPLC system

proteins work in health and disease," commented James Bernard, acting CEO of Oxford Expression Technologies. "*flash*BACULTRA includes additional modifications to the virus genome that further enhance the secretion and yield of high quality recombinant proteins."

Sample prep

Researchers who work with proteins demand accurate quantitation while minimising the consumption of precious sample. The **Thermo Fisher NanoDrop™ 2000 and 2000c** spectrophotometers use only 1µl of sample for highly accurate quantitation without the need for cuvettes and capillaries. The user simply pipettes a 1µl sample directly onto a fibre optic measurement surface where it is held in place by a patented retention system. During each measurement cycle the full absorbance spectrum of the sample is assessed at four different path lengths, resulting in the broadest dynamic range without the need for dilutions.

GE Healthcare has launched **ÄKTA™ avant**, a high performance liquid chromatography system providing a complete, robust solution for fast, scalable and high quality protein separations in process development. The built-in UNICORN™ 6 control system with integrated Design of Experiment (DoE) functionality saves time and increases productivity. The advanced configuration, flow and pressure capabilities of ÄKTA avant enable the use of modern, high-flow BioProcess chromatography media including MabSelect™ and Capto™, which can shorten process times by days and provide significant cost savings.

Analysis

PARP inhibitors have recently been pushed to the forefront of many avenues of cancer research, having been shown to potentiate the cytotoxcity of anti-cancer drugs, and are therefore extremely interesting target compounds for cancer research. **BMG LABTECH's FLUOstar Omega** is a multidetection microplate reader that is able to perform the complex assays needed for the evaluation of PARP inhibitors. The FLUOstar Omega can read numerous detection modes including fluorescence, luminescence and absorbance.

RayBiotech offers **RayBio® Protein Arrays** for screening protein-protein interactions, monitoring autoantibody expression, determining antibody specificity, identifying protein modifications and detecting small molecule-protein interactions. The protein arrays are fully customisable with any protein the customer specifies and are available as a complete kit including washing and blocking buffers, biotinylated secondary antibodies, and fluorescent-conjugated streptavidin.

Lipoparticles are non-infectious virus-like particles that incorporate target membrane proteins at concentrations 10 to 100-fold higher than in cells or membrane preparations, typically at 50-200 pmol/mg. As biochemical reagents, Lipoparticles overcome significant limitations of working with membrane proteins, enabling new applications that are difficult or impossible using traditional membrane protein sources. **Integral Molecular's** Lipoparticle technology offers unique solutions to the challenges of studying complex membrane proteins such as GPCRs and ion channels.

Protein crystallisation

For protein crystallography the **TOPAZ** system from **Fluidigm** provides a highly efficient screening method – Free Interface Diffusion (FID). The system samples crystallisation space more broadly while using significantly less protein sample than other products. Fluidigm has now introduced the new 1.96 Diffraction Capable (DC) integrated fluidic circuit, which will provide researchers with direct screen-to-beam capabilities without the need to physically harvest a crystal from the device. The **TOPAZ 1.96 DC** chip provides the ability to obtain high quality *in situ,* diffraction data, thus allowing true "hands off" diffraction-based screening. "The TOPAZ 1.96 DC chip gives researchers the ability to screen broadly to find protein crystals and then immediately expose their targets to an x-ray source directly through the chip," commented Gajus Worthington, Fluidigm President and Chief Executive Officer. "The 1.96 DC chip finally allows screening decisions to be based on data rather than guesswork."

> **"Our new system allows scientists to produce proteins faster, more easily and cost-effectively using automated and high-throughput methods."**
>
> James Bernard, Acting CEO, Oxford Expression Technologies

One method for successful crystallisation of membrane proteins exploits the ability of lipids to form liquid crystals or mesophases. However, the method has not been widely adopted as it is difficult to perform. Problems include the need to manipulate an extremely viscous lipidic cubic phase and accurately position the precipitant on top of the cubic phase. **Anachem** has launched the **Flexus Crystal IMP** for Cubic Phase *in meso* Protein Crystallography. Designed specifically for speed, precision and careful handling, the system fully automates the delivery of small nanolitre volumes of highly viscous cubic phase.

Companies mentioned in this Product Focus:

Anachem – www.anachem.co.uk
Bachem – www.bachem.com
BMG Labtech – www.bmglabtech.com
Fluidigm – www.fluidigm.com
GE Healthcare – www.gelifesciences.com
GenScript – www.genscript.com
Integral Molecular – www.integralmolecular.com
Oxford Expression Technologies – www.oetltd.com
R&D Systems – www.rndsystems.com
RayBiotech – www.raybiotech.com
Rockland Immunochemicals – www.rockland-inc.com
Sigma-Aldrich – www.sigmaaldrich.com
Thermo Fisher Scientific (NanoDrop) – www.nanodrop.com