

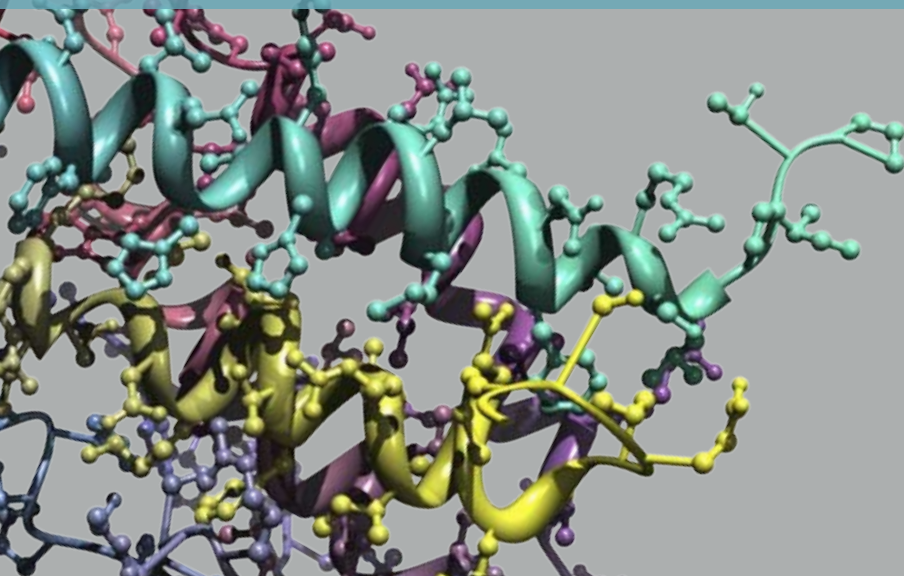


crawford scientific

Chromatography...every step of the way

Bioproducts

www.crawfordscientific.com



Introduction

The treatment of disease has been revolutionised through developments in proteomics, genomics and systems biology.

From holistic approaches for identifying changes in protein expression levels, to the comprehensive characterisation of biopharmaceuticals, to the analysis of mammalian cell culture nutrient levels, Crawford Scientific offers a comprehensive range of instrumentation and biocolumns for separation analysis.

Simplification

The identification of proteins linked to causation of disease has proved difficult historically because of the relatively small number of high abundance proteins (HAPs) which comprise a very large percentage of any biological sample's total protein mass.

In total twenty HAPs represent >98% of the total protein mass, and combine to significantly inhibit the detection of low abundance proteins (LAPs) that may be associated with a physiological dysfunction.

Agilent Technologies Multiple Affinity Removal System

The Multiple Affinity Removal System (MARS) reproducibly and specifically removes up to 14 human and 3 murine HAPs found in biological samples.

Available in column format and convenient spin filters and concentrators for automated, integrated immunodepletion.

Bio-Rad ProteoMiner

Novel preparation tool which compresses the dynamic protein concentration range in complex biological samples.

Large sample volumes can be processed, significantly increasing the opportunity for capture and detection of LAPs.

Fractionation

A robust and reproducible fractionation technique is critical in ensuring that downstream mass spectrometric analysis can identify the maximum number of proteins. Simultaneously, to avoid loss or alteration of key proteins, any fractionation technique must minimise the number of sample manipulation steps.

Agilent Technologies 3100 OFFGEL Fractionator

The 3100 OFFGEL Fractionator separates proteins and peptides electrophoretically using their isoelectric point (pI).

Reproducible fractionation of up to 16 samples in parallel, with liquid-phase recovery for easy transfer to LC-MS(MS).



Lab-on-a-Chip Technology

In a single, compact system the Agilent Technologies 2100 Bioanalyzer integrates sample handling, separation, detection and data analysis, thereby eliminating time consuming procedures and the possibilities for potential mistakes.

Agilent Technologies 2100 Bioanalyzer

Capable of handling proteins, nucleic acids and cells on one platform through the use of micro-fabricated “chips”.

Increased sample analysis speed and efficiency that significantly improves productivity.

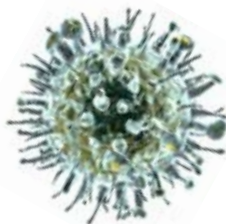


Size Exclusion Chromatography

Molecular weight determination of antibodies, proteins, polypeptides, peptides, nucleic acids and carbohydrates.

Agilent Technologies ZORBAX Gel Filtration

Unique zirconia modification of the silica extends the pH range from 3.0-8.0



Shodex Protein KW-800/SB-800 HQ

Available in a variety of porosities allowing optimum separations based on M_w .

YMC-Pack Diol

Diol coverage of silica surface minimises non-specific secondary interactions allowing for very high recoveries (>90%).

Tosoh TSK-GEL

Available in a variety of porosities and particle sizes allowing optimum separations. BioAssist PEEK columns available for biocompatibility.

Sepax Technologies SRT

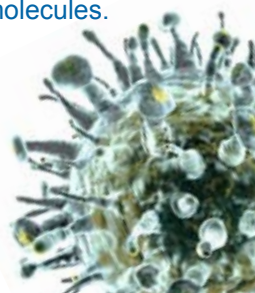
High stability silica with large pore volumes for high capacity separations with excellent resolution.

Sepax Technologies Zenix

Zenix SEC combines $3\mu\text{m}$ particles with large pore volume to achieve the highest separation efficiency and resolution.

Sepax Technologies Nanofilm SEC

High resolution and maximum recovery separation of biological molecules. Composed of uniform, nanometre thick hydrophilic, neutral and polymeric thin films, ensuring exceptional silica stability and column reproducibility.



Reversed-phase Chromatography

Recombinant proteins, monoclonal antibodies and therapeutic peptides represent the largest portion of biopharmaceuticals in development, with their molecular weight size and complexity necessarily requiring a variety of bioanalytical techniques for accurate and reproducible characterisation.

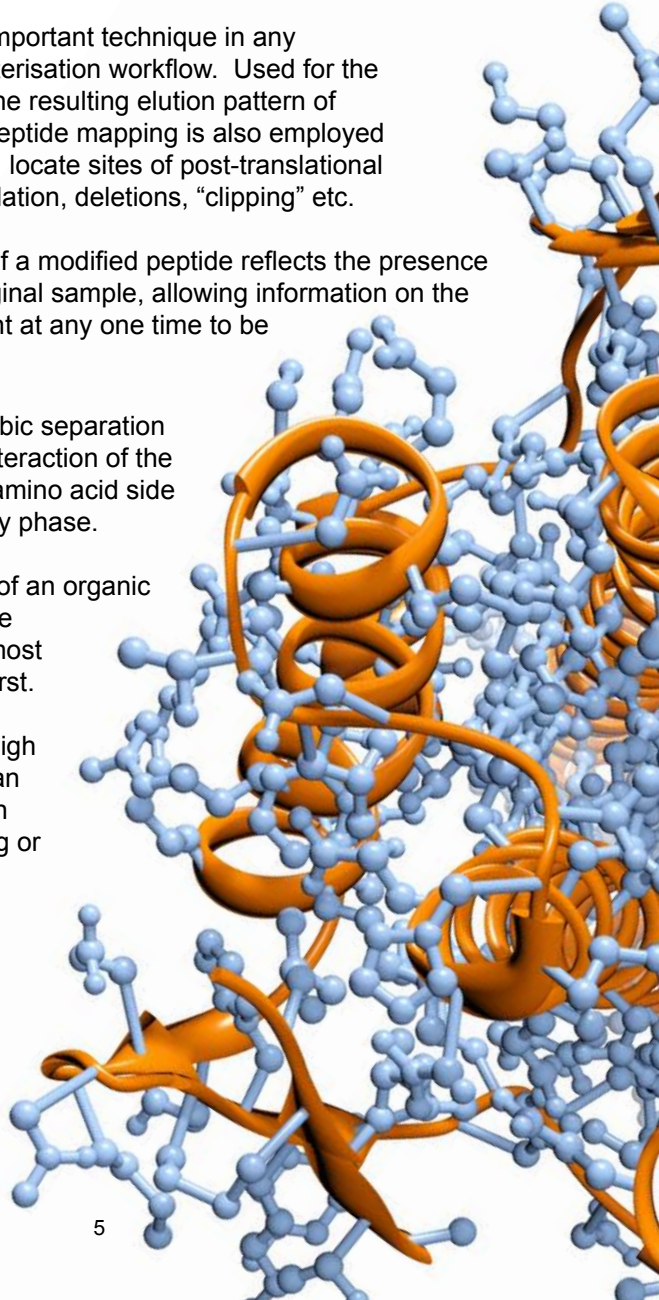
Peptide mapping remains an important technique in any comprehensive protein characterisation workflow. Used for the identification of proteins from the resulting elution pattern of observed peptide fragments, peptide mapping is also employed to derive structural information, locate sites of post-translational modification, oxidation, deamidation, deletions, "clipping" etc.

Confirmation of the presence of a modified peptide reflects the presence of a modified protein in the original sample, allowing information on the mixture of protein forms present at any one time to be determined.

Reversed-phase is a hydrophobic separation technique, which utilises the interaction of the protein or peptide's non-polar amino acid side chain groups with the stationary phase.

Elution is achieved by the use of an organic modifier, whose strength can be varied by a gradient, with the most hydrophilic molecules eluting first.

Reversed-phase provides for high resolution separations, and is an important separation step when further downstream sequencing or structural analysis is required.



Reversed-phase Chromatography

Agilent Technologies mRP-C18 High Recovery Protein Column

Suitable for protein samples requiring further fractionation or desalting.

High sample loadability and recovery for increased downstream processing sensitivity.

Agilent Technologies Poroshell 300SB-C18, C8, C3 and Extend-C18

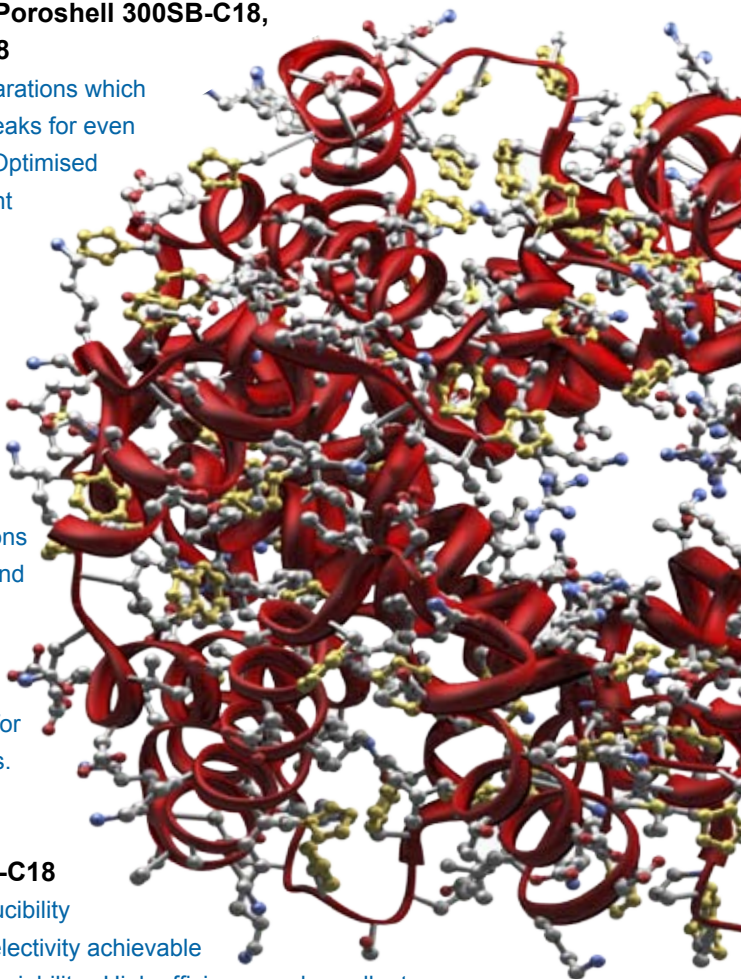
Fast flowrate enabled separations which maintain sharp, efficient peaks for even the largest biomolecules. Optimised selectivity with four different bonded phases to meet method development criteria.

Agilent Technologies ZORBAX 300SB-C18, C8, C3 and CN

Effective 1-D or 2-D proteomic-based separations of proteins, polypeptides and peptide digest samples. Deliver long column lifetimes at high temperatures and low pH for high resolution separations.

Agilent Technologies ZORBAX 300Å Extend-C18

Excellent retention reproducibility and different separation selectivity achievable through high and low pH variability. High efficiency and excellent recovery of hydrophobic and transmembrane-located peptides in high pH mobile phases.



YMC-Pack ProC18

High capacity separations of small peptides ($M_w < 3.5\text{kDa}$) and ultrafast peptide mapping using Ultra-HT ProC18. Fully endcapped, C18 bonded phase on ultra-high purity silica base.

YMC-Pack Protein-RP

Separation of high M_w proteins ($\sim 450\text{kDa}$) and small peptides with very high sample recovery.

Fully endcapped C4 bonded phase on a wide pore high purity silica base.

Vydac MS

Unique selectivity and improved resolution for a variety of "difficult" protein samples including membrane, hydrophobic and less-soluble proteins and peptides.

Vydac Everest

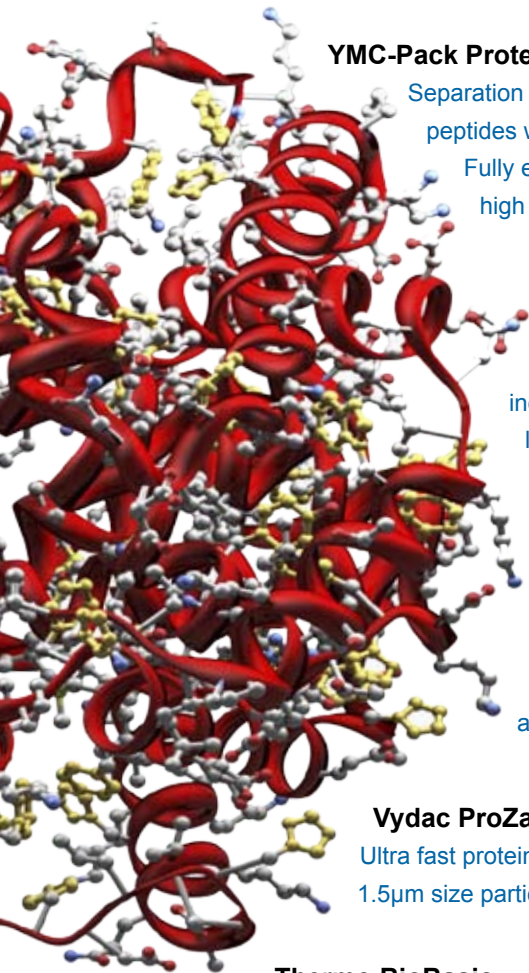
New C18 bonding technology provides high resolution and unique selectivity for complex peptide digest separations. Increased shielding of the base silica reduces the amount of TFA required.

Vydac ProZap C18

Ultra fast protein and peptide separations using high efficiency $1.5\mu\text{m}$ size particles with conventional HPLC systems.

Thermo BioBasic

Effective 1-D or 2-D proteomic-based separations of proteins, polypeptides and peptide digest samples. Extra dense bonding chemistry provides highly stable, reproducible surface for improved resolution and efficiency.



Ion Exchange Chromatography

Ion exchange column chemistries deliver the flexibility necessary to develop methods that separate proteins, peptides and nucleic acids based on charge differences.

YMC-BioPro QA & SP / YMC-BioPro QA-F & SP-F

High capacity separations of proteins, nucleotides and other charged biomolecule species. Porous and non-porous hydrophilic polymer possessing QA (Quaternary Amine) and SP (Sulfopropyl) chemistries.

Agilent Technologies Bio-Monolith

For process monitoring and QC of antibodies, proteins, plasmid DNA, viruses and phages. Polymer-based, monolith disc columns for rapid “On-Off”, flow-rate independent biomacromolecule separations.

Agilent Technologies ZORBAX Bio-SCX Series II Ion Exchange

Ultra-pure 3.5 μ m 300Å ZORBAX sulfonic acid bonded silica optimised for 2-D protein and peptide separations using LC-MS(MS). Provides increased resolution and stronger retention of smaller peptides than some other SCX columns.

SIELC Promix SP / AP / MP / LP

Reproducible and efficient mixed-mode separations of proteins, polypeptides and peptides. Presence of both ion exchange groups and hydrophobic chains allows biomolecule retention to be selectively controlled.

Sepax Technologies Proteomix

High resolution, efficiency and recovery separations of proteins, peptides, oligonucleotides and carbohydrates. Hydrophilic, neutral polymer layer on porous and non-porous PS/DVB spherical particles eliminates non-specific binding.

Sepax Technologies Antibodix

Non-porous PS/DVB column for high resolution, efficiency and recovery separations of antibodies and proteins. Densely packed, nanometre thick hydrophilic coating, with a uniformly attached weak cation exchange layer.



Amino Acid Analysis (AAA)

Amino acids are the building block constituents of proteins, as well as being intermediates in numerous metabolic pathways. Protein identification, detection of protein structural variants or the measurement of the nutritional value of food or feedstuffs requires acid hydrolysis of the attached amino acids and their assay.

Free amino acid levels can be measured directly, allowing real-time monitoring of cell culture and fermentation processes and the presence of an underlying metabolic pathway disease.

Agilent Technologies ZORBAX Eclipse AAA

Reproducible and efficient separations of OPA (o-phthaldialdehyde) and FMOC (9H-Fluoren-9-ylmethoxycarbonyl) derivatised amino acids. Easily automated using a detailed on-line derivatisation protocol available for use with the Agilent autosampler.

SIELC Primesep A / 100 / 200 / 300

Ideal for the reproducible and efficient separation of underderivatised amino acids.

On one column; improved retention of basic analytes by embedded carboxylic acid cation exchange, separation of acid analytes by ion exclusion and retention of neutral analytes by reversed-phase.

Alltech OPA Amino Acid

Reproducible, high speed and efficient separations of OPA (o-phthaldialdehyde) amino acids

Carbohydrate Analysis

The simplest carbohydrates are small, monomeric molecules termed monosaccharides. Monosaccharides link together to create disaccharides, then oligosaccharides and finally polysaccharides.

These biomolecules exert critical influences and play important roles in the immune system, blood clotting and development.

Polysaccharides are critical in the storage and transport of food energy, and form the structural scaffolding for plants and arthropods.

Agilent Technologies ZORBAX Carbohydrate

Reproducible and efficient separations of monosaccharides and disaccharides.

YMC-Pack Polyamine II

Separation of acidic and basic water-soluble compounds and biomolecules.

Transgenomic CARBOSep

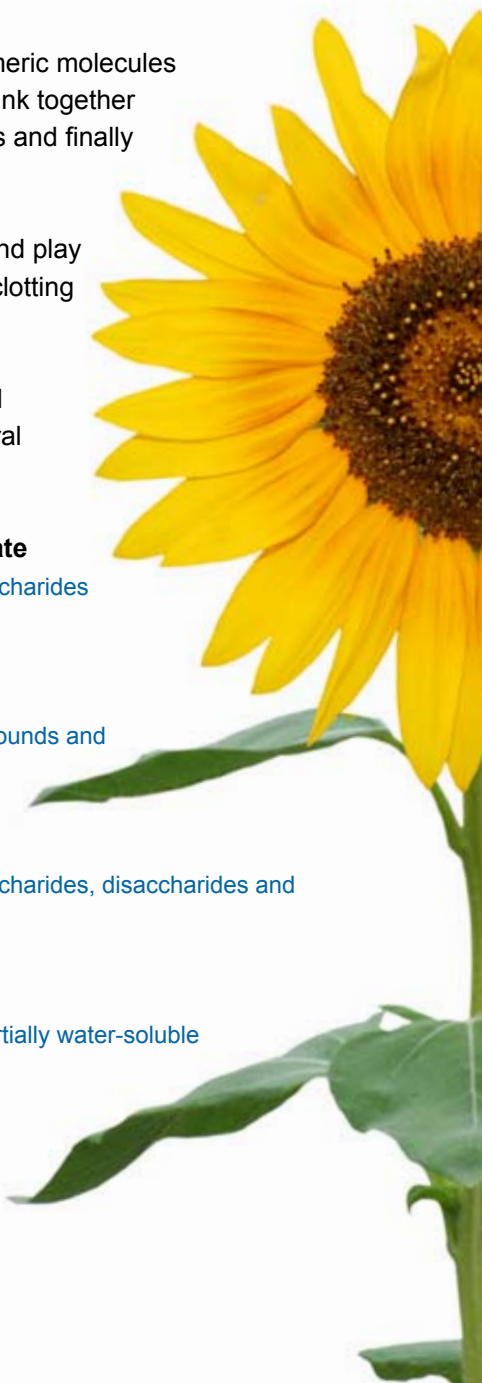
Reproducible and efficient separations of monosaccharides, disaccharides and oligosaccharides.

Sepax Technologies Carbomix

High resolution separation of water-soluble and partially water-soluble organic compounds.

Thermo Hypercarb

Unique structure and retentive properties allow for the separation of highly polar “problem” species.



Bulk Media

Within the biopharmaceutical industry improved downstream processing media is required to process increased product loads.

The availability of new, fully synthetic polymer-based matrices exhibit important advantages over traditional polysaccharide-derived media.

YMC-BioPro Q75 / S75

Excellent performance with high dynamic capacity binding and high efficiency for intermediate purification steps. Porous hydrophilic polymer coated 75µm particles with QA (Quaternary Amine) and SP (Sulfopropyl) chemistries.

YMC-BioPro Q30 / S30

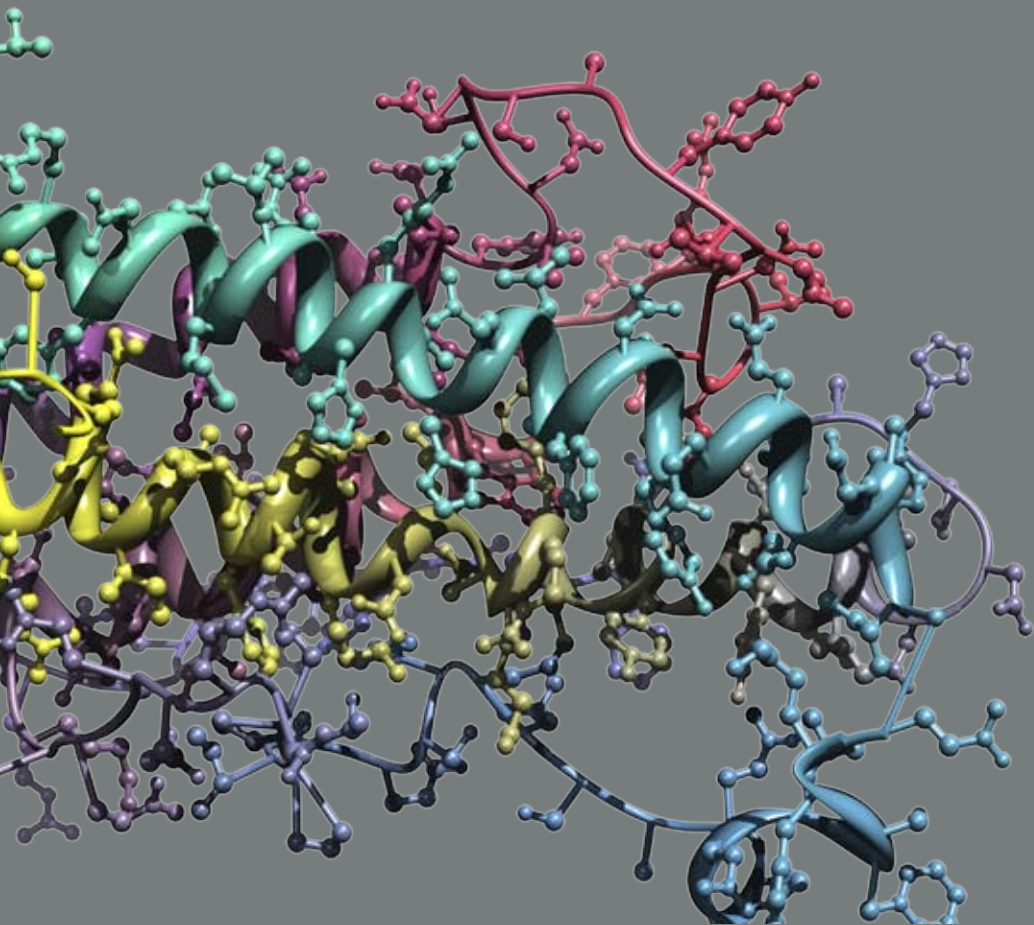
Excellent performance with high dynamic capacity binding and high efficiency for final “polishing” process steps. Porous hydrophilic polymer coated 30µm particles with Q (Quaternary amine) and S (Sulfobutyl) chemistries.

Kronlab ECOplus glass column range

End-user packing of soft gels for low pressure LC applications.

Kronlab ECOplus glass column range

End-user packing of soft gels and rigid packings for almost all types of normal and reversed-phase LC applications.



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