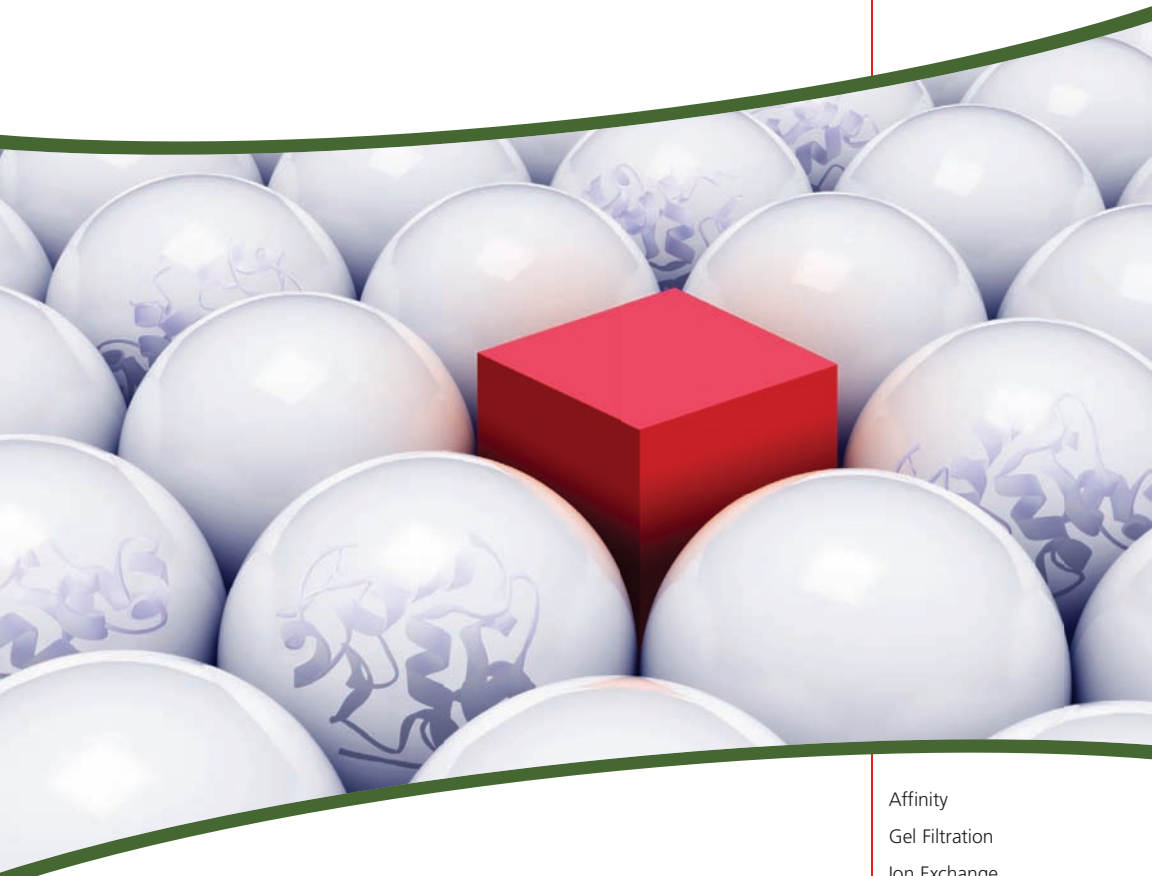


# Chromatography Products for Biological Research



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Columns  
Solvents

## Introduction

At its inception, liquid chromatography was performed in open columns using gravity to “pump” the solvent through the column. This type of low pressure liquid chromatography (LPLC) is also called open column liquid chromatography, because the top of the column is not sealed with an endfitting but instead is connected to a solvent reservoir. To introduce a sample onto the column, the solvent is drained to the top of the packing bed and the reservoir is removed, the sample is added via a pipette, the solvent is carefully added without disturbing the sample band, and the solvent reservoir is reattached.

In recent years, instrumentation has been incorporated into LPLC. An inexpensive low pressure pump (often peristaltic) feeds the solvent onto the column. The sample can be introduced through an injector (low pressure), as in HPLC, and a simple UV or refractive index (RI) detector can be placed in line to monitor the column effluent. In yet another variation that has become popular with organic chemists – flash chromatography – an inert gas is employed to force the solvent through the column.

### Packing Materials (Media)

Although some LPLC columns are available in already-packed form, more often the analyst fills a column with the packing material of choice, which depends on the LPLC application. Traditional inorganic adsorbents include silica and bonded silica, alumina, carbon, and Florisil®. The most important use for inorganic matrices is in the purification and isolation of small molecular weight compounds, including environmental analytes. Polymeric adsorbents have important applications in the pharmaceutical industry, e.g., purification of antibiotics from fermentation broths. Their stability over virtually the entire pH range makes them easy to clean with caustic solutions. Polymeric ion exchangers are predominantly used for water softening and polishing, chelation, metal processing, acidification, neutralization, decolorization, etc.





Biochemical research has spawned the development of many new media as well as new LC techniques. Among the first media biochemists used to purify proteins were dextran-based Sephadex® beads for gel filtration and ion exchange. These and other soft-gel beads, such as Sepharose® and Sephacryl® media, have been important factors in the continuous improvements in protein purification since the late 1950s. Recent developments include media that have better pressure stability and resolution (e.g., Toyopearl® and Superdex® media) to allow higher flow rates and reduced purification times.

### Column Hardware, LPLC Accessories

Glass and inert plastic are the most common column materials. Depending on what solvents will come into contact with the column hardware, the fittings are either made from polypropylene (for aqueous mobile phases) or materials that can resist organic solvents, such as Teflon® or KEL-F®.

Empty columns of various design, fittings, injectors, valves, filters, and tubing suitable for low pressure liquid chromatography are listed in the Supelco® catalog.

**For more information on Sigma's protein chromatography offerings, visit [sigma.com/chromselection](https://sigma.com/chromselection)**