

Advanced Material for Rapid, Low-Cost Protein Separation

Description:

This low-cost, user-friendly protein separation technology could have significant impact within biopharmaceutical, diagnostic, and clinical/research laboratory applications. This invention utilizes bundles of capillary channel polymer fibers, in particular 4DG™ fibers, which exhibit superior fluid-wicking properties making them ideal for biotechnology applications, particularly as stationary phase materials for liquid chromatography separations. In the present work, polypropylene fibers, which are readily extruded and chemically robust are most often used as the support phase. Variations in functionalization permit the “chemical tuning” of the separation process. Through this technology, protein separations for macromolecules can be performed in multiple modes which include reversed-phase, ion exchange, and hydrophobic interactions.

With this technology, significantly lower back pressures are required as compared to traditional bead-based separation techniques. A second important characteristic is that minimal sample is required (~2-10 microliters) and the high sensitivity is potentially capable of isolating low-abundance proteins in fluids such as saliva.



Benefits:

- High degree of surface chemistry flexibility
- Single-fiber to highly scalable formats
- Inexpensive materials /disposable sample clean-up matrix
- Decreased propensity for protein denaturation
- Simplified process compared to current alternatives
- Complementary use in conjunction with mass spectrometry instrumentation

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