



FILTRATION

Selective Membranes Improve Protein Separation

A new filtration system developed by New Jersey Institute of Technology researchers (NJIT, Newark, NJ, www.njit.edu) can separate proteins of nearly identical molecular weights. While typical systems can set apart proteins with molecular-weight ratios of 5–6, NJIT's ultrafiltration technology can purify binary mixtures containing proteins with molecular-weight ratios as small as 1.03.

Three regenerated cellulose membranes—all of the same molecular weight cutoff—are stacked one on top of the other without any gaskets or spaces in between. The rejection of one protein increases with each membrane layer, resulting in a completely rejected species. “The third membrane is exposed to the feed solution, and under appropriate conditions, only one pure protein in the permeate

stream will come through. The other protein will remain on the feed side,” says Kamalesh K. Sirkar, PhD, distinguished professor of chemical engineering and the project's lead researcher.

According to the research team, the multimembrane system is cost-effective because machines can run continuously. “Using several membranes is not going to cause a significant cost increase,” says Sirkar. Although the system must be operated at a slightly higher pressure than typical filtration methods, additional pumps or housings aren't needed.

At present, Sirkar is studying whether the ultrafiltration technology can separate mixtures containing more than two proteins. The team also is seeking a corporate partner to bring the technology to market.

-Kaylynn Chiarello

ADVAINSTAR
C O M M U N I C A T I O N S