

Invention could help pharmaceutical industry save money

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Two Michigan State University researchers have invented a protein purifier that could help pharmaceutical companies save time and money.

The details of the invention, which appear in a recent issue of the journal *Langmuir*, demonstrate that MSU chemists Merlin Bruening and Greg Baker's high-performance membranes are highly suitable for protein purification, a crucial step in the development of some [new drugs](#).

Purifying proteins, the process of isolating a single, desired protein from all others, is an expensive, time-consuming hurdle that contributes to the high cost of some prescription drugs. Obtaining pure proteins, however, is a necessary step to increasing these drugs' effectiveness and safety. Streamlining the process could help manufacturers reduce costs, speed new drugs to consumers and reduce pharmaceutical costs, Bruening said.

"The [membrane](#) devices that we've manufactured can simplify protein purification by rapidly capturing the desired protein as it flows through membrane pores," said Bruening, who has patented the process and is working to scale up his invention. "Our membranes have two to three times more capacity than existing commercial devices, and they should reduce the purification process time substantially. Typically, our procedures are complete in 30 minutes or less."

The pursuit of a comparable, but complex purification procedure led to the discovery of the researchers' simpler invention. Bruening and his colleague were trying to grow extended [polymer chains](#) in the

membranes in a multistep, oxygen-free process. Untangling the complexities of the first method led to the revelation that direct adsorption of acidic polymers at low pH is much simpler yet accomplishes the same task of creating extended polymer in the pores. (The purifier uses adsorption rather than absorption; the filter attracts contaminants to its surface rather than sucks them up like a sponge.)

"Once our findings began steering us toward the simpler solution, we began developing simple processes to modify membranes by simply flowing [polymer](#) solutions through the membranes," Bruening said.

The next challenge for Bruening and his colleagues will be to upscale his invention so that rapid [protein purification](#) with inexpensive membranes becomes a standard for not only [pharmaceutical companies](#), but also researchers trying to rapidly isolate proteins to determine their structure and function.

Provided by Michigan State University

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