Determining what binds to mucus

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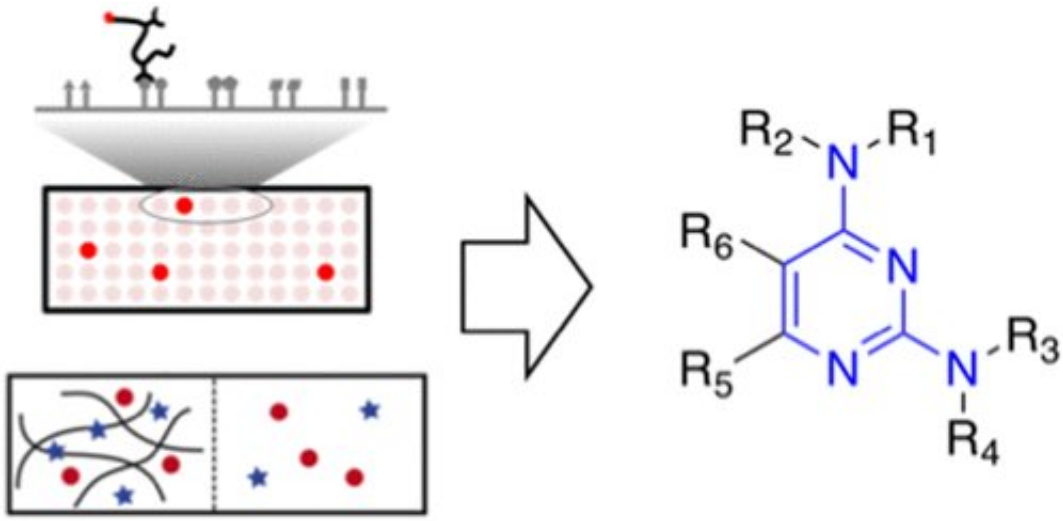

Credit: American Chemical Society

The human body is full of mucus. This viscous goo isn't just a nuisance that gets coughed up or sneezed out—it can bind to drugs, toxins or microbes, potentially impacting human health. However, relatively little is known about such interactions. Now, researchers reporting in ACS' *Biomacromolecules* say they have developed a new way of analyzing mucus binding that could lead to better drug development.

Mucus is a water-based substance comprised largely of mucins, large proteins with sugars on them that provide its signature gooey-ness. It serves as a protective layer in the lungs, stomach and other organs. Diseases, such as cystic fibrosis and asthma, result in an overproduction

of mucus, so a better understanding of how various substances stick to the slimy material could help researchers develop better treatments. Previous studies have been limited in their scope or have relied on indirect measurements. That's why Jacob Witten, Tahoura Samad and Katharina Ribbeck developed a new technique to measure an array of molecules and how they bind mucin and other biopolymers in mucus.

The researchers' new strategy was based on equilibrium dialysis. Mucin or another mucus component was on one side of a dialysis membrane. Molecules that bound to mucus components concentrated on one side of the membrane, whereas molecules that didn't bind were at the same concentration on both sides. Their new workflow allowed them to analyze the binding of thousands of small molecules to mucus components. With the method, the researchers found a previously unknown pattern, or motif, associated with mucin binding. They say that the strategy could facilitate new advances in treating diseases that are associated with mucus overproduction.

More information: Jacob Witten et al. Molecular Characterization of Mucus Binding, *Biomacromolecules* (2019). DOI: 10.1021/acs.biomac.8b01467

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