

A new coating to protect kidney failure patients on dialysis

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Researchers from the University of Saskatchewan (USask) and St. Paul's Hospital in Saskatoon used the Canadian Light Source (CLS) at USask to help improve health outcomes for patients on dialysis.

A main function of the kidneys is to remove toxins from the body. When they stop functioning properly, patients go on dialysis where their blood

gets filtered by an [artificial membrane](#). However, this process can cause inflammation and adverse side effects.

Dr. Ahmed Shoker, a Professor with the USask College of Medicine and Medical Director of the Saskatchewan Transplant Program at St. Paul's Hospital, and Dr. Amira Abdelrasoul, Assistant Professor with the USask College of Engineering, Chemical and Biological Engineering Department, want to improve [dialysis](#) and the design of these membranes.

"We comprehensively tested two hemodialysis membranes currently in use in Canadian hospitals," said Abdelrasoul. "Our aim was to explore how membranes interact with the patient's blood."

The team has developed a membrane coating that is more compatible with the human body and has resulted in fewer side effects for patients.

"It's not possible to do the research we're doing without the CLS," she added. "Their [imaging techniques](#) allowed us to understand the blood protein behavior at all points of the filtration process and at all times. So, we could monitor when, how, and why a protein aggregates and blocks the membrane pores under different operating conditions. It allowed us also to have real-time visualization in three dimensions."

The researchers are hopeful that this innovation, which they are continuing to test and develop, will help to minimize the side effects experienced by kidney disease patients.

The research was published in *Surfaces and Interfaces*.

More information: Shaghayegh Saadati et al, In situ synchrotron imaging of human serum proteins interactions, molecular docking and inflammatory biomarkers of hemocompatible synthesized zwitterionic

polymer coated-polyvinylidene fluoride (PVDF) dialysis membranes, *Surfaces and Interfaces* (2021). [DOI: 10.1016/j.surfin.2021.101505](https://doi.org/10.1016/j.surfin.2021.101505)

Provided by Canadian Light Source

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