

Exploring novel separation-sensing membrane for clinical diagnosis

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Membrane technology has been widely applied in industrial fields such as water treatment, product extraction, air purification, *etc.* However, in the medical and healthcare fields, blood separation which is vital for the diagnosis and rescue still relies on traditional centrifugation method and remains great challenge for current membrane technology. Recently, our group proposed several new types of separation-sensing membrane for blood simultaneous separation and sensing, achieving both immediate and online serum analysis during the blood drawing. This presentation will review our latest progresses in the design strategies, materials preparation and nanostructures control for coupling membrane separation and biosensing abilities into one. We will demonstrate that these new separation-sensing membranes can be of clinical importance in monitoring blood glucose, lactate, glutamate, transaminase, cancer markers, proteins and so on. They have successfully and accurately detected the key blood components in the patients suffering the various diseases, such as liver transplantation, portal vein thrombosis, endometrial cancer, femoral neck fracture and rectal place. Our results demonstrate that the proposed separation-sensing membrane design, showing great potential in the online monitor and immediate response of vital components during surgery, emergency rescue and disaster relief, is expected to provide an inspiration to accelerate the development of membrane in clinic diagnosis.