Scientists get closer to developing bioartificial kidney

November 19 2016

Investigators are getting closer to creating a functional bioartificial kidney, with advances being presented at ASN Kidney Week 2016 November 15-20 at McCormick Place in Chicago, IL.

A bioartificial kidney could replace the need for dialysis or transplantation in the millions of patients with kidney failure. A key requirement for such a device is the formation of a "living membrane" that consists of a tight kidney cell layer on artificial membrane surfaces and can transport molecules from one side to the other. In their latest work, Dimitrios Stamatialis, PhD (University of Twente, in The Netherlands), Roos Masereeuw, PhD (University of Utrecht, in The Netherlands), and their teams achieved this using conditionally immortalized human renal proximal tubular epithelial cells (ciPTECs) on polyethersulfone-based hollow fiber membranes. They demonstrated that the cell monolayer is indeed functional as a living membrane.

"This study shows the successful development of a living membrane consisting of a reproducible ciPTEC monolayer on hollow fiber membranes, an important step towards the development of a bioartificial kidney device," said Prof. Stamatialis. "The strategies and methods of this work could be relevant to the development of other bioartificial organs, such as a bioartificial liver or bioartificial pancreas, and organs on chips—such as a kidney on chip, a lung on chip, or a liver on chip."

  More information: Study: "Development of a Bioartificial Kidney Device" (Abstract 23)

Provided by American Society of Nephrology

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