

Industry Spotlight

New Technology May Reduce Kidney Injuries

A research team at the University of Michigan (U-M), Ann Arbor, has devised a technique to use cultured kidney cells to simulate the way kidneys clear drug compounds.

The innovation could someday bring precise dosing, for example, to intensive care units where drug delivery is critical, researchers said. The invention uses a microfluidic chip device to deliver a precise flow of medication across cultured kidney cells. The research team tested their approach by comparing two different dosing regimens: a high concentration that quickly tapered, like an injection, versus a lower concentration

infused at a constant rate, like an IV drip. Both approaches used the same amount of drug. The device sandwiched a thin, permeable polyester membrane and a layer of cultured kidney cells between the top and bottom compartments. Researchers pumped a gentamicin solution into the top, and the drug gradually filtered through the cells and the membrane, and simulated the flow of medication through a human kidney.

In the journal *Biofabrication*, the team reported that a once-daily dose of gentamicin is significantly less harmful to kidney cells than a continuous infusion—even though both ultimately delivered the same

dose of medication. To commercialize the biomarker readout aspect of the technology, Shuichi Takayama, a U-M professor of biomedical engineering, has founded PHASIQ, an Ann Arbor-based spinoff company, in conjunction with the U-M Office of Technology Transfer.

Today's method of relying on lab animals to measure drug toxicity may not be precise enough to determine safe dosages, but "the goal for the future is to improve these devices to the point where we're able to see exactly how a medication affects the body from moment to moment, in real time," Takayama said. ●

Filter Firm Aims for Positive Cash Flow

Nephros (River Edge, NJ), a medical device company that develops and sells high-performance liquid purification ultrafilters and a hemodiafiltration (HDF) system for use with a hemodialysis machine, reported in its first quarter 2016 results that it had gained "510(k) clearance on two additional products and successfully completed the software upgrade and additional training development for our H2H (company brand) modules needed to expand our hemodiafiltration footprint." Nephros said the company will aim

for positive cash flow from its products in the coming months.

The firm's SSUmini, launched in March 2016, is aimed at dialysis clinics that need an economical solution for a polish filter (to remove small particulate material or dissolved material) for smaller, portable reverse-osmosis systems that need hemodialysis-quality water. The SSUmini also provides hemodialysis-quality bicarbonate concentrate for dialysis clinics with centralized bicarbonate systems.

Nephros announced that EndoPur™ will become the brand name for all of its ultrafiltration products for dialysis water and bicarbonate concentrate, including the SSUmini, the DSU-D, the SSU-D, and the 10" cartridge platform.

For the quarter that ended March 31, 2016, total revenues were approximately \$590,000 and operating expenses were approximately \$1.1 million, compared to approximately \$544,000 and \$1,088,000 for the quarter ended March 31, 2015. ●



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