

EMBARGOED FOR RELEASE until March 3, 2016 – 5:00 PM (ET)

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CELLS COLLECTED FROM PRETERM INFANTS' URINE MAY ADVANCE REGENERATIVE KIDNEY REPAIR

Highlights

- Urine collected from preterm infants one day after birth often contains progenitor cells that can develop into mature kidney cells.
- The cells also have natural defenses that protect against cell death.

Washington, DC (March 3, 2016) — Cells collected noninvasively from the urine of preterm infants may lead to breakthroughs in regenerative kidney repair for patients with kidney disease and injury, according to a study appearing in an upcoming issue of the *Journal of the American Society of Nephrology* (JASN).

In humans, kidney development is complete by approximately 34 weeks of gestation, after which kidney cells are lost through natural aging or by disease or trauma. Investigators have been searching for ways to regenerate kidney cells, for example by coaxing other types of cells to take on the filtering properties of those in the kidney.

To this end, Elena Levtchenko, MD, PhD, Fanny Oliveira Arcolino, MSc (Katholieke Universiteit Leuven, in Belgium), and their colleagues examined the potential of stem cells or kidney progenitor cells in the urine of healthy adults; however they found that after maturation of the kidneys, such undifferentiated cells are very rare. "Therefore, we thought that urine of babies born prematurely would be a better alternative, because their kidneys are still under development," explained Dr. Levtchenko. "We collected urine of preterm neonates one day after birth and found that in 50% of the cases, the samples contained progenitor cells." These cells were capable differentiating into mature kidney cells and also had defenses that protected against cell death.

"Preterm neonatal progenitor cells might represent a powerful tool to be used in cell therapy and regeneration of damaged kidneys," said Arcolino, a PhD student in Dr. Levtchenko's lab. She also noted that a condition called renal insufficiency, in which the kidneys fail to adequately filter waste products from the blood, is a possible consequence of premature birth. Retaining progenitor cells collected from the urine of preterm babies shortly after birth and using them as a treatment might provide life-saving benefits for such newborns.

Study co-authors include Silvia Zia, Katharina Held, Elli Papadimitriou, Koen Theunis, Benedetta Bussolati, Anke Raaijmakers, Karel Allegaert, Thierry Voet, Jan Deprest, Joris Vriens, Jaan Toelen, and Lambertus van den Heuvel,

Disclosures: The authors reported no financial disclosures.

The article, entitled “Urine of Preterm Neonates as a Novel Source of Kidney Progenitor Cells,” will appear online at <http://jasn.asnjournals.org/> on March 3, 2016, doi: 10.1681/ASN.2015060664.

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