

Regenerative Pharmacology (session 1/4)

Date: Tuesday, September 22nd

Time: 04:00 pm – 04:45 pm (CEST)

Location: Zoom Video Conferencing

Registration: Required

Organizing partners: NVF & UIPS

Program:

04:00 pm – 04:45 pm **Bioengineered kidney tubules for regenerative pharmacology**

Prof. dr. Roos Masereeuw, professor of Experimental Pharmacology at Utrecht University

Abstract

In patients with severe kidney disease, adequate renal clearance is compromised which results in the accumulation of a wide range of endogenous solutes. These uremic retention solutes, also named uremic toxins, are a heterogeneous group of organic compounds with intrinsic biological activities, of which many are too large to be removed by dialysis and/or are protein-bound. Their renal secretion depends largely on active tubular secretion, which shifts the binding and allows for active secretion of the free fraction. To facilitate this process, renal proximal tubule cells are equipped with a range of transporters that cooperate in basolateral uptake and luminal excretion. In recent years, we and others have invested in the development of bioengineered kidneys that could potentially restore this essential function. For this, well-characterized renal tubular epithelial cells were combined with functionalized membranes.

This presentation addresses these developments in the context of renal tubular clearance mechanisms for uremic toxins with emphasis on the role of protein binding, which is compromised in CKD due to posttranslational modifications. This results in increased unbound fractions of uremic toxins accelerating the many complications of CKD. Furthermore, hurdles to take before a safe implementation of bioengineered kidneys in clinics becomes a realistic option will be discussed.

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