

# TERMIS EU 2019



Tissue Engineering Therapies:  
From Concept to Clinical  
Translation & Commercialisation

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## **(Bio)engineered organs for blood detoxification**

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For patients with chronic kidney disease the best solution would be organ transplantation. However, due to shortage in donor organs and the fact that not all patients are eligible for transplantation, most patients are currently treated with therapies using artificial kidney devices. In hemodialysis therapy, a widely available and well-established treatment for the patients with End Stage Renal Disease, the blood of these patients is cleansed 3-4 times a week in dedicated dialysis centres. Major drawbacks of the therapy are the poor removal of middle-sized molecules and protein-bound uremic solutes and the non-continuous treatment, causing large fluctuations in water balance and uremic wastes of the patients. Besides, the need for continuous visits at the dialysis centres is a great social and psychological burden for these patients. In this talk we will discuss bioengineered concepts for achieving better and more continuous removal of a broad range of uremic solutes and for mimicking better the kidney function, including the concept of: Mixed matrix membranes (MMM) which combine the benefits of diffusion and /or convection, provided by the membrane structure, and of adsorption, achieved by sorbent particles dispersed in the membrane; Bioartificial kidney where “living membranes” of tight renal cells monolayer with preserved functional organic ion transporters attached on suitable artificial membranes, can actively remove the uremic solutes mimicking the function of the kidney proximal tubule.