

Denys PAVLENKO

ESR 1, **UTwente**, the Netherlands

PhD Research Activities

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Towards a new generation of dialysis: mixed matrix membranes

Organ replacement therapy remains the treatment of choice for those people who suffer from end-stage renal disease. However, due to the lack of donor organs, waiting period for patients with renal problem varies from 3 to 5 years. During this time they are strongly dependent on dialysis treatment.

Although dialysis treatment provides efficient removal of small water soluble solutes, it has rather low performance in removal of middle molecules, like beta-2-microglobulin, and protein-bound toxins. To overcome these limitations we would like to combine benefits of diffusion and adsorption in one step by incorporating activated carbon into highly porous polymer matrix. To avoid possible problems with haemocompatibility we will cover blood side of the membrane by blood-compatible polymer.

My tasks here include membrane fabrication, characterization and modification of double layer mixed matrix membranes.