

NEW MEMBRANES FOR HEMODIALYSIS BASED ON BLENDS OF POLYETHERSULFONE (PES) WITH POLYETHYLENE OXIDE - POLYETHERSULFONE (PEO-PES) COPOLYMER

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1. Introduction

Hollow fiber membranes are used during dialysis to filter out toxins from the blood of end-stage kidney failure patients. Membranes are currently made from hydrophobic polyethersulfone (PES) and hydrophilic additive polyvinylpyrrolidone (PVP). [1] However, it has been shown that PVP can elute from membranes during sterilisation or dialysis. [2,3] That can lead to decreased membrane hemocompatibility and increased fouling. PVP elution is one of the factors that prevents application of these membranes in long term dialysis therapies, and especially these therapies could remove more toxins and increase patients' quality of life.

2. Objectives

Usage of alternative hydrophilic additives to create hollow fiber membranes for prolonged dialysis.

3. Methods

Hollow fibers membranes containing PEO-PES as hydrophilic additive were fabricated using liquid induced phase separation. Produced fibers were tested further to determine their morphology, ultrafiltration coefficient and protein retention.

4. Results

Created hollow fiber membranes are in a high flux range with ultrafiltration coefficient of 50 ± 9 mL/(m²*h*mmHg). They have satisfying protein retention index of 0.85 ± 0.05 . We will further test the membranes to investigate their uremic toxin removal properties.

5. Conclusion

These fibers show promise for alternative additive usage in hollow fiber membranes for dialysis. If toxin removal will be comparable to commercial fibers, this will show that there are alternative hydrophilic polymers that can be used in dialysis fibers.

6. References

- [1] Yang et al, J of Memb Sci, 326: 322–331, 2009.
- [2] Namekawa et al, J Artif Organs, 15:185–192, 2012
- [3] Sato et al, Bioch and Biophy Rep, 28:101140, 2021