



## Centre for Natural Sciences and Technologies

J. E. Purkyně University in Ústí n. L.  
Faculty of Science  
Pasteurova 3632/15  
400 96 Ústí nad Labem

**prof. RNDr. Pavla Čapková, DrSc**  
E-mail: [pavla.capkova@ujep.cz](mailto:pavla.capkova@ujep.cz)  
Tel.: +420 475 286 625  
Room: 2.07

**Mgr. Petr Ryšánek Ph.D.**  
E-mail: [petr.rysanek@ujep.cz](mailto:petr.rysanek@ujep.cz)  
Tel.: +420 475 286 644,  
+420 608 627 053  
Room: 2.20

# NANOPOROUS POLYMER MEMBRANES PREPARED BY ELECTROSPINNING

## RESEARCH/TECHNOLOGY INTRODUCTION

Within the Ústí Material Center, we focus on the development of polymer nanofiber membranes from various polymers. Through research, we are able to chemically and physically modify these membranes for specific functions such as: separation, filtration and purification technologies, air and water antibacterial filtration, membrane distillation, acid gas absorption, stripping and pollutant removal (VOC), battery separators, piezo membranes, etc.

## POTENTIAL USERS

Small and medium-sized enterprises, manufacturers of protective equipment, face masks, respirators, protective clothing, etc. Industrial enterprises in the field of chemistry, which deal with the separation and capture of gases and liquids.

## ADVANCEMENT OF TECHNOLOGY AND MARKET APPLICATION

Commercial polymeric thin film membranes exhibit poor water permeability. Electrospun nanofiber membranes have a much higher porosity due to their unique interconnected structured fibers. In addition, this technology makes it possible to control the morphology of nanofibers, porosity and permeability using process parameters. In one spinning step, the nanofiber structure can be chemically modified for various specific functions.

## ADDITIONAL INFORMATION

To predict the properties of modified membranes, we also use computer modeling methods, which allow us to design the final product before starting experimental work.



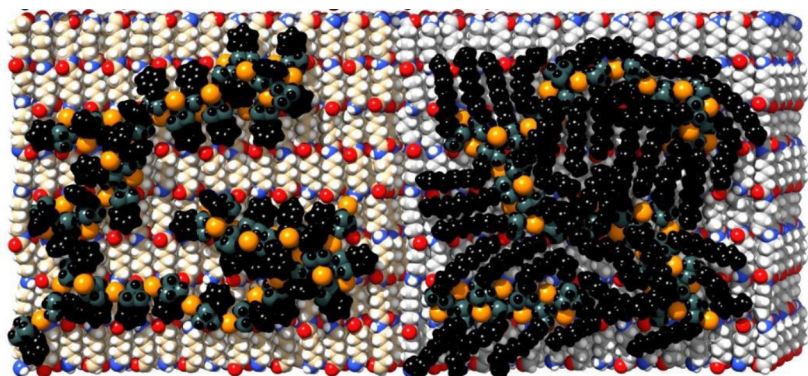


Figure 1: Imaging of the surface of a nanofiber modified with two antibacterial additives using computer modeling

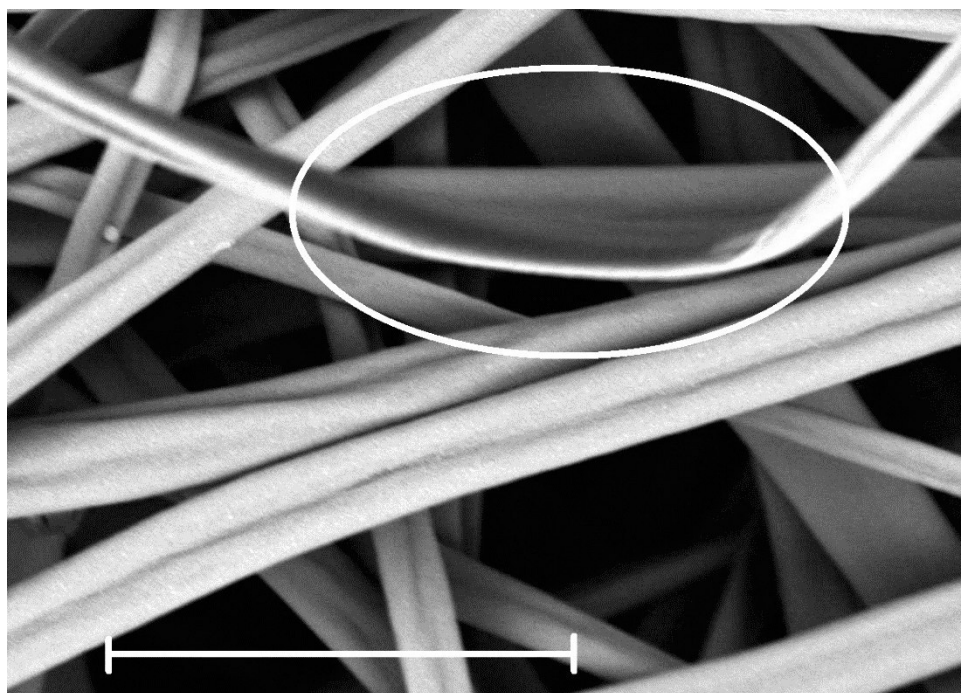


Figure 2: Hollow nanofibers prepared by electrospinning of a PAN polymer