# Enhancement of a hollow fiber filter via a graphene oxide coating

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**Abstract**
In the recent years, new classes of contaminants are consistently being found in the ground and even in drinking water supplies. The occurrence of these compounds, known as emerging contaminants (ECs), in water supplies may lead to severe environmental pollution and health problems [1]. Several studies suggest that the use of membranes doped with nanomaterials represent a promising strategy to address this crucial issue. Among nanomaterials, graphene oxide (GO) is considered one of the most suitable choices for this use, due to its unique chemophysical properties, versatile potential for covalent functionalisation and commercial availability in large amount and good standard quality [2]. Polyethersulfone-polyvinylpirrolidinone hollow fibers (PES) are commercially available microfiltration membranes used as active components of modules for blood filtration and water disinfection. PES microfiltration mechanism relies majorly on size exclusion, thus making these filters ineffective for the removal of small molecules such as drugs. However, PES hollow fibers are suitable for surface modification with GO, allowing the production of PES-GO core-shell hollow fibers and derived filters, which combine the microfiltration mechanism of PES with the adsorption capability of GO [3]. This composite material allows a synergic and efficient removal of both nanoparticles, through microfiltration, and small molecules, through adsorption by intercalation between GO layers, as demonstrated by combined X-Ray Diffraction experiments and molecular modelling. In this communication, we describe the fabrication of core shell PES-GO hollow fiber filters and their use for simultaneous removal of several contaminants.

**Figure 1:** Core-shell hollow fiber PES-GO cartridge for synergic microfiltration and adsorption of microcontaminants from drinking water.

**REFERENCES**

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