



Case #642

## **Nano-Biocatalytic Membranes for Water Treatment**

As the need for more sources of drinkable water increases, there is a strong interest in developing more advanced water purification technologies. During long term use, water purification membranes are susceptible to biofilm formation, clogging the membranes, reducing the effective life of the membrane and putting water supplies at risk.

This technology is a multi-functional membrane to prevent biofouling during water purification processes. The membrane is functionalized with antibacterial nanoparticles and anti-quorum sensing technology in a two-prong approach to preventing bacterial contamination and biofilm establishment on the membrane. The technology is inexpensive, non-toxic and more effective than current technologies in preventing biofouling.

### **Applications:**

- Wastewater reuse and desalination using ultrafiltration, nanofiltration or reverse osmosis.
- Biomedical filters.
- Coating surgical instruments and implants.
- Coating oil pipelines or ship hulls to prevent biocorrosion.

### **Advantages:**

- Lower costs and less leaching
- Non-toxic green materials used.
- Can be used to functionalize existing commercial membranes.
- Magnetic nanoparticles can be separated and collected for easy recycling.
- Inexpensive maintenance.

### **Intellectual Property and Development Status:**

PCT Application WO2018148054A1

Looking for research and development partners and licensing opportunities.

### **References:**

“Ultrafiltration Membranes Functionalized with Lipophilic Bismuth Dimercaptopropanol Nanoparticles: Anti-Fouling Behavior and Mechanisms”, *Chemical Engineering Journal*, (2017), 313, p293-300

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