

# **Incorporation of bactericidal nanomaterials in development of antibacterial membrane for biofouling mitigation: A mini review**

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## **Abstract**

Biofouling has become concern issue in all pressure driven membrane technology. The attachment of microorganism to the membrane surface gave an effect to membrane life span, increased operating and maintenance costs. Therefore, this review is focusing on the development of nanocomposite membrane based on improving bactericidal properties to suppress the activity of attached organisms in order to minimize biofilm formation. This approach was done with incorporation of biocidal nanomaterials into a polymeric membrane matrix by include metal-based nanoparticles such as Titanium dioxide (TiO<sub>2</sub>), Copper (Cu), Silver (Ag), Zinc oxide (ZnO); carbon-based nanomaterials including graphene oxide (GO) and carbon nanotubes (CNTs) and hybrid nanomaterials. Current constraints and prospective by the use of nanomaterials are discussed in order to increase antibacterial property for long term application for further implementation in membrane systems from the views of water and wastewater treatment applications.

## **keywords**

- Antimicrobial properties
- Biofilm
- Nanoparticles
- Surface modification

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