



July 19, 2019

Jialan Zhang,
Editor, *Journal of Visualized Experiments*

Dear Dr. Zhang,

I thank you for the invitation to submit a manuscript to *JoVE* to expand on our latest work: <https://doi.org/10.1016/j.memsci.2019.117185>. Here, I am submitting a manuscript entitled “**A Proof-of-Concept for Gas-Entrapping Membranes (GEMs) Derived from Water-loving SiO₂/Si/SiO₂ Wafers for Green Desalination**” by Ratul Das, Sankara Arunachalam, Zain Ahmad, Edelberto Manalastas, Ahad Syed, Ulrich Buttner, and myself for your consideration for publication as an article in *JoVE*.

In this article we present a stepwise microfabrication protocol for achieving gas-entrapping membranes (GEMs) from SiO₂/Si/SiO₂ wafers, which includes designing, photolithography, isotropic and anisotropic etching, and cleaning. Despite the hydrophilic constitution of silica, when silica-GEMs are immersed in water they prevent water from intruding them. This apparent contradiction stems from the fact that the GEM architecture traps the solid-liquid-vapor system in a kinetic state whose stability can be tuned to vary over orders of magnitude by controlling the shape and surface chemistry of the substrate. While silicon wafers and microfabrication are not the desired material and platform, respectively, for desalination membranes, the protocols presented here will enable engineers and scientists to explore innovative ways for conceptualizing and testing new strategies for green desalination. The resulting design principles can be translated to common (perfluorocarbon-free and inexpensive) plastics through additive manufacturing, among other upcoming approaches. Thus, I believe that this work would be of much interest to the readership of *JoVE*.

If you need anything else, please don't hesitate to contact me.

Sincerely,

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