Novel PVA membranes functionalized with L-arginine for virus capture

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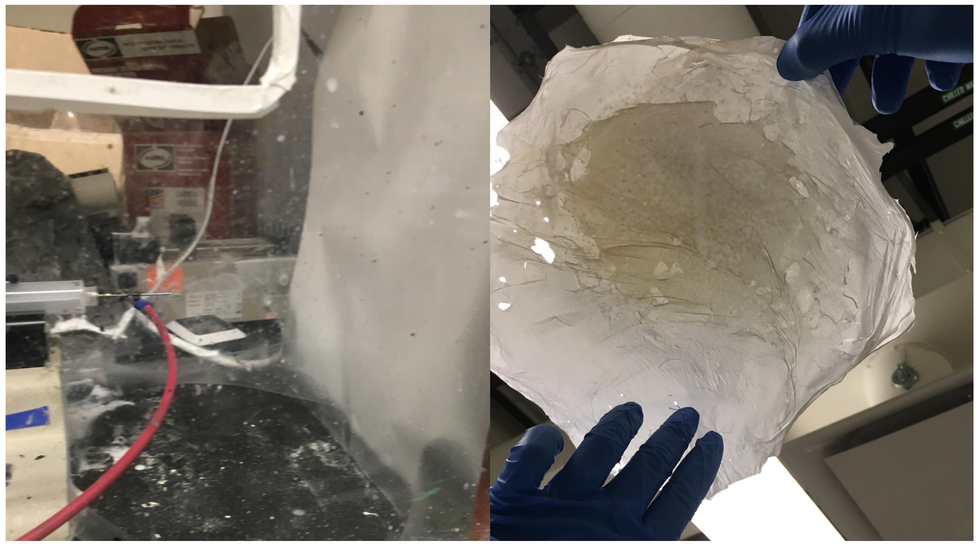
Research Question/Motivation:

This fibrous mat can then be functionalized with L-arginine to increase the charged ammonium groups in the membrane. These charged groups will then improve ionic conductivity as well as thermal and chemical stability. After synthesizing this membrane the steps to cross link and to Quaternized the PVA (poly(vinyl alcohol)) can be interchangeable. Crosslinking the membrane would enhance the overall tensile strength and mechanical properties. While the Quaternization fabricates an anion-exchange and enhances hydrophilicity. Development of this membrane will lead to a mask that enables better screening of viral droplets. The proposed mask will also be reusable multiple times after washing it with alcohol. The proposed synthesis scheme is also "Green" and involves functionalizing a biocompatible polymer.

Research Method:

- Electrospinning PVA nonwoven fibrous matt
- Functionalizing PVA (poly)vinyl Alcohol membrane with L-Arginine
  - Testing & changing concentrations of PVA (5%,10%-14%)
  - Changing ratios of L-Arginine concentrations of 25% to PVA
- Interchangeable crosslinking membrane and to Quaternize

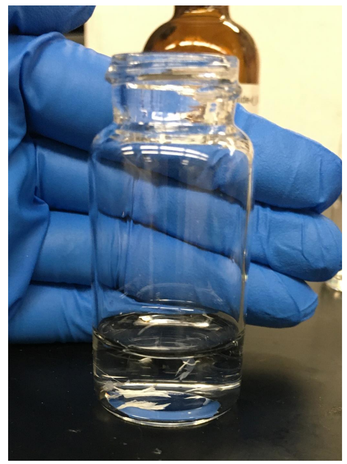


Obstacles faced/overcome:

- Not sure if the L-arginine is completely chemically reacting with the PVA or how to control the reaction concentrations.
- No way to ensure if the L-Arginine is completely attached the membrane which would mean that the absorption would only be through the L-Arginine.
-Increasing ratio of PVA to L-Arginine might lose the charge on the ligands or chains (indicating too much crosslinking)

Findings and progress thus far:

Crosslinking proven:



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