

Supplemental Information for:
Use of 3D Printing and Modular Microfluidics to Integrate Cell Culture, Injections and Electrochemical Analysis

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STL files included as supplemental information

- 1) Cell Culture Module (depicted in Figure 1B)
- 2) Wall-Jet Module (depicted in Figure 1C)
- 3) Sample Injection Module-Rotor (depicted in Figure 3A)
- 4) Sample Injection Module-Base (depicted in Figure 3B)

SI- Section 1: Endothelial cell culture

Bovine pulmonary endothelial cells (bPAECs; ATCC Manassas, VA, USA) were purchased frozen at a concentration of 1×10^6 cells/mL. Upon arrival the cells were thawed and seeded to a 60 cm² tissue culture petri dish using a DMEM media (ATCC Manassas, VA, USA) supplemented with 5 mL penicillin/ streptomycin (1 % v/v) and 62.5 mL bovine serum albumin (10% v/v). Except for when passaging, harvesting or changing media, the cells were kept in an incubator at 37 °C and 5% CO₂. When the cells reached ~ 80% confluency, they were harvested from the flask using a trypsin reagent pack (CC-5034; Lonza, Walkersville, MD, USA). These cells were diluted to a concentration of $\sim 1 \times 10^6$ cells/mL in complete media and used for the cell studies.

SI- Section 2: Supplemental Figures

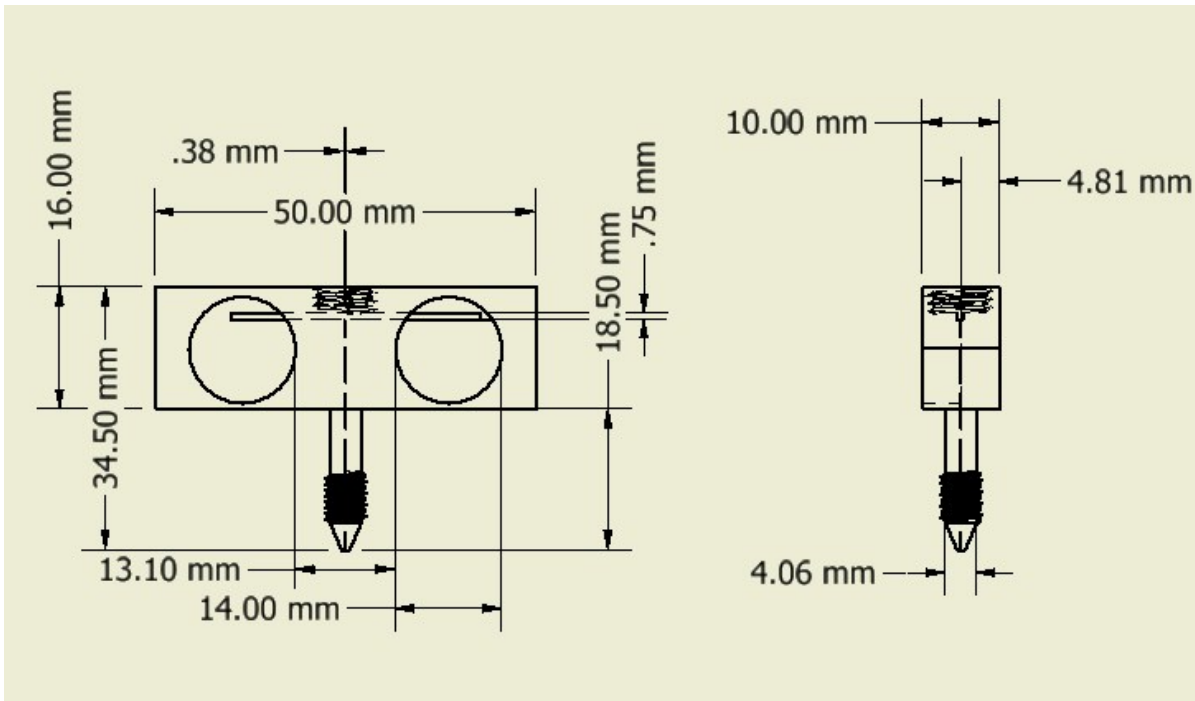


Figure S1: CAD drawing of Wall-Jet (WJE) device.

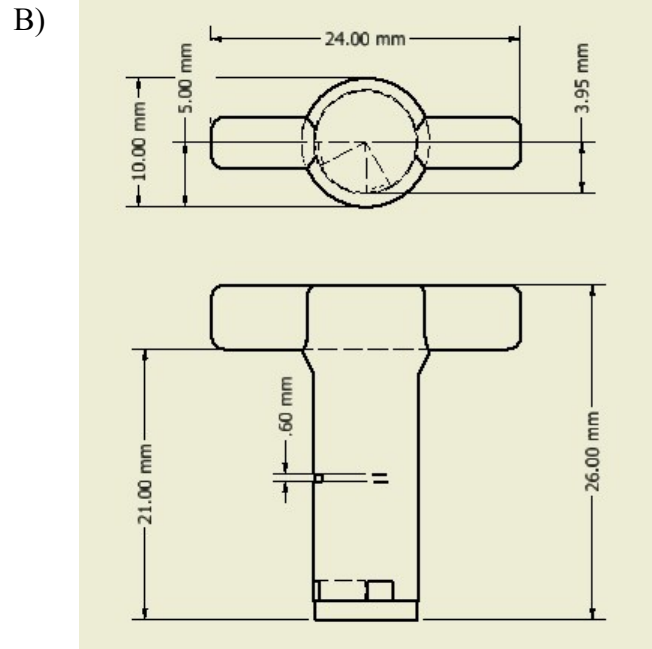
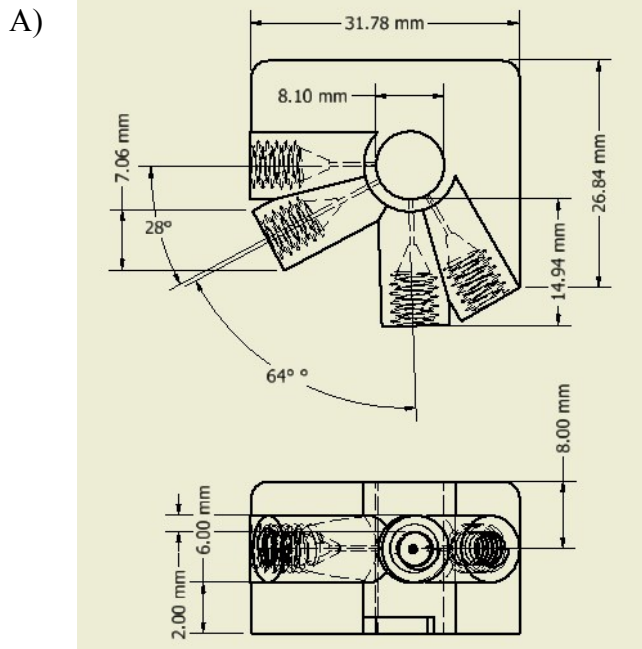


Figure S2: CAD drawing of 3-D printed sample injection module. (A) Sample injection module- base component. (B) Sample injection module- rotor component.

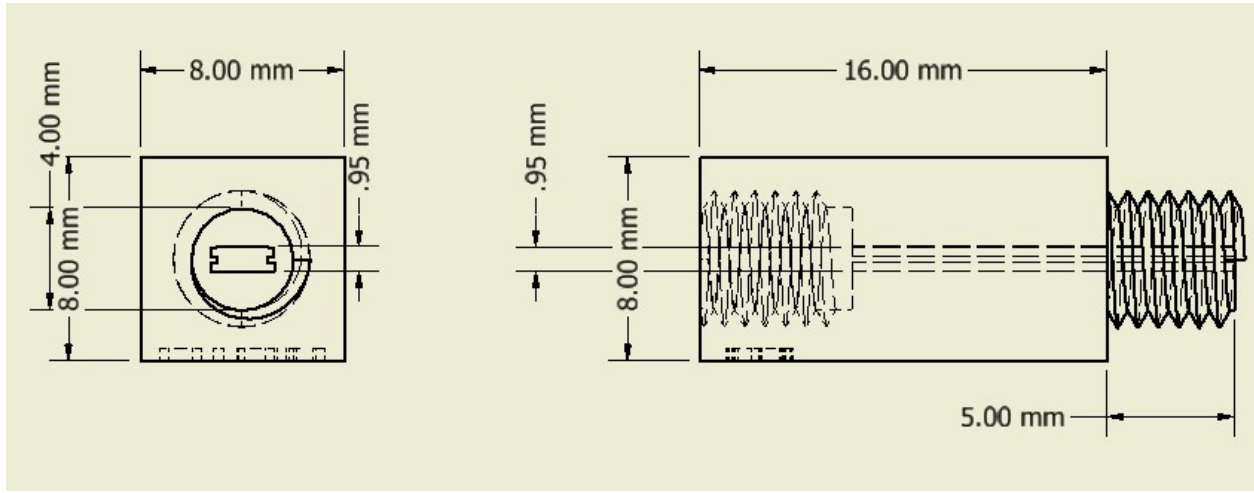


Figure S3: CAD drawing of the 3-D printed cell culture module.

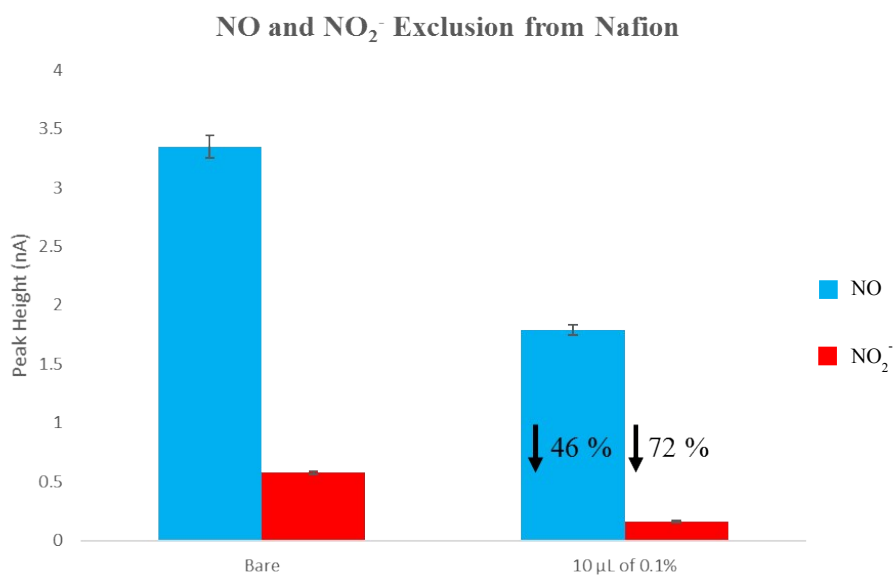


Figure S4: Electrode Modification with Nafion. With the addition of 0.1 % Nafion, we see a reduction in peak height of 46 % for NO and 72 % for NO₂⁻, giving an NO:NO₂⁻ peak height ratio of 11.1. The NO:NO₂⁻ peak height ratio for the bare electrode is 5.8, showing increased electrode selectivity for NO with the Nafion coating ($n = 5$, error bars are standard deviation).