LICENSING OPPORTUNITY: **MULTIDIMENSIONAL PRINTER**



Problem

Current state-of-the-art e-beam and X-ray lithography requires vacuum conditions and, therefore, dry samples, which restricts the ability to perform beam-induced additive printing in a continuous process.

Invention

In our invention, the electron or X-ray beam penetrates the liquid from the vacuum after passing through the ultra-thin separating membrane and crosslinks the polymer molecules in the liquid solution within the interaction volume. Additive layerby-layer fabrication can be achieved via electrochemical delamination of the prior layer from the separating membrane.

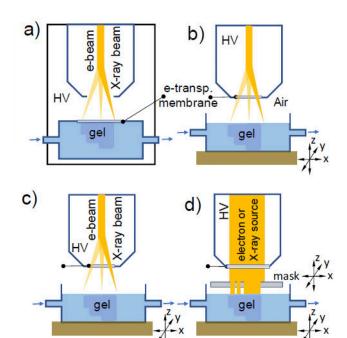
BENEFITS

Potential Commercial Applications

Applications include individual biocells interfacing with gel contacts, nanoscale tissue engineering, soft robotics, biosensing, drug delivery, wound treatment, and biomedical research.

Competitive Advantage

The key advantage of the method compared to prior dry gel patterning is the ability to micropattern gel solution in its liquid state with nanoscopic resolution.



- a) Liquid gel precursor is enclosed inside the chamber capped with electron transparent membrane.
- b) High vacuum inside microscope is preserved by electron transparent membrane and the liquid is under ambient conditions.
- c) Focused beam irradiation for addressable cross-linking.
- d) Nano-parterning via broad beam irradiation through the mask.

