

## Microfluidic Hydrogel: A New Platform for Efficient Solution Supply

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(geenius7@gmail.com\*)

This presentation describes how microfluidic channels can be embedded in a hydrogel to mimic the venation network of a natural leaf and its functionality. Microfluidic patterns are easily formed in moldable hydrogels, where unique convective/diffusive transport mechanism in porous gel could be used for uniform delivery of reagent solution. For better understanding of solute transport in a microfluidic hydrogel, we established a simulation procedure by using COMSOL. The numerical analysis allows evaluating the rapidity and efficiency of the solute supply through the various channel design embedded in hydrogel media. We demonstrate a soft matter photoreactor and suggest a new concept of regenerative photovoltaic systems on the basis of the microfluidic hydrogel platform.