

## Programmed Wrinkle Patterns by Crosslinking Gradient on Hydrogel Film

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Wrinkled hydrogel films have a high potential value in many aspects including sensors, responsive coatings and adhesives. In this study, we developed a method to reversibly fabricate the desired shape of wrinkles. We irradiated the monomer solution with omnidirectional UV light via a pinhole array photomask (< 10 μm). As a result, a hydrogel film having gradient crosslinking density can be obtained. Closer to the hole, higher the degree of polymerization of hydrogel film was obtained. Gradient film made of pH-responsive hydrogels, poly(2-hydroxyl methacrylate-co-acrylic acid) (p(HEMA-co-AA)) was swollen depending on pH. Subsequently, a wrinkled structure was formed on the surface of the hydrogel film reversibly. It was possible to obtain wrinkles of various patterns such as a square or a hexagon in accordance with the photomask pattern. Eventually, we succeeded in sorting the yeast cells into the desired shape using the wrinkle structure.