

METHOD FOR RAPID THERMOFORMING AND DESIGN ITERATION OF BESPOKE POLYCARBONATE TISSUE CULTURE DEVICES

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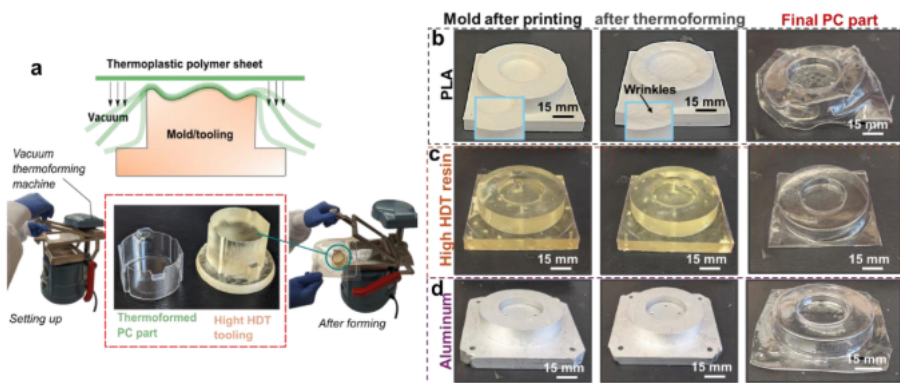
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Value Proposition: *Rapid thermoforming process that can produce custom, low-cost devices for cell culture that are compatible with common cell culture techniques.*

Technology Description

Researchers at Washington University in St. Louis have developed a process where formulation adjustments and pre-heating of a particular set of commonly used plastics & materials can result in visibly transparent research devices with good consistency and accuracy to the 3D mold and improved performance in cell culture. Traditional manufacturing of cell culture accessories, such as injection molding and machining, is often too costly and slow for producing custom designs in small batches. Techniques like soft lithography cannot carve out larger items easily. While materials like PDMS elastomers allow for rapid iteration, they suffer from an affinity for hydrophobic small molecules (problematic for drug screening projects), sub-optimal interactions with certain cell types, difficult to manipulate (smaller sizes become tricky). Better materials like polystyrene cannot survive autoclave temperatures.

This method allows for the rapid, low-cost creation of customizable devices that are both transparent and autoclavable, producing a significantly higher “quality” for cell culture and greatly enhancing differentiation and culturing.



Stage of Research

Fully developed

Publications

Malayath G, Huebsch N. Rapid thermoforming of polycarbonate cell culture accessories from 3D printed molds. bioRxiv [Preprint]. 2025 Jul 10:2025.07.07.663502. doi: 10.1101/2025.07.07.663502. PMID: 40672346; PMCID: PMC12265631.

Applications

- Manufacturing of cell culture accessories

Key Advantages

- Low-cost and customizable
- Allows for rapid fabrication (approximately one minute per part)
- Has high optical transparency, is autoclavable, and is resistant to hydrophobic molecule absorption
- Compatible with multiple cell types
- Able to fulfill shape, precision, and custom requirements

Patents

Patent application filed

Related Web Links – [Nathaniel Huebsch Profile](#); [Huebsch Lab](#)