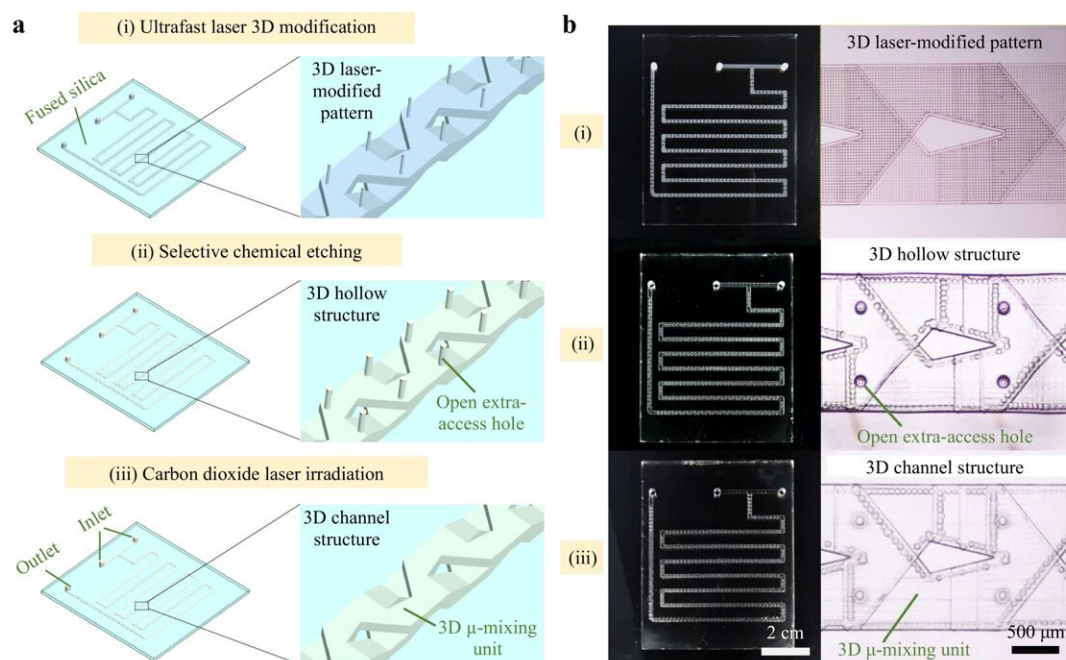


New technique paves the way for efficient vitamin D3 production

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Schematic of the manufacturing procedure. Credit: *Light: Advanced Manufacturing* (2024). DOI: 10.37188/lam.2024.010

Scientists have developed a method to produce vitamin D3 (VD3), a vital nutrient for bone health and immune function, with greater efficiency and purity. This breakthrough utilizes intricately designed microchannels carved into glass using ultra-fast lasers.

The tiny channels offer exceptional transparency for ultraviolet (UV) light, the key ingredient in VD3 production. This allows for more efficient use of [light](#), leading to higher yields of VD3 and lower production costs.

Traditionally, VD3 production relies on bulky reactors and inefficient processes. The new microfluidic approach overcomes these limitations, enabling continuous-flow production with significantly improved yield (more than 20%). The research is [published](#) in the journal *Light: Advanced Manufacturing*.

"This technology represents a major leap forward in VD3 production," said Ya Cheng, senior author of the study. "It paves the way for more affordable and readily available VD3 supplements, benefiting consumers and health care systems alike."

The microchannels are made from fused silica glass, chosen for its superior UV transparency and chemical resistance. Additionally, the laser carving technique allows for precise control of the channel design, optimizing mixing and flow for enhanced efficiency.

The researchers also demonstrated the platform's versatility by successfully producing VD3 using an array of UV LED lights. This opens doors for future miniaturization and integration of VD3 production into [portable devices](#).

This innovative approach holds potential beyond VD3. Its ability to handle complex reactions under high temperatures and pressure makes it suitable for a wide range of chemical synthesis applications, from pharmaceuticals to [materials science](#).

More information: Aodong Zhang et al, Efficient synthesis of vitamin D₃ in a 3D ultraviolet photochemical microreactor fabricated using an

ultrafast laser, *Light: Advanced Manufacturing* (2024). DOI: [10.37188/lam.2024.010](https://doi.org/10.37188/lam.2024.010)

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