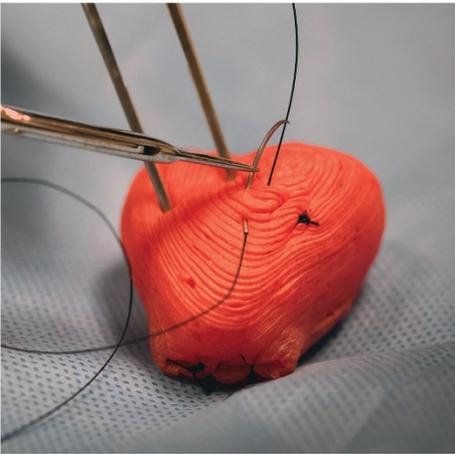
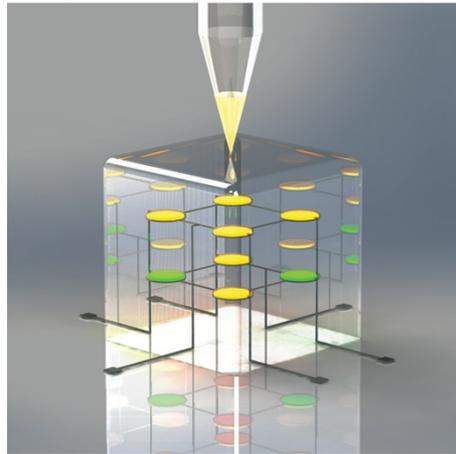


3D Printing Functional Materials & Devices



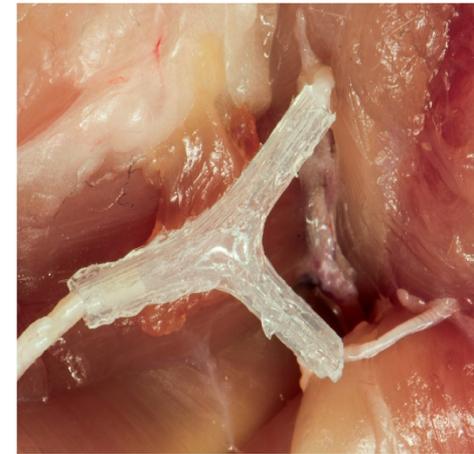
Organ Models



3D Electronics



4D Bioprinting



Biomedical Devices

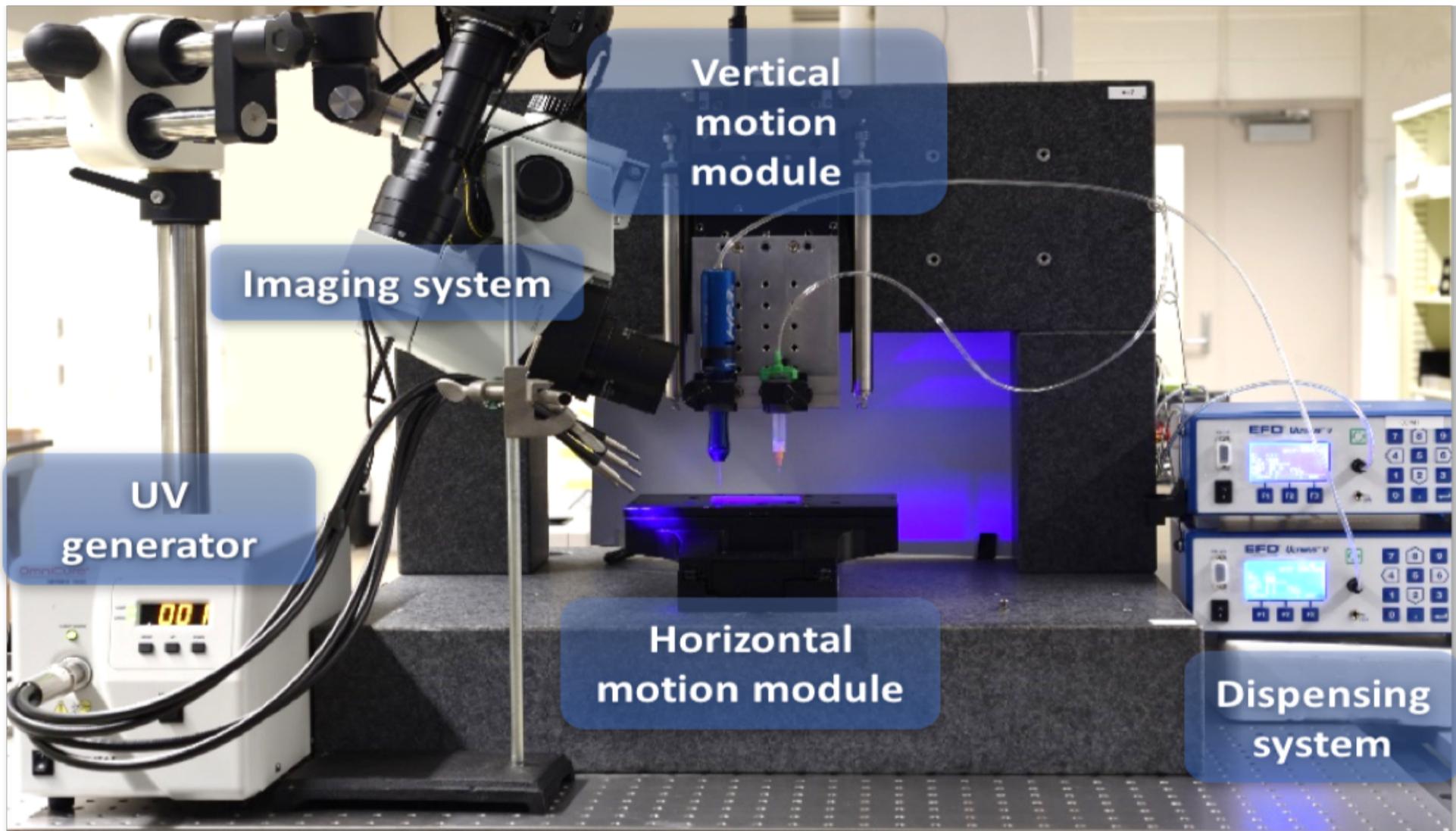
Michael C. McAlpine
Benjamin Mayhugh Associate Professor
Mechanical Engineering, University of Minnesota

mcalpine@umn.edu | (612) 626-3303 | www.umn.edu/~mcalpine

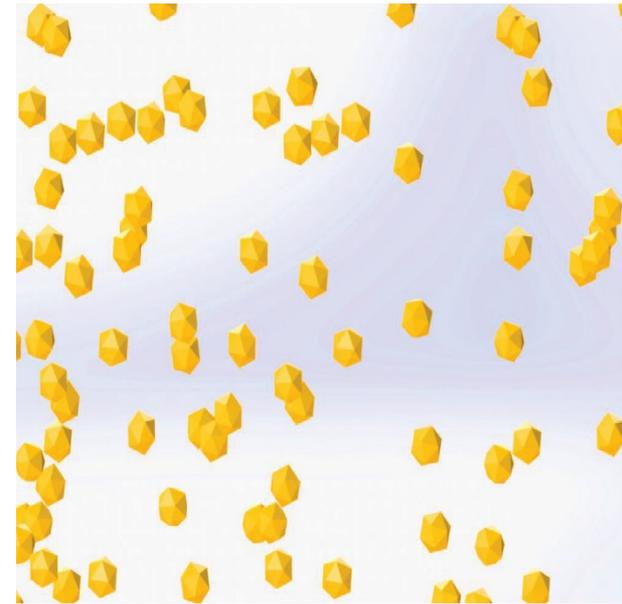


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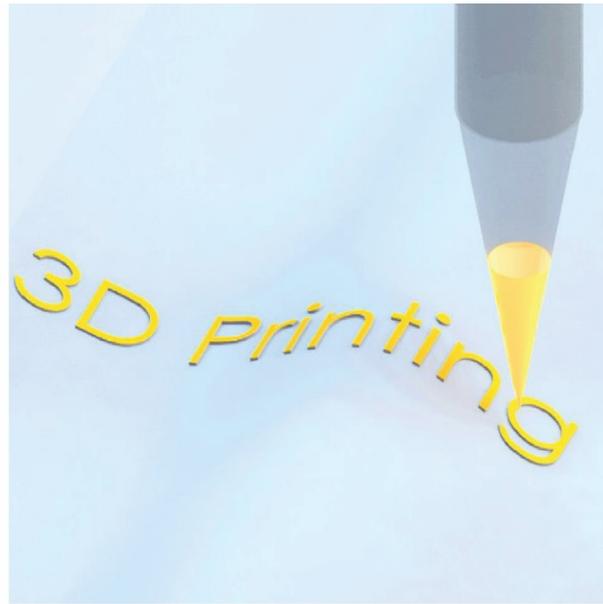
Custom-Built 3D Printers



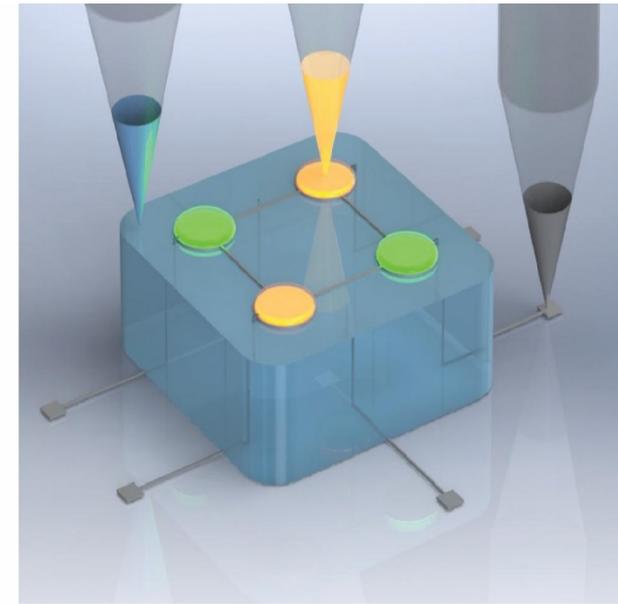
Multiscale, Multifunctional Manufacturing



Functional Nano-Inks



Microscale Printing



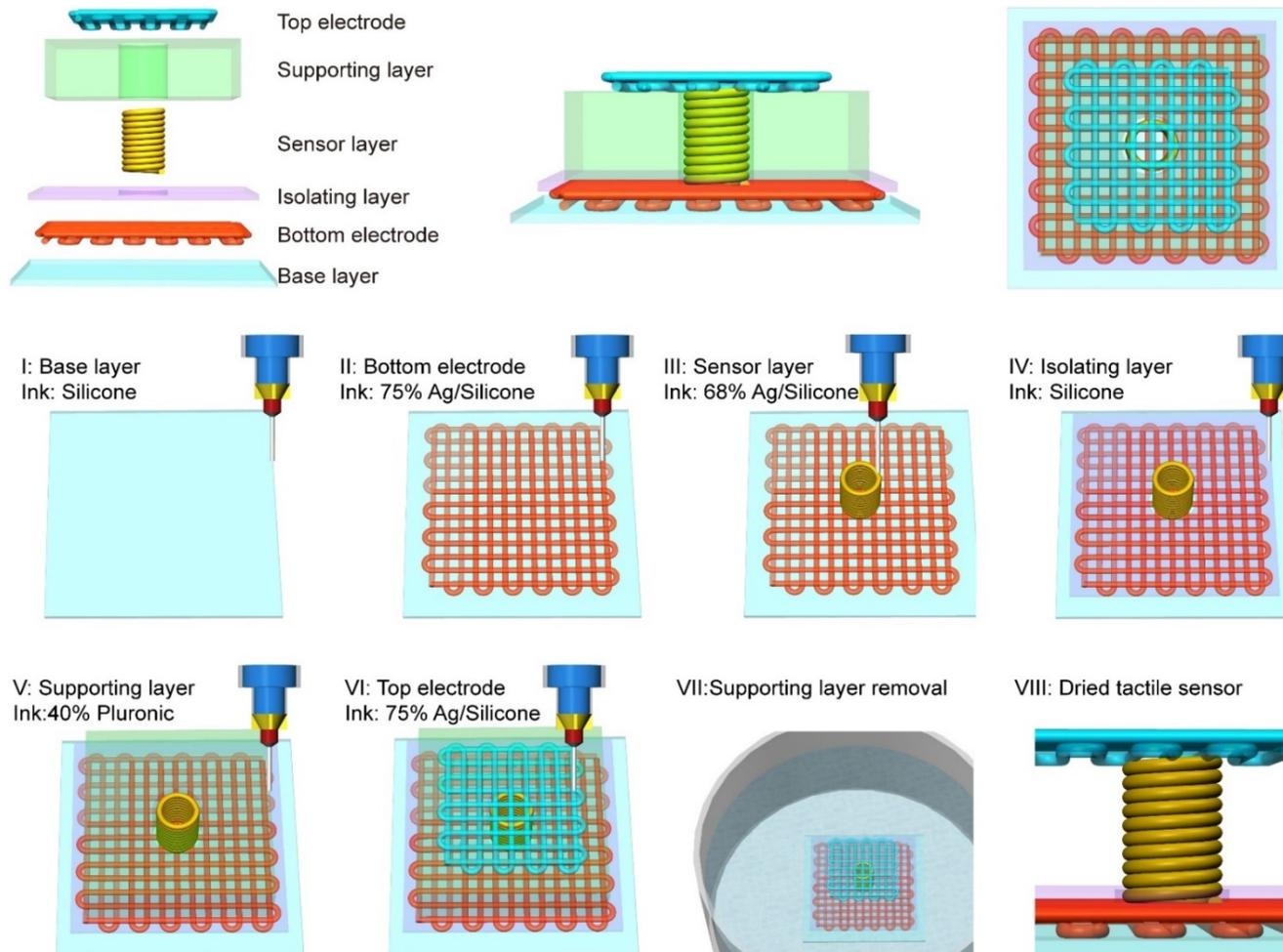
Macroscale Devices

Nano Today **11**, 330 (2016).



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3D Printed Piezoresistive Tactile Sensors



Adv. Mater. **29**, 1701218 (2017).



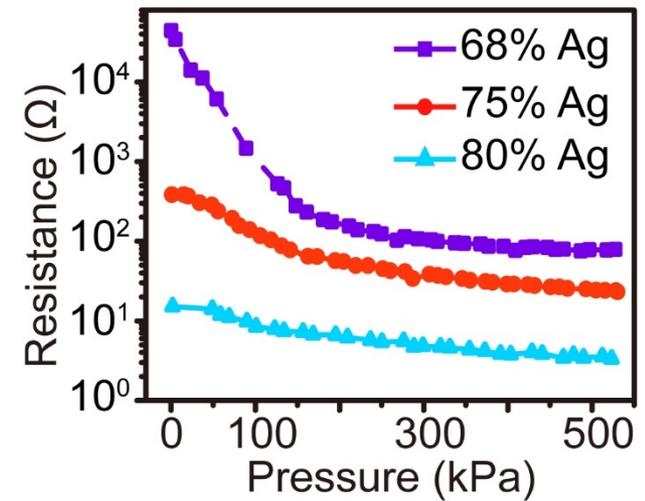
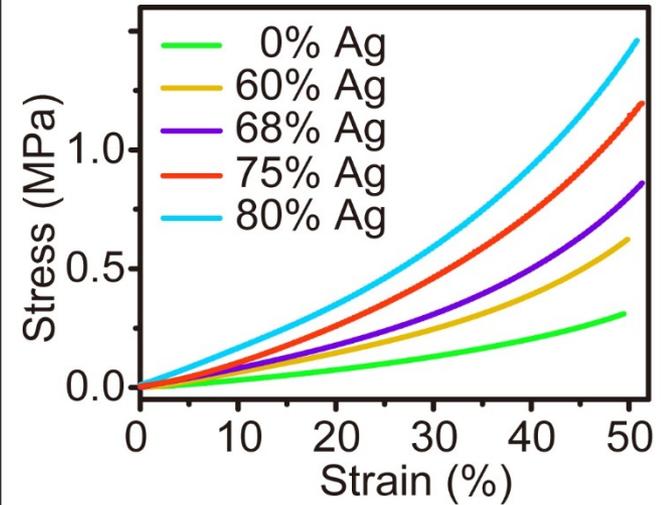
Conformally 3D Printed Tactile Sensors



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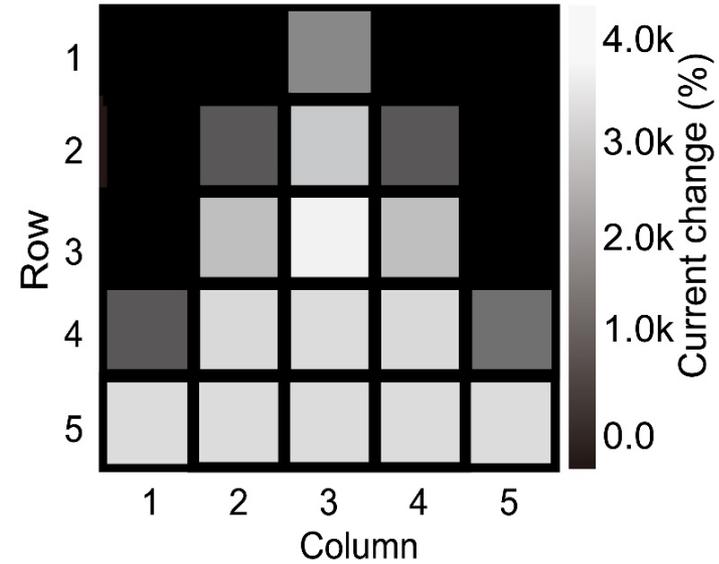
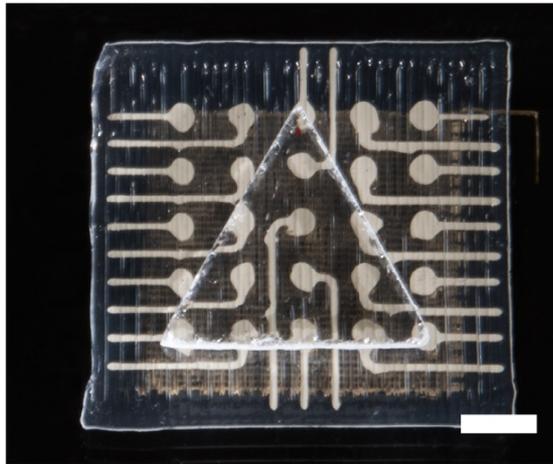
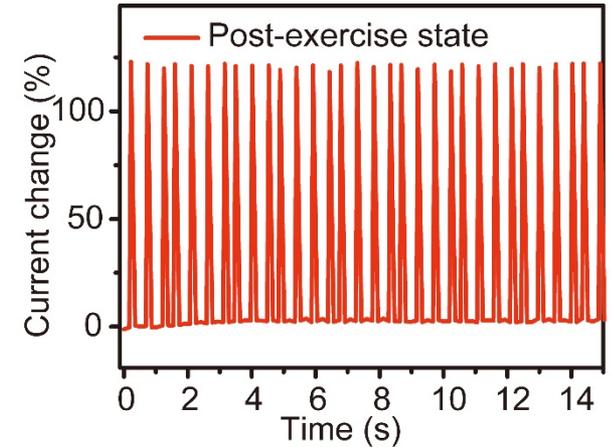
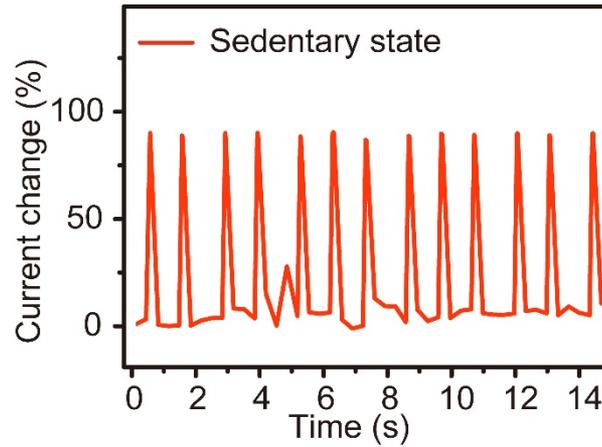
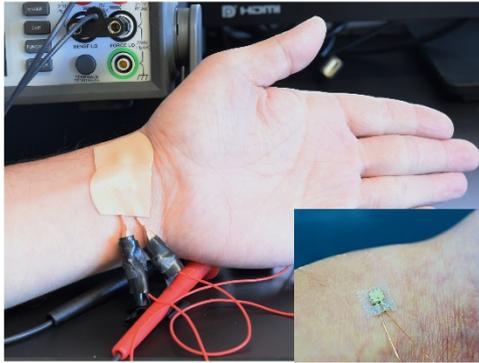
Properties of Conductive Inks



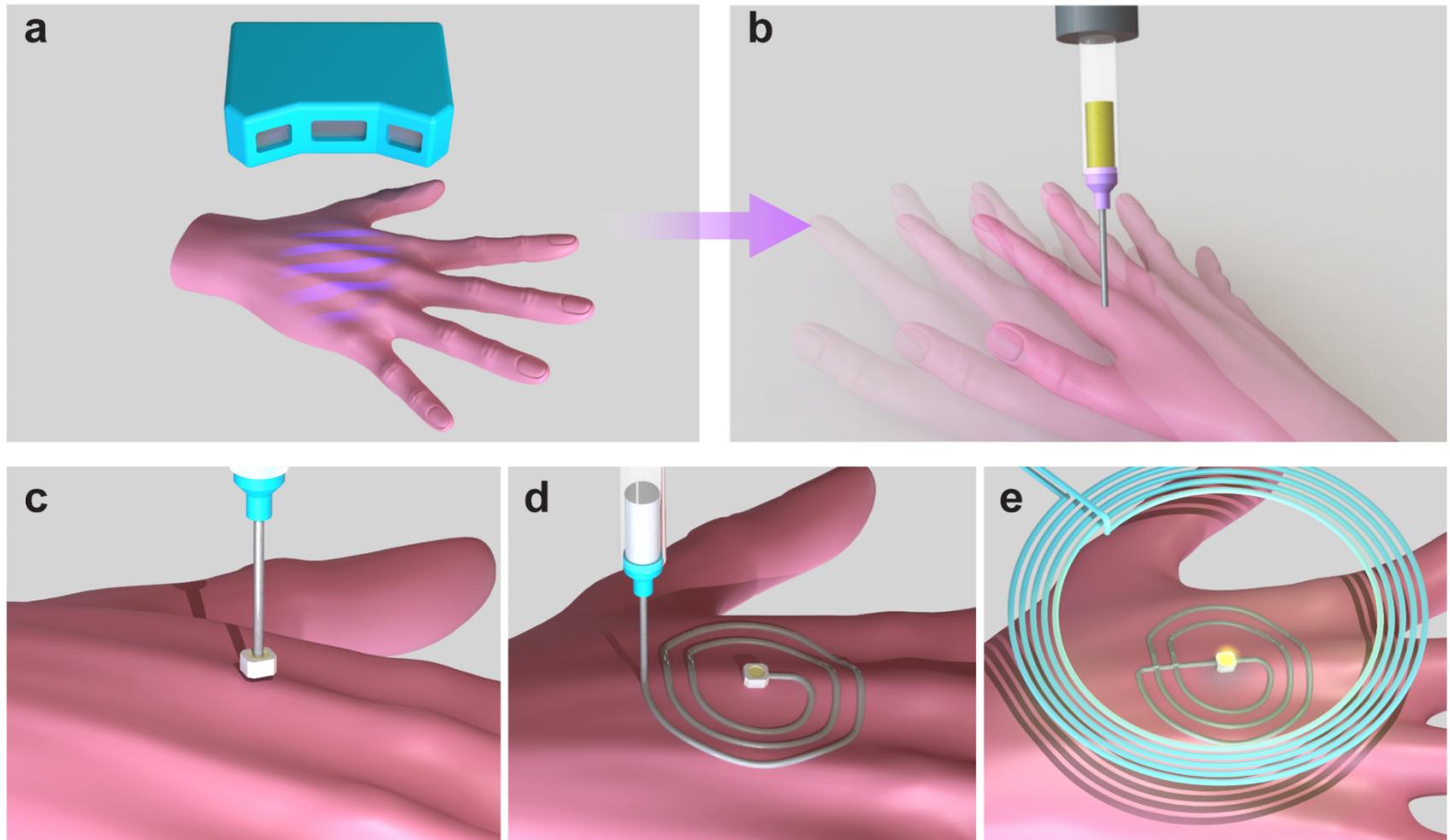
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Biointegrated 3D Printed Tactile Sensors



3D Printing Electronics on Human Hand



Adv. Mater. **30**, 1707495 (2018).



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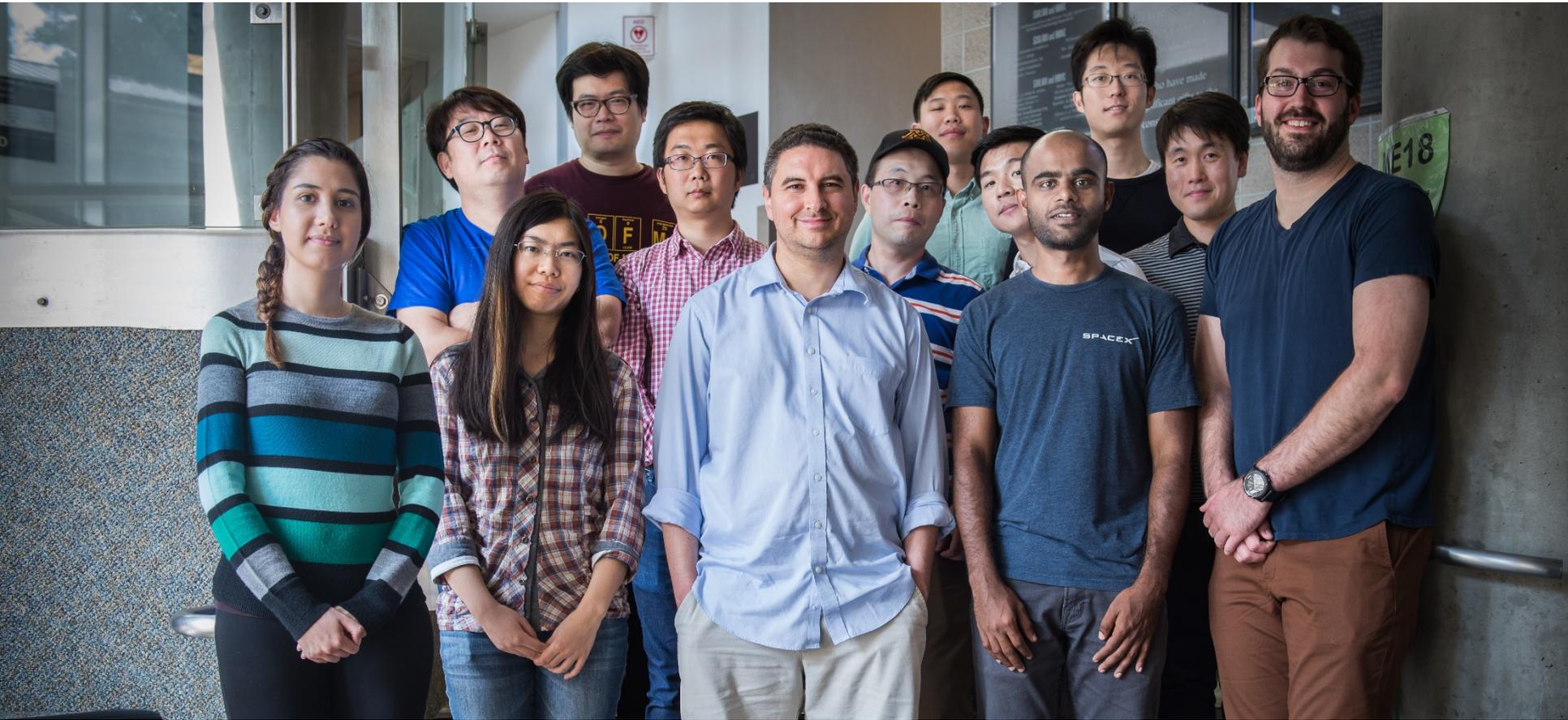
3D Printing on Moving Hand Demo



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McAlpine Research Group



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