

Abstract Submitted
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Regenerated Spider Silk Possess Mechanical Properties of Super- and Cyclic Contraction in Response to Environmental Humidity SHAN LU, GANESH SWAMINATHAN, SAMUEL EVANS, TODD BLACKLEDGE, University of Akron — Major Ampullate (MA) spider silk is among the most impressive biomaterials due to its unparalleled mechanical properties, such as super-contraction and cyclic response to changes in humidity. Electro-spinning enables the generation of engineered silk fibers with controlled parameters and dimensions for various medical and commercial applications. However, their applications hinge on the ability to reproduce the mechanical properties such as a precise expansion-contraction response existed in natural silk fibers. Here, we successfully reproduced MA spider-silk fibers from solutions of natural MA silk proteins via electrospinning, which exhibit the super-contraction and cyclic response to humidity change in a manner mirroring the natural fibers.

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