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Topic of the Speech:
Volumetric Bioprinting of Protein-based (Bio)inks for Tissue Engineering

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He has published over 30 peer-reviewed research work include Nature Communications, Science Translational Medicine, Proceedings of the National Academy of Sciences USA, Advanced Materials, Advanced Functional Materials, STAR Protocols, Biomaterials, etc. He has applied for 16 Chinese patents and 2 PCT patents. He serves as reviewers for over >10 international journals include Advanced Science, Advanced Healthcare Materials, ACS Nano, Applied Materials Today, Nanoscale, etc.

ABSTRACT SUBMISSION
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Volumetric Bioprinting of Protein-based (Bio)inks for Tissue Engineering

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ABSTRACT

Volumetric (bio)printing (VBP) enables fast photopolymerization of three-dimensional constructs by illuminating dynamically evolving light patterns in the entire build volume. However, the lack functional bioinks suitable for VBP is a critical limitation. Here, we report rapid volumetric (bio)printing of natural, unmodified silk-based (silk sericin (SS) and silk fibroin (SF)) (bio)inks and decellularized extracellular matrix (dECM)-based (bio)inks to form sophisticated shapes and architectures within tens of seconds[1,2]. Of interest, combined with post-fabrication processing, the volumetrically (bio)printed SS constructs reveal properties including reversible as well as repeated shrinkage and expansion, or shape-memory; whereas the (bio)printed SF constructs exhibit tunable mechanical performances ranging from a few hundred Pa to hundreds of MPa. Both types of silk-based (bio)inks and dECM-based (bio)inks are cytocompatible. This work supplies expanded bioink libraries for VBP and provides a path forward for rapid volumetric (bio)printing of protein-based constructs, towards broadened biomedical applications.

REFERENCES:

1 M.B. Xie et al (2023) *Nat Commun*, **14**:210, 2023.
2 L.M. Lian et al (2024) *Adv Mater*. 2304846.