

## MS42-P10 | IN-SITU WIDE-ANGLE X-RAY SCATTERING ON LIQUID CRYSTALLINE ELASTOMERS FOR ORTHOPEDIC APPLICATIONS

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Liquid-crystal elastomers (LCEs) are a class of stimuli-responsive and mechanically-active polymers that combine the properties of anisotropic liquid crystals and rubber elasticity, making them capable of exceptional mechanical and optical properties. The stimuli-induced actuation and shape-memory properties of LCEs have shown significant potential in use as actuators, artificial muscles, and soft robotics [1-5].

In this contribution, we report in-situ tensile investigation using fast wide-angle X-ray scattering experiments on main-chain liquid crystalline elastomers for orthopedic applications. Our results show that stretching of the sample to different degrees of orientation is possible due to elasticity of the polymer chains between adjacent liquid crystal units. Yet, liquid crystal units do not orient instantly along mechanical field but follow the behavior of polymer chains with some delay.

These results allow us to gain better understanding of mechanical properties of this important group of materials.

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