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Mechanism underpinning biological ferroelectricity

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ABSTRACT

Ferroelectricity in biological materials, while speculated, has been a matter of much debate. Recent experimental discovery of this phenomenon in elastin – a key ingredient of aorta, lung, ligament, and skin has given rise to tantalizing questions regarding its origins as well as ramifications. In this presentation, motivated by the experiments performed by one of us, we present a two-scale modeling approach consisting of a coarse-grained statistical mechanics model and molecular dynamics to elucidate the microscopic mechanisms underpinning ferroelectricity in elastin.