Abstract Submitted
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Self-organized DNA/F-actin gels: entangled networks of nematic domains with tunable density[1] JOHN BUTLER, OLENA ZRIBI, University of Illinois at Urbana-Champaign, IVAN SMALYUKH, University of Colorado at Boulder, GHEE HWEE LAI, University of Illinois at Urbana-Champaign, RAMIN GOLESTANIAN, University of Sheffield, THOMAS ANGELINI, Harvard University, GERARD WONG, University of Illinois at Urbana-Champaign — We examine mixtures of DNA and F-actin as a model system of like-charged rigid rods and flexible chains. Confocal microscopy reveals the formation of elongated nematic F-actin domains reticulated via defect-free vertices into a network, all embedded in a mesh of random DNA. Synchrotron x-ray scattering results indicate that the DNA mesh squeezes the F-actin domains into a nematic state via the osmotic pressure of uncondensed counterions, so that the inter-actin spacing within the domains decreases with increasing DNA concentration. These observations are consistent with arguments based on electrostatics and nematic elasticity.

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