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Structural Transitions of F-actin Polyelectrolyte Bundles in the Presence of Strongly Size-mismatched Cations ROBERT CORIDAN, Dept. of Physics, University of Illinois, Urbana-Champaign, LORI K. SANDERS, Dept. of Materials Science and Engineering, University of Illinois, Urbana-Champaign, WU-JING XIAN, Dept. of Materials Science and Engineering, Dept of Bioengineering, University of Illinois, Urbana-Champaign, GERARD C. L. WONG, Dept of Materials Science and Engineering, Dept. of Physics, Dept. of Bioengineering, University of Illinois, Urbana-Champaign — In the presence of multivalent cations, the polyelectrolyte F-actin exhibits the phenomenon of 'like-charge attraction'. Simple divalent ions cause F-actin to form close-packed bundles with an interstitial 1-D density wave of ions along the length of the bundle. Lysozyme, a nonavalent (+9) cationic globular protein (45Åx25Åx25Å) causes F-actin to form similar bundles, with a larger inter-actin distance and an incommensurate 1-D column of close-packed lysozyme along the three-fold tunnel within the bundle. Using genetically engineered lysozyme with different charges, we examine the competition of these cationic agents and their effect on F-actin bundle structure.

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