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Polyamine Induced Bundling of F-actin GLENNA Z. SOWA, University of California, Los Angeles, DAVID S. CANNELL, University of California, Santa Barbara, EMIL REISLER, University of California, Los Angeles, ANDREA J. LIU, University of Pennsylvania — To better understand the mechanism of F-actin bundle formation, we have measured the phase boundary between isotropic F-actin and F-actin bundles as a function of polyamine concentration. F-actin was incubated with spermine or spermidine overnight, and the samples were spun at low speeds to separate bundles from unbundled F-actin. The relative amounts of actin in the pellet and supernatant were determined via gel electrophoresis. With this approach, we have mapped the phase boundary between bundled F-actin and isotropic unbundled F-actin for two F-actin/polyamine linker systems. Surprisingly, the dependence of bundle formation on actin concentration is small to non-existent. At the actin concentrations we studied, actin tends to form bundles at or above a single linker concentration. In order to understand the interactions holding F-actin together in bundles, we used NMR to determine where the polyamines were with respect to the bundled and unbundled phases of actin. Surprisingly, the spermine and spermidine did not segregate with the bundled actin indicating that they do not bind to the actin strongly even though their addition to F-actin solutions induces bundle formation.

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