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**Phase Behavior of F-actin** GLENNA Z. SOWA, UCLA, Dept. of Chemistry and Biochemistry, DAVID S. CANNELL, UCSB, Department of Physics, ANDREA J. LIU, UCLA, Dept of Chemistry and Biochemistry, EMIL REISLER, UCLA, Dept. of Chemistry and Biochemistry — To better understand the close spatial proximity of F-actin (filamentous actin) bundles to other structures comprised of F-actin in cellular environments, we have measured the phase boundary between F-actin and F-actin bundles as a function of spermine concentration. To do this, we first grew actin filaments by adding $MgCl_2$ to G-actin (globular actin). F-actin was then incubated with spermine (a low-binding-energy linker and actin-bundling factor) overnight, and then 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, yielding a description of the bundling transition as a function of actin and spermine concentrations. With this approach, we are constructing a phase diagram for the F-actin/spermine system. Surprisingly, the dependence of bundle formation on actin concentration is small to non-existent. At the actin concentrations we studied (4.5, 9, 18 and 36$\mu$M), actin tends to form bundles at the same spermine concentration. This observation calls for the evaluation of the effect of the ambient $Mg^{2+}$ in solution (added to polymerize actin) on actin bundling by spermine.

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