

Derivation of a fluid-type continuum model for contracting actomyosin bundles.

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Starting from a detailed physical model for the interplay of actin filaments, myosin motor proteins and cross-linker proteins in a contracting cell division ring, we derive a continuum model as a short filament limit of the agent based model. The model features highly nontrivial pattern formation and traveling wave solutions and explains the aggregation of actin and myosin predicted by the microscopic model as well as the scaling properties that cause the constant rate of contraction.

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