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**Finite-deformation mechanics of generalized cell vertex models** TRISTAN SHARP, University of Pennsylvania, MATTHIAS MERKEL, LISA MANNING, Syracuse University, ANDREA LIU, University of Pennsylvania — A class of models called cell vertex models has been shown to capture aspects of the mechanics of confluent cell tissues (tissues in which constituent cells occupy essentially all of the volume). We investigate the mechanics of a cell vertex model beyond the regime of linear response, in 2D and 3D. In such tissues, we assume an energy cost for cell deformations that arises when cells are locally compressed together. We introduce a generalization of a cell vertex model to include key effects of the extracellular matrix (ECM) in non-confluent biological tissues. Because the ECM can prevent rearrangements in which cells change neighbors, we also introduce an energy penalty to suppress rearrangements. We describe the consequences of these added interactions on the rigidity transition and nonlinear mechanics.

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