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Two interacting active dimers on a rigid track DAVID MAYETT, Syracuse University, MOUMITA DAS, Rochester Institute of Technology, J. M. SCHWARZ, Syracuse University — Cell migration in morphogenesis and cancer metastasis typically involves an interplay between different cell types. The rules governing such interplay remain largely unknown; however, a recent experiment studying the interaction between neural crest (NC) cells and placodal cells reveals an example of such rules. The study found that NC cells chase the placodal cells by chemotaxis, while placodal cells run away from NC cells when contacted by them. Motivated by this observation, we construct and study a minimal one-dimensional cell-cell model comprised of two cells with each cell represented by two-beads-connected-by-an-active spring. The active spring for each moving cell models the stress fibers with their myosin-driven contractility (and alpha-actinin extendability), while the friction coefficients of the beads describe the catch/slip bond behavior of the integrins in focal adhesions. We also include a dynamic contact interaction between the two cells to decipher the chase-and-run dynamics observed in the experiment. We then use our model to construct a "phase diagram" consisting of chase-and-run behavior, clumping (of the two cells) with repolarization behavior and clumping with no repolarization behavior that can be qualitatively compared to experiments.

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