

Abstract Submitted
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Physical Guidance of Cell Migration WOLFGANG LOSERT, University of Maryland College Park — Cells migrate as individuals or groups, to perform critical functions in life from organ development to wound healing and the immune response. While directed migration of cells is often mediated by chemical or physical gradients, our recent work has demonstrated that the physical properties of the microenvironment can also control and guide migration. I will describe how an underlying wave-like process of the actin scaffolding drives persistent migration, and how such actin waves are nucleated and guided by the texture of the microenvironment. Based on this observation we design textures capable of guiding cells in a single preferred direction using local asymmetries in nano/microtopography on subcellular scales, or altering migration in other ways. This phenomenon is observed both for the pseudopod-dominated migration of *Dictyostelium* cells and for the lamellipod-driven migration of human neutrophils. The conservation of this mechanism across cell types suggests that actin-wave-based guidance is important in biology and physiology.

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