

How cells steer themselves by making and breaking attractants

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Cells do not simply follow external chemical cues; they actively shape them. This is turning out to be almost universally true - passive responses are rare and self-steering is seen in immune cells including neutrophils, macrophages and dendritic cells, neural crest, amoebas and bacteria. Self-steering is also a potent driver of collective migration - an attractant for one cell is an attractant for its neighbours. I will talk about how migrating cells generate, degrade, and recycle attractants to create self-generated gradients that steer movement with robustness and precision. By coupling signal breakdown, secretion, and endocytosis to actin dynamics, cells control when and where they sense, enabling reliable navigation in complex and changing environments.