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*Studying Directed Cell Migration Using Microfluidic Devices and Quantitative Modelling*

Directed cell migration is a complex and highly coordinated biological process with important relevance to various physiological functions and pathological problems. Understanding directed cell migration requires the researcher to approach it as a complex interacting network of guiding cues, the responding cellular machinery and the extracellular matrix. Microfluidic devices provide a powerful experimental platform for cell migration analysis in controlled cellular guiding microenvironments. Such experimental studies further facilitate the development of quantitative models for directed cell migration. Toward this direction, we study cell migration in complex chemical and electric fields using a combination of microfluidic experiments and quantitative modelling. In this talk, I will discuss a few focused studies including 1) chemotactic navigation in complex assays of chemoattractant gradients; 2) lymphocyte migration in lymph node relevant co-existing chemokine fields; 3) cell migration in competing chemical gradient and electric field.