

## 6. Immune Cell Migration and Invasion

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### **Outline of the lecture**

- I. Four pillars of directed cell migration:
  1. Environmental cues (signals) which set directionality. Diversity of cues.
  2. Decoding the environment: how cells sense the cues.
  3. Transmitting the signal inside the cell: polarization of cells.
  4. Response: exerting the force to the environment that makes cells move.
- II. Invasion as a special type of migration
  1. Types of barriers that cells have to overcome *in vivo*
    - Extracellular matrix
    - Tissue cells adhered to each other (examples: blood vessel wall, epithelial tissues).
  2. Cellular mechanism to sense barriers.
  3. Mechanisms to penetrate through the barrier.

### **Discussion:**

Lämmermann, T., Bader, B., Monkley, S. *et al.*

Rapid leukocyte migration by integrin-independent flowing and squeezing.

*Nature* **453**, 51–55 (2008). <https://doi.org/10.1038/nature06887>

### **Reviews:**

SenGupta, S., Parent, C.A. & Bear, J.E. The principles of directed cell migration. *Nat Rev Mol Cell Biol* **22**, 529–547 (2021). <https://doi.org/10.1038/s41580-021-00366-6>

Extra reading:

Yamada, K.M., Sixt, M. Mechanisms of 3D cell migration. *Nat Rev Mol Cell Biol* **20**, 738–752 (2019). <https://doi.org/10.1038/s41580-019-0172-9>