



Hamilton Institute

Stochastic Modelling and Immunology: How Many Populations? How Many Cells? How Many Encounters?

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Abstract: More than 10^{11} T cells circulate through the human body, using T-cell receptors (TCRs) to probe the surfaces of antigen-presenting cells they come into contact with. Any one T cell expresses only one type of TCR on its surface, on average about 30,000 per cell. How many different types of T cells do you have? T-cell activation relies on encounters with dendritic cells in lymph nodes. How many dendritic cells are required to initiate a T-cell response?

We present a stochastic model of the T cell repertoire, based on competition between large numbers of clonotypes. We also present a simplified theoretical model, approximating the movement of cells in a lymph node by Brownian motion, that yields simple expressions for the rate of contacts between two types of immune cells that are compared with direct experimental measurements from Institut Pasteur.

Venue: Seminar Room, Hamilton Institute, Rye Hall, NUI Maynooth

Time: 2.00pm - 3.00pm

Travel directions are available at www.hamilton.ie