Hamilton Institute

A JOINT SEMINAR WITH THE DEPARTMENT OF BIOLOGY, NUIM

From single B cells to the population level in vitro and in vivo: development of quantitative systems to screen therapeutics for manipulation of the antibody response

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Abstract: Lymphocytes, the principal agents of adaptive immunity, undergo atypical pattern of response following stimulation in vivo: the cells proliferate, differentiate to effector cells, cease dividing and predominantly die, leaving behind a small proportion of long-lived memory and effector cells. Understanding the underlying processes that regulate this response is important for developing interventions to enhance immunity in immunocompromised individuals, or restrict the response in auto-immune patients. Using reductionist in vitro experimental methods, we have dissected the components of proliferation, survival and differentiation and how they interact to generate this response. Here, the population division tracking and single cell video microscopy experiments used to construct this model will be described. Our results demonstrate that a simple stochastic model of simultaneous competing processes, the Cyton model, provides an accurate tool for quantifying the lymphocyte response. In addition, applications of the Cyton model will be demonstrated. Specifically, how intrinsic genetic factors or changes to the external environment can regulate B lymphocyte fate. Finally, long term in vivo microscopy experiments will be described that highlights the potential to understanding how specific microenvironments might influence the immune response.

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

Time: 2.00pm - 3.00pm

Travel directions are available at www.hamilton.ie