Hamilton Institute

Lifecycle of HIV-infected Cells

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Abstract:
In HIV dynamics models, it is commonly assumed that HIV-infected cells all have the same viral production and death rates. We explored the dynamics of viral production and death in vitro to determine the validity of this assumption. We infected human cells with HIV-1 constructs that expressed enhanced green fluorescent protein (EGFP) and determined the amount of viral proteins produced by infected cells. Analysis of the flow cytometry data showed that the productively infected cells exhibited a broad, approximately log-normal distribution of viral protein content (spanning several orders of magnitude) that changed its shape and mean fluorescence intensity over time, and that population death rate apparently did not correlate with its mean EGFP content.

We assumed that the observed EGFP fluorescence level represented the balance of protein production and degradation. In our model of the infected cell population, EGFP fluorescence distribution at any time depended on probability distributions of four independent parameters: time to the start of protein production, protein production and degradation rates, and the lifespan of infected cells. After exploration of possible combinations of parameter distributions, we found that a distribution of protein production rates that is negatively correlated to the times to start of production of viral can explain the observed time course of the distribution of EGFP intensity.

Venue: Seminar Room, Hamilton Institute, Science Building, NUI Maynooth

Time: 2.00pm - 3.00pm (followed by tea/coffee)

Travel directions are available at www.hamilton.ie

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