Predicting pathogen-specific CD8 T cell immune response from a modelling approach.

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The development of vaccines geared towards the generation of a CD8 T cell immunity may provide protection from diseases caused by intra-cellular pathogens with high mutational rates that escape humoral surveillance. However, the development and monitoring of vaccines in pre-clinical models is a long process and tools, such as mathematical models, that could predict the generation of memory CD8 T cells from early events of the response, would help saving time and money and would improve ethical issues. We have previously developed a minimal mathematical model that captures the dynamics of a CD8 T cell response described in the literature. Here, we will describe an extension of this model that allows the description of CD8 T cell responses to infections with a live pathogen. This model can fit three series of experimental data of the total CD8 T cell dynamics in response to *influenza* and vaccinia viruses as well as *Listeria monocytogenes* infections. Systematic analysis of the parameter space identified common and specific features of the three responses and demonstrated the robustness and predictive capacity of the model.