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Outcome prediction in a mathematical model of immune response to infection MANUEL MAI, Yale University, KUN WANG, MICHAEL KIRBY, Colorado State University, MARK D. SHATTUCK, City College of New York, COREY S. O'HERN, Yale University — In clinical settings, it is of great importance to diagnose patients in the shortest amount of time and with the highest achievable accuracy. Current open questions concerning the modeling of the host response to infection include: How many measurements and with what frequency are needed to diagnose patients with a given accuracy? What is the effect of patient variation on the prediction accuracy? We employ machine-learning techniques to predict disease outcomes from data generated from a set of ordinary differential equations (ODE) used to model the immune response to infection. ODE models have the advantage that we can generate an unlimited amount of data, and we can easily simulate patient differences by varying model parameters. We explore the dependence of the prediction accuracy on data sets generated from the sets of ODEs as a function of the number of and spacing between measurements, number of measured variables, and the size of the patient variability.

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