

Preface

The new experimental and imaging techniques of the past few decades allow us to observe, study and ponder the world of cells and molecules inside our bodies, stimulating the development of new mathematics and putting a new perspective on our view of our own world.

Whole new areas of immunological research are emerging from the analysis of experimental data, going beyond statistics and parameter estimation into what an applied mathematician would recognise as modelling of dynamical systems. Stochastic methods are increasingly important, because stochastic models are closer to the Brownian reality of the cellular and sub-cellular world.

This volume contains chapters on mathematical modelling, on immunology, and on mathematical modelling in immunology. Although there is a bias towards the adaptive immune system, and towards T cells in particular, the reader will find Chapters on dendritic cells, B cells and germinal centres.

We hope the list of abbreviations will help to indicate the type of research that is being carried out at the interface of mathematics and immunology.

This book would not have been possible without the passion and perseverance of Joseph Burns. We are extremely grateful for the support, assistance and patience of Andrea Macaluso, Jeffrey Ciprioni and Melanie Wilichinsky.

That the two of us are doing research in mathematical immunology at all is due to the influence of David Rand, Nigel Burroughs and Hugo van de Berg.

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