

## Guest editorial

### Immunology

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*Ahmed Wadee's ranging research interests include, but are not limited to, the immunology of tuberculosis. His many years of research experience in the field have included macrophage, T cell, cytokine and cytokine activated killer cell interactions with mycobacteria and other immunological disease states.*

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Immunology can be defined as a study of the mechanisms responsible for resistance to infection. However, these same mechanisms may occasionally also be responsible for the production of disease symptoms. Until a few decades ago immunology was almost synonymous with microbiology and infectious disease medicine; it has subsequently developed into a major independent discipline.

Infectious diseases are among the strongest agents of natural selection, and adaptations constituting the armament of pathogens and the consequent defensive action of the host involve many of the most fascinating mechanisms in biology. Despite the well-developed innate and adaptive immune mechanisms providing host defence, either individually or in concert, aberrations resulting in a breakdown as a consequence of a defective or an overactive immune system may result in disease. This edition of *CME* focuses on some aspects of immunology and the diverse range of conditions encountered in general practice. Disturbances of the immune system are a common feature resulting in serious, and sometimes life-threatening, infections. The topics were selected to provide a simple and practical approach to a few of these disorders and are useful to medical students and general physicians. We cover the understanding of basic mechanisms and interactions of the various components of the immune system and possibilities of therapies in various clinical conditions.

Innate immune mechanisms as discussed by Anderson and Wadee demonstrate the effectiveness of the first-line host defence against microbial, viral and parasitic pathogens. These mechanisms cover the natural defences as the anti-infective agents

including glycoproteins, proteins, cytokines and cellular elements act as the barrier against invasion. The breakdown of the innate immune system is discussed in the light of orders such as cystic fibrosis, and acquired and primary immunodeficiency disorders associated with abnormalities of complement, cytokine and cellular (neutrophil) function.

Buldeo *et al.* discuss primary immunodeficiency diseases (PIDs) as disorders resulting from defects in the development or function (or both) of the immune system. These include mutations at the genetic level, the cause of each and the possible therapeutic regimen that may be followed. This article also explores possible reasons for under-diagnosis of patients presenting with recurrent, persistent, severe or even unusual infections due to PIDs.

Tiemessen and Martinson review data suggesting that early treatment for HIV infection is beneficial to control the disease in an individual and to prevent on-going HIV transmission. Their observations focus on heterogeneity in immune and genetic characteristics between individuals resulting in HIV infection progressing/non-progressing. These different factors and combinations of factors may be important in playing a crucial role in patient response to infection. Work of others, and that emanating from their laboratory, suggests possibilities of biological approaches and the identification of pathways that may be involved in the natural control of the infection and the possibilities of future treatments.

Meyer presents an elegant review of biomarkers and genes that play a role in rheumatoid arthritis. The review focuses on the latest classification and diagnostic

value of laboratory findings for rheumatoid factors and anticitrullinated peptide antibodies and the identification of specific cytokines and their receptors together with host HLA. Combinations of the use of all of these may be valuable in predicting disease outcome and possible therapy.

Occupational allergies caused by agents in the workplace are progressively increasing and Singh explores trends in occupational allergies, and the diversity and complexity of causative agents/inducers. Atopy, psychological stress and genetic variability have been associated with various occupational allergic diseases. Insights into disease management that may lead to the development of novel preventive and therapeutic strategies are discussed.

The valuable role of the South African Bone Marrow Registry (SABMR) as presented by Du Toit *et al.* should be applauded. The SABMR's international role in providing unrelated donors for allogeneic stem cell transplantation is well established and recognised. This service includes liaising between the patient's doctor and local donors, or the international donor registry, and assists the transplant centre with the selection of the best HLA-matched donor at a DNA level.

The papers outlined above and appearing in this issue of *CME* are in essence practical and informative and also provide a useful backdrop to the modern immunology laboratory and its usefulness. They also suggest a way forward in some aspects of proper and rational patient care. It is hoped that the reader will appreciate the importance of careful clinical examination and logical interpretation of symptoms and signs in arriving at a diagnosis and in planning treatment.