PREFACE

Clinical biochemistry (clinical chemistry) is an analytical and interpretive science. The analytical part involves the determination of the level of chemical components in body fluids and tissues. The interpretive part examines these results and uses them in the diagnosis of disease, the screening for susceptibility to specific diseases and for monitoring the progress of treatment. The analysis can be for the presence of abnormal components, normal components in abnormal amounts, and for monitoring the level of therapeutic drugs.

The analysis requires the use of a variety of techniques and instruments. This book is designed to cover the major techniques and analytical instruments used in clinical biochemistry. Hands-on experience greatly enhances the understanding of analytical techniques and instrumentation. Hence, the book is also designed to be used as a laboratory manual.

Each chapter is based on a specific technique, or techniques, with associated instrumentation. These are discussed in some detail, leading into the practical exercises. The first exercises in most chapters are a general introduction to the technique, leading on to those with a clinical bias. Where applicable, the clinical practical exercises are associated with a case history and/or the discussion of the relevance of the assay to diagnosis and prognosis and to monitoring recovery. The practical exercises are set out in an easy to follow step-by-step fashion with details of reagent preparation etc. Each chapter concludes with a selection of appropriate references.

The book is based on material taught in the degree and masters courses in medical laboratory science and clinical toxicology at the Royal Melbourne Institute of Technology (Australia). As with most teaching institutions, access to the latest instrumentation is limited due to a lack of available funds. Hence, some exercises use instruments that have been around for a while. These have an advantage over the latest instruments in that they require a greater understanding of how the instrument works, rather than pressing a few keys on a keyboard. This helps to dispel the "black-box" mentality that some students have towards analytical instruments. We were fortunate in that the major Melbourne hospitals and private pathology laboratories gave us their old instruments when they updated. Hence, we were not too out of date. Where specific instruments are used in the exercises, the analytical procedure should be able to be modified, fairly easily, to suit other instruments.

Most analytical work carried out in a clinical biochemistry (clinical chemistry) laboratory is now undertaken using automated instruments. There are a whole variety of these on the market and in service. These instruments are designed for easy use and can be run by people with little training. This book is designed to educate the users of these instruments about the analytical principles that lie beneath the surface of these pieces of equipment.

The book is mainly designed for students and staff in medical science courses, clinical biochemistry (clinical chemistry) hospital and private pathology laboratory staff. The book will also be of use in a general biochemistry course, as most of the contents are of general interest. Some of the material would be of use in certificate and diploma courses in medical technology. Analytical chemistry students will also find this book of value.