

Preface to Second Edition

The success of our first edition, with reader feedback, has encouraged us to produce an expanded and updated second edition of *Bioanalytical Chemistry*. Over the past decade, we have both read, in the primary literature, about enormous advances in certain areas, including imaging and microfluidic devices. It had also been suggested that an introductory chapter involving instrumental measurement principles and methods would be helpful to readers. New chapters were warranted, and we have included these in our second edition.

Traditional areas of bioanalytical chemistry, such as electrophoresis, chromatography and immunoassay, have also seen surprising and significant developments. An enormous development in 2D electrophoresis, involving the simultaneous separation of two or more cell lysates on a single gel, has provided a quantum leap for proteomic studies. Nanoparticles, quantum dots and new polymers have seen many applications to biomolecule separation and quantitation. We have attempted to provide an introduction, as well as leading references, to these areas in our second edition.

The Argentine-Canadian collaboration of the authors began in the mid-1990s as a result of mutual interests in bioanalytical chemistry research and teaching. Over the years, despite the advantages of modern telecommunications technology, we have found that travel is both necessary and beneficial, especially when the final stages of manuscript preparation are underway. With the north-south travel, we have found that the climate is always pleasant somewhere.

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The expanding role of bioanalytical chemistry in academic and industrial environments has made it important for students in chemistry and biochemistry to be introduced to this field during their undergraduate training. Upon introducing a bioanalytical chemistry course in 1990, I found that there was no suitable textbook that incorporated the diverse methods and applications in the depth appropriate to an advanced undergraduate course. Many specialized books and monographs exist that cover one or two topics in detail, and some of these are suggested at the end of each chapter as sources of further information.

This book is intended for use as a textbook by advanced undergraduate chemistry and biochemistry students, as well as bioanalytical chemistry graduate students. These students will have completed standard introductory analytical chemistry and biochemistry courses, as well as instrumental analysis. We have assumed familiarity with basic spectroscopic, electrochemical and chromatographic methods, as they apply to chemical analysis.

The subject material in each chapter has generally been organized as a progression from basic concepts to applications involving real samples. Mathematical descriptions and derivations have been limited to those that are believed essential for an understanding of each method, and are not intended to be comprehensive reviews. Problems given at the end of each chapter are included to allow students to assess their understanding of each topic; most of these problems have been used as examination questions by the authors.

As research in industrial, government and academic laboratories moves toward increasingly interdisciplinary programs, the authors hope that this book will be used to facilitate, and to prepare students for, collaborative scientific work.

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