

Preface

The famous physician William Osler once said, while instructing a student during an autopsy, "it is always best to do a thing wrongly the first time." Indeed, in the fledging stages of our scientific careers we are likely to make not just one but many mistakes. Although one can learn from one's mistakes, we believe that some can be prevented by appropriate instruction and reading. Nobel Prize winner Max Perutz allegedly complained that in his opinion "many young scientists work too much, and read and think too little." If this was the case 50 years ago, it is probably a larger problem today. The pace of graduate studies has accelerated, and it is often difficult for students to find the time to read even the most relevant scientific articles, not to mention entire books that have been written on the various themes that we present in this book. We are not aware of any other textbook that includes most of the subjects dealt with in this volume. Our wish in creating this book is to make academic life easier for graduate students.

The history of this book began several decades ago, when the three of us started to arrange courses to help PhD students avoid some of the pitfalls that we ourselves experienced, and to teach them some basic rules, *lege artis*, for doing research. At the turn of this century, a national program was adopted in Norway that applied to all students enrolled in doctoral programs at Medical Schools. It included a compulsory course that covered a broad range of topics and that came to comprise the basis of a textbook, which was first published in Norwegian by Gyldendal Akademisk, and later in English by Elsevier, as a revised and expanded version of the Norwegian edition (*Research Methodology in the Medical and Biological Sciences*, 2007). Some chapters of the present book resemble those of the former book, but all chapters have been thoroughly revised. The following chapters are either completely new or have been written by new authors: "Ethics and scientific conduct," "Basic medical science," "Translational medical research," "Qualitative research," and "Evidence-based practice."

There are several reasons for the broad range of topics covered in this book. Master's and PhD programs should train students for competence in research as well as other professional pursuits that require scientific insight, including the basics of the research process. Students entering these graduate programs typically come from a variety of undergraduate

programs, including studies in medicine, natural sciences, social sciences, or nursing. During their undergraduate studies they gain only narrow scientific capabilities, which can lead to difficulties communicating and working with colleagues who belong to other fields even after they have finished their graduate work. This is contrary to the goals established by the European Qualifications Framework (EQF) as to what a student at these levels should know, understand, and be able to do. It is therefore important that graduate studies include schooling in general scientific research, regardless of the specific discipline pursued.

This book is intended for students with varied professional backgrounds. Multidisciplinary communication and research cooperation is increasingly important, as the "learning outcomes" of the EQF imply. Scientists in any one scientific community should be familiar with and should respect the traditions of other scientific communities. This book outlines a possible curriculum for Master's and PhD students in the medical and biological fields. We believe that everyone in these fields should know a little about all the subjects covered in this book, in addition to the deeper knowledge of topics related to their own disciplines.

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