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Careers with the Pharmaceutical Industry

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This book is an updated and revised edition of the 1994 book *Discovering New Medicines*. The title was changed to more accurately reflect the content, which is a discussion of careers in and around the pharmaceutical industry.

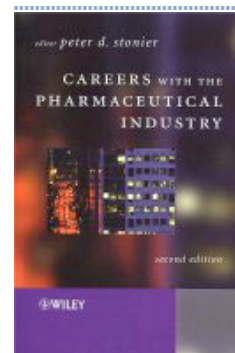
During the nine years between editions, there have been significant changes in all areas of the pharmaceutical industry, including the information and technology used in the research and development of new drugs, and the business environment in which those finally approved new pharmaceutical products are marketed.

The delicate balance between the potential benefits of successful treatment and the risk of adverse effects continually presents new challenges to the drug discovery industry. These factors have caused significant changes in not only the tasks performed by various people within the industry, but also in the type of positions, and career tracks that are needed in this industry. It is these changes that necessitated, and are reflected in, this updated edition.

There are 28 authors in this volume, 25 are from the UK, and one each from the USA, Australia, and Switzerland. Obviously, this book focuses on the UK pharmaceutical industry. This is not a small industry — it employs about 60 000 people directly, with an additional 250 000 people in the related supporting, servicing and regulating industries. Many of these supporting positions are in academia, health care, government, contract research and consulting positions. Other European Union countries are mentioned, for example, when talking about reciprocity of training credentials, but it is definitely a UK-centric book.

That being said, the fact that I do not have a first-hand or thorough understanding of the UK health care and educational systems made it difficult for me to judge the accuracy and comprehensiveness of the information in this book.

If you are just looking to get ideas about possible new careers, and follow up with networking and further investigation, this volume is a nice complement to many others already out there. If you are already familiar with these types of positions, and are looking for more detailed insight into the US marketplace, you would do better looking elsewhere.



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In addition to the Eurocentric view, the main thing that differentiates this book is its focus on the regulatory end of the pipeline, instead of the actual laboratory work of pharmaceutical research and discovery.

This book discusses jobs such as managing clinical trials, regulatory affairs, sales and marketing, and so on. Most of these positions are involved very late in the pharmaceutical discovery cycle, after a promising new chemical entity has been identified, and has passed a significant numbers of in-house screens. The author admits up front that manufacturing, business management and administration are not covered in this volume, but the core areas of clinical trials, marketing and sales are well represented.

In addition to providing information about potential career paths, this volume also provides interesting insights for those curious about how new drugs pass regulatory hurdles and come to be available in the marketplace. Many people outside the industry do not realize the full extent of clinical trials that a potential new drug goes through before being approved for use in humans.

Once a promising pharmaceutical compound has been identified, it is put through a series of rigorous clinical trials, where it is evaluated for safety and efficacy in human beings. These generally include trials with healthy male volunteers, usually college students or prisoners (with consent) to determine safety and dosing levels, followed by trials on those with the disease of interest, to confirm safety and determine efficacy. Later trials with larger numbers of patients, and even post-marketing studies are also often required. Managing all these trials, and understanding the data that comes out of them, requires large numbers of trained professionals.

This book is divided into five parts, each consisting of several chapters. The first part is 'Background to Medicines Research and Development', which contains three chapters:

1. Pharmaceutical Medicine — A Specialist Discipline
2. The Contribution of Academic Clinical Pharmacology to Medicine Research
3. A Career in Drug Discovery

The first chapter describes the brief but interesting history of drug regulation worldwide, including the development of the United States Food and Drug Administration (FDA) and the various other national regulatory agencies and pharmacopoeias. Regulation and patent control did not spring up overnight, but were created in response to specific human tragedies. It is common knowledge that the unforeseen adverse effects of thalidomide on the fetuses of pregnant women led to the creation of regulatory agencies throughout Europe. However, it is less well known that an earlier incident involving sulfanilamide in diethylene glycol, which resulted in the death of 107 people in the late 1930s, led to the formation of the USFDA.

There is a wonderful set of tables in this chapter listing the professional support organizations and standard setting bodies for many of the pharmaceutical disciplines, as well as post-graduate degrees that are available and the universities that offer them. Of course, these are UK-based organizations and schools, which may or may not be of interest to those in other parts of the world.

The second chapter in this section talks about how academic clinical pharmacologists can participate, by applying their research in dose-response, special patient populations, interactions and compliance to specific pharmaceutical problems, and the final chapter in this section gives a very brief overview of the drug discovery process.

The second major section is 'Careers in Pre-Clinical and Clinical Research', and is composed of the following chapters.

4. A Career in Clinical Pharmacology

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5. Career Opportunities for Physicians in the Pharmaceutical Industry
6. The Clinical Research Associate
7. Clinical Trial Administrator and Study Site Coordinator — Key Roles in Clinical Research
8. Statisticians in the Pharmaceutical Industry
9. Careers in Data Management
10. Working in a Contract Research Organisation

Each chapter discusses the specific educational background required to get started in that field, and at what places in the pharmaceutical pipeline such a background would be useful. Many chapters also include information on advanced education and training, possible paths for career progression, and in a few cases even a prediction as to how the career opportunities in that field will change over the next few years. Specific personal characteristics and skills that are required, or that contraindicate, that career path are also discussed. The final chapter in this section talks about a type of employer rather than a career field — the contract research organization — but the issues are similar.

'Careers in Sales and Marketing' is the third section, which includes two chapters, 'A Career in Product Management' and 'A Career in Medical Sales and Medical Sales Management'. These chapters discuss careers such as product/brand manager, medical representative, sales manager and so on, discussing what types of things people in these positions do, how they do them, and what type of educational background and experience is required. Specific valuable skills and aptitudes are also discussed.

The fourth section is 'General Careers with the Pharmaceutical Industry', which contains chapters on a number of healthcare related careers:

13. The Role of the Pharmacist in Health Care
14. Careers for Nurses with the Pharmaceutical Industry
15. The Toxicologist in Pharmaceutical Medicine
16. A Career in Clinical Quality Assurance
17. A Career in Product Registration and Regulatory Affairs
18. Careers in Drug Safety and Pharmacovigilance
19. Careers in Medical Information
20. Medical Writing as a Career
21. Career Opportunities in Medicines Regulation — The Medical Assessor
22. Pharmaceutical Law — A Growing Legal Speciality
23. Industry Careers for Pharmacoeconomists
24. Consultant in Pharmaceutical Medicine

These chapters describe traditional careers for these health-care related professions, as well as less well-known opportunities within the pharmaceutical industry. The issues discussed in these chapters are similar to those in the second section — educational background, training, roles and responsibilities, qualities and abilities required, and possible career paths. Many of these fields are not something in which you would major in school, but fields for which a strong science background is a prerequisite. This section also defines many specialized terms used in pharmaceutical regulation.

The final slender section is 'Career Progression', comprised of three chapters:

25. Landing that Job — Recruitment, CVs and Interviews
26. Career Development in Pharmaceuticals
27. Opportunities for Education and Training in the Pharmaceutical Industry

This section talks about career development in the internet age — how to write a CV and cover letter, how to handle an interview, and how to negotiate a job offer. Again, the advice presented here is based on the

UK work place, and may or may not be applicable to other countries.

The advice on planning your own career path, and being proactive about getting what you want out of your job, applies to everyone. The final chapter has general advice on how to evaluate opportunities for continuing education, and a list of advanced training sources available in the UK. Like any good career resource, this volume makes the point that in order to guarantee employment, you must acquire transferable skills through continuing education and training, and maintain both flexibility in where and how you are willing to work.

Opinions expressed here are those of the reviewer and not necessarily those of Elsevier.

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