

The Science and Business of Drug Discovery

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Demystifying the Jargon

 Springer

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To Rosie

Preface

Jargon, according to the *Concise Oxford Dictionary*, can either mean unintelligible words, or gibberish, barbarous or debased language, or else a mode of speech only familiar to a group or profession. Anyone trying to approach the drug discovery industry from the outside might have some sympathy with all of these definitions, particularly if required to deal with industry insiders on a professional basis. The language may indeed seem barbarous or gibberish, but mostly of course, it is the mode of speech familiar to the scientists, clinicians and business people who are responsible for discovering and developing new medicines. All the different professional groups that deal with the pharmaceutical industry will be exposed to the jargon at some point, because the business is highly technical. It is true that a non-scientist, for example, in a technology transfer office, will not be expected to have a detailed knowledge of a product or service being offered to a pharmaceutical company because that is normally left to technical colleagues. On the other hand, he or she should at least be able to recognize where these offerings fit into the bigger picture of drug discovery and why their clients might be interested in taking discussions to another level. In some ways, listening to scientists talking in a business meeting is the same as listening to conversations in a foreign language; just having a sense of the meaning rather than the full detail is enough to avoid feeling excluded. These general principles apply to other professions as well, such as recruiters and translators who, of course, have their own specific issues with jargon. So the need for a guide to the drug discovery industry for non-specialists is clear enough, but what form should it take?

One possibility is a training program like the *How the Drug Discovery Industry Works* course that I run in Cambridge, England. Although it is quite possible to cover the main points about the biopharmaceutical industry in a single day, only a limited amount of information about such a vast subject can be conveyed to delegates without all concerned feeling that they had just finished the New York marathon. My thoughts turned to producing something that could be hosted online. This not only has obvious attractions in terms of distribution and reach, but also runs the risk of being submerged in the vast oceans of information available in cyberspace. Since there is something quite comforting about reading the printed word on

paper (or e-Reader), I resisted the temptations of the new and decided to write a book instead. The aim is to provide a thorough review of the technical and business aspects of drug discovery in a way that can be understood by a reader with little scientific knowledge while still retaining the jargon and terminology that is actually used in the pharmaceutical industry. This jargon and terminology can be daunting even to a trained scientist, so in keeping with the second part of the title *Demystifying the Jargon*, the meanings behind the key terms and phrases are explained in simple terms and placed in the relevant context.

There is no single source of information about all the activities occurring within the pharmaceutical industry, as the sheer number and variety of different processes make this impossible. These activities include such disparate topics as the biology of an infectious microbe, or the leakage of contaminating chemicals from bottle stoppers. Reference material about drug discovery and development is, of course, readily available on the Internet and elsewhere, but this is both a curse and a blessing. When approaching the subject for the first time, it is very difficult to put the information in context, to find authoritative sources and to discriminate between what is important and what is not. On the other hand, once the path through the maze of information has been mapped out, the available resources are incredibly powerful and can provide detail on almost any topic. This book focuses on the most important elements of drug development by laying out a smorgasbord of the topics that underpin discovery, clinical trials, marketing and the pharmaceuticals business, without going into excessive detail about specific points. The vast subject of biochemistry, for example, is covered in fewer than two pages, but the information given is sufficient to give the reader a sense of the essence of the subject, so they are in a position to make an informed (rather than random) search of outside sources.

In writing this book, I have drawn upon experiences gained while working in the pharmaceutical and biotechnology industries for over 20 years since leaving academia. I discuss the technical aspects of chemical and biological research from the perspective of a lab scientist and cover more commercial and strategic issues from a research management background. The great challenge is to convey this knowledge in a way that is intelligible to non-scientists and PhD level scientists alike. I hope that I have been able to achieve this by offering a choice of material that can be used or bypassed according to the reader's experience. Chapter 3, for example, covers the chemistry of small and large molecules in a very basic way and will probably be glossed over by anyone with a science background. However, even in a chapter like this, there will be material that is tailored specifically for some aspect of drug discovery and its jargon, so it will still be useful to those with a more advanced knowledge of chemistry.

Science and business move at such a rapid pace that it is sometimes difficult to keep up with events. Despite this, every effort has been made to keep this book as up to date as possible on both the technical and commercial aspects of drug development. New technical areas (or rebranded old ones), such as systems biology, translational medicine and chemical genomics, are covered in various chapters, as well as the full range of molecular entities that have pharmaceutical potential, including nucleic acids and stem cells. Attention is also given to the major structural upheavals

underway in research-based pharmaceutical companies and how these create both opportunities and barriers to those who deal with the industry.

Finally, to make the demystifying process less arduous, this book intersperses factual information with lighter comments and asides gained from personal observations of the pharmaceutical industry and the behaviour of the participants in this fascinating and important world.

A Brief Note About Terminology

The names used to describe the drug discovery industry and the companies that form it are used interchangeably according to context:

Drug discovery industry/company

Pharmaceutical industry/company

Pharma industry/company

Biotechnology industry/company

Biotech industry/company

Biopharmaceutical industry/company

Big pharma

Research and development organization

R&D organization

The context should be obvious in most cases. For example, a big pharma company like Pfizer is clearly not the same as a small biotechnology company, although it does use the same technologies. The term “biopharmaceutical company” is a useful term for companies of all sizes that research and develop new medicines, so this term will be used from now on as a generic name for a drug discovery organization. Clearly, a Research and Development organization (or R&D organization) is not restricted to pharmaceuticals, but the term is still used in practice.

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This book grew out of my drug discovery training courses and it would not have been possible to write it in its present form without helpful discussions and feedback from my delegates, in particular Dr Graham Wagner from Medical Research Council Technology in London. He is an enthusiastic supporter of the approaches I use to explain the complexities of drug development and I am very grateful to him for his encouragement.

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