

Eichmann K. Köhler's Invention. Basel, Switzerland: Birkhäuser Verlag (www.birkhauser.ch); 2005. 223 pages; ISBN 978-3-7643-7173-9; price: US\$69.95

Field of medicine: Immunology.

Format: Hardcover book.

Audience: Immunologists, scientists, students, historians, lay public.

Purpose: The book is a scientific biography of Georges Köhler, the immunologist who invented the technique for producing monoclonal antibodies. He made the discovery with Cesar Milstein, while working as a postdoctoral fellow in Milstein's laboratory in Cambridge, UK. The discovery not only made a revolution in immunology and medicine, but also left a lasting controversy of intellectual property in science. The debate on relative contributions of Köhler and Milstein to the invention of fusing spleen cells with tumor cells to generate antibody-producing hybridomas continues to this day. The writer of the book is Klaus Eichmann, one of the pioneers in the field of antibody research in immunology and a close

collaborator of Georges Köhler, whom he invited to be his co-director at the newly established Max-Planck Institute for Immunology in Freiburg.

Content: The book is divided into two parts. The first part is entitled "The time before," and its 8 chapters address Köhler's way into immunology and his discovery of monoclonal antibodies with Cesar Milstein in Cambridge. The second part of the book describes Köhler's life and work after receiving the Nobel Prize for this discovery. This part is entitled "The time after" and has 9 chapters, which deal not only with Köhler's work at the Max-Planck Institute of Immunobiology in Freiburg and his premature death, but also with the problem of antibodies, which has still not been quite solved. The book ends with two appendices: transcripts of two lectures given by Köhler to general audiences, and the list

of his prizes and awards. Köhler's complete bibliography is also included, together with references and sources of information used in writing the book.

Highlights: Scientists usually have no time to read anything but scientific articles about their research field, students are preoccupied with mastering the body of knowledge from textbooks needed to pass their examinations, whereas lay public may think that non-scientific writings about science would still be a difficult read. However, all of them should read Eichmann's book on Köhler and the invention of monoclonal antibodies. Not only because it will help them understand why this was so important for the science of immunology and why it made a revolution in immunological and medical technology, but also because it will show them the human face of science.

The book, indeed, uncovers many of the faces of scientific research which are not visible from public presentations of scientists and their published works. It introduces us to a young doctoral fellow who has to decide on the course of his scientific career and choose a topic and a place for his first postdoctoral research. We are offered a glimpse into professional and private interactions between a young scientist and his mentor, which in case of Köhler and Milstein led to the dispute over who should have greater credit, both material and professional, for the invention. We also see how the Nobel Prize affects the career of its winner, who was at the young age of a postdoctoral fellow when he got it. To me, as a journal editor and educator of science communication, Eichmann's description of Köhler's presentation of his work to Swedish colleagues after receiving the Nobel Prize is especially illustrative. As this description is so instructive, showing the difference between unskilled and experienced research presentation, I will quote Eichmann's text: "The only noteworthy exceptions were the lectures the Nobel laureates had to give at the Karolinska Institute the following day. Niels Jerne, who liked wine, was so drunk that he could hardly make sense out of his perfectly prepared manuscript. Köhler, who was second, was unexperienced enough to have planned his lecture with far

too many slides. When he ran out of time, he started to rush through his slides, losing his audience in due course. Milstein was last and rescued the event by doing his job well." This paragraph is perhaps the briefest and clearest instruction on how to present research – simplicity, brevity, and clarity are prerequisites for accuracy and understanding of data.

The commercial face of scientific research is uncovered in Chapter 8, entitled "The patent disaster." The chapter describes how the scandal with monoclonal antibody patents influenced the commercialization of academic biomedical research. Before the time of monoclonal antibodies, academic research rarely resulted in patents and products with commercial value. With the development of molecular biology and monoclonal antibodies, science became a profitable industry and patent protection and stock options became facts that scientists have to master together with their research field. Milstein and Köhler never patented the production of antibody-secreting hybridoma cells. Milstein did try, but he was met with a lack of administrative support from the government funding bodies in the UK. The scandal developed when two Americans from the Wistar Institute in Philadelphia filed two patents, both in the USA and UK, on hybridoma technique for antibody appli-

cations. The British authorities were outraged, but a subsequent heated public debate never discovered the culprit for such national disaster, similar to the case with US patents on penicillin, discovered by Fleming in the UK. Today's scientists are not so naive, and the economy of science and technology is as vigorous as any other profession with commercial possibilities.

As interesting and instructive the first part of the book was, the second part, describing Köhler's post-Nobel research is perhaps even more enlightening. We learn a lot about the politics of science – functioning of research institutes, setting research agenda, recruiting best research leaders, and publishing research in prestigious journals. Again, as a journal editor and educator of science communication, I liked Eichmann's honest description of many biases in scientific publishing. Perhaps the most disturbing bias is that of equalling quality of research to person's reputation and not to the actual research. The Latin proverb "Nomen est omen" is so very true in science publishing. Eichmann is very open about how names are indeed "signs" of good science: "Owing to Köhler's reputation, they managed to publish this inconclusive work, representing the major result of the department in 1989/1990, in the *EMBO Journal*, the official journal of the European Molecular Biology Organization,

and in the *Journal of Experimental Medicine*, both in the upper ranges of the impact scale. Other investigators would not have got these papers through the review process, or would perhaps not have attempted to publish these results in the first place.” This is one of the reasons why journal editors would certainly benefit from reading this book.

There are many other interesting human faces of scientific research uncovered in the book – only a few have been addressed in my review and I am sure that there are many more that I did not see. It is for the reader to enter this book as a room with

many mirrors and discover the faces of science relevant for his or her professional and private life. One thing is certain – they will have a great time.

The only fault of the book are typing errors, which occur often enough to cloud the true enjoyment in smooth reading. Here are examples: Figure 5 on page 15, and pages 28, 93, 95, and 105. I am sure that the errors have been already discovered and corrected.

Related reading: Scientist and science historians may enjoy reading the original work of Köhler and his collaborators. Some of the problems addressed

in these articles are still relevant to immunology. Students and lay public may enjoy reading biographies or autobiographies of other famous researchers. For those interested in immunology, there are two books that certainly make an amusing but also enlightening reading: “Memoirs of a Thinking Radish. An Autobiography” by Peter Medawar, published by the Oxford University Press in 1986, and “The Youngest Science: Notes of a Medicine Watcher” by Lewis Thomas, published by Penguin Books in 1995.

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Bradburn N, Sudman S, Wansink B. Asking Questions: The Definitive Guide to Questionnaire Design. San Francisco: Jossey-Bass; 2004. 448 pages; ISBN 0787970883; price: \$35.

Field of medicine: Originally social sciences, but could prove invaluable in public health, epidemiology, social medicine, and medical psychology.

Format: Paperback book.

Audience: Researchers who intend to use any kind of questionnaire will find this book a must-read.

Purpose: To provide an extensive overview and detailed information of methods for questionnaire design and use.

Content: The book is organized into three parts and twelve chapters. The first part covers strategies for asking questions by examining the social context of question asking. It introduces the reader to questioning as a social process where respondents are viewed as volunteer conversationalists. It also reminds the reader of issues such as socially desirable responding and asking about sensitive topics. Ethical issues related to questioning

are also covered, as well as the distinction between a research question and an actual question a researcher may ask respondents in order to get an answer to the research question. Finally, authors give detailed suggestions for beginners in this field.

The second part takes up a main portion of the book and deals with the tactics for asking questions. The first two chapters cover the issues of asking both non-threatening as well as

threatening questions about behavior. Accuracy of respondents' recollection and ways of improving it are also addressed here, and insight is given into various response biases and instructions on how to avoid them. The next topic are questions about attitudes and behavioral intentions are covered. Authors discuss basic preparation that should precede writing new questions for measuring attitudes. Special attention is paid to the wording, as it may have a major impact on the distribution of attitude responses in closed questions which are often used. Different estimates of behavioral intentions, likelihood estimates, and frequency estimates are discussed in the context of their effectiveness under different circumstances. The chapter also deals with the usage of the two main question formats, open-ended and closed ended questions. Here, authors offer explanations why, although there are some important uses of open-ended questions, most questions should still be in the closed-end-

ed format. Questions that measure knowledge and performance are covered in the next two chapters. The following chapter on asking psychographic questions may be of special interest to market and consumer researchers, in that it explains how psychographic questions may be used for purposes of profiling and segmenting people based on how they think and act. The last chapter of the second part deals with collecting demographic data. Here, authors suggest and demonstrate the use of standard methodologies instead of wasting time in determining how to gather this type of data.

Part three is a practical guide on how to draft and conduct a questionnaire and do questionnaire research. The appendices offer a list of academic and non-profit survey research organizations in the US, Canada, UK, and Germany, as well as three complete surveys as examples.

Highlights: The book abounds in examples of questions and offers parts of different surveys, which makes a less experienced

reader especially thankful. Part three "Drafting and crafting the questionnaire" covers many very important issues that can easily be overviewed during questionnaire design. Sections that are especially interesting are those that cover computer assisted interviewing. Glossary at the end makes it a useful resource for quick recollection.

Limitations: Authors may have considered including a few chapters that would introduce a reader to issues important for psychometric evaluation of questionnaires. This, of course, is a topic that demands a book in itself, but it could be useful to offer an introduction on what else to seek in questionnaire design, especially for a readership which is not too familiar with these issues.

Related reading: At the end of each chapter, authors offer extensive information on additional reading related to specific topics covered in the chapter.

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