

laboratories in Switzerland (Swiss Institute for Reactor Research) and France (Center for Nuclear Studies at Saclay), where his interests were in biomedical research and reactor theory. He has a lovely wife and plays a mean guitar.

Tumour Localization with Radioactive Agents
(Proceedings, Advisory Group Meeting, Vienna, December 9-13, 1974)

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Reviewer James M. Woolfenden, MD

This volume, the Proceedings of an International Atomic Energy Agency Advisory Group Meeting held in Vienna in 1974, is composed of 11 contributed papers and group discussions. The purpose of the meeting was to summarize results obtained to date using radioactive tumor-localizing agents and to delineate some possible trends in further development. Characteristics of an ideal radiopharmaceutical for tumor localization are noted in the Foreword:

The present agents for detecting tumors by scintigraphic techniques are not as good as they should be. The ideal agent should be highly specific for cancer with an avid uptake in the tumor, and a fraction which is not taken up by the tumor should be rapidly excreted from the body. The compound should be inexpensive, simple to prepare, heat-stable, easily sterilized, have low chemical toxicity, be reliable and only cause a low radiation exposure. These criteria may never be met at the same time in any one radiopharmaceutical.

The present era of tumor localization with radiopharmaceuticals and external imaging devices was foreshadowed, as one of the contributors notes, as early as 1930 by Herbert Kahn, who discovered that radioactive bismuth could accumulate in tumors. Kahn observed that if adequate equipment were available, the agent could be used for "photographic" diagnosis of a primary tumor and its metastatic lesions. Although no chapter of the book is devoted expressly to the history of tumor-seeking agents, historical citations such as this one help to place the current search for better tumor-seeking radiopharmaceuticals in perspective.

The overall quality of the contributed papers is excellent, and several are outstanding. McCreedy and Trott of the Royal Marsden Hospital provide a detailed survey of the physical and biological factors affecting tumor imaging. In a complementary paper, Hayes of Oak Ridge Associated Universities presents a lucid discussion of factors affecting tumor uptake of radioactive agents.

The stimulating discussions that follow each paper provide useful perspective on the papers and also contribute additional theoretical and practical information on tumor imaging. The "Summary of General Discussion," presented as the final chapter, provides concise guidelines and recommendations for developing new tumor-seeking radio-

pharmaceuticals. This summary should be required reading for anyone interested in tumor localization using radionuclides.

Most of the material presented remains timely, although the meeting was held in 1974. Gallium-67 citrate, which at present is probably the most widely used agent for soft tissue tumor imaging, is considered in some detail. Cobalt-57 bleomycin, which at present is a promising investigational new drug for tumor localization, is briefly discussed, along with other radiolabeled antibiotics that show selective uptake in tumors. Preliminary data are presented that suggest some of the radiolanthanides may have useful tumor-seeking properties; the lanthanides have not yet been fully evaluated in this regard. The chapters on radiomercurials and ⁷⁵Se labeled compounds are now mainly of historical interest.

The final contributed paper by Comar from Orsay, France, presents the potential for tumor localization using compounds labeled with accelerator-produced short-lived radionuclides, such as ¹¹C, ¹³N, ¹⁵O, and ¹⁸F. Development of such compounds poses a number of challenges, particularly in the area of ultra-rapid radiochemistry; as Comar observes, the 2-min half-life of ¹⁵O prevents its use in synthesis of complex molecules or investigation of slow phenomena. Utilization of such compounds also requires proximity to a particle accelerator; Comar anticipates that compact medical cyclotrons, installed in or near hospitals, will become more widely available.

This book is well produced, with a clear typeface and a minimum number of typographical errors. Graphs and line drawings are clear, but the few radiographic and scintigraphic images are poorly reproduced.

Tumour Localization with Radioactive Agents is highly recommended to anyone interested in medical applications of radionuclides. At \$10.00, the book is an exceptional bargain.

James M. Woolfenden is assistant professor of radiology in the Division of Nuclear Medicine at the University of Arizona Health Sciences Center, Tucson. He received his undergraduate degree from Stanford University and his MD from the University of Washington. His current research is directed at developing both improved tumor-seeking radiopharmaceuticals and miniature radiation detectors for in vivo localization of the radiopharmaceuticals. He has been actively involved in clinical studies of radiolabeled bleomycin for tumor localization.

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Reviewer Donald E. Livingston

This volume, costing \$49.00 for 807 pages, more than 6¢ per page, is hardly the kind of tome a person would buy just to find out the contents. Certainly students and