<<分子影像技术及其应用>>

图书基本信息

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前言

Preface As an effective information acquisition and processing methodology for biomedical study, molecular imaging has become a rapidly developing and very promising research area, in which conventional medical imaging technology and modern molecular biology are being combined to non-invasively delineate in vivo physiological and pathological processes directly, sensitively and specifically at cellular and molecular levels. The goals of this discipline are to develop imaging theories, technologies and instruments for studying biological and medical processes as well as diagnosing and managing diseases better, especially for tumorigenesis research, cancer diagnosis, metastasis detection, gene therapy, drug discovery and development. Discussing the problems and challenges in details and illustrating recent progress and future directions, this book introduces novel theories and algorithms, new molecular probes, imaging systems and experiments, final clinical or preclinical applications of recent years according to the traditional research guidelines from the theory, to the system to be probed and then to the application. This book is based on the published research results of our group and other scholars or experts in the area of molecular imaging. The contents can be divided into three sections. The first section presents the details of molecular imaging theory and the system for different modalities, including diffuse optical tomography (DOT), fluorescence molecular tomography (FMT), bioluminescence tomography (BLT), positron emission tomography (PET), single photon emission computed tomography (SPECT), magnetic resonance imaging (MRI) and some other imaging technologies. For optical molecular imaging, the molecular optical simulation environment (MOSE) is presented for the simulation of light propagation both in tissues with complicated shapes and in free-space based on the Monte Carlo method. Furthermore, optical multi-modality molecular imaging, the algorithms and platforms of medical image processing and analysis are also described in this section. The next section starts with radiolabeled molecular probes and then covers oligonucleotide probes, quantum dots, and RGD-based molecular probes. The last section mainly illustrates the applications of molecular imaging in biomedical and life science research, such as clinical practice for tumors, protein-protein interactions, transgenic animals and diabetes-related studies. This book is supported by the National Basic Research Program of China (973 Program) under Grant Nos. 2006CB705700, 2011CB707700 and the Hundred Talents Program of the Chinese Academy of Sciences. In Part I we are grateful to Professor Jing Bai and her group for Chapter 4 and part of Chapter 10; Professor Shanglian Bao and his group for Chapters 7, 8 and part of Chapter 10; Professor Feng Gao and his group who contributed to Chapter 3; Professor Baoci Shan and his group for providing Chapter 6. We appreciate Professor Taiwei Chu, Professor Deming Kong, Professor Wenyou Li, Professor Fan Wang and their groups for writing Chapters 1, 2, 3 and 4 in Part II, respectively. In Part III we are thankful to Professor Yinghui Li and her group for Chapters 1 and 4; Professor Xiaopeng Zhang and his group for writing Chapter 2; Professor Liangyi Chen and his group for Chapters 3 and 5. Finally, we wish to thank our group, Dr. Karen von Deneen, Dr. Xin Yang, Dr. Chenghu Qin, Dr. Xiaochao Qu, Dr. Shouping Zhu and our students Ping Wu, Jinchao Feng, Kai Liu, Jianghong Zhong, Dong Han, Xibo Ma, Xiaoqian Dai, Xiuli Li, Kexin Deng, Dehui Xiang, Xing Zhang, Wei Jiang, Peng Zhao, Fei Yang and others for editing the text and proof-reading the book. We express our sincere thanks to all the authors for making this book possible and successful.Jie TianBeijing, ChinaJune 8, 2012

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内容概要

Jie Tian Editor《Molecular Imaging》 Fundamentals and Applications is a comprehen-sive monograph which describes not only the theory of the under-lying algorithms and key technologies but also introduces a prototype system and its applications， bringing together theory,technology and applications.

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书籍目录

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编辑推荐

《中国科技进展丛书:分子影像技术及其应用(英文版)》通过对分子影像学的基本概念、基本原理、成像方法、研究进展和及其在生物制药领域应用的介绍，为从事医学影像研究和生命科学研究的科研人员提供详尽的理论知识和技术方法。
《中国科技进展丛书:分子影像技术及其应用(英文版)》既有理论算法，又有关键技术，既有原型系统，又有应用实例，是理论、技术与应用相结合的产物。

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