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细胞术方法精要

Essential Cytometry Methods

Zbigniew Darzynkiewicz, J. Paul Robinson and Mario Roederer



Essential Cytometry Methods

细胞术方法精要

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导 读

二十一世纪是生命科学的世纪,生命科学的发展离不开实验技术的进步,生命科学的发展对实验技术提出了更高的要求。细胞术在细胞生物学中的应用是在分子和机体层面揭示生命过程的驱动力。

细胞术由流式细胞术和辅助成像细胞术组成。作为分子生物学分析工具的补充,细胞术是细胞生物学、分子生物学、免疫学、微生物学和医学等领域研究细胞的生物学特性非常重要的实验手段。细胞术对核生物学、生物技术及环境科学等学科的发展也有很大帮助。随着细胞生物学和分子生物学技术的发展及实验仪器设备的开发,细胞术方法不断地被更新,自从1990年《细胞生物学方法》(Methods in Cell Biology, MCB)有6卷(33,41,42,63,64,75)系列发表了关于细胞术的方法学,有260章阐述了不同的细胞术方法。Zbigniew Darzynkiewicz, J. Paul Robinson 和 Mario Roederer 编著的《Essential Cytometry Methods》概括了细胞术的基本原理和最新进展。

本书的优点是系统全面地介绍细胞术相关的新方法。分七个部分分别介绍荧光染料/常规技术、细胞DNA含量分析、细胞增殖和死亡的检测、细胞表面免疫分型、细胞遗传学/染色质结构、细胞生理学分析、微生物和病原体的检测。每一部分又分几个专题介绍相关的实验方法。每一个专题都详细介绍了细胞术新方法的原理、应用、优点,技术的关键点、实验方法、实验结果与讨论、结论,以及在使用时容易犯的错误。为便于读者查阅,还列出了参考文献,大部分章节列出了方法的更新,有助于读者深入了解新的实验技术和方法。

本书的特点是实用性很强。每一章节包括本领域的简短综述和一套简便易学的操作方法,对每一种方法都详细介绍了操作过程及注意事项,给出应用实例,展示实验结果,图文并茂,为相关领域的科学家提供经过时间检验的实验方法手册。读者可以根据自己的实验设计选用合适的方法,提高工作效率。本书不仅是生物、医学等相关专业的本科生、研究生和教师的一本很实用的参考书,也适用于从事生命科学研究工作的广大科技工作者参考。

冯仁青

2011年10月5日于燕园

前 言

自从 1990 年《细胞生物学方法》(MCB)有 6 卷(33,41,42,63,64,75)系列发表了关于细胞术的方法学,有 260 章阐述了不同的细胞术方法。这些卷的编辑试图组织这些章节以描述流式和定量成像细胞术应用最广的方法。这些章节概括这些方法的原理、应用、优点,以及在使用时容易犯的错误,并且在细胞生物学家论坛上进行介绍。在 MCB 系列中,这些内容受到广泛关注,引用率高,对促进不同领域的细胞生物学家改进细胞术方面很有价值。

在 MCB 章节中对细胞术特别高的关注促使出版社计划在命名为“实验室解决方案”新系列范围内出一个特刊“细胞术方法精要”,重点阐述以前几卷介绍的方法中最常用的方法。以高频率引用和相关方法学为入选标准。由于许多方法被广泛应用,这样一个版本介绍当代技术将对许多研究者,尤其是在研究中运用细胞术的年轻研究者而言,是很有帮助的。

编纂时要求这一卷的作者给原文提供短小的前言、修改内容(如果需要),对其负责的章节进行更新。更新突出在方法学的主要进展、新颖试剂、新应用、自从原文发表后开发的姐妹方法。包括更新介绍必要的参考文献。因为有些作者联系不到,特别是在 MCB 33,41,42 卷早期发表的章节,他们的章节还没有更新。编辑对有些熟悉的方法进行了更新。

细胞术方法的应用对细胞和分子生物学、免疫学、微生物学和医学的各个领域有巨大的影响。我们希望这一卷将有助于在其研究领域需要这些方法的许多研究者,激发这些方法在新领域的应用,并且促进科学进步。

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PREFACE

Two hundred and sixteen individual chapters dedicated to different cytometric methodologies were published since 1990 in the six cytometry-committed volumes of the series of *Methods in Cell Biology* (MCB; Volumes 33, 41, 42, 63, 64, and 75). The editors of these volumes attempted to assemble chapters describing the most widely used methods of flow- and quantitative image-cytometry. The chapters outlined principles of these methods, their applications, advantages, as well as possible pitfalls in their use, and presented them to the forum of cell biologists. Within the series of MCB, these volumes received wide readership, high citation rates, and were valuable in promoting cytometric techniques among cell biologists across different fields.

The exceptionally high interest in the MCB chapters on cytometry prompted the Publisher to propose a special edition of the “*Essential Cytometry Methods*” within the framework of the new series of volumes defined “*Reliable Lab Solutions*.” This volume presents the chapters describing the most frequently used methods among those presented in the previous volumes. The chapters were selected based on high frequency of citations and relevance of the methodology. Since most these methods are still widely used, such an edition is contemporary and will be of use to many, particularly to young investigators who are starting to use the methods of cytometry in their research.

Authors of this volume were asked to update their chapters by providing a short foreword to the original text and make corrections in the text, if needed. The update highlights in brief progress in the methodology, novel reagents, new applications, and sister methodologies developed since the original publication. Additional references essential for the presentation of the update are included. Because some authors, particularly of the chapters early published, in MCB volumes 33, 41, and 42, could not be reached, their chapters remain without the update. Some chapters were updated by the Editors who are familiar with the methodology described in them.

Applications of cytometric methods have had a tremendous impact on research in various fields of cell and molecular biology, immunology, microbiology, and medicine. We hope that this volume will be of help to many researchers who need these methods in their investigation, stimulate application of the methodology in new areas, and promote further progress in science.

Zbigniew Darzynkiewicz
Mario Roederer
J. Paul Robinson

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