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Book Reviews: Technical Books Section

...AN EXCELLENT BOOK ON INFLAMMATION PROTOCOLS ...the 62 contributors, mostly from United Kingdom, have done a great job of putting together a variety of protocols to facilitate studies in inflammation under several different scenarios. It is an ever-evolving field, necessitating regular updates on newer protocols and techniques. I wish I had this manual earlier!...

Inflammation Protocols (Methods in Molecular Biology Series, Vol. 225), 1st Edition edited by Paul G. Winyard and Derek A. Willoughby, Hardback, acid-free Paper, 6"x9"
Humana Press Inc., 999 Riverview Drive, Suite 208, Totowa, New Jersey 07512. Publication Date 22 November 2004. xii + 378 pages, ISBN 0-89603-970-6, E-ISBN 1-59259-374-7. Price $99.50

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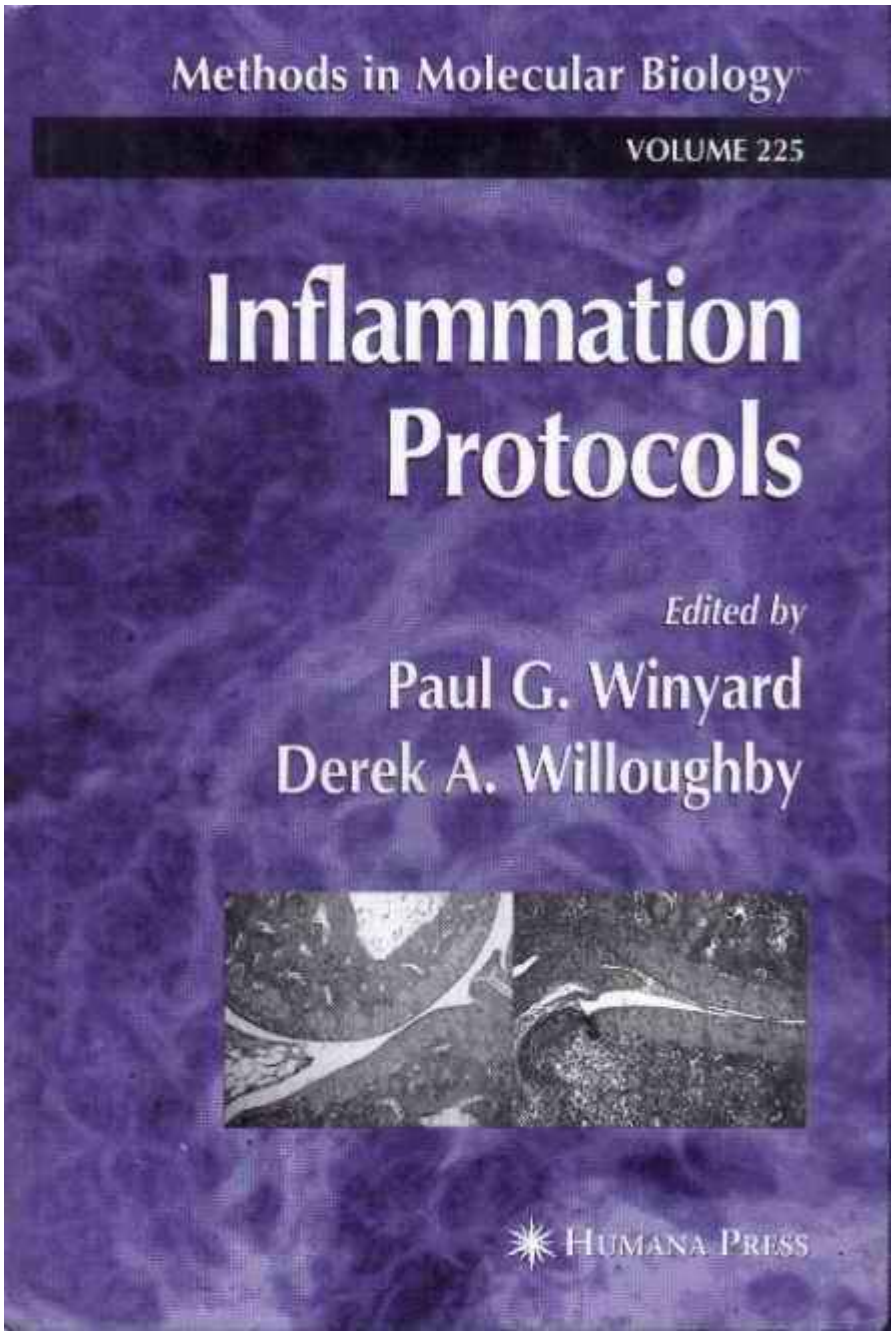

Inflammation is a reaction of bodily tissue to an insult which may or may not be overtly identifiable. Inflammation following infections or trauma is known since ancient times. Aulus Celsus described in seventh century A.D. its cardinal signs viz. calor, tumor, rubor, and dolor. Since then, a great progress has been made in the understanding of the pathophysiology of inflammation and the transduction pathways & events therein including the variety of cells involved, and the regulatory mechanisms. Now we study cell migration, cell proliferation, the prostanoids, leukotrienes and lipoxins, the cytokines and neurokinins, leukocyte adhesion and adhesion molecules, the reactive oxygen species, the oxidative and non-oxidative activity. Besides, clinical implications appear endless, and it is commonplace to talk of inflammation in immunological diseases, malignancies, and in causation of atherosclerosis and myocardial infarction. Not surprisingly, the hunt for drugs against inflammation (steroidal and non-steroidal anti-inflammatory drugs, the NSAIDs) is never ending. All this requires standardized protocols to study the process of inflammation and to unravel the benefits of newer non-steroidal inflammatory drugs.

This volume of Methods in Molecular Biology on "Inflammation Protocols" Eds. Winyard PG, and Willoughby DA, Humana Press (2003) is a step in this direction by putting together several protocols to study basic and applied aspects of inflammation.

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...The editors have put together several of such protocols dealing with transcription factors, adhesion molecules, cyclo-oxygenase-2, COX-2 inhibitors, nitric oxide NO synthases, and metallo-proteinases. with an evident thrust on clinical therapeutic applications as brought out by Professor Derek Willoughby in the two chapters, "In vivo models of inflammation" and "A reply to 'an iconoclastic approach to pharmacodynamics in Model systems: their relevance to humans...
As the author put it, "a proper understanding of the inflammatory basis may provide clues to new therapeutic targets not only in classic inflammatory disease but atherosclerosis, cancer, and ischaemic heart disease as well. Because of the large multidisciplinary scope of inflammatory research, it is inevitable that a protocols collection such as "Inflammatory Protocols" will represent a limited selection of the more important tools for studying inflammation."

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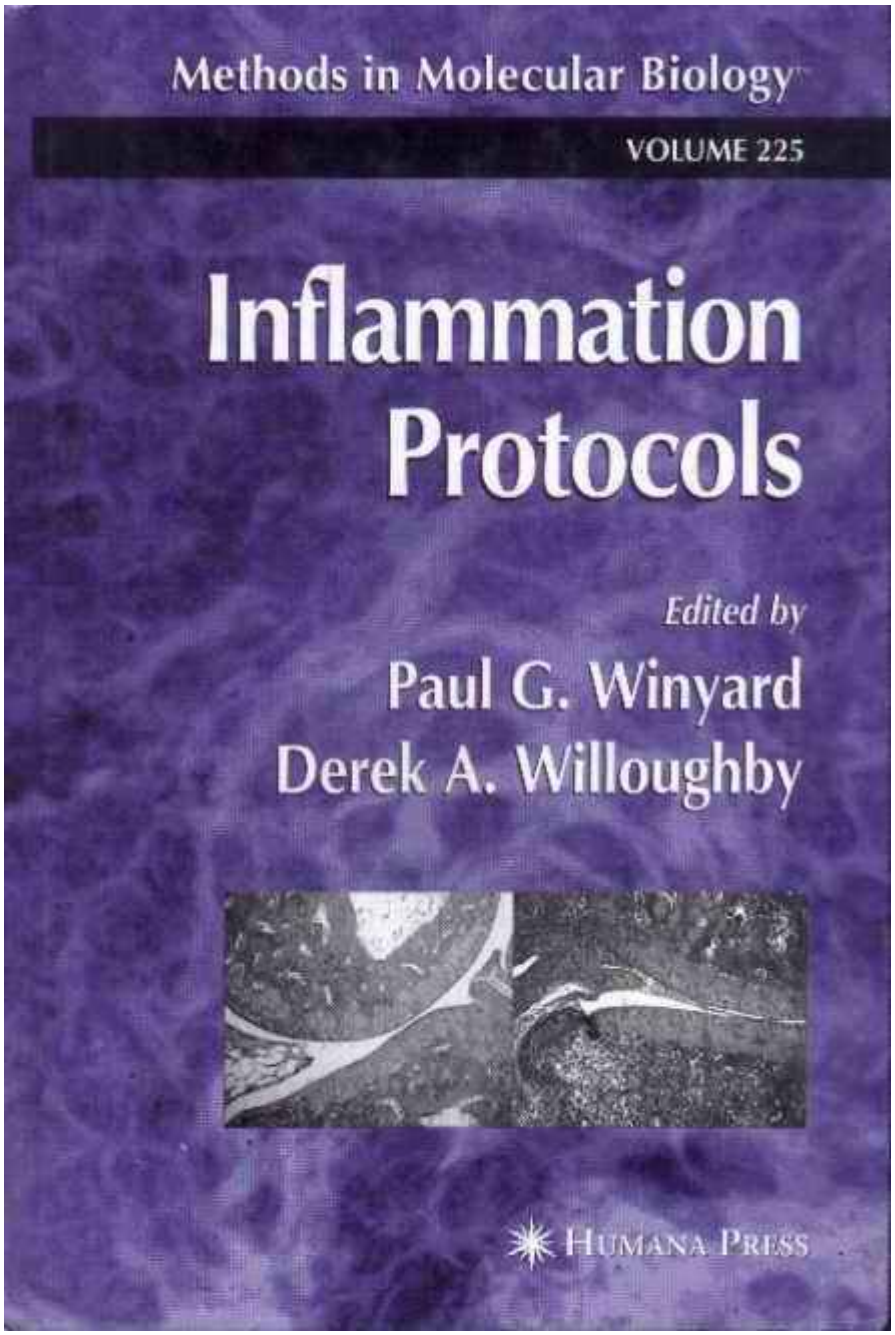
The protocols under the 20- odd chapters follow a precise and clear description in a structured format which makes for an easy referral and comprehension. Each has matter categorized under Materials, Methods, and Supplementary notes providing practical tips too. All this is preceded by an apt introduction to put the protocols in s proper perspective and makes their relevance meaningful. A number of tables, charts, graphs, and other illustrations are included for clarity. All the chapters are well referenced with up-to-date scientific publications, with some chapters running over 50 of them.

The protocols in "Inflammation." are grouped under three sections- i) in vitro systems for studying inflammatory response and testing of anti-inflammatory drugs, ii) in vitro models, and iii) assessment of pharmacodynamic endpoints in experimental models and in human clinical studies. Each section has one or two of the opening chapters to introduce the section and provide an overview on the protocols to follow. Such a division is as much practical as essential to facilitate study of the different aspects of inflammation. The latter is a very dynamic process changing within fractions of a second, making an in vitro replica nearly impossible. Thus, study of cytokines and other mediators is best done in vivo. However, to elucidate the underlying mechanisms and the signal transduction pathways, in vitro models are useful. Both are complementary and are necessary before a pharmacologic agent can be taken up for clinical trials. Hence the segmentation of the book into in vitro, in vivo, and in clinical scenario.

Quick Facts



& Cutting-edge techniques for the study of inflammation in chronic human diseases.
& Pharmacodynamic assays for assessment of antiinflammatory compounds in humans.

The section on in vitro models has protocols to study the transcription factors (F) AP-1 and NF-KB signaling resulting from binding of pro-inflammatory cytokines to membrane receptors, screening of inhibitors of TF, adhesion molecule expression, different aspects of particle phagocytosis, cytosolic free calcium measurement using fluorescent probes, neutrophil oxidase activity assay, complement activation using monoclonal antibodies, matrix metalloproteinase (MM p-2 and MM p-9) activities, aggrecanase generated catbolites using western blot analysis, and human models of joint cartilage degeneration. There are three dealing with articular cartilage inflammation.

And there are another three chapters dealing with arthritis models in the in vivo section. Others refer to models of inflammation in pleura, ear, kidney, intestine, skin, and coronary arteries. There is also an interesting one on seaweed carageenan-induced inflammation.

The final section relates to pharmacodynamic measurements for the assessment of anti-inflammatory compounds using radio-labeled antibodies against adhesion molecules ICAM-1 and V-CAM-1, or radio-labeled leukocytes, immunoperoxidase histochemistry for detection of cytokines/ chemokines/ CAMs, assessment & analysis of nirtic oxide superoxide, assay for COX-2, automated methods for measurement of markers of lipid peroxidation in plasma/ urine/ other tissues, and the assay of acute phase reactant CRP and of the MMPs, and their inhibitors. It is this last section that appealed the most to me looking for protocols in clinical research.

No such manual can be all-inclusive. Nevertheless, the 62 contributors, mostly from United Kingdom, have done a great job of putting together a variety of protocols to facilitate studies in inflammation under several different scenarios. It is an ever-evolving field, necessitating regular updates on newer protocols and techniques. I wish I had this manual earlier!



-Review by Naresh Gupta
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