

# PREFACE

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The revelation that aspirin and aspirin-like compounds have notable antineoplastic properties has revolutionized cancer research. *COX-2 Blockade in Cancer Prevention and Therapy* chronicles the evidence and presents exciting new opportunities for the use of cyclooxygenase-2 (COX-2) blockade in the prevention and treatment of cancer. The text is divided broadly into five areas. First, an historical overview documents the scientific discovery of COX-2 and the pharmaceutical development of nonsteroidal anti-inflammatory drugs (NSAIDs) designed for selective COX-2 inhibition. The process by which essential polyunsaturated fatty acids (PUFAs) stimulate prostaglandin biosynthesis and cancer development, and its interruption by COX-2 inhibition, is elucidated. This is followed by a section on the epidemiology of NSAIDs and cancers of the colon and breast, and other anatomic sites. These chapters reflect significant cancer protection owing to the regular use of common NSAIDs such as aspirin and ibuprofen. A section on animal models of carcinogenesis presents comprehensive evidence that general NSAIDs inhibit a variety of malignant neoplasms in vivo, and highlights recent findings which show that COX-2 blocking agents produce striking chemopreventive effects against colon cancer and breast cancer as well as other malignancies. Genetic models are presented confirming the critical role of COX-2 in carcinogenesis. Section IV then discusses the molecular biology of COX-2 *vis-à-vis* the role of COX-2 and, to a lesser extent, COX-1, in modulating a number of important processes in molecular carcinogenesis such as mutagenesis, cell division, angiogenesis, cell differentiation, and apoptosis. Autocrine and paracrine mechanisms of carcinogenesis are addressed, as well as COX-dependent and COX-independent effects of NSAIDs. Finally in Section V, clinical applications of selective NSAIDs are discussed that are immediately relevant to cancer prevention and control, and future perspectives of utilizing COX-2 blocking agents are projected, which may help reduce the burden of cancer. The comprehensive nature of *COX-2 Blockade in Cancer Prevention and Therapy* makes it an important reference text for applied cancer research and provides a general basis for extended research and development on the antineoplastic properties of COX-2 blockers.

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