
Preface

Osteoarthritis (OA), the most common form of arthritis, is generally characterized by a slowly progressive degeneration of articular cartilage, particularly in the weight-bearing joints. It has a stronger prevalence in women, and its incidence increases with age. OA is a major and growing health concern in developed countries, owing to steadily increasing life expectancy and the demand for better quality of life. Because of its chronic nature and nonfatal outcome, OA affects the growing population of the elderly over an increasing time span. Moreover, despite its relatively benign character, OA is one of the most disabling diseases; it is responsible for increasing financial and social burdens in terms of medical treatments, forced inactivity, loss of mobility, and dependence.

Despite a growing awareness of OA as a medical problem that has yet to reach its maximum impact on society, there is a surprising absence of effective medical treatments beyond pain control and surgery. So far, only symptom-modifying drugs are available, while there remains a major demand for disease-modifying treatments of proven clinical efficacy. This demand will hopefully be met in the future by some of the drugs that have been pressed into development and are now at different stages of clinical investigation. Nevertheless, the current lack of effective treatments reflects a still insufficient knowledge of cartilage with respect to its metabolism, interactions with other joint tissues, and causes and mechanisms (possibly of very different nature) leading to failure of its turnover. As is seen in other therapeutic fields, the future availability of better drugs will depend on a deeper knowledge of OA physiopathology, allowing rational definition of new molecular targets for pharmacological intervention. This new interest in OA is fostering an intense research effort both in academic institutions and in the pharmaceutical industry.

In this context, two volumes of the *Methods in Molecular Medicine*TM series are dedicated to research protocols on cartilage and osteoarthritis. *Cartilage and Osteoarthritis*, Volume 1, *Cellular and Molecular Tools* combines classical but still evolving techniques with emerging methods that promise to add critical knowledge to our understanding of cartilage metabolism in health and disease. Authors with hands-on expertise have described protocols for the in vitro study of normal and osteoarthritic cartilage through biochemical, biomolecular, immunological, and physical approaches. Volume 2: *Structure and In Vivo Analysis* is dedicated to procedures for study at the tissue level of turnover, structure, and functioning of normal and diseased articular cartilage, through invasive and noninvasive means.

We hope and expect that the two volumes of *Cartilage and Osteoarthritis* will constitute a welcome addition to the literature of research protocols, as well as a helpful and trusted laboratory companion.

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