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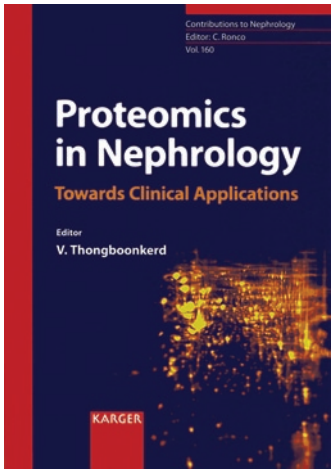
Proteomics in Nephrology: Towards Clinical Applications



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Since the term 'proteome' was first introduced in 1994, the field of proteomics has rapidly grown. Although many scientists have tried to apply simultaneous large-scale analysis of proteins to nephrology, progress has been slow, in part because of technical limitations, challenges in working with serum and urine, and the large number of different cells in the kidney. However, recent methodological developments have enabled the proteomic techniques needed to improve our understanding of renal physiology and pathology, as well as to identify candidate biomarkers to improve diagnosis and therapy.

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The second volume of *Proteomics in Nephrology*, published in 2008, gives us an excellent introduction to this dynamic field and an updated summary of recent scientific discoveries and clinical trials. This book reviews the rapid progress in proteomics in a wide range of renal diseases. Like the first volume, it was edited by Visith Thongboonkerd of the Medical Proteomics Unit, Siriraj Hospital, Mahidol University in Bangkok, Thailand, who is an established expert in this field. A group of international experts in protein-based approaches to different kidney diseases contributed to each of the different chapters.

The current volume is quite different from the first, which provided more of an overview of proteomics and data on different kidney cell types and urine. The second volume handles different renal diseases in separate chapters and is a very practical book. Studies of acute kidney injury (AKI) are emphasized. There are a host of candidate biomarkers for AKI, and although many are promising, to date, none has been validated for clinical use. Using biomarkers from the urine proteome to monitor drug responsiveness in nephrotic syndrome and allograft rejection is currently challenging; however, there is the promise of noninvasive detection of early progression, and of ways to minimize drug toxicity. The chapter on diabetes provides strong evidence for biomarkers beyond microalbuminuria. Particularly interesting is the section on pharmacoproteomics for diabetes, in which the molecular structures of novel drugs are designed to fit the newly discovered therapeutic target. Metabolomics, a relatively new field analyzing metabolites from biological processes, is discussed as having promise for AKI and risk stratification of allografts. It is nice to see a classic problem, the search for uremic toxins, getting a new discovery angle and emphasis.

Unlike many other technique books, this book has sufficient breadth for the kidney aficionado, with a chapter on stones and also vasopressin signaling. The database and bioinformatics chapters provide a useful perspective on the tough cognitive/computational areas that are keys to this field after the clinical samples and wet-lab work. Chapters on renal-cell carcinoma pathogenesis and newborn obstructive nephropathy demonstrate the importance of learning from areas outside that of many adult nephrologists' usual reading. Current efforts toward constructing a complete database of the proteome for urine and different types of cells in the kidney will be essential for understanding the pathophysiology of various diseases and adopting proteomics as a strong diagnostic tool. There is a lot of redundancy in the book where different proteomic techniques are introduced; however, this is actually helpful for the non-expert—abundant tables, such as the one comparing techniques in the capillary electrophoresis chapter, can be referred to repeatedly. Unfortunately, the book misses the opportunity to

discuss biomarkers for chronic kidney disease and the promise for proteomics here.

The chapters are concise and generally well illustrated, helping even the non-investigator to enjoy this text despite the intimidating title for clinical nephrologists. One of the challenges in such a rapidly developing field is to read a book rather than new publications. However, the field of proteomics has moved more slowly than genomics, and this fun-to-read book is currently useful and will be for some time to come for kidney investigators, clinicians, and trainees.

Proteomics in Animal Model Studies, 2237. Challenges and Future Prospects, 2237. Completing the Proteome Map of the Human Kidney and Urine, 2237. Advancing Proteomics to the Renal Diagnostics Arena, 2238. From Parts Catalog and Biomarkers to Systems Biology, 2239. Genomics is the study of the entire DNA sequence of an organism. Towards Application-Oriented Data Anonymization - Semantic Scholar. Application of Proteomics in Cardiovascular Research - IngentaConnect. Application of proteomics in environmental science | SpringerLink. This article provides a review on the development of the main proteomic and non-gel based technologies, and their applications in environmental science.Â In the clinical arena of the diagnosis and treatment of kidney disease, a major priority is the identification of disease-associated biomarkers that may find application in, for example, population-based preventive screening of early kidney disease, in the early detection of acute renal failure, in the non-invasive diagnosis of acute renal allograft rejection and in the specific non-invasive diagnosis and. Proteomics in nephrology. towards clinical applications. by Visith Thongboonkerd. Published 2008 by Karger in Basel, New York . Written in English. Subjects.Â Proteomics of plasma and urine in primary nephrotic syndrome in children / G. Candiano [et al.] Urinary proteome profiling to search for biomarkers in steroid-resistant nephrotic syndrome / A.Z. Traum, A.D. Schachter. Searching for novel biomarkers and new therapeutic targets of diabetic nephropathy using proteomics approaches / V. Thongboonkerd.