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## Preface

*Thou hast made me endless, such as thy pleasure.  
This frail vessel thou emptiest again and again, and fillest it  
ever with fresher life. This little flute of a reed thou  
hast carried over hills and dales and hast breathed through  
it melodies eternally new. At the immortal touch of thy  
hands my little heart loses its limits in a great joy and gives  
birth to utterance ineffable. Thy infinite gifts come to me  
only on these very small hands of mine. Ages pass and  
still thou pourest and still there is room to fill.*

Rabindranath Tagore (Gitanjali: Song of offerings)

This book is a product of a long-standing interest of the editors to handover compilations of chapters on a number of proteases and their pathophysiological consequences to the scientific fraternity.

The existence of proteases has been known for centuries. Their use was noted very early in our everyday life. In early days, the properties of proteases were exploited by man for food processing. Proteases from *Aspergillus oryzae* were used to modify wheat gluten, a component of bread indigestible to many people, which also affects yield of loaf processing. Gastric juice was demonstrated to be full of proteases and known to be responsible for food digestion.

Proteases play important physiological functions including cell division, regulation of functional and structural protein turnover and activation of zymogens, formation and lysis of blood clot, entry of sperm into ovum and fertilization, processing and transport of secretory proteins across membrane, regulation of gene expression and also in infection of pathogens. Based on the catalytic site on substrate, proteases are mainly classified into endoproteases and exoproteases. However, considering the mechanism of catalysis, proteases are classified into six distinct classes: aspartic, glutamic, metallo, cysteine, serine and threonine proteases.

In the recent past, inhibitors of angiotensin converting enzyme (ACE) and HIV proteases have shown substantial therapeutic success in developing drugs. However, due to difficulties of clear understanding of the selectivity of the active site of target protease, discovery of new drugs appears to be challenging. Therefore,

more basic research is needed on proteases with reference to their physiological and pathological consequences. In this book, eminent scholars illuminated us with new information, which, we believe, will surely benefit researchers to unravel, at least, some of the yet unknown complexities of proteases and their pathological implications.

This book contains twenty-nine chapters, which are contributed by established investigators from across the globe. We are grateful to all the authors for enthusiasm, energy and precious time that they spent on their respective chapters to materialize this project. We would like to thank Praveenkumar Vijayakumar, Dr. Madhurima Kahali and Vinoth Selvamani (Springer) for their persuasiveness to achieve our goal. We are also thankful to Prof. Sankar Kumar Ghosh, Vice Chancellor, University of Kalyani for his encouragement.

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