
Preface

The Small Ubiquitin-related MOdifier (SUMO) molecules are implicated in the regulation of multiple critical cellular functions and consequently associated with several pathologies. Functions regulated by the different SUMO molecules are diverse and in most cases unrelated to those controlled by ubiquitin, with the enzymes regulating protein modification and de-modification by SUMO molecules being distinct to those regulating other members of the ubiquitin family. However, recent discoveries indicate that SUMO-regulated functions can be more interconnected with those regulated by ubiquitin than initially suspected. In this volume of *SUMO Methods and Protocols*, leading experts propose basic and “state-of-the-art” methodologies to explore biochemical, molecular, and cellular biology aspects of some of the many processes regulated by protein SUMOylation. Chapters highlight relevant aspects of the SUMO biology that should contribute to develop fundamental and translational research in this area.

This volume is organized in four parts, which start with an historical overview of protein SUMOylation and a presentation of the methods included in this book. The first part also includes a review on chromatin regulation by dynamic SUMO modifications. The second part of this volume focuses on in vitro techniques including biochemical methods to study mechanistic aspects of protein SUMOylation. The third part includes protocols to be used with cell cultures, which often are the first approaches used in most laboratories. The final part includes methodologies adapted for the analysis in vivo using distinct model organisms. This volume of *SUMO Methods and Protocols* has been written following the highly successful *Methods in Molecular Biology*[™] series format. Each chapter includes a brief introduction to the subject, a list of necessary materials and reagents, a step-by-step reproducible laboratory protocol, and a Notes section detailing tips on troubleshooting and strategies to avoid known pitfalls. Unique and cutting edge, this SUMO Protocols volume provides the necessary procedures for specialists as well as for researchers not familiar with this vital system.

I would like to extend my deepest gratitude to all contributors of this book. Sharing your know-how with the readers of this book is priceless. I would like to gratefully emphasize the special efforts of Michael Matunis and Mark Hochstrasser who contributed with outstanding reviews that provide relevant scientific background to this book. Special thanks to the PROTEOSTASIS COST Action 1307 and the contribution of its members. We (the SUMO community) are grateful to Humana Press for giving us the opportunity to assemble this book and to John Walker for his help in the edition of this book.

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SUMO

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