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Fas Signaling

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PREFACE

More than 15 years ago the isolation of monoclonal antibodies inducing programmed cell death (apoptosis) in lymphoblastic cells and fibroblasts by the groups of Peter Krammer (Heidelberg) and Minako Yonehara (Tokyo) opened the door to a new field of apoptosis research. The identification of Fas/anti-APO-1 (CD95), a member of the TNF receptor superfamily, as the antigen recognized by the death-inducing antibodies and the growing overall interest in apoptosis encouraged a huge number of researchers to take a closer look at this molecule and its functions. This work did not only lead to a detailed understanding of Fas-induced apoptosis and Fas biology but has also defined principle mechanisms which are of broader relevance. For example, the research on Fas revealed a new category of protein-protein interaction domains (the death domain fold), established the "induced proximity" model of caspase activation and also uncovered basic mechanisms of activation of TNF receptors. Moreover, Fas malfunction or deregulated Fas signaling have been implicated in a growing list of pathologies making Fas and its ligand (FasL) attractive targets for the development of new therapies. Recent studies revealed that Fas is more than just a death inducer. It has been found that Fas mediates liver regeneration, proliferation, neuronal differentiation and inflammation. Thus, the Fas field shows more and more diversification over the initial apoptosis-related focus.

We hope that this book will help students and scientists gain a general overview and first-hand information on Fas signaling and Fas biology from leading scientists in the field. In the first part of this book the signaling mechanisms of Fas are summarized whereas the second part of the book focuses on specialized aspects of Fas biology and discusses the medical and biotechnological relevance of the molecule.

Finally, I want to thank the authors of each chapter for their pleasant cooperation and the staff of Landes Bioscience, in particular Cynthia Conomos and Kristen Shumaker, for their great help during the whole editorial process.

Harald Wajant, Prof., Ph.D.