Signal Transduction in Cancer Metastasis
Signal Transduction in Cancer Metastasis

Edited by

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Preface

Cancer remains to be one of the most devastating diseases worldwide since long ago. The poor prognosis of cancer is largely due to metastasis. Metastasis is often depicted as a multistage process in which malignant cells spread from the primary locus to distant organs via circulation. Whereas genetic alterations were suggested to be essential for transformation of primary tumor cells into metastatic phenotype, epigenetic events are equally important, which may be triggered by metastatic factors wherever in the primary tumor locus, blood circulation and the secondary loci. Signal transductions initiated by the metastatic factors are responsible for mediating the molecular and cellular processes leading to metastasis. Blockade of the relevant molecular pathways is one of the most effective strategies for prevention of tumor metastasis. Clinical trials are underway with promising outcome.

In this book, we take comprehensive review in regard with this exciting field of cancer research. Chapter 1 takes a brief overview of recently identified signal mechanisms for each step of tumor metastasis including the initiation stage, intravasation, anti-anoikis in blood circulation, homing, extravasation and final survival in the metastatic site. Chapter 2 makes a completed review for the molecular and cellular events involved in initiation of metastasis. Especially, the signaling mechanisms for mediating tumor progression induced by some important metastatic factors are described. In Chapters 3 and 4, the central roles of MAPK and its downstream effectors MAPKAPK play in each step of tumor metastasis are well delineated. Chapter 5 further describes detailedly about how Grb2 and other adaptor proteins, upstream of MAPK cascade, contribute to metastasis. In Chapter 6, the role of reactive oxygen species (ROS) in tumor progression are highlighted. Moreover, the potential contribution of ROS to cross talk between major signaling cascades that lead to sustained MAPK activation are proposed in Chapter 7. Chapter 8 takes an insight into the signaling mechanisms for dynamic trafficking and turnover of focal adhesion proteins in regulation of traction and retraction forces, which are needed for cell locomotion and invasion. Chapter 9 describes the involvement of Notch signaling pathway which is not only essential for embryonic development but also plays important role in tumor progression. Chapter 10 reviewed the recently identified cancer- and metastasis-initiating cells involved in tumor progression. Especially, signal pathways that are frequently deregulated in cancer stem/progenitor cells...
during cancer progression are highlighted. Chapter 11 describes the role of lipid rafts, a special component within membrane lipid domain, in signal transduction triggered by growth factor receptors leading to tumor metastasis. Finally, Chapters 12, Chapters 13, and Chapters 14 present the signaling pathways responsible for metastatic progression of specific tumors including ovarian cancer, uveal melanoma and hepatoma, respectively.


We hope this book might stimulate more cancer biologists to emphasize this field which benefits devising more effective molecular targeting strategies for prevention of cancer metastasis.

Hualien, Taiwan

Wen-Sheng Wu
Chi-Tan Hu
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