

Contents

List of contributors ix

Preface xv

Part 1 – Introduction to modular organization of the networks of gene functions and cancer

- 1 **Systems biology of cancer progression** 1
Sam Thiagalingam
 - 2 **Lessons from cancer genome sequencing** 7
Antoine Ho and Jeremy S. Edwards
 - 3 **Application of bioinformatics to analyze the expression of tissue-specific and housekeeping genes in cancer** 20
Xijin Ge
- ## Part 2 – Alterations in the regulatory networks of cellular and molecular events
- 4 **Events at DNA replication origins and genome stability** 35
Kathleen R. Nevis, Kimberly L. Raiford, Cyrus Vaziri and Jeanette Gowen Cook
 - 5 **Systems biology approaches bring new insights in the understanding of global gene regulatory mechanisms and their deregulation in cancer** 56
Arnaud Krebs and László Tora
 - 6 **Regulation and dysregulation of protein synthesis in cancer cells** 70
Michael J. Clemens, Androulla Elia and Simon J. Morley

Part 3 – Events responsible for aberrant genetic and epigenetic codes in cancer

- 7 **Genomic instability and carcinogenesis** 93
Mark E. Burkard and Prasad V. Jallepalli
- 8 **Epigenomic code** 113
José Ignacio Martín-Subero and Manel Esteller
- 9 **MicroRNA epigenetic systems and cancer** 134
Holly Lewis and Aurora Esquela-Kerscher
- 10 **Dietary and environmental influences on the genomic and epigenomic codes in cancer** 154
Hamid M. Abdolmaleky, Mohammad R. Eskandari and Jin-Rong Zhou

Part 4 – Functional networks of events that modulate phenotypic manifestation of cancer

- 11 **Regulatory signaling networks in cell transformation and cancer** 169
Yashaswi Shrestha and William C. Hahn
- 12 **RAS signaling networks** 183
Douglas V. Faller and Andrew M. Rankin
- 13 **PI3K pathway in cancer** 193
Amancio Carnero
- 14 **TGF β and BMP signaling in cancer** 204
Panagiotis Papageorgis, Arthur W. Lambert, Sait Ozturk and Sam Thiagalingam

Contents

- | | |
|---|---|
| <p>15 The Wnt signaling network in cancer 222
 Johanna Apfel, Jignesh R. Parikh, Patricia Reischmann, Rob M. Ewing, Oliver Müller, Yu Xia and Isabel Dominguez</p> <p>16 Apoptotic pathways and cancer 256
 Jian Yu and Lin Zhang</p> <p>17 Molecular links between inflammation and cancer 273
 Paola Allavena, Giovanni Germano and Alberto Mantovani</p> <p>18 Cancer metastasis 282
 Sait Ozturk, Arthur W. Lambert, Chen Khuan Wong, Panagiotis Papageorgis and Sam Thiagalingam</p> <p>19 Cancer metabolism 295
 Dimitrios Anastasiou, Jason W. Locasale and Matthew G. Vander Heiden</p> <p>20 Tumor microenvironment: blood vascular system in cancer metastasis 309
 Shantibhusan Senapati, Rakesh K. Singh and Surinder K. Batra</p> <p style="text-align: center;">Part 5 – Current state of the evolving MMMN cancer progression models of cancer</p> <p>21 Genetic alterations in glioblastoma multiforme 323
 Giselle Y. López, Marc Samsky, Rosanne Jones, Cory Adamson and Hai Yan</p> <p>22 Breast cancer 345
 Arthur W. Lambert, Sait Ozturk, Chen Khuan Wong, Panagiotis Papageorgis and Sam Thiagalingam</p> <p>23 The role of growth factor-induced changes in cell fate in prostate cancer progression 361
 Min Yu, Gromoslaw A. Smolen, Daniel A. Haber and Shyamala Maheswaran</p> <p>24 Colon cancer 377
 Anthony Scott and Zhenghe John Wang</p> | <p>25 Biology of human stomach cancer 386
 Bryan G. Sauer and Steven M. Powell</p> <p>26 Pancreatic cancer 409
 Sergii Ivakhno, Kristopher Frese, Simon Tavaré, Christine Iacobuzio-Donahue and David Tuveson</p> <p>27 Deregulated signaling networks in lung cancer 421
 Anurag Singh</p> <p>28 Modular signaling in hematopoietic malignancies 443
 Adam Lerner</p> <p style="text-align: center;">Part 6 – Applications of comprehensive cancer progression models in the fight against cancer</p> <p>29 Role of network biology and network medicine in early detection of cancer 457
 Asad Umar and Simon Rosenfeld</p> <p>30 Systems biology in cancer biomarkers for early detection, diagnosis, and prognosis 464
 Sudhir Srivastava and Karl Krueger</p> <p>31 Prognosis of cancer 473
 Sharyn Katz and Wafik S. El-Deiry</p> <p>32 Cancer pharmacogenomics: challenges, promises, and its application to cancer drug discovery 499
 Lihua Yu and Kevin Webster</p> <hr/> <p><i>Index</i> 518</p> <hr/> <p><i>The color plate section appears between pages 320 and 321.</i></p> |
|---|---|