

Preface

It is a great honor to serve as Guest Editors for these issues of *Translational Lung Cancer Research* devoted to lung cancer. In 1949, in *Cancer*, Karnofsky published the first study on the treatment of lung cancer with nitrogen mustard. Response rates were observed in plain chest X-rays, and the improvement of symptoms was scored from + to +++. After more than 60 years, lung cancer remains an incurable disease, with a five-year survival of around 4% in metastatic disease. The importance of customized chemotherapy is based on the abundant knowledge of DNA repair and the multiple components that influence the complex DNA repair machinery. In addition, importantly, the cornucopia of driver mutations discovered in the last ten years has allowed the development of specific treatments. Along with these discoveries, new mechanisms of resistance, including the release of negative feedback mechanisms and crosstalk among different signaling pathways, has led to new hurdles and new therapeutic strategies based on synthetic lethality.

The primary focus of these issues is the well-known driver mutations in lung adenocarcinomas, not only EGFR and EML4-ALK but also the more recently identified ROS1 and RET, which represent challenges for diagnosis and specific treatments. KRAS mutations still constitute a major challenge in this area. Other druggable mutations, such as HER2 and BRAF, are also explained, as well as the new promise of FGFR1 in squamous cell carcinoma of the lung, which provides hope for specific treatment with FGFR1 inhibitors. Methodologies for developing drugs for the numerous newly revealed driver mutations are also discussed in these issues. Optimal targeted approaches are also necessary to improve the outcome of small-cell lung cancer. Recently discovered gene signatures can identify patients with a high risk of relapse after resection and can help guide adjuvant chemotherapy. Novel technologies, whole-genome-sequencing approaches and the role of circulating tumor cells are also defined in these issues, as well as the new mechanisms of resistance that can be identified through early re-biopsy programs. The state of radiotherapy and the management of elderly patients are also described. With these two issues, we aim to provide practical information epitomizing the rapid progress in the field of lung cancer today and instilling in physicians the confidence derived from this knowledge when dealing with patients. We would like to express our gratitude to all the leading investigators who have contributed to this endeavor and to the Editor-in-Chief for giving us this valuable opportunity to contribute to the growing knowledge of lung cancer today.

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