

Lung cancer is the leading cause of cancer mortality worldwide. Over the last decade, there have been tremendous strides towards improving outcomes for lung cancer patients, in particular those afflicted with non-small cell lung cancer (NSCLC). This progress stems from increased understanding of the genetic and molecular mechanisms of tumor initiation and progression. Identification of various oncogenic mutant forms kinases, such as EGFR, ALK, ROS1, BRAF, and others now affords a targeted treatment option for many NSCLC patients. Immunotherapy with checkpoint blockade antibodies (against PD1 or PDL1) benefits other molecular classes of NSCLC patients, such as those with squamous cell carcinoma and high tumor expression of PD1 or PDL1. Survival outcomes are now improving at a pace never before witnessed in lung cancer management. Simultaneously, the quality of life for patients is improving as well, as these biomarker-driven molecular treatments are generally less toxic than conventional cytotoxic chemotherapy.

This volume focuses on this recent progress. Current challenges that remain obstacles to transforming lung cancer into a chronic or curable disease are also discussed. These challenges include the clinical problem of drug resistance that limits long-term patient survival. Additionally, the profound inter- and intra-tumor heterogeneity present within a lung cancer in individual patients is emerging as a key challenge to the use of molecularly targeted agents including current immunotherapy.

Potential solutions to these challenges are discussed in this volume, bringing hope for the future. These include understanding the molecular basis of drug resistance and elucidating the extent and clinical relevance of tumor molecular and cellular heterogeneity. Improved molecular diagnostics, such as the use of circulating biomarkers (for instance, circulating free DNA in blood) offer for the first time the possibility of “liquid biopsies” to monitor and quantitatively measure disease burden and tumor recurrence or progression on therapy.

We hope this volume enhances the understanding of the importance of continued research to catalyze even greater progress towards converting lung cancer from a lethal disease into a long-term chronic disease, or perhaps even a curable condition, in the years to come.



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