Lung cancer remains the leading cause of cancer related mortality worldwide, mainly due to the late stage of disease at the time of diagnosis and a paucity of curative therapies for advanced tumors. Our understanding of the causes and biology of lung cancer has advanced greatly in the past decade, providing new avenues towards preventing and managing this disease. For example, a sustained emphasis on smoking cessation programs combined with elucidating risk factors to identify individuals that may benefit from screening using low dose computed tomography has led to decreased lung cancer incidence, increased early detection rates and reduction in mortality. In parallel, mechanistic insights into the initiation, progression and response to therapy of the different histological subtypes of lung cancer has spurred tailored therapeutic strategies that have improved response rates and the quality of life of patients with advanced tumors. Specifically, large scale sequencing studies aimed at uncovering the genetic drivers of lung cancer have led to the development of therapies that target mutated components of key cellular pathways on which tumors cells have become dependent on for survival. Tyrosine kinase inhibitors (TKIs) targeting lung adenocarcinomas driven by mutant Epidermal Growth Factor Receptor (EGFR) are the paradigm of this concept, highlighting the clinical potential of designing drugs to specifically target the molecular mechanisms driving cancer development, commonly known as "precision medicine". Recent efforts have identified other drivers mutated in subsets of lung cancer patients that respond to clinically approved drugs, with trials for the next generation of inhibitors currently in progress. Lastly, advances have been made in deciphering immune-tumor interactions in model systems and the clinically setting, with strategies that disrupt immune checkpoints showing tremendous promise in subsets of patients. Together, these findings illustrate the power of translational cancer research, utilizing knowledge of the fundamental biological underpinnings of disease to improve lung cancer patient care.

However, despite these encouraging developments, significant issues remain. First, the majority of lung cancer patients are not candidates for these therapies as they have tumors without mutations in targetable genes, owing either to the lack of an identified driver or mutation in drivers such as KRAS for which the development of inhibitors has proven elusive until recently. Second, patients inevitably develop resistance to treatment with targeted agents, either through secondary mutation of the target gene or downstream activation of their signaling pathways that sustain tumor growth. Similar problems pertain to immune therapy, with checkpoint inhibitors effective in only a fraction of patients and biomarkers of response still largely unknown. Furthermore, screening programs are still hampered by determining which high risk individuals should be enrolled in these programs aside from heavy smokers, limiting their current potential for early detection. Thus, while undoubtedly major advancements in improving patient outcomes, the main goal of increasing long-term survival rates of lung cancer still faces major challenges.

Key Leaders' Opinion on Translational Lung Cancer Research summarizes recent influential studies that have aimed to address the problems described above. Over its four sections, it covers aspects of epidemiology and surveillance, cancer biology, molecular targets and treatment, describing important new findings that will yield the next stage of translational lung cancer research and define patient care in the years to come. These findings are summarized and contextualized by a group of international experts and edited by the AME Publishing team, providing the reader with a complete picture of the current status of the field and highlighting key plans for the immediate future. With the proven success of translating findings from cancer biology to advancements in targeted and immune therapy, this textbook serves as an important foundation for all lung cancer researchers, both established and emerging, and it is my pleasure to provide its preface.

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