

Small cell lung cancer has been called a recalcitrant cancer, mainly because it is a very aggressive tumor type, and is difficult to treat. The majority of patients are diagnosed at an advanced stage, where local therapies are no longer possible. Chemotherapy has long been the standard approach to this disease, in combination with chest radiation in limited disease. Only about 20% of patients with limited disease can be cured, and although small cell lung cancer is exquisitely sensitive to chemotherapy, recurrence is the norm in extensive disease and no cure is possible. Improvements have been obtained by prophylactic brain irradiation and chest radiation in the past two decades, with no new drug approved until very recently.

The biology of small cell lung cancer is now better understood thanks to efforts in next generation sequencing as well as the development of novel tumor models, in particular patient derived xenograft models, and genetically engineered mouse models. The use of cell lines, which have been around for a long time, has provided a great source for studies of the biology of this tumor, but new models are necessary. Small cell lung cancer is, together with melanoma, the tumor with the highest number of mutations, which reflects the fact that this is a tumor which is primarily caused by cigarette smoke. Unfortunately, though, no driver mutation has been so far discovered in small cell lung cancer, which is reflected by the absence of targeted therapies in this disease, unlike in adenocarcinoma of the lung.

Very recently two PD-L1 antibodies have shown a significant improvement in survival in patients with extensive disease who were treated with platinum-etoposide and atezolizumab or durvalumab. Atezolizumab has already been approved by FDA. Nivolumab has also been approved for third line treatment, although the response rate is rather low. These are the first new drugs to show improved efficacy, after over two decades since the FDA approval of topotecan.

This book summarizes the main findings in the biology of small cell lung cancer and the potential for these findings to translate into novel therapies for patients in the future. A large number of clinical trials are now being performed in small cell lung cancer, which will provide a wealth of information when the results will be available. Clearly there is a renewed interest in this disease and advancements are being made, after a long stagnation in the field. This is an exciting moment.



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