How Molecularly Targeted Therapy Changes Our Daily Practice in Treating Cancer Patients— Focusing on recent advances in non-hematologic malignancies

Chih-Hung Hsu

Graduate Institute of Oncology, National Taiwan University College of Medicine, Taipei; Department of Oncology, National Taiwan University Hospital, Taipei, TAWIAN

Over the past decade, molecularly targeted therapy (MTT), by targeting the molecular derangements in cancer cells and/or their microenvironment, has made a paradigm-shift in cancer therapy. MTT agents have not only demonstrated activity in advanced stages of many cancers, but also proven to be useful as front-line and even adjuvant therapy for earlier stages of cancer. Some of them, such as anti-HER2 antibody for HER-2 (+) breast cancer and imatinib for gastrointestinal stromal disease, have become the standard adjuvant therapy for localized diseases after curative resection. The discovery of EGFR with activating mutations and several other genetic alterations as “oncogenic drivers” of lung adenocarcinoma has resulted in a brand-new type of cancer patient management, which is completely different from what we did 10 years ago. The treatment of lung adenocarcinoma has been evolving to be a “personalized” and “precision” cancer therapy tailed to the genetic alterations of the tumors. MTT has also turned several previously-thought difficult-to-treat cancers into treatable diseases. Renal cell carcinoma (RCC) and melanoma were notoriously for the chemoresistance and had little treatment options in the past. Nowadays, patients with RCC can be treated with antiangiogenic agents targeting vascular endothelial growth factor receptor (VEGFR) signaling pathway or drugs targeting mammalian target of rapamycin (mTOR) signaling pathway; and patients with melanoma can be treated with inhibitors targeting B-Raf or MEK if their tumors contain mutated B-Raf gene. As the landscape of genetic alterations of many human cancers have been gradually delineated, new MTTs and other novel therapeutics are expected to enrich our armaments of cancer therapy very soon.