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# FRONTIERS IN CANCER THERAPY

## STOCKING ONCOLOGY'S MEDICINE CABINET

By **Paula A. Kiberstis** and **John Travis**

**A** decade of cancer genome projects has provided a sobering message about the complexity of this disease. Genetic alterations contributing to tumor growth can vary among patients, between primary tumors and metastases, and even within different regions of a single tumor. This heterogeneity can explain why a specific drug benefits one patient but not another and why a patient initially helped by a medication might later present with recurrent, drug-resistant disease.

Cancer's genetic complexity poses a formidable challenge for therapy, but researchers are addressing this challenge on several fronts. There is a growing recognition, for example, that simple changes to the dose and/or scheduling of existing cancer drugs can delay the emergence of drug resistance. For promising drugs such as immunotherapies and tyrosine kinase inhibitors, the search is on for predictive biomarkers that will help identify the patients most likely to respond. And cancer drugs that operate through new mechanisms of action are in the pipeline, exciting many in the field. Among these are molecules that target the activity of epigenetic regulators with established roles in cancer development and molecules that selectively kill tumor cells by exacerbating the detrimental effects of mutations. Other molecules are finally reaching protein targets previously classified as "undruggable." And as the cancer medicine cabinet becomes better stocked, clinicians will continue experimenting with combinations of drugs, which history has shown can be more effective than treating with single agents. It will no doubt take a complex array of therapies to defeat this complex foe.

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In the world of cancer drug development, the path from scientific concept to clinical efficacy is often long and full of unexpected twists and turns.

# Science

## Stocking oncology's medicine cabinet

Paula A. Kiberstis and John Travis

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