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Précis: In AML patient-derived xenografts, treatment with the chemotherapeutic cytostatic selected for a resistant population exhibiting enhanced oxidative phosphorylation, but did not select for quiescent leukemic stem cells.

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JULY 2017 • VOLUME 7 • NUMBER 7
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Transdifferentiation as a Mechanism of Treatment Resistance in a Mouse Model of Castration-Resistant Prostate Cancer


Précis: In a mouse model of Trp53/Pten-mutant castration-resistant prostate cancer (CRPC), abiraterone promotes transdifferentiation of luminal adenocarcinoma to neuroendocrine CRPC to promote drug resistance.

See commentary, p. 673

Caboza

Identification of a DNA Damage–Induced Alternative Splicing Pathway That Regulates p53 and Cellular Senescence Markers


Précis: A DNA damage–induced alternative splicing pathway that includes induction of the β isoform of TP53 as a mediator of damage-induced cellular senescence.

Correction

Adaptive Reprogramming of De Novo Pyrimidine Synthesis Is a Metabolic Vulnerability in Triple-Negative Breast Cancer

Using acute myeloid leukemia (AML) patient-derived xenografts, Farge and colleagues investigated the molecular mechanisms underlying resistance to the chemotherapeutic cytarabine (AraC) in vivo. Previous reports suggested that a refractory quiescent leukemic stem cell (LSC) population underlies AraC resistance, but AraC treatment unexpectedly reduced the number of LSCs as well as mature AML cells, indicating that AraC resistance is not mediated by LSCs. Instead, AraC induced chemoresistance by selecting for a preexisting population of resistant cells that exhibited enhanced oxidative phosphorylation (OXPHOS). AraC-resistant cells showed elevated mitochondrial respiration, and blocking OXPHOS increased AraC sensitivity. Together, these findings demonstrate that high OXPHOS activity is associated with chemoresistance in AML and suggest the possibility that therapeutic targeting of mitochondrial metabolism may enhance chemosensitivity. For details, please see the article by Farge and colleagues on page 716.