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METABOLISM

Craving for glycine

Nearly a hundred years ago, Otto Warburg and co-workers showed that cancer cells have very different appetite from that of normal cells, and they can metabolize approximately tenfold more glucose. Now, Jain *et al.* have shown that rapidly proliferating cancer cells require large amounts of glycine. The authors analyzed 60 well-characterized human cancer cell lines and, using liquid chromatography-tandem mass spectrometry, they created a profile for each of the more than 200 metabolites and determined exactly how much of every metabolite was being consumed or released (CORE) by each cell. This CORE profile revealed interesting metabolic patterns of cancer cells. For instance, while ornithine was released from leukaemia cells, adenosine and inosine were released from melanoma cells, reflecting metabolic activities unique to these cancers.

The researcher then determined whether any metabolite was particularly associated with cell proliferation. Among the more than 200 metabolites analysed, only two, phosphocholine and glycine, were significantly correlated with proliferation rate across all the cancer cell lines. Interestingly, glycine was consumed by rapidly proliferating cells and released by slowly proliferating cells, suggesting that rapidly dividing cancer cells might need more glycine than they can produce whereas slowly proliferating cells might produce more glycine than they need. Specific tumor types—such as ovarian, colon, and melanoma cells—showed increased glycine consumption and faster proliferation rate.

These results may help in developing cancer therapies based on inhibiting glycine influx, which could be effective against highly proliferative cancers often associated with poor prognosis.

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Original article Jain, M. *et al.* Metabolite profiling identifies a key role for glycine in rapid cancer cell proliferation. *Science* **336**, 1040–1044 (2012)