Metabolomics Reveals Vicious Cancer-Biofilm Cycle

Cell Metabolism: Colon cancer stimulates growth of cancer-promoting bacterial biofilms that in turn stoke cancer cells

By Stu Borman

Researchers have proposed that bacterial biofilms might play a role in colon cancer, but experimental verification for the proposal has been sparse. A new study of the phenomenon now reveals a vicious cancer-biofilm cycle: Colon cancer stimulates further growth of bacterial biofilms in the colon, and the biofilms promote further proliferation of the cancer (Cell Metab. 2015, DOI: 10.1016/j.cmet.2015.04.011). The findings show that antibiotic treatment of bacteria eliminates biofilms and therefore might impede cancer development.

Gary Siuzdak of Scripps Research Institute California, Cynthia L. Sears of Johns Hopkins School of Medicine, and coworkers used metabolomics and nanostructure-initiator mass spectrometry imaging to demonstrate that levels of a cancer-promoting polyamine metabolite, N₁,N₁²-diacetylspermine, not only are raised significantly in colon cancer tissue but also are more abundant when biofilms are present in the colon. Antibiotic treatment clears the biofilms and decreases levels of N₁,N₁²-diacetylspermine to normal concentrations. “These results show that colonic mucosal biofilms alter the cancer metabolome to produce a regulator of cellular proliferation and colon cancer growth, potentially affecting cancer development and progression,” the team writes.
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