Induction of cytochrome P450 1A1 and 1B1 in human lung adenocarcinoma CL5 cells by frying-meat emission particulate.

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摘要

Abstract

The effect of airborne frying-meat emission particulate (FMEP) on cytochrome P450 (P450)-dependent monooxygenase was determined using human lung adenocarcinoma cell line CL5 treated with organic extract of FMEP prepared from beef, fish or pork. Treatment with fish FMEP extract caused greater increases of intracellular peroxide production and glutathione content than did beef and pork FMEP extracts. Treatment with 200 microg/ml beef, fish or pork FMEP extract for 6 h increased benzo[a]pyrene hydroxylase, 7-ethoxyresorufin and methoxyresorufin O-dealkylases activities in S9. Immunoblot analysis of S9 proteins from control cells and cells treated with FMEP extracts revealed that the airborne particulates increased proteins immunorelated to CYP1A1 and CYP1B1. Northern blot analysis of total cellular RNA from controls and cells treated with FMEP extracts showed that the cooking by-products increased the levels of CYP1A1 and CYP1B1 mRNA. Treatment with 1 microM dibenzo[a,h]anthracene for 6 h increased monooxygenase activities, CYP1A1 and CYP1B1 protein and mRNA levels in CL5 cells. Beef FMEP extract and dibenzo[a,h]anthracene also induced CYP1A1 and CYP1B1 in human lung carcinoma NCI-H322 cells. The present finding demonstrates that airborne particulates generated during the frying of beef, fish and pork can induce carcinogen-metabolizing CYP1A1 and CYP1B1 in the human lung-derived cell line CL5.