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Blood Cell Origin of Circulating MicroRNAs: A Cautionary Note for Cancer Biomarker Studies
Colin C. Pritchard, Evan Kroh, Brent Wood, Jason D. Arroyo, Katy J. Dougherty, Melanie M. Miyaji, Jonathan F. Tait, and Muneesh Tewari


ABOUT THE COVER

Anchorage-independent growth in semisoluid medium and the formation of xenografts in immunocompromised mice are generally considered to be informative for assessing human cell tumorigenility. Long-term treatment with cigarette smoke condensate (CSC) significantly increases (versus DMSO control or no treatment) the anchorage-independent growth of A549 lung adenocarcinoma cells. A549 cells were treated with CSC for 300 days (mimicking long-term cigarette smoking) and were allowed to grow for 14 days in soft agarose. The cover features a phase-contrast microfotograph (40× magnification) of colonies of these cells that do not require a solid substratum for growth, an important characteristic feature of cancer cells. 300-Day CSC treated cells were injected s.c. into athymic nude mice, producing tumors of significantly increased volume (P < 0.001) and rate of development (P < 0.01) at 12 weeks versus injected 300-day DMSO or parental (no-treatment) cells, not shown. These oncogenic effects were due partly to down-regulation of Smad3. Immortalized bronchial epithelial HPL1A cells, however, did not exhibit similar phenotypes, putatively because these cells may require a longer period of CSC treatment to undergo the additional genetic or epigenetic changes necessary to become tumorigenic. See article by Samanta et al. (beginning on page 453) for more information.