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Identification of differentially expressed genes in human lung adenocarcinoma: ERGIC3 as a novel lung cancer-related gene

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Abstract

To understand the carcinogenesis caused by accumulated genetic and epigenetic alterations and identify novel biomarkers for various cancers, studying differentially expressed genes between cancerous and normal tissues is crucial. Here we constructed two cDNA libraries of differentially expressed genes using lung adenocarcinoma tissue and adjacent nonmalignant lung tissue by suppression subtractive hybridization: the forward-subtracted library (FSL) contained 177 genes and the reverse-subtracted library (RSL) 59 genes. Bioinformatic analysis demonstrated these genes were involved in a wide range of cellular functions. A subset of genes was newly identified to be abnormally expressed in lung cancer. In the first stage of the screening for 16 genes, we compared lung cancer tissues with their adjacent non-malignant tissues at the mRNA level by quantitative real-time polymerase chain reaction, and found six genes from the FSL were significantly up-regulated while two genes from the RSL were significantly down-regulated. The ERGIC3 protein was also over-expressed in lung cancer cells, but it was not expressed in normal bronchial epithelial cells and alveolar cells; likewise its expression was correlated with the differentiated degree and histological type of lung cancer. Furthermore, the up-regulation of ERGIC3 could promote cellular migration and proliferation in vitro. Our data suggests that ERGIC3 may play an active role in the development and progression of lung cancer, as well as it may be a candidate novel lung cancer-related gene and a potential biomarker. These two libraries of differentially expressed genes may provide the basis for new insights into finding novel lung cancer-related genes and biomarkers.

Biography

Mingsong Wu has completed his Ph.D at the Chinese Academy of Sciences. He is an associate professor of Zunyi Medical College and a researcher and teacher at the Department of Cell Biology and Genetics. He has over 10 manuscripts published, mostly on the topic of lung cancer and opioid drug dependence.