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MicroRNAs in lung cancer development and drug resistance

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Our recent study demonstrates that a number of microRNAs (miRNAs) are downregulated in human lung cancer and those levels of miRNA suppression correlate with advanced cancer stages and drug resistance. The miRNA suppression is involved in inducing tumor growth and angiogenesis through the induction of their direct target genes. To understand the suppression mechanism, we found that some miRNAs are inhibited by the DNA methylation while some miRNAs are inhibited by higher levels of reactive oxygen species (ROS) production in cancer cells. MiRNA suppression is important for autophagy response and drug resistance.

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Lumps, bumps, spots and shadows: The unnerving world of the solitary pulmonary nodule

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The pulmonary nodule is a single, spherical, well circumscribed, radiographic opacity that measures, 3 cm in diameter and is completely surrounded by aerated lung. There is no associated atelectasis, hilar enlargement, or pleural effusion. Approximately 150,000 such nodules are identified each year according to dated estimates. The incidence is likely much higher than this because of the increasing use of chest CT scan for the evaluation of a myriad of pulmonary symptoms and disorders. The National Lung Screening Trial has shown screening patients with low-dose CT (LDCT) scanning led to a relative risk reduction in death from lung cancer by 20%. Over the 3-year screening period, however, 39.1% of the participants in the LDCT scanning group had a nodule discovered, of which (96.4%) were benign. Currently, 7 million Americans meet the National Lung Screening Trial screening criteria. Even if only one-fourth of those eligible are screened, a possible 680,000 new nodules could be discovered over 3 years. Should a national policy for screening for lung cancer with LDCT imaging be broadly implemented in the United States, the incidence of pulmonary nodules has the potential to rise dramatically. During the evaluation of a pulmonary nodule, clinicians usually decide on one of three management strategies: Serial imaging, biopsy, or surgery. This decision is based on their initial assessment of the probability that the nodule is malignant and should take into account the patient's comorbidities and preferences. The focus of this talk is to highlight the challenges with each of the management options and future directions in pulmonary nodule management.

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