Pharmacogenetics Approaches to Smoking Cessation Treatment

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Abundant data from animal studies and human twin studies have established that smoking behavior is, in part, heritable. With advances in molecular genetics, recent studies have sought to identify specific genes associated with different smoking phenotypes. Initial studies have found associations of smoking behavior with genes involved in the catecholamine pathways, thereby supporting a more general genetic susceptibility to addictive behavior. Other studies have provided evidence relating smoking behavior to genes in pathways that are more specific to nicotine, such as nicotine metabolism and receptor polymorphisms. The emerging field of pharmacogenetics has the potential to advance the science of nicotine addiction and smoking cessation treatment further by generating new knowledge about genetic factors that influence clinical treatment outcome. The basic premise of this approach is that inherited differences in drug metabolism and drug targets have important effects on treatment toxicity and efficacy. This presentation will review evidence supporting the potential utility of a pharmacogenetics approach to smoking cessation treatment and will discuss briefly the clinical, health policy, and bio-ethical implications of this line of research.