1. No.
   2021Y016

2. Title
   Machine learning-supported prediction of smoking behaviors in psychiatric disorders using genome information and intermediate phenotypes

3. Period
   2021-2023

4. Summary
   The purpose of our study was to elucidate the relationship between smoking behavior and its genetic and environmental factors in patients with psychiatric disorders, specifically through the use of genomic information and intermediate phenotype data in machine learning. Discriminant analysis using brain cortical structure as predictive factors demonstrated that specific cortical features could distinguish smokers from non-smokers among patients with psychiatric disorders, with high accuracy. Furthermore, polygenic scores (PGS) analysis through machine learning revealed that combinations of specific psychiatric disorders and intermediate phenotypes, including smoking behavior, significantly improved the accuracy of diagnosis prediction for psychiatric disorder. These results suggest the existence of common biological factors between psychiatric disorders and smoking behavior. However, predictions based solely on brain structure or genomic information have limitations, indicating the need for combining multiple biomarkers to enhance predictive accuracy. Future research is needed to further improve the accuracy of predicting smoking behavior in patients with psychiatric disorder by integrating more diverse intermediate phenotype information.