

## MRI-Based Personalized Medicine for Schizophrenia: Predicting Antipsychotic Treatment Response using Machine Learning

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### Short Report

This study is based on the growing interest in personalized medicine for the treatment of schizophrenia (SCZ), a complex psychiatric disorder that affects approximately 1% of the global population [1]. Despite the availability of several antipsychotic medications, response rates vary widely, and treatment is often characterized by a trial-and-error approach [2]. This approach can lead to suboptimal outcomes, including prolonged illness, relapse, and poor quality of life [3]. Recent advances in machine learning (ML) and magnetic resonance imaging (MRI) technology have provided opportunities for developing more precise and individualized treatment plans for SCZ patients [4]. MRI provides a non-invasive way to assess brain structure and function, which can be used as a biomarker for predicting treatment response [5]. In particular, previous studies have suggested that MRI measures of brain structure and function may be associated with differential response to antipsychotic medications [6].

This study will use the MCIC dataset [7], which includes MRI data from 230 SCZ patients who were treated with either risperidone or olanzapine. The dataset also includes clinical information such as symptom severity and medication dosage. The study will use ML techniques to extract MRI features and develop predictive models for treatment response to the two medications. The goal is to identify MRI-based biomarkers that can be used to match antipsychotic medications with SCZ patients and improve treatment outcomes. The results of this study have the potential to contribute to personalized medi-

cine in the treatment of SCZ and improve patient outcomes. By identifying MRI-based biomarkers for predicting treatment response, clinicians may be able to select the most appropriate medication for individual patients, leading to improved symptom control, reduced side effects, and enhanced quality of life. Ultimately, this research may pave the way for a more precise and personalized approach to the treatment of SCZ.

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