IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 1, December 2025
Impact Factor: 7.67

Optimizing Drug Safety and Pharmacogenomic Profiling

Miss. Dnyaneshwari Pralhad Gawande, , Dr. Avinash S. Jiddewar, Asst. Prof. Rajani H. Sonone
Miss. Saloni R. Halmare, Miss. Tanvi Vilas Kathalkar
NSPM College of Pharmacy, Darwha, Yavatmal

Abstract: *Pharmacogenomics (PGx) is transforming modern healthcare by shifting treatment strategies away from generalized prescribing toward personalized, gene-guided therapy. By examining genetic variations that influence drug metabolism, transport, and target interactions, PGx enables safer and more effective medication selection. This field leverages technologies such as targeted genotyping and next-generation sequencing to predict treatment response and reduce adverse drug reactions. Although PGx has demonstrated major benefits in areas like oncology, cardiology, and emerging fields such as psychiatry, several barriers limit full clinical integration—including physician knowledge gaps, regulatory constraints, inconsistent biomarker validation, and complex environmental influences. Continued advancements in research, clinical infrastructure, and education are essential to fully implement personalized medicine and ensure equitable access to its benefits*

Keywords: Pharmacogenomics; Precision Medicine; Personalized therapy; Genetic variability; Drug response; Pharmacokinetics; Pharmacodynamics; Genetic biomarkers; Genotyping; Next-generation sequencing (NGS); Adverse drug reactions; Clinical implementation

DOI: 10.48175/568