

# Pharmacogenetics and pharmacogenomics in Asian populations and impact on Clinical Pharmacology

Hong-Hao Zhou

Pharmacogenetics Research Institute, Institute of Clinical Pharmacology, Central South University, Changsha, CHINA

Ethnic differences exist in both pharmacodynamics and pharmacokinetics of drugs that are well documented by our previous comparison studies of propranolol, atropine and morphine between Chinese and White normal subjects. It is the consequence of variation in intrinsic factors and extrinsic factors and plays an important role in optimization of therapy for the individual patient, drug development and drug administration. The clinical impact of ethnic factor depends on a number of factors including nature of ethnic difference, extent of inter-ethnic difference, extent of intra-ethnic difference, the therapeutic index of the drug, the slope of dose-response curve of the drug.

Interethnic differences in drug responses may result from interethnic differences in distribution of a polymorphic trait and mutations which code for enzymes or receptors with abnormal activity occurring with altered frequency in different ethnic groups. However, the Interindividual variability within populations seems to be greater than the differences between populations.

Interindividual genetic variability in drug response occurs as a result of molecular alterations at the level of drug metabolizing enzymes, drug targets and drug transport proteins and the phenotype and genotype of these drug related proteins that showed a diverse profile in different ethnic population were extensively investigated in Asian countries. The data also showed that gene dosage of both drug metabolizing enzyme and receptors determine the drug metabolism and clinical response. Again, the potency of inducibility of a drug on the drug metabolizing enzyme activity related to the phenotype and genotype of the enzyme.

Identifying the best drug to be administered to particular patient and the most effective and safest dosage for the therapy has become practical as the new era of personalized drug therapy comes.