

## Clinical Pharmacogenomics and Individualized Medicine

Keh-Ming Lin

Director, Division of Mental Health and Drug Abuse Research, National Health Research Institutes (NHRI), Taiwan

Date: Friday, August 19, 2005

Time: 14:00-15:30

Despite the existence of huge inter-individual and cross-ethnic variations in response to psychotropics and other medications, the practice of pharmacotherapy (including psychopharmacotherapy) has been largely "one size fits all," leaving drug choice and dosing decisions mostly to trial and error. Further complicating this is the fact that our knowledge base on the efficacy and tolerability of most medications has been derived from research conducted in selected groups that in no way reflect the remarkable diversity of the world's population.

Variations in pharmacological responses are derived from both pharmacokinetic (metabolism and disposition of medications) and pharmacodynamic (interactions with putative therapeutic targets) factors. Most genes controlling the expression of drug metabolizing enzymes as well as the function of brain are highly polymorphic, and the pattern and distribution of these polymorphisms are typically divergent across ethnic groups. To the extent that these genetic patterns determine drug response, individual and ethnic variations in these genetic dispositions will lead to differential responses in the clinical setting. In addition, the expression of these genes is significantly influenced by environmental factors including diet as well as exposure to natural products (e.g., herbs and tobacco). Further, superimposed on these biological influences, culturally determined beliefs and behavioral patterns also profoundly influence patients' expectations of treatment response, adherence, as well as interactions with clinicians.

Coupled with recent advances in gene array technologies, it is expected that pharmacogenetic panels will be developed for routine clinical use in the near future, such that the results derived from such tests will be used to inform clinicians regarding the choice of medications, dosing strategies as well as risks for different side effects in ways that are individually tailored and ethnically relevant. Parallel efforts need to be made in adapting pharmacotherapeutic practices in local sociocultural settings, such that patients receive optimal benefits from these powerful agents irrespective of their backgrounds and origin.