- The study of drug interactions and PGt/PGx has revealed that many unexpected pharmacodynamics responses and pharmacokinetic variations among individuals during drug therapy involve genetic factors.
- These genetic factors contribute to variation at many levels including drug transport, metabolism, and interaction at the receptor site.
- Applying genetics to study interindividual variation in drug response may greatly improve drug therapy.
- Understanding and monitoring the underlying pharmacokinetic factors will allow physicians to optimize efficacy and minimize side effects.
- The labeling of many new drugs now contains more information on drug interactions and metabolism based on our understanding of PGt/PGx.
- PGt/PGx is influencing the study of pharma-

cokinetics and pharmacodynamics.

- Models that will predict dosing and an individual's drug clearance more accurately will require more details concerning the individual patient's genetic profile, demographic and pathologic information, as well as the drug PK profile.

- If one of the patient's parents is homozygous for a specific isoenzyme that metabolizes the drug, this information can be linked to clearance prediction for the patient.

- Recognizing the allele that predisposes the patient to a sever adverse reaction or toxic plasma concentration may allow the dose to be reduced or the drug avoided entirely.

• Similarly, if a patient is known to be a none responder due to genetic variation, that information can be used to select an alternate drug a priori.

• A mixed-effects model is described that takes into account the effect of enzyme induction due to concomitant administration of a drug that induces enzyme.

• The successful application of genetic screening tests to identify patients with specific risks in drug response or drug toxicity depends on many factors.

• Large amounts of relevant genetic information must be monitored

• Robust, high-throughput, high positive and low-negative predictive tests must be developed and implemented.

• Such an endeavor will also involve considerable training, adaptation, and acceptance of the new technology by physicians and other health care personnel.

• With genetic diagnostic tests becoming more common and affordable, it is expected that individual drug dosing will become more accurate and ultimately result in vast improvements in therapeutic response and better drug tolerance.

• Researchers have high expectations that the use of diagnostic DNA microarrays or gene chips will simplify and expand testing and have clinical applications in diagnosis, disease prevention, drug selection and dose calculation.

• The challenge to pharmacokinetics is to integrate all the relevant information into a model that is accurate and simple enough for practical

application.

1- Describe Genetic polymorphism in CYP2D6 and 2C9 isozymes. [5M, June 14] [5M, Feb 12/

2. Define pharmacogenetics [2M, June 14] [2M, Aug 10] [Feb 12] [Aug 13/

3. Explain the role of genetic polymorphism on drug metabolism with examples. [5M, Aug 10

4. What is the significance of P-glycoprotein? [2M, Aug 10, Aug 11, Feb 12,

5. Explain the role of P-glycoprotein in bioavailability of drugs. [5M, Feb-11/

6. Define Genetic Polymorphism [2M, Feb/11 / +Ex Sep 12

6. Define genetic polymorphism. Explain its role in drug metabolism with examples [5M, Aug 11/ Aug 13

7. Explain with examples how drug efflux transporters influence the bioavailability of drugs [5M, Sep 12/