Human genome research is an epic drama...It is my hope and expectation...genomic discoveries will lead to...health benefits for all the world’s peoples.

--Dr. Francis Collins
“Geneticists worldwide must investigate a much broader ensemble of populations...if we do not...genetic medicine will largely benefit a privileged few.”

THE 5% RULE

Gene variants found in less than 5% of the population may be the most significant in understanding disease risk and therapy response.
One Size Does Not Fit All

Percentage of the patient population which does not respond to a major drug, by condition

- **Major Depression (SSRIs)**: 38%
- **Asthma**: 40%
- **Diabetes**: 43%
- **Rheumatoid Arthritis**: 50%
- **Alzheimer's**: 70%

# One Size Does Not Fit All

## Genes and Drug Metabolism Variation in Hispanic Populations

<table>
<thead>
<tr>
<th>Gene</th>
<th>Hispanic Variation</th>
<th>Major Drugs Regulated</th>
</tr>
</thead>
</table>
| CYP3A4 | Slower metabolism/higher blood levels in Mexicans (metabolism in U.S. Hispanics not yet studied) | • nifedipine (cardiovascular)  
|        |                                                                                     | • cyclosporine (immunosuppressive)             |
|        |                                                                                     | • midazolam (anesthetic)                       |
|        |                                                                                     | • sildenafil (erectile dysfunction)            |
| CYP2D6 | Faster metabolism in Mexican Americans  
Slower metabolism in Dominicans and Puerto Ricans | • many cardiovascular drugs  
|        |                                                                                     | • many psychotropic drugs                      |
| CYP2C9 | Slower metabolism in Spaniards (metabolism in U.S. Hispanics not yet studied)      | • warfarin (stroke prevention)  
|        |                                                                                     | • phenytoin (epilepsy)                         |
|        |                                                                                     | • many diabetes medications                   |

Personalized Medicine is Key to Good Health

Variability in clinical response

Culture
- Attitudes
- Beliefs
- Family influence
- Literacy

Environment
- Climate
- Smoking
- Alcohol
- Drugs
- Pollutants

Biology
- Genetics
  - Age
  - Gender
  - Chronic Disease

Adapted from Poolsup et al. *J Clin Pharm Ther* 2000;25(3)197-220.
It is far more important to know what person the disease has than what disease the person has.

--Hippocrates
text "INSPIRE" to 805722

text "INNOVATE" to 805722

text "ENGAGE" to 805722