- Cultural factors
  - Attitudes
  - Beliefs
  - Family influence
- Biological factors
  - Age
  - Gender
  - Weight
  - Disease
  - Genes
    - Pharmacogenetics
    - Pharmacogenomics

Cardiovascular drugs and racial/ethnic origin

- Ace inhibitors
  - More effective in Caucasians than in African Americans
- Beta - Blockers
  - More effective in Caucasians than in African Americans
- Alpha - Blockers
  - More effective in Caucasians than in African Americans
- Thiazide (diuretic)
  - More effective in African Americans than in Caucasians

BiDil in African Americans with Congestive Heart Failure

- Isosorbide/hydralazine combination
- BiDil is the first drug approved for use in African-Americans only

<table>
<thead>
<tr>
<th>Class of drug</th>
<th>Non-responders (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSRIs</td>
<td>10 - 25</td>
</tr>
<tr>
<td>ACE inhibitors</td>
<td>10 - 30</td>
</tr>
<tr>
<td>Beta-blockers</td>
<td>15 - 25</td>
</tr>
<tr>
<td>Tricyclic Anti-depressants</td>
<td>20 - 50</td>
</tr>
<tr>
<td>HMGCoA reductase</td>
<td>30 - 70</td>
</tr>
<tr>
<td>Beta2 agonists</td>
<td>40 - 70</td>
</tr>
</tbody>
</table>

Adverse responses to therapeutic drugs (USA data)

<table>
<thead>
<tr>
<th>Annual Prescriptions</th>
<th>Annual Adverse responses</th>
<th>Annual Hospitalizations</th>
<th>Annual Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.2 bn</td>
<td>2.1 m</td>
<td>1 m</td>
<td>100,000</td>
</tr>
</tbody>
</table>

*Lazurev et al JAMA 279; 1200-1205: 1998

*Drugs in bold = important for this course