

# Biologic Responses as Indicators of Exposure, Pathobiology, Clinical Disease, and Genetic Susceptibility

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# Exposure Biology: Measurements to Linkages to Mechanisms

Clinical  
Disease

Pathogenesis/  
Early disease

THRESHOLD?

External  
Expos.  
Dose

Adaptive Response:

- Oxidative stress
- Inflammation
- DNA damage

- Question're
- Monitoring/  
modeling
- Biomonitoring

- Peripheral/tissue  
indicators
- Pathway

BIOLOGY GENETICS

- Structural/  
Functional changes

# Session Speakers

**Samuel Wilson:** *State of the Science*

**Leroy Hood:** *Systems Biology to Understand  
Gene-Environment Interactions*

**John Groopman:** *Biomarkers to Pathobiology*