

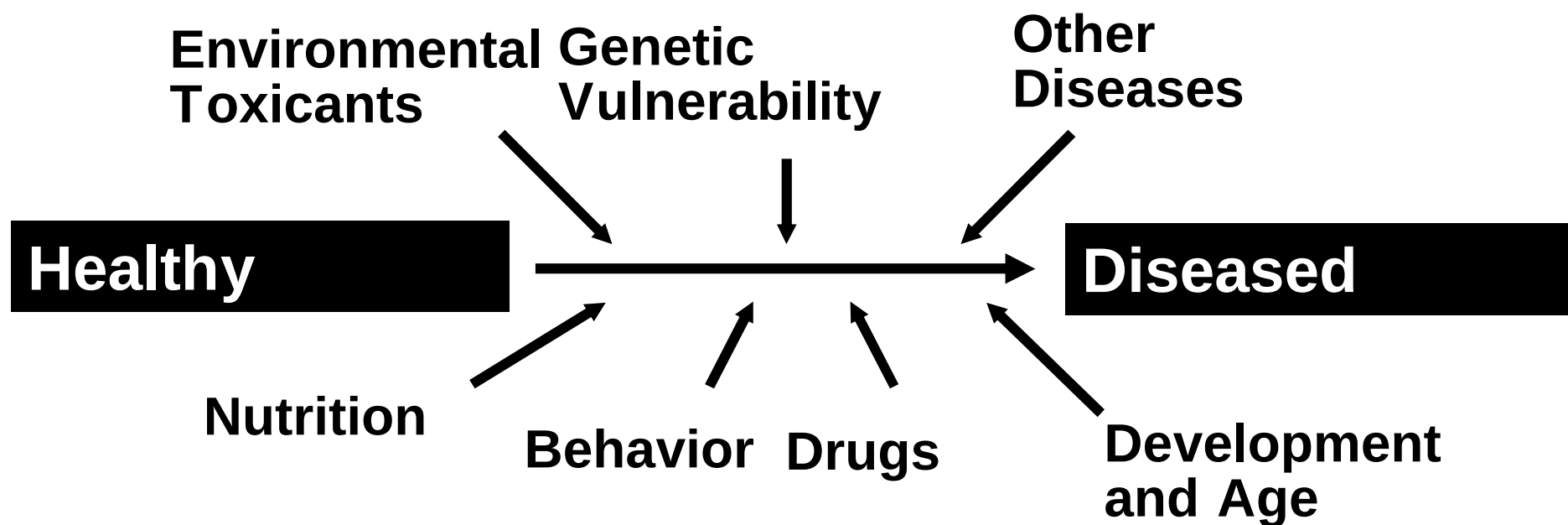
Welcome!

Making the case for advancing the Exposome (or EWAS)

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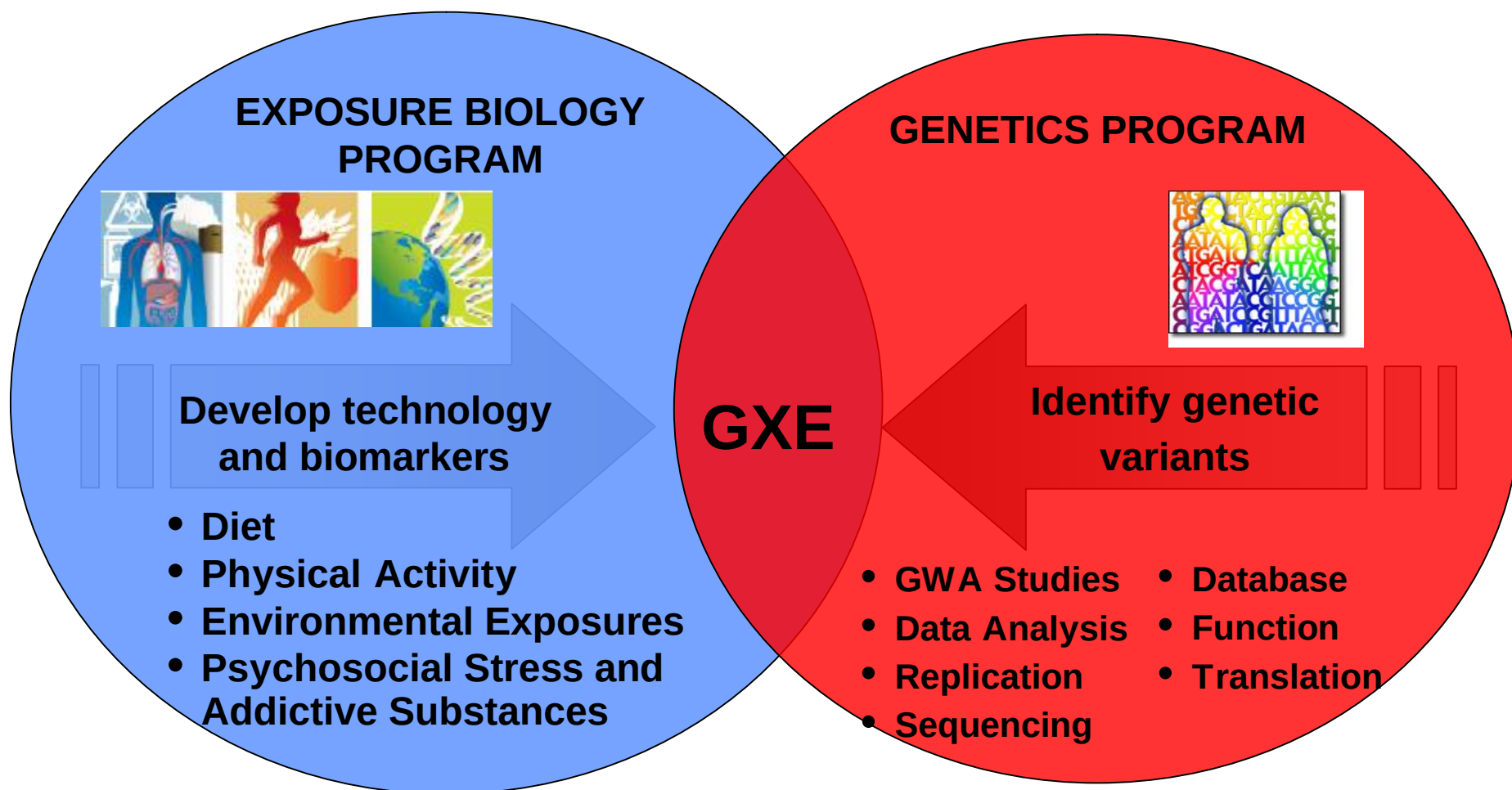






NIH Genes, Environment and Health Initiative Exposure Biology Program

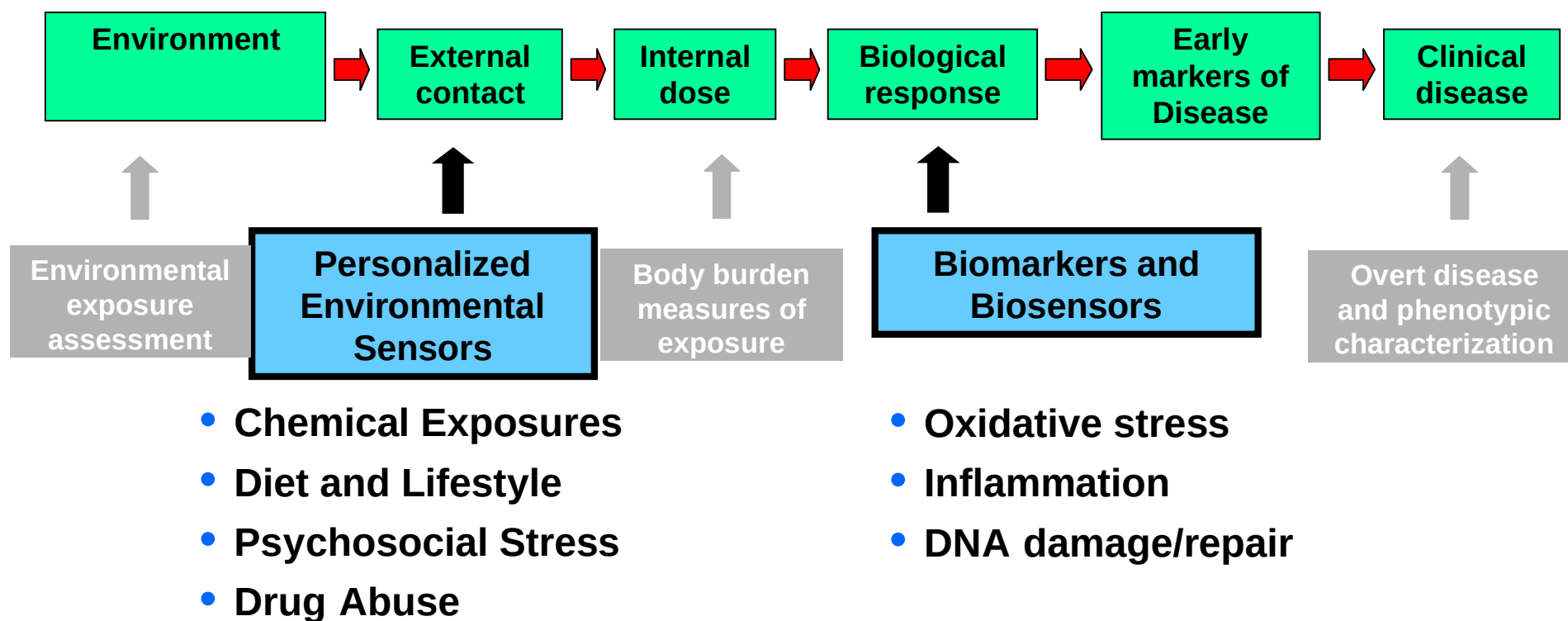
Genes, Environment, and Health Initiative





NIH Genes, Environment and Health Initiative Exposure Biology Program

Exposure Biology Program



Link personal exposures to biology to disease



NIH Genes, Environment and Health Initiative Exposure Biology Program

FY07

FY08

FY09

FY10

FY11

Environmental Sensors

Diet/Physical Activity
Chemicals/Biologics
Psychosocial Stress/Addictive
Substances

U01

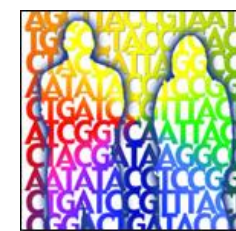
U01 **SBIR**

U01

DEVICES



APPLICATION



Biological Response

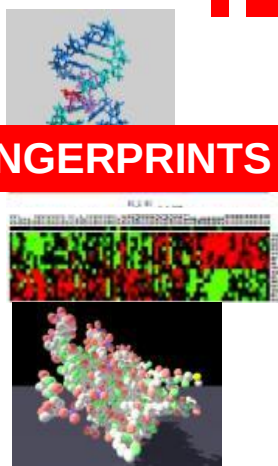
Biomarkers
Centers – biomarkers/biosensors

U01

FINGERPRINTS

U54
SBIR

Lab on a Chip
DEVICES



Population
based
studies



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Y Current Prototypes



– Sensors for Analysis of Chemical Exposures

... 8 of 8 projects including sensors for PM10, 2.5 and 1; allergens, pesticides, ozone, BTEX and high priority volatile toxic industrial chemicals

– Diet and Physical Activity



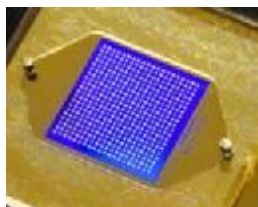
... 6 of 7 have functional prototypes, including activity monitors paired with other sensors, camera phones to capture dietary intake, and video device to record diet and activity events.

– Network for Psychosocial Stress and use of Addictive Substances

... All 5 projects have a functional prototype tool including measures of salivary alpha amylase, circadian disruption, phenotypic measures of stress response and improved systems for ecological momentary assessment



– Biological Response Indicators



... Technologies for measuring biological responses include an array-based HT method for the Comet Assay, a GCFP assay for detection of low-abundance proteins, an ELISA microarray chip for HT screening of plasma proteins, a Single Cell Genetic Analysis device for measuring rare mutations in blood, and new methods to detect protein adducts from carcinogen exposures.

... Emerging biomarkers include mRNA and miRNA profiles of TSE in buccal and nasal cells and enhanced urinary biomarkers of exposure and response to TSE.

So, Where do we go from here?

- We need new technologies and approaches
- The NAS Committee on Emerging Science for Environmental Health Decisions
 - Evaluate the Utility and Importance of new tools/approaches in guiding public health decisions
 - How can scientific advances be used in the identification, quantification and control of environmental impacts on public health?
 - Facilitate Communication among Government, Industry, Environmental Groups and the Academic Community

More specifically, for the focus of this workshop

- We need to be able to analyze ‘The Environment’ in a way analogous to the Genetics community analysis of variation
 - A ‘global’ view of the exposure and its variation over time and space
 - An ‘integrated’ view of the environment including chemical exposures, diet, physical activity, stress, and more
 - A ‘realistic’ view of environmental technologies that can be applied cost effectively in population based studies
 - A ‘representative’ view that spans all aspects of the exposure-disease continuum and includes populations from the relevant windows of susceptibility

Thank You!