

STANFORD

SCHOOL OF
HUMANITIES AND SCIENCES



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Environment**

Doing Research Wrong Costs Lives and Money

- Between 1997 and 2000, 10 drugs were withdrawn from the U.S. market because of life-threatening health effects—8 of those showed greater severity in women (GAO, 2001).

Doing Research Right Saves Lives and Money

WHI Hormone Therapy Trials

- Each \$1 spent, returned \$140
- Health Improvements
 - * 76,000 fewer cases of cardiovascular disease
 - * 126,000 fewer breast cancer cases
 - * 145,000 more quality-adjusted life years
- * However: 263,000 more osteoporotic fractures

Joshua A. Roth et al., *Annals of Internal Medicine* (2014) 60, 9:594-602.

Will analyzing sex as a variable cost more money?

- 1. Effects on sample size.** Adopting a strategy of 50/50 female and male animals or cells, instead of 100% of one sex seems likely to allow detection of at least some sex influences, namely the largest ones with no impact on sample size.

Will analyzing sex as a variable cost more money?

2. Effects on other study costs. Many costs of running studies are "fixed" (e.g. basic lab operation costs) and would not vary with the sex of included animals or cells. Some costs may in fact be expected to decline, for example because housing female animals may be less expensive than housing male animals.

Will analyzing sex as a variable cost more money?

- **In general**, some costs might increase and in others they might decrease.
- Even when costs increase, one should weigh the additional costs against the possibility of new insights, improved therapies, and a reduced risk of subsequent problems.

Gendered Innovations

in Science,
Health & Medicine,
Engineering, and
Environment

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What is **Gendered Innovations**?

SEX & GENDER ANALYSIS

Methods

Terms

Checklists

CASE STUDIES

Science

Health & Medicine

Engineering

Environment

POLICY

INSTITUTIONAL
TRANSFORMATION

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SCIENCE

Sex and Gender Methods for Research

Gendered Innovations



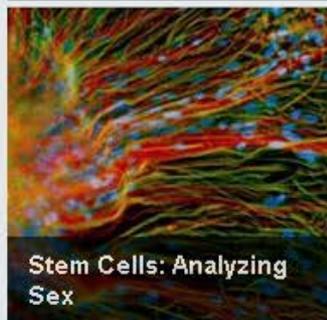
SCIENCE

HEALTH & MEDICINE

ENGINEERING

ENVIRONMENT

FEATURED CASE STUDIES



Stem Cells: Analyzing
Sex



Osteoporosis
Research in Men:
Breaking the Gender
Paradigm



HIV Microbicides:
Formulating Research
Questions & Analyzing
Academic Disciplines

Why Gendered Innovations?

“Gendered Innovations”
employs methods of
sex and gender
analysis to create
new knowledge.

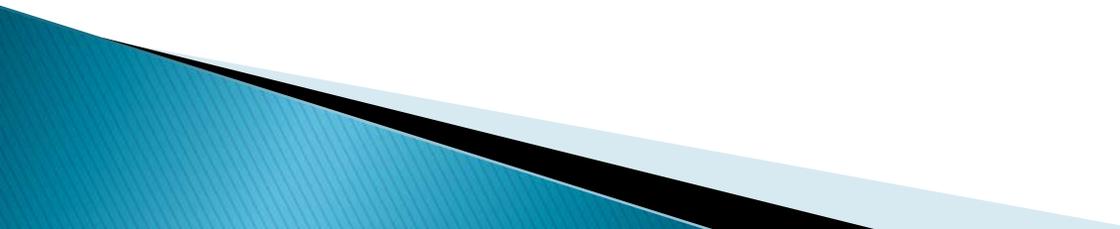
Gendered Innovations

- 1) develop state-of-the-art Methods of sex and gender analysis
- 2) provide Case Studies to illustrate how gender analysis leads to innovative science and technology.

Analyzing “gender” in animals

- ✓ **Gender** is a constellation of socio-cultural processes that interact with, and thus influence, biology.

DANGER!

- ▶ That PIs confound sex with gender
 - ▶ that PIs “see” sex (or a biological trait), when they are really looking at “gender” (or an environmental condition that may impact male and female animals differently)
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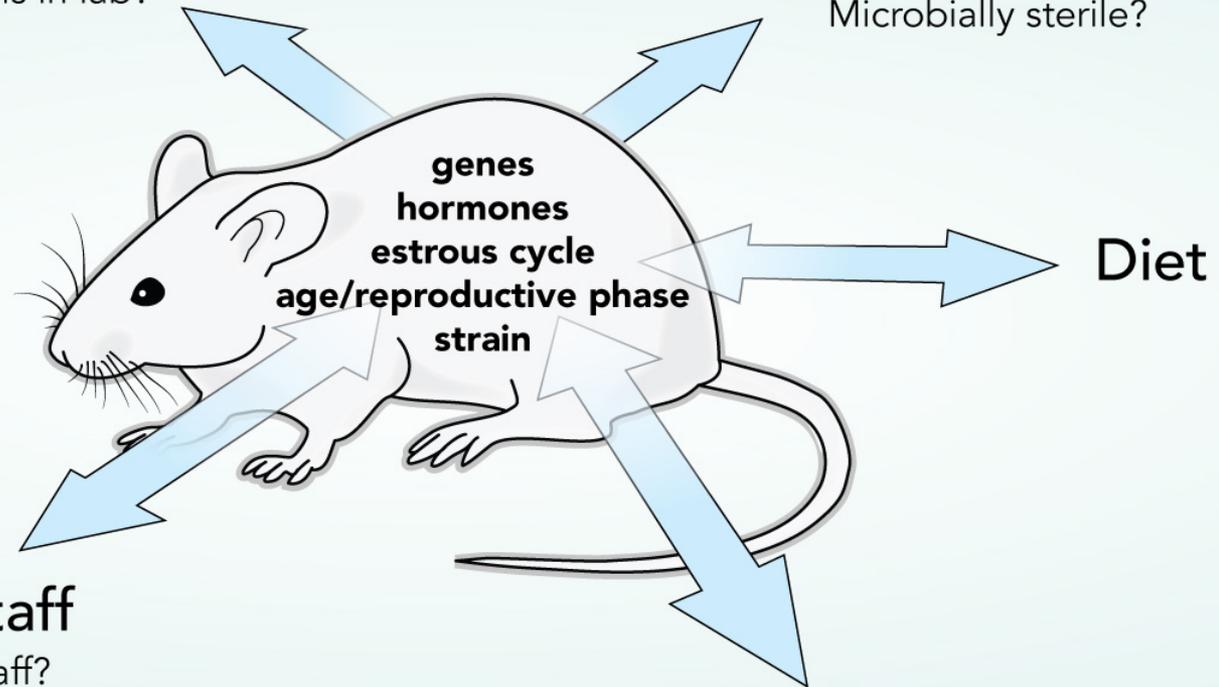
Integrating Sex & Gender into Animal Research

Social Dynamics

Sex-segregated or male/female mix?
Number and mix of animals in lab?

Caging

Individual or group? Size?
Complex environment vs. no enrichment?
Microbially sterile?



Diet

Researcher/Staff

Sex of researcher/staff?
Research/staff handling of
male/female animals?

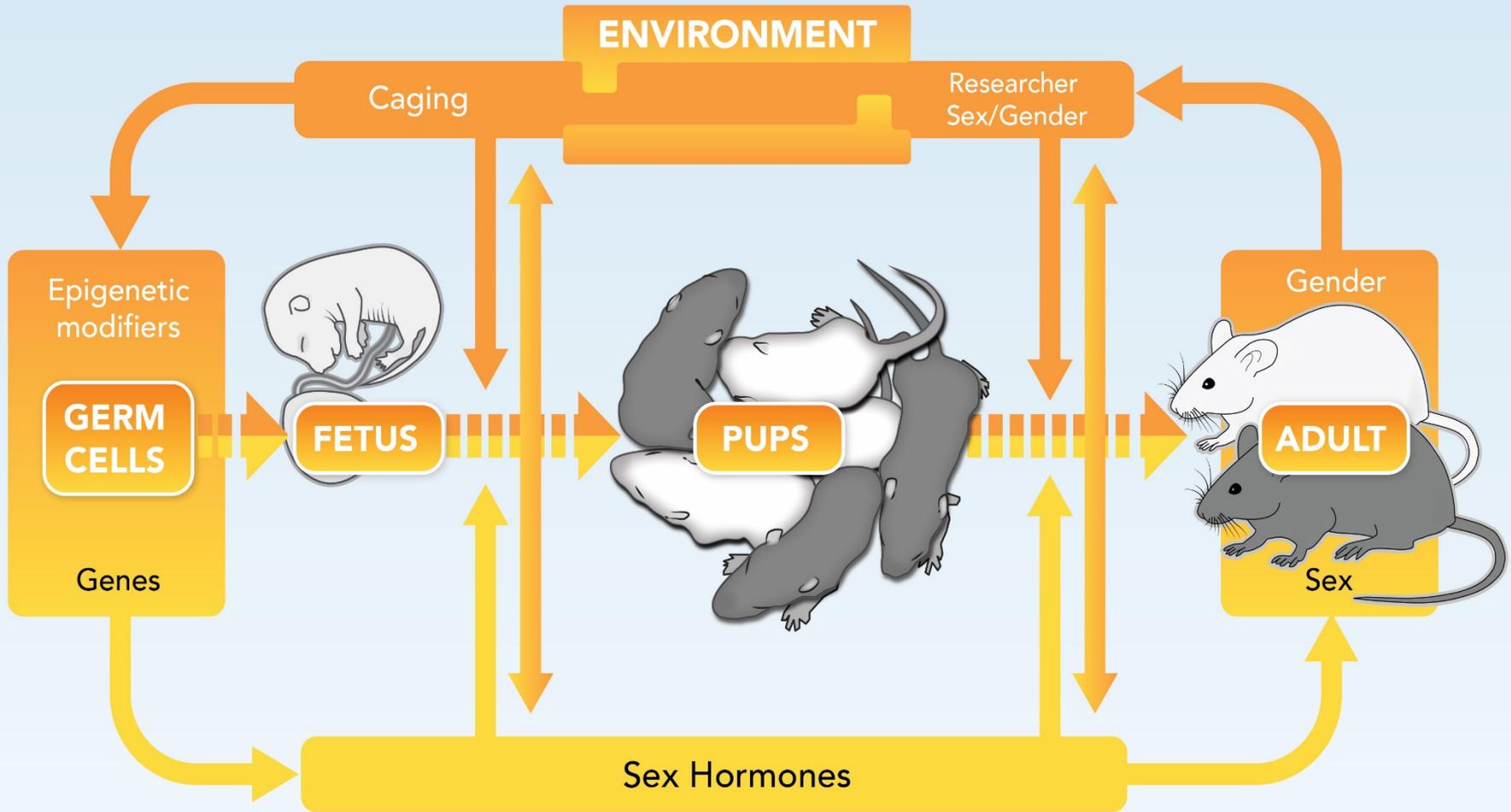
Room

Temperature?
Sound?
Lighting (circadian)?
Odor?

Analyzing “gender” in animals

- ✓ **Gender Norms** refer to researchers’ differing attitudes toward and handling of male or female animals.
 - ✓ **Gender Relations** refer to *interactions* between:
 - male and female animals
 - men or women researchers and male vs. female animals.
- [– **Gender Identities** refer to how individual animals perceive and present themselves, and how they are perceived by others.]
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Sex and Gender Interact



Adapted from Regitz-Zagrosek, V. (2012). Sex and Gender Differences in Health. EMBO Reports. 13(7). 596-603.

▶ Continue to:

<http://genderedinnovations.stanford.edu/>