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CAPHRI School for Public Health and Primary Care

Gendered Innovations in Science, Health & Medicine and Engineering

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Madrid, 14 december 2011

Changing biomedical research practices

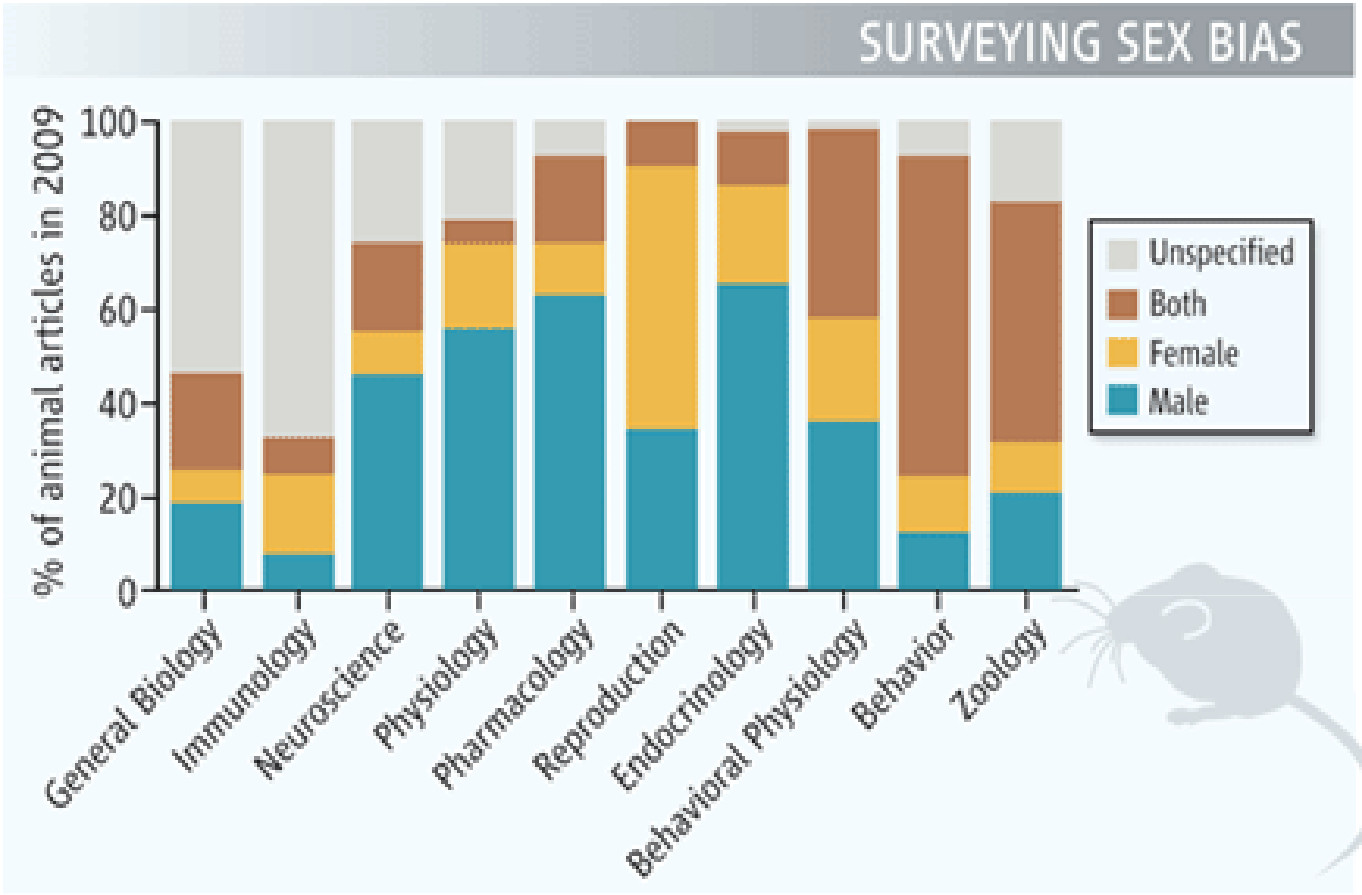
- Moving beyond bias, rationale
- Account of EU research policy on sex and gender
- Important steps taken
- Gendered Innovations project

Moving beyond bias : business case

Sex and gender bias in research

- Is expensive in terms of lives and cost
- Limits the excellence of research and hence the potential benefits to society

Most research is done in males



CREDIT: ADAPTED FROM ANNALIESE K. BEERY AND IRVING ZUCKER. Cited in Wald, C. & Wu, C. (2010). Of Mice and Women: The Bias in Animal Models. *Science* 327: 1571-1572.

Business case public health

- *Science* (26-03-2010): Between 1997 and 2000, 10 drugs were withdrawn from the market because of life threathening effects – 4 of those showed greater severity in women

IT'S NOT ENOUGH TO IDENTIFY BIAS

- **We need to DESIGN research correctly from the beginning**

EU Research Policy on sex and gender

- Policy framework of gender equality & gender mainstreaming
- Applied to research policy since 2000

Important steps taken in the EU

- Gender Impact Assessment studies FP5 2000-2001
- Gender Action Plans of FP6
- GenderBasic project (2005-2008)
- Gender Toolkit FP7
- Meta-analysis of Gender and Science Research 1980-2010, FP7

Gendered Innovations project

- Collaboration between EU and US
- To move beyond identifying bias
- To employ sex and gender analysis as a *resource* to create new knowledge
- To secure scientific excellence and spark creativity

Gendered Innovations

- Translation of theoretical developments into research practices: methods of sex and gender analysis for basic and applied research

Gendered Innovations

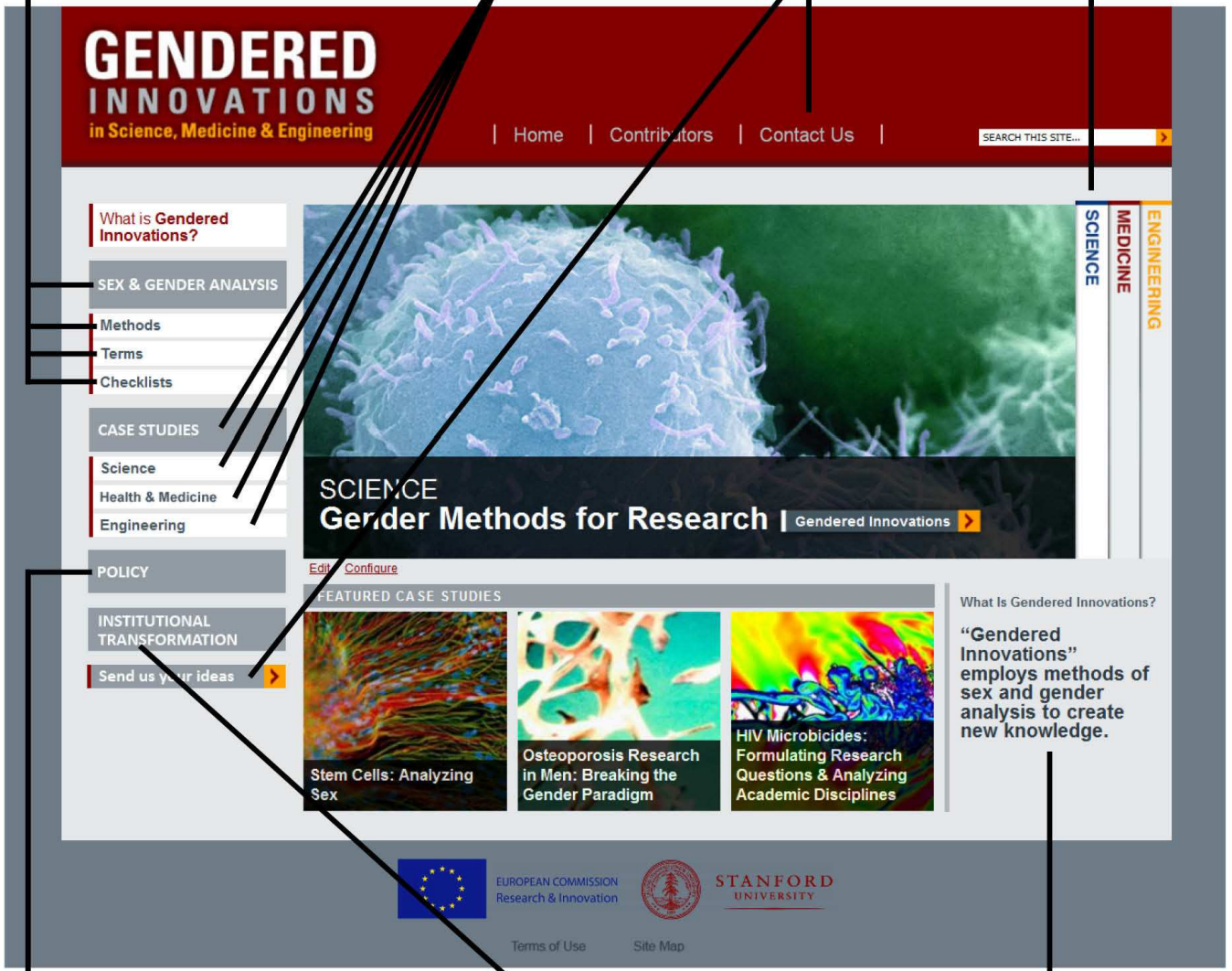
- develops METHODS of sex and gender analysis for research and engineering
- provides CASE STUDIES as concrete examples of how sex and gender analysis leads to **innovation**
- **www.genderedinnovations.eu**

These portals take users to interconnected parts of the Gendered Innovations project.

Website users learn best from research relevant to their fields. Sorting Case Studies by field maximizes accessibility and impact.

These links solicit user feedback on content and design, ideas for new Case Studies, etc.

Sliding tabs on the home page highlight key Case Studies in science, health and medicine, and engineering in a visually-appealing manner.



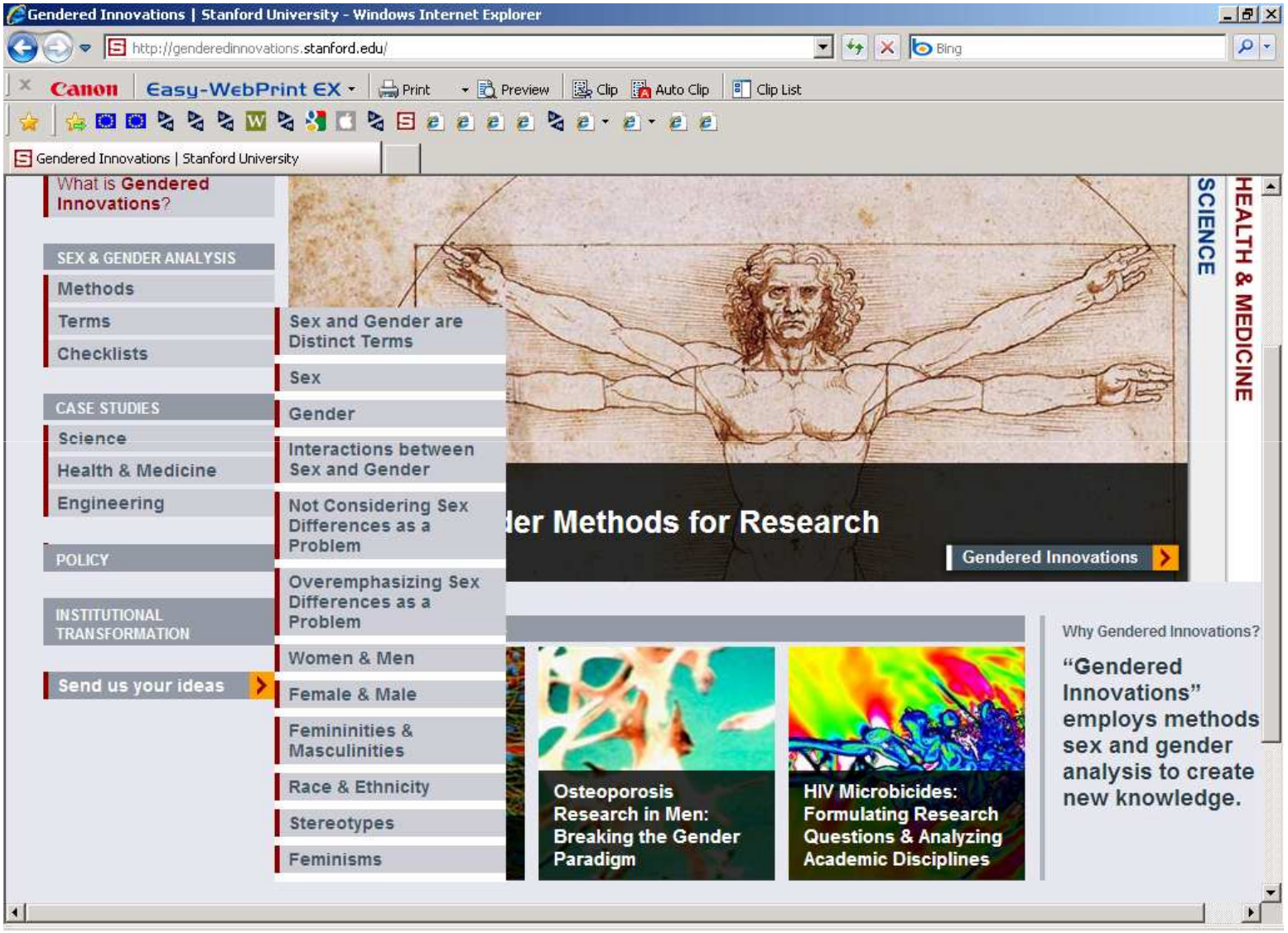
This portal provides a timeline of government and institutional policies important to Gendered Innovations.

This portal provides summaries of the best literature on this topic.

A concise definition of Gendered Innovations explains the purpose of the site.

Developing methods

- Started with definition of terms such as sex, gender, male, female, women, men, race & ethnicity, stereotypes, masculinity, femininity,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Gender
Interactions between Sex and Gender
Not Considering Sex Differences as a Problem
Overemphasizing Sex Differences as a Problem
Women & Men
Female & Male
Femininities & Masculinities
Race & Ethnicity
Stereotypes
Feminisms
der Methods for Research
Gendered Innovations
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Osteoporosis Research in Men: Breaking the Gender Paradigm
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Why Gendered Innovations?
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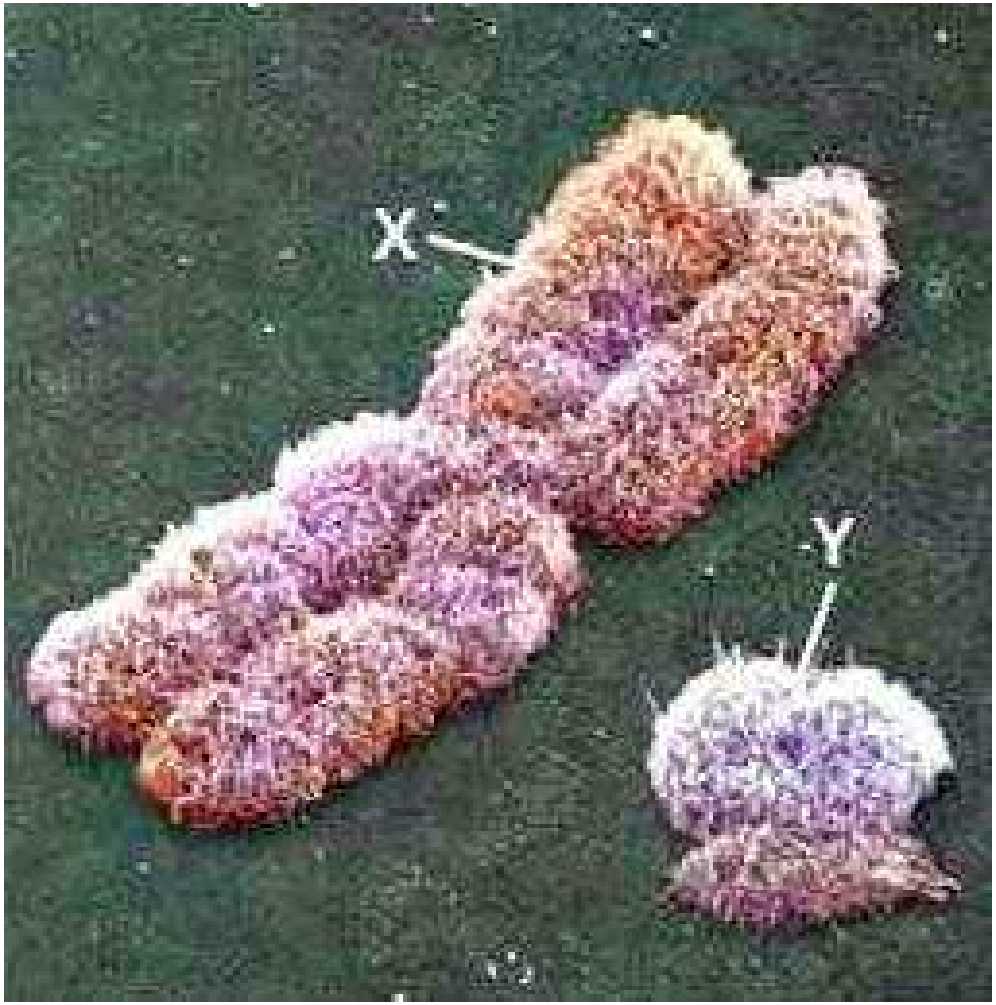
Term sex

Sex may be defined according to

- Genetics
- Gametes
- Morphology
  - primary sex characteristics
  - secondary sex chracterstics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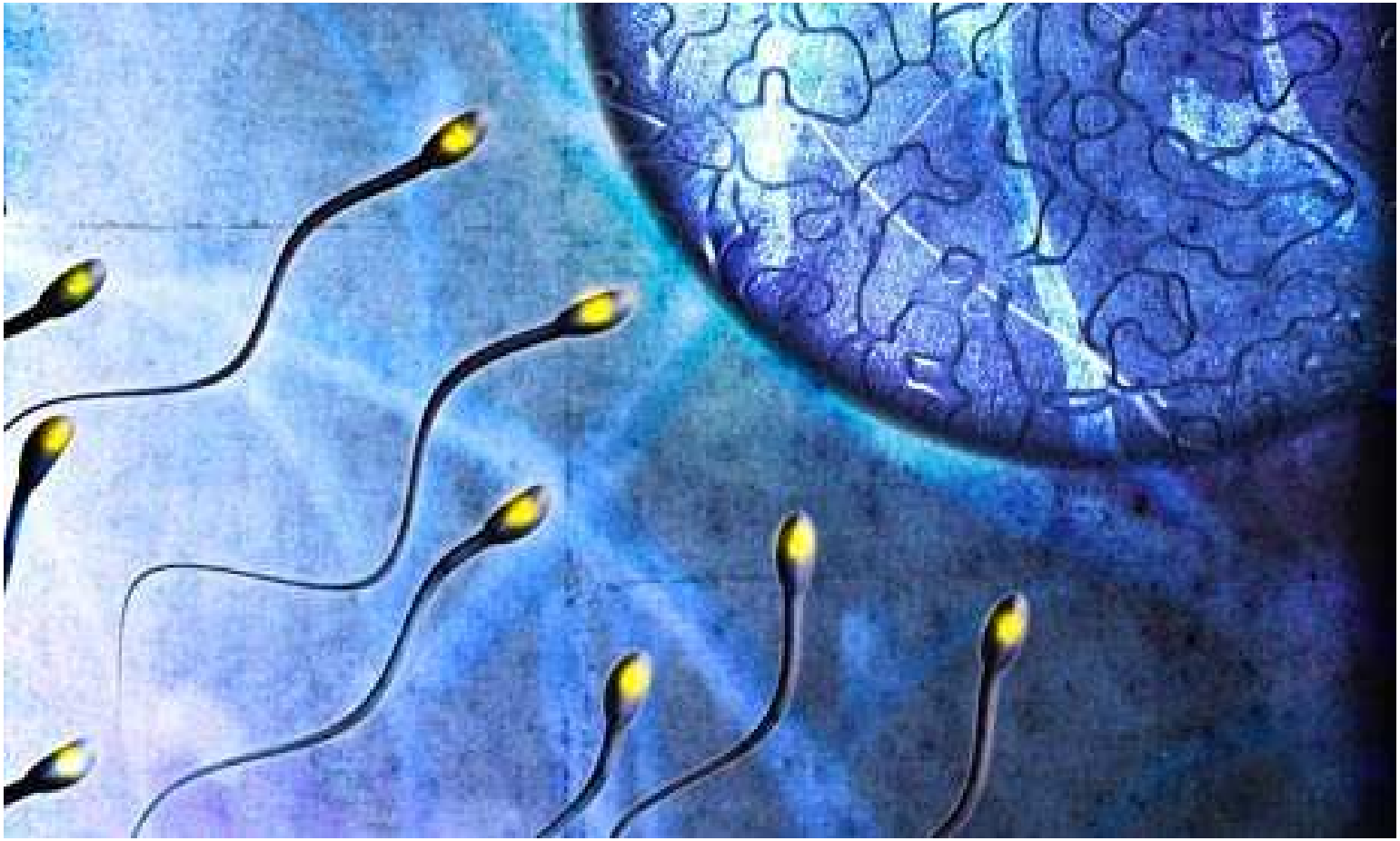

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Analyzing sex

- Sex is a fundamental variable in all biomedical research and a key consideration of product and systems design. Analyzing sex is important but see also : Overemphasizing sex as a problem. Analyzing sex involves the following steps:
  - reporting sex of research subjects
  - recognizing differences within groups of females & males
  - collecting data on factors intersecting with sex and gender
  - Analyzing and reporting results by sex
  - Reporting null findings
  - Meta -analysis

Term gender

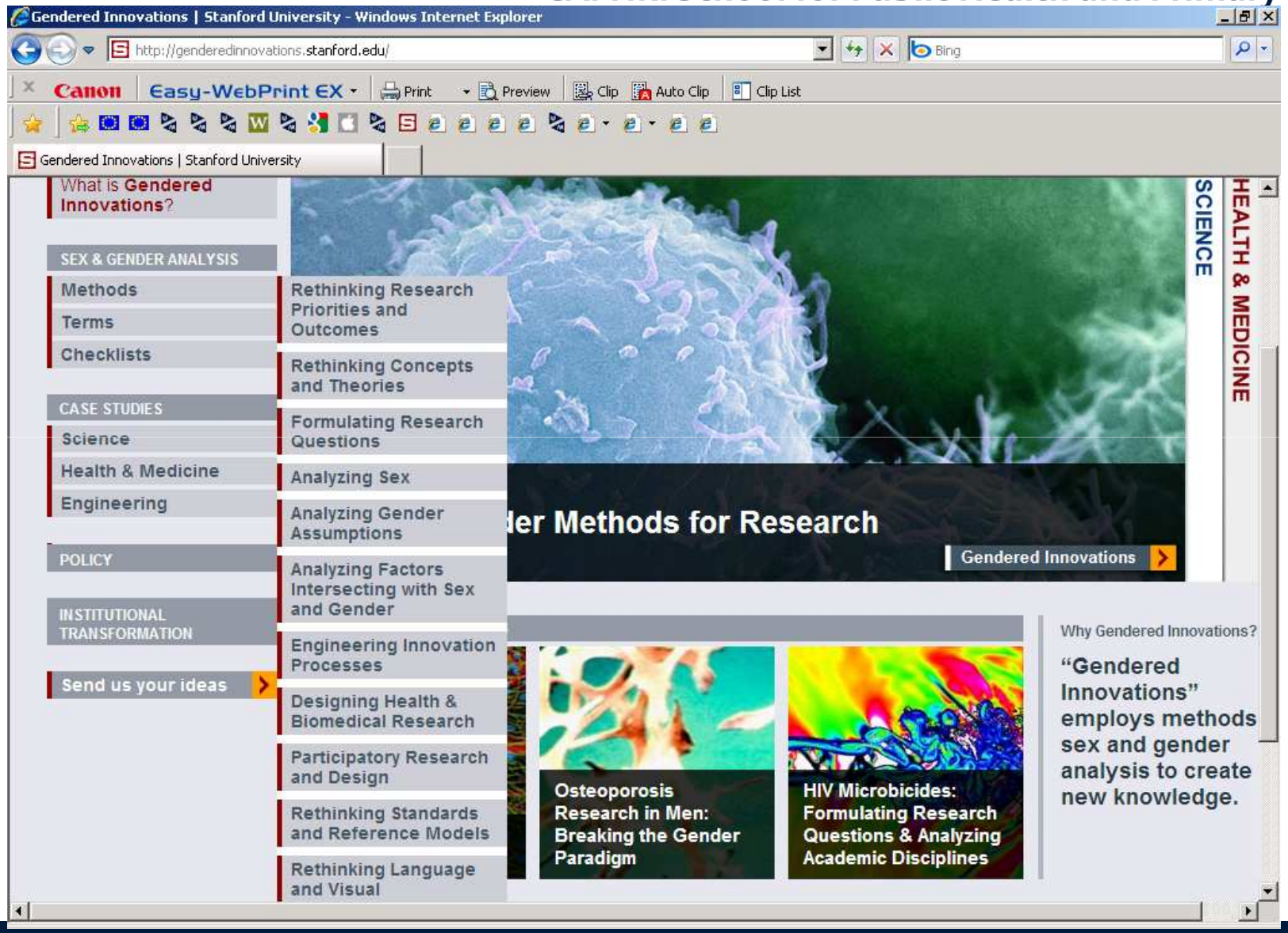
- Gender – a socio-cultural process – refers to cultural and social attitudes that together shape and sanction "feminine" and "masculine" behaviors, products, technologies, environments and knowledges
- Note: several European languages do not have a word for "gender"

How gender functions:

- Gender norms: refer to attitudes about what behaviours, preferences, products, professions or knowledge are appropriate for women and men
  - stereotypes
  - reproduced through social institutions
- Gender relations: refer to empirical observations of the actual roles of women and men and how they interact in a particular context
- Gender identities

Analyzing gender assumptions

- This method looks specifically at:
  - researchers assumptions and behaviours as these relate to the proposed research
  - research subjects and users gender needs, assumptions and behaviours as these relate to the proposed research
  - how 1 and 2 interact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Rethinking Research Priorities and Outcomes
Rethinking Concepts and Theories
Formulating Research Questions
Analyzing Sex
Analyzing Gender Assumptions
Analyzing Factors Intersecting with Sex and Gender
Engineering Innovation Processes
Designing Health & Biomedical Research
Participatory Research and Design
Rethinking Standards and Reference Models
Rethinking Language and Visual
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Sex and gender interact

- Sex and gender are analytically distinct but not independent. They interact in important and complex ways:
  "Not only can gender relations influence expression and interpretation of biological traits, but also sex-linked biological characteristics can, in some cases, contribute to or amplify gender differentials in health" (Krieger, 2003)
- Sex and gender are distinct terms, yet they interact in important ways. Rarely does an observed sex difference involve only sex and not gender, and rarely does gender analysis operate outside of the context of sex (Krieger, 2003). Apparent sex differences may be caused by gendered variables, such as social divisions of labor. Analyzing gender should accompany analyzing sex.

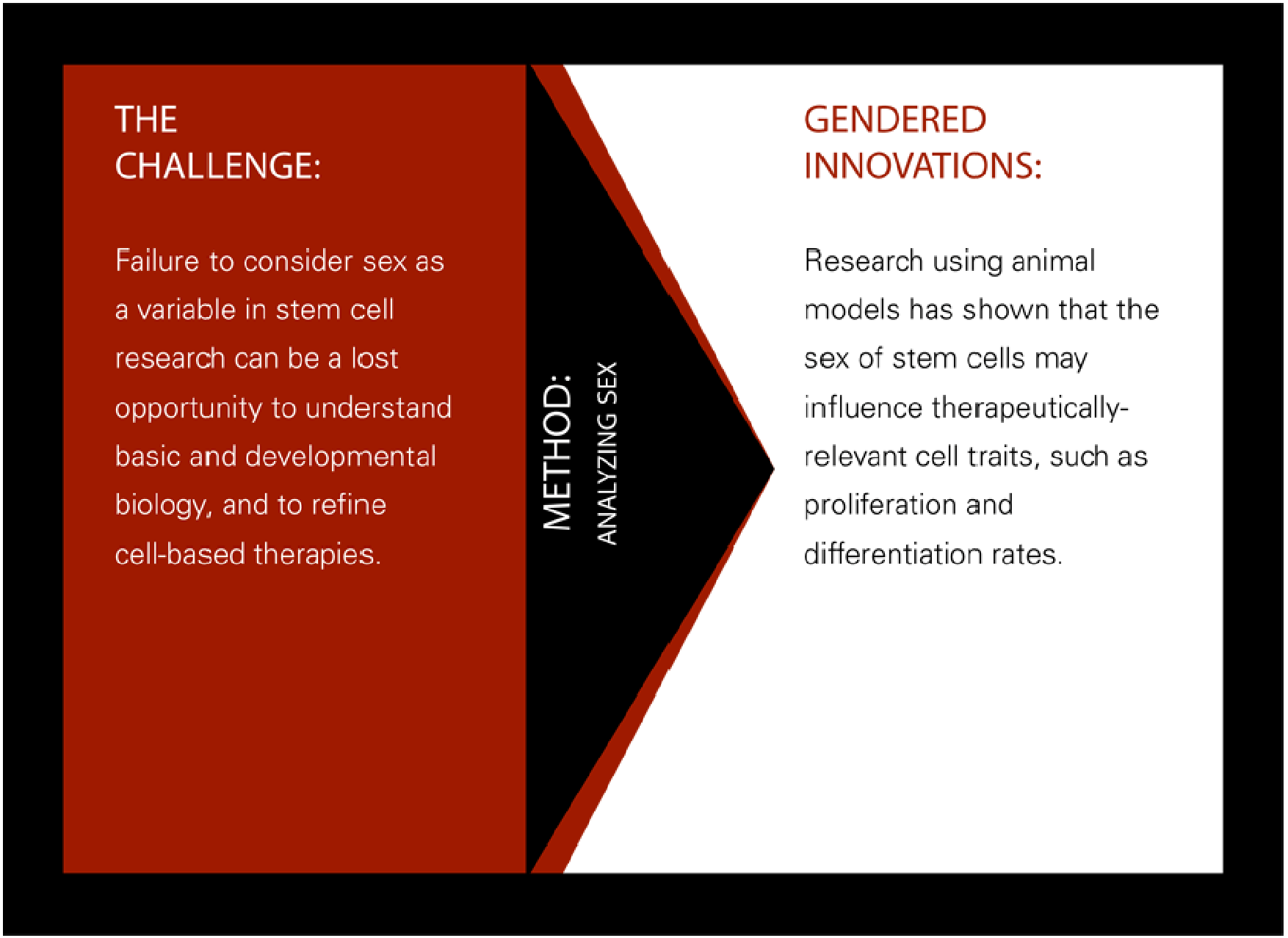
Analyzing factors intersecting with sex and gender:These factors or variables can be biological, socio-cultural, psychological, etc. aspects of users, customers, experimental subjects, cells, etc. These factors include but are not limited to:

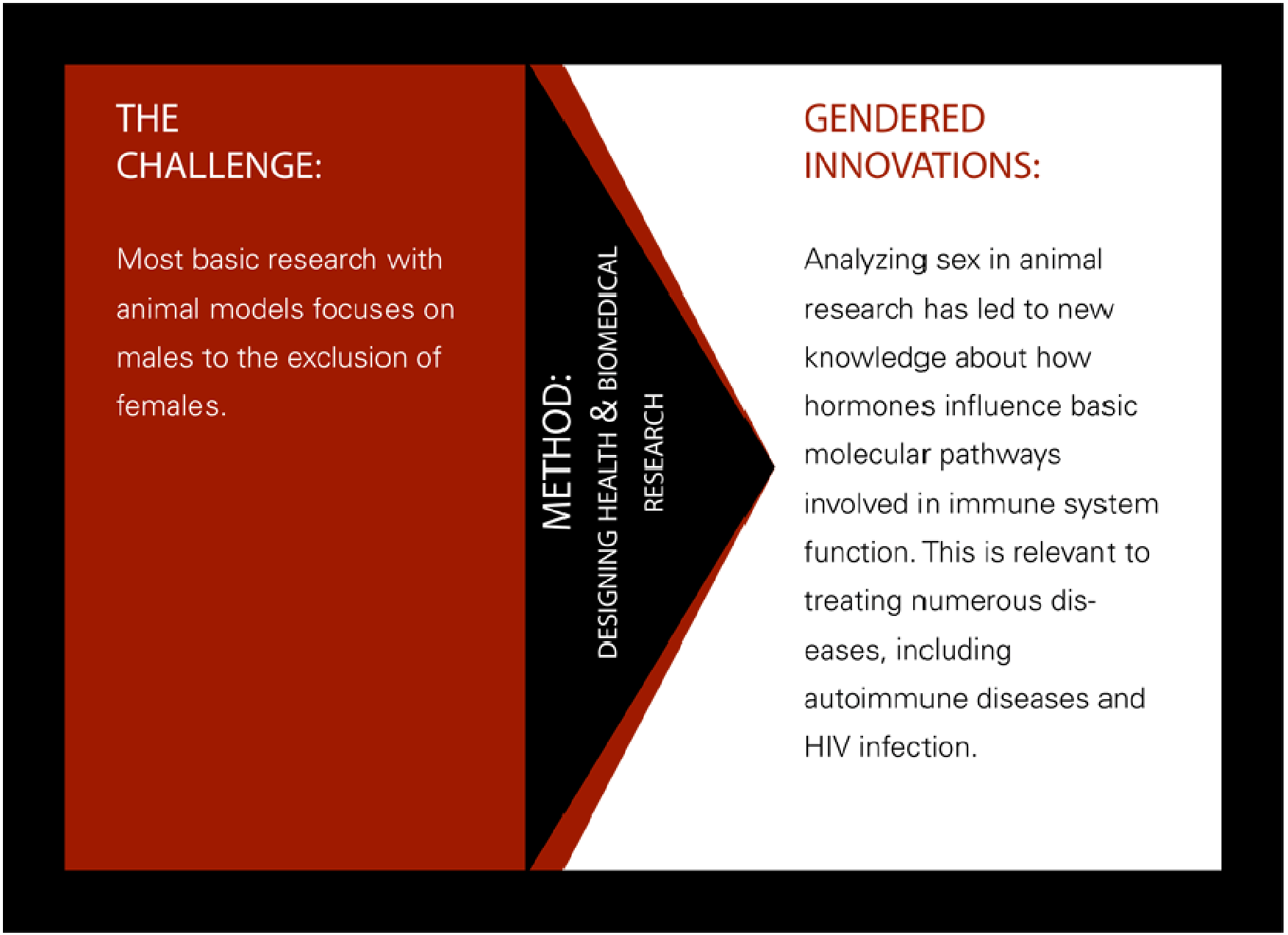
- Genetics
- Age
- Sex Hormones
- Reproductive Status
- Body Composition
- Co-morbidities
- Body Size
- Disabilities
- Ethnicity
- Nationality
- Geographic Location
- Socioeconomic Status
- Educational Background
- Sexual Orientation
- Religion
- Lifestyle
- Language
- Family Configuration

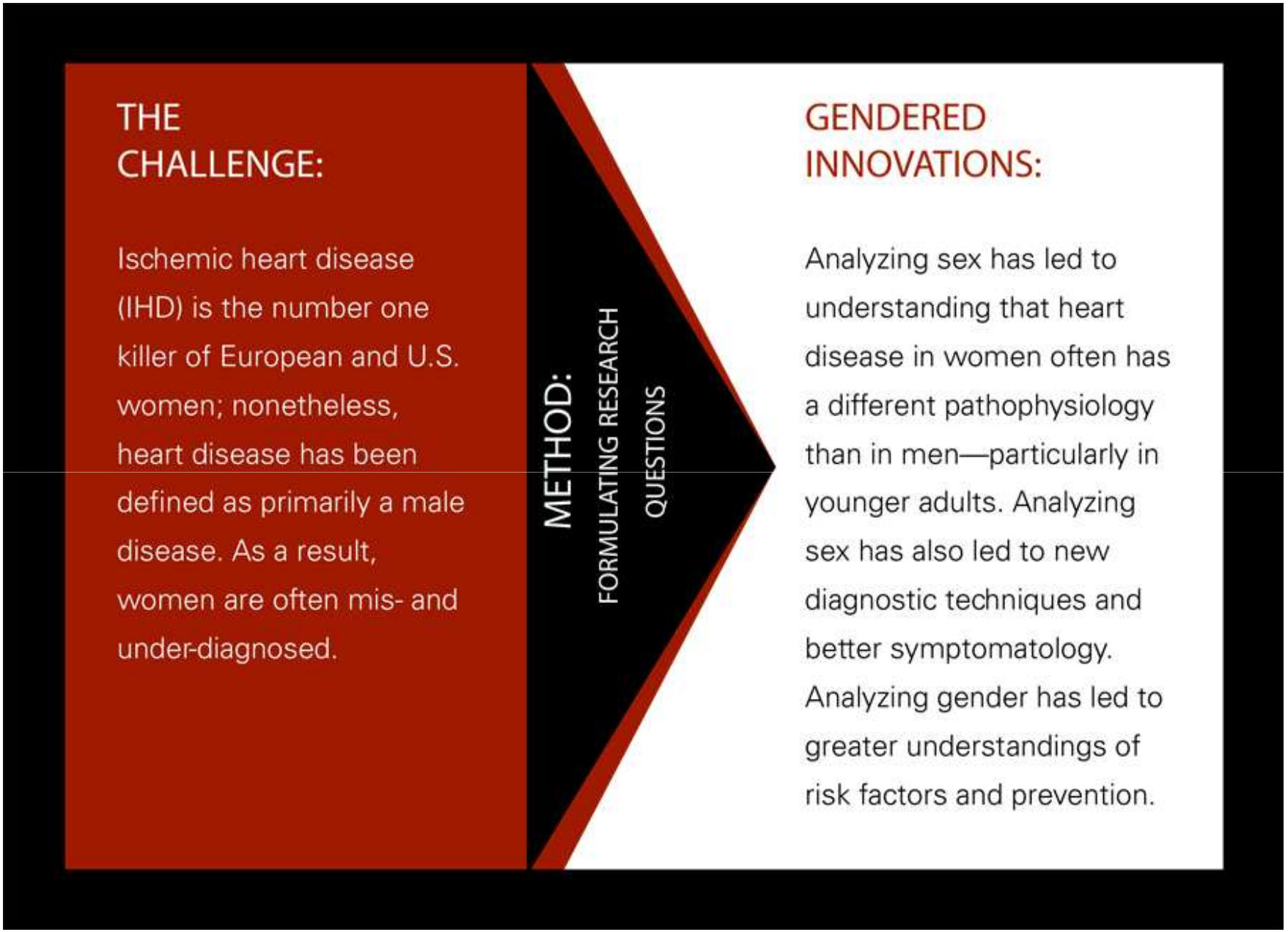
SEX AND GENDER ANALYSIS

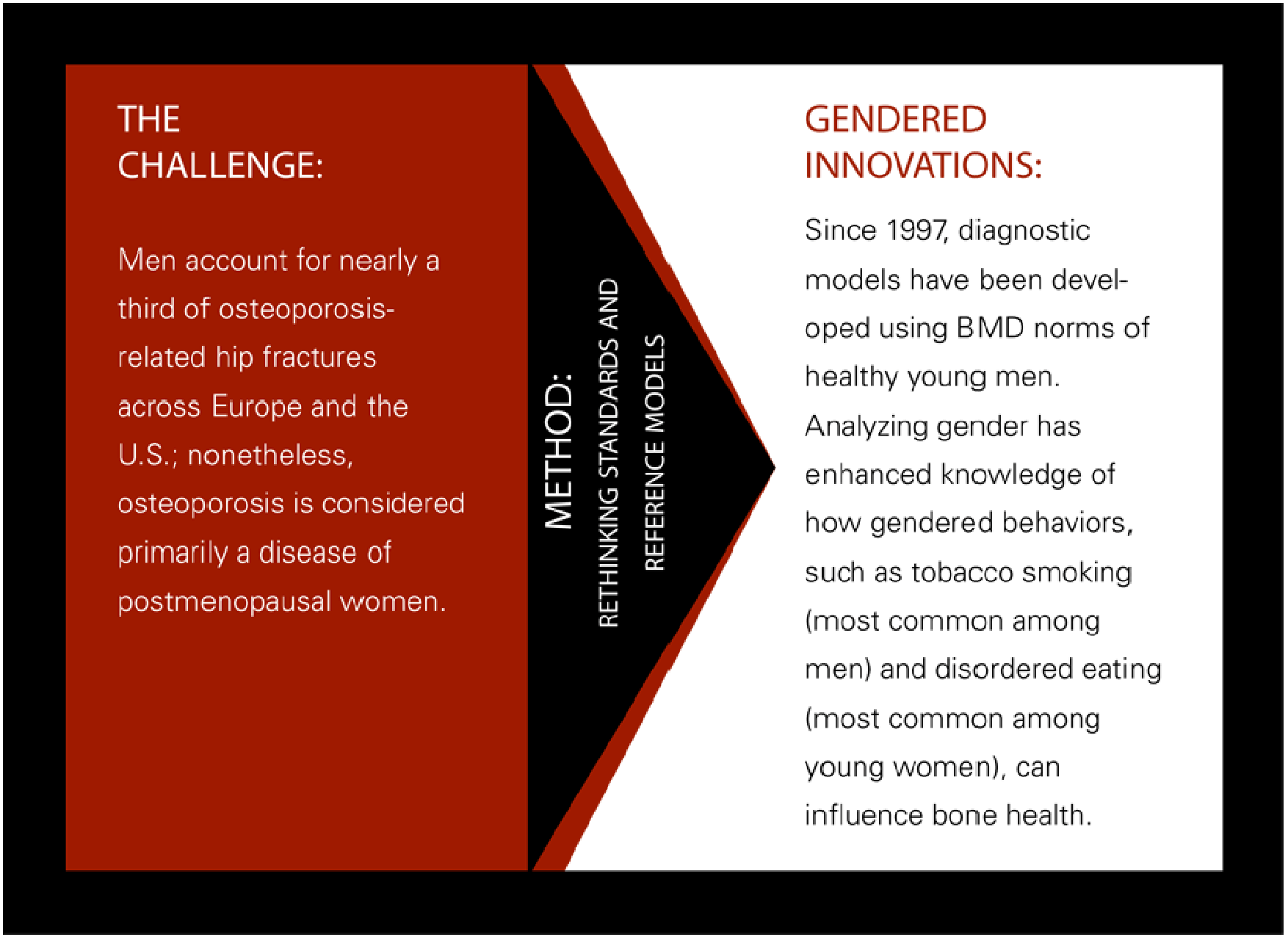
FUNCTIONS IN EACH STEP OF THE RESEARCH PROCESS

- Setting Research Priorities
- Making Funding Decisions
- Establishing Project Objectives
- Developing Methodologies
- Gathering and Analyzing Data
- Evaluating Results
- Developing Patents
- Transferring Ideas to Markets
- Drafting Policies


THE CHALLENGE:
Failure to consider sex as a variable in stem cell research can be a lost opportunity to understand basic and developmental biology, and to refine cell-based therapies.
METHOD:
ANALYZING SEX
GENDERED INNOVATIONS:
Research using animal models has shown that the sex of stem cells may influence therapeutically-relevant cell traits, such as proliferation and differentiation rates.


THE CHALLENGE:
Most basic research with animal models focuses on males to the exclusion of females.
METHOD:
DESIGNING HEALTH & BIOMEDICAL RESEARCH
GENDERED INNOVATIONS:
Analyzing sex in animal research has led to new knowledge about how hormones influence basic molecular pathways involved in immune system function. This is relevant to treating numerous diseases, including autoimmune diseases and HIV infection.


THE CHALLENGE:
Ischemic heart disease (IHD) is the number one killer of European and U.S. women; nonetheless, heart disease has been defined as primarily a male disease. As a result, women are often mis- and under-diagnosed.
METHOD:
FORMULATING RESEARCH QUESTIONS
GENDERED INNOVATIONS:
Analyzing sex has led to understanding that heart disease in women often has a different pathophysiology than in men—particularly in younger adults. Analyzing sex has also led to new diagnostic techniques and better symptomatology. Analyzing gender has led to greater understandings of risk factors and prevention.

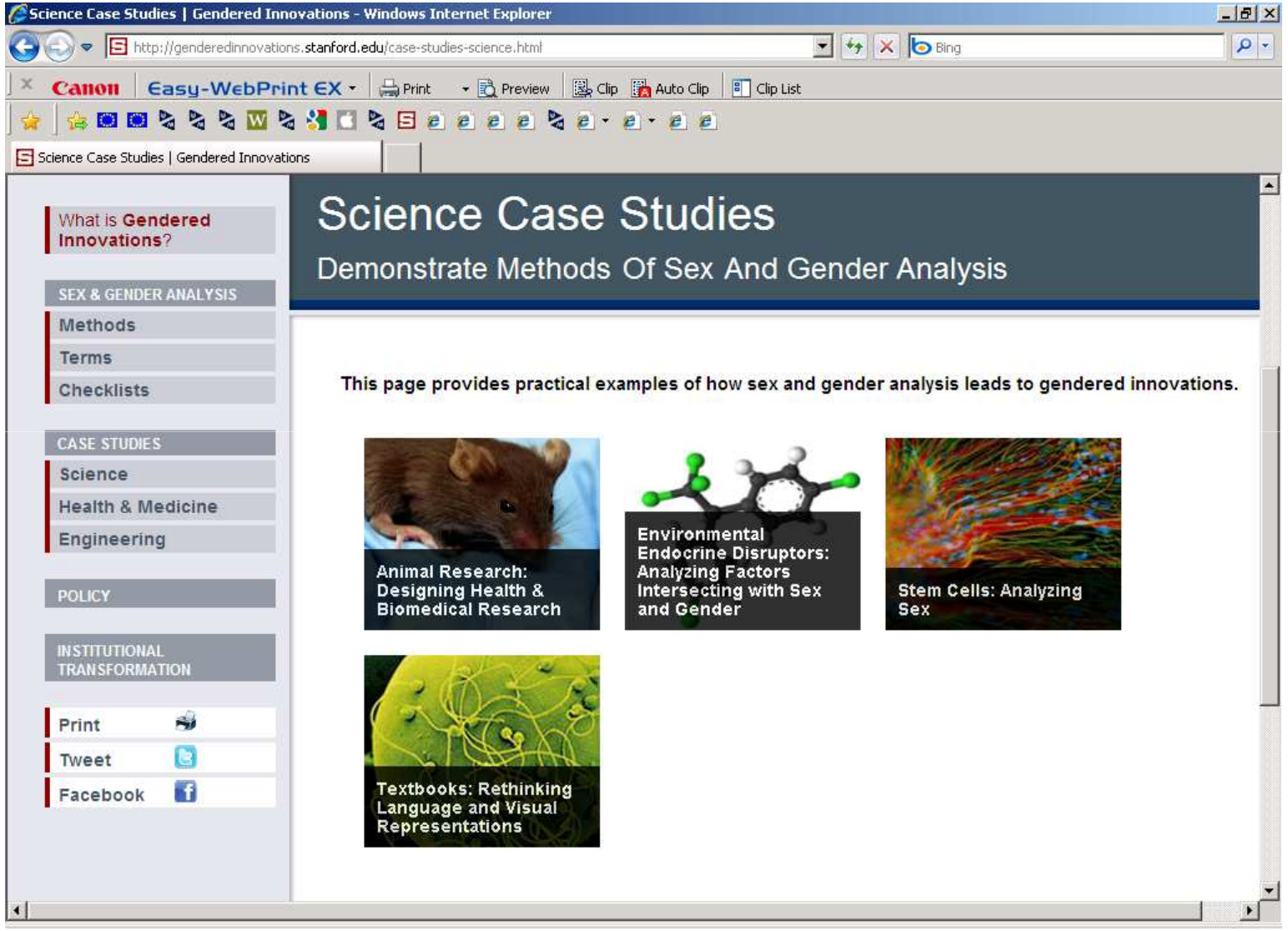

THE CHALLENGE:
Men account for nearly a third of osteoporosis-related hip fractures across Europe and the U.S.; nonetheless, osteoporosis is considered primarily a disease of postmenopausal women.
METHOD:
RETHINKING STANDARDS AND REFERENCE MODELS
GENDERED INNOVATIONS:
Since 1997, diagnostic models have been developed using BMD norms of healthy young men. Analyzing gender has enhanced knowledge of how gendered behaviors, such as tobacco smoking (most common among men) and disordered eating (most common among young women), can influence bone health.

Gendered Innovations

- **Add value to research** by ensuring excellence and quality in outcomes
- **Add value to society** by making research and engineering projects more responsive to social needs
- **Add value to business** by developing new ideas, patents, and technology

Reading suggestions

- Linda Nieuwenhoven & Ineke Klinge(2010) Scientific Excellence in Applying Sex- and Gender-Sensitive Methods in Biomedical and Health Research Journal of Women's Health. February 2010, 19(2): 313-321. doi:10.1089/jwh.2008.1156.
- Klinge (ed)(2007). GenderBasic: Promoting Integration of Sex and Gender Aspects in Biomedical and Health-Related Research. *Gender Medicine.* 4(Supplement B), S59-S178.
- Ineke Klinge & Claudia Wiesemann (eds) Sex and Gender In Biomedicine. Theories, Methodologies, Results. Universitätsverlag Göttingen 2010. ISBN 978-3-941875-26-5
- La medicina non è uguale per tutti / How incorporating sex and gender aspects in biomedical and health research will lead to a better health care. http://www.ingenere.it/articoli/la-medicina-non-uguale-tutti-0
- Londa Schiebinger & Ineke Klinge (eds) Meta-analysis of gender and science research-Topic Report Mainstreaming sex and gender analysis into research, http://www.genderandscience.org/doc/TR6_Content.pdf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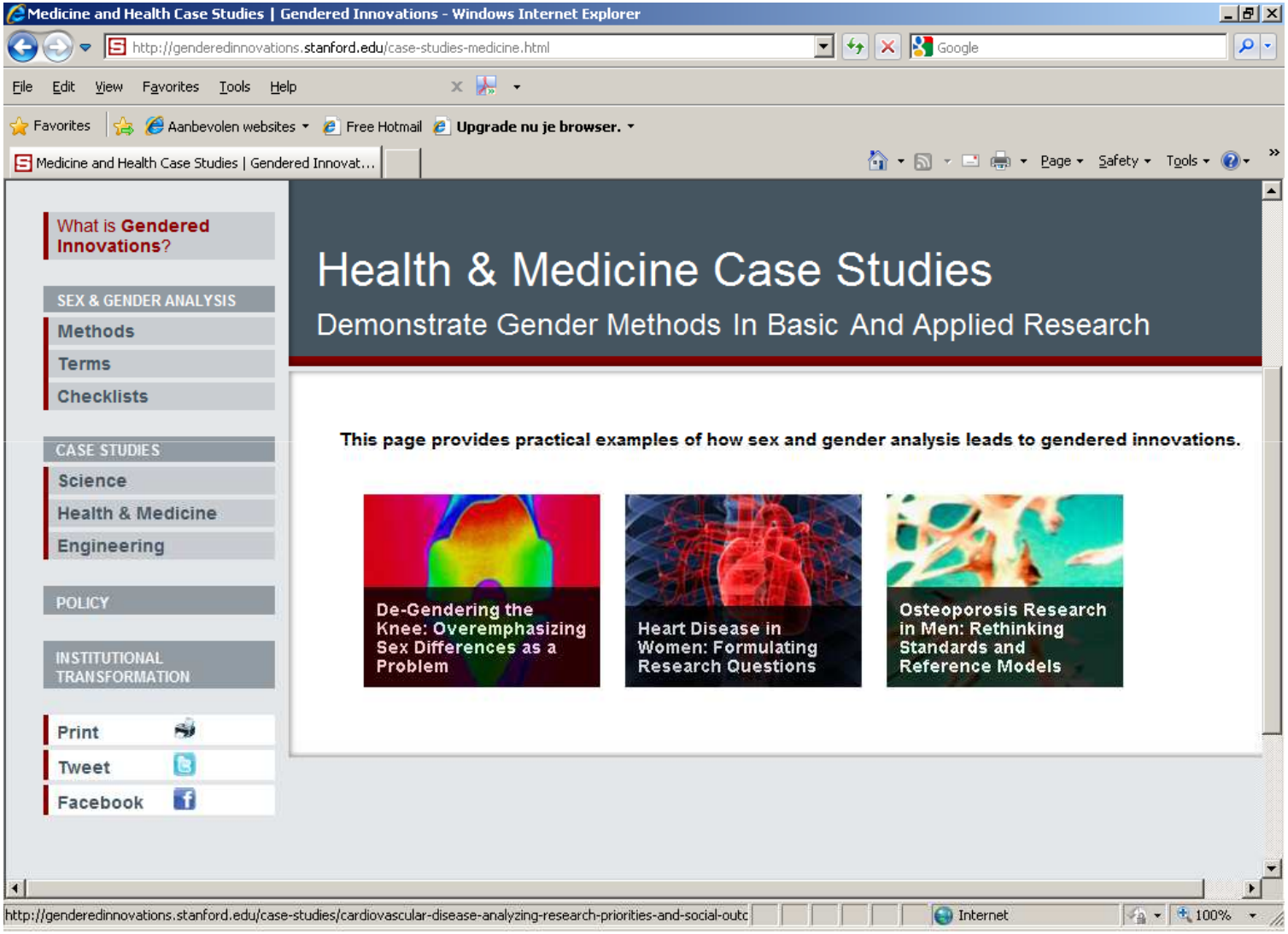
Environmental Endocrine Disruptors: Analyzing Factors Intersecting with Sex and Gender
Stem Cells: Analyzing Sex
Textbooks: Rethinking Language and Visual Representations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