Summary of the Recommendations of the Interagency Breast Cancer & Environmental Research Coordinating Committee

April 3, 2013

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Breast Cancer & Environmental Research Act of 2008

- ✓ **Review federal research on** environmental and genomic factors related to breast cancer; outline key research questions, methodologies, and knowledge gaps.
- ✓ **Identify scientific advances** in breast cancer research
- ✓ **Develop a comprehensive strategy** for accelerating transdisciplinary, innovative, and collaborative research on breast cancer and the environment across federal agencies and in partnership with nonfederal organizations.
- ✓ **Determine how to increase public participation** in decisions about breast cancer research and dissemination of information on research progress.

Breast Cancer Burden - psychological, physical & financial

- In 2012...
  - 227,000 women and 2,200 men will be diagnosed with breast cancer
  - 40,000 women and 400 men will die from breast cancer – 14% of all cancer deaths
  - National cost - $17.35 billion
  - 3 million women in the US are breast cancer survivors
- Women with breast cancer have 67% increased risk of a new breast cancer diagnosis during the first 10 years after initial diagnosis.
- Leading cause of cancer deaths in women worldwide.

The Path Forward: Major Recommendations

1. Make prevention a priority

– The Committee recommends a national breast cancer prevention strategy to prioritize and increase federal government investments in breast cancer prevention. Funding for prevention needs to be on a level playing field with other types of research

The Path Forward

2. **Transform how research is conducted**
   - We recommend investigation into compelling scientific themes using a transdisciplinary approach.
3. **Intensify the study of chemical and physical factors** that potentially influence the risk of developing and the likelihood of surviving breast cancer.
4. **Plan strategically across Federal agencies**
   - We recommend that federal, state, and nongovernmental organizations coordinate and collaborate *to accelerate the pace of scientific research* on breast cancer and the environment.

The Path Forward

5. **Engage public stakeholders at every phase of the research process**.
6. **Train transdisciplinary researchers**
   - We recommend federal programs that encourage and enable scientists to engage in transdisciplinary research.
7. **Translate and communicate science to society by building the platform from the start into every funded program** that focuses on breast cancer and the environment.

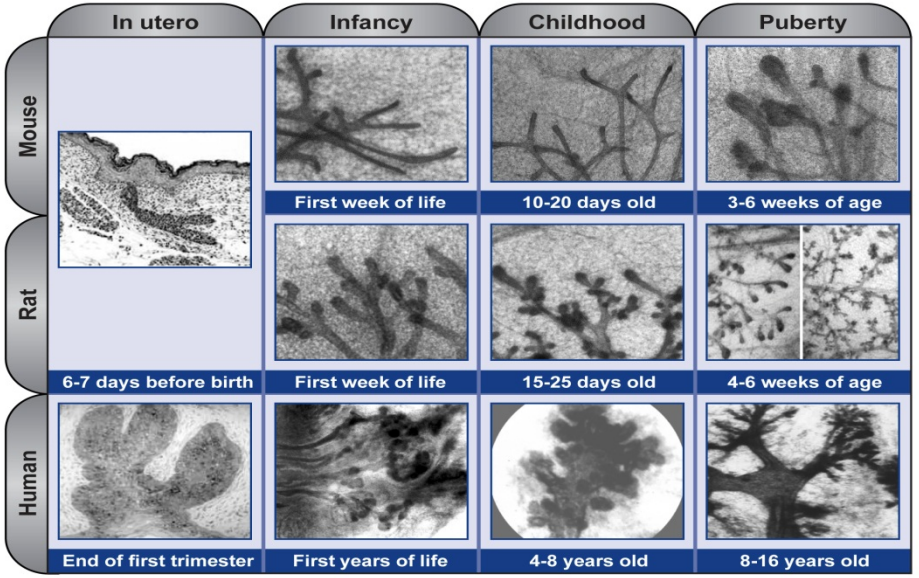
State of the Science:
Principles, Approach, and Mechanisms

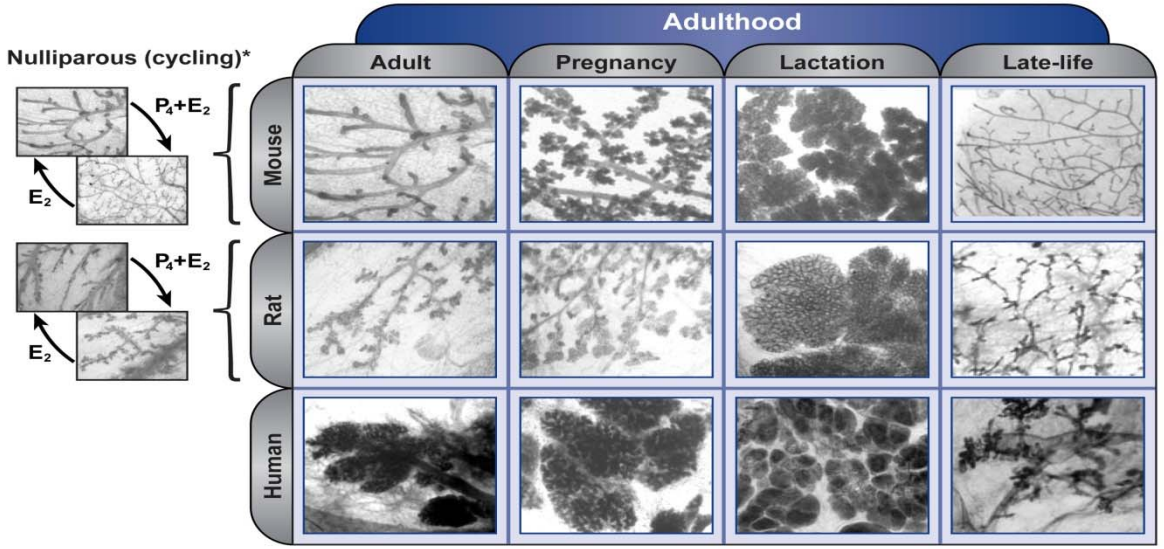
Premises - State of the Science Review

- **Timing matters:**
  - Dose and duration of exposure at a specific time period may be key to observe a detrimental or beneficial effect
  - Identify windows of susceptibility when exposures alter breast development and regulation and breast cancer risk/survival
- **Animal and human research matters**
  - Entire body of evidence (animal and human population studies, and underlying mechanisms) all important in establishing causality
  - Animal models are only as good as the knowledge about the characteristics and limitations of the model
  - Study design and exposures assessment methodology in human research are key to understanding incidence, recurrence and survival

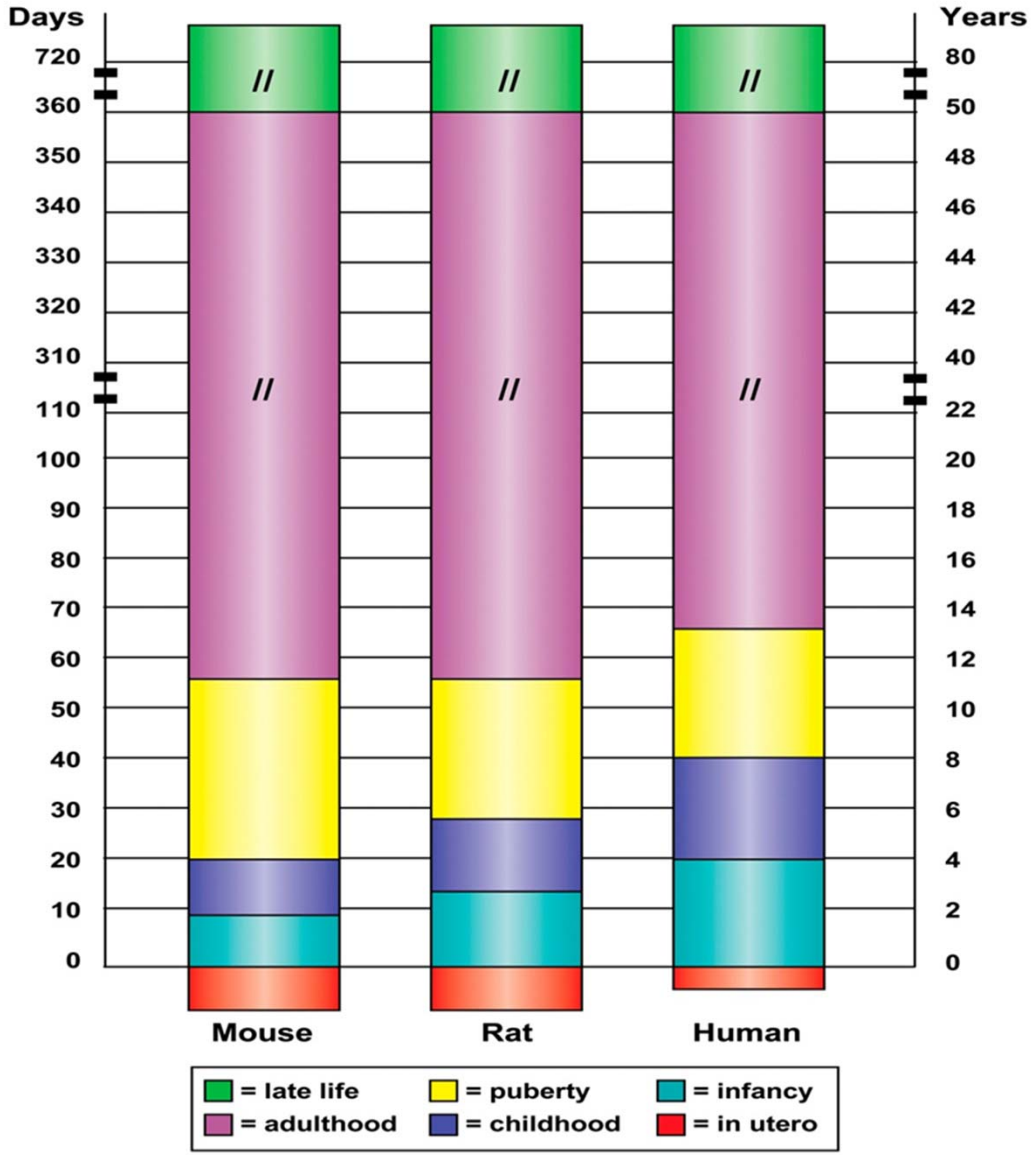
Breast Cancer and the Environment: Prioritizing Prevention

Timing matters:
Structure of the mammary gland during the different life stages of the mouse, rat, and human & potential windows of susceptibility.

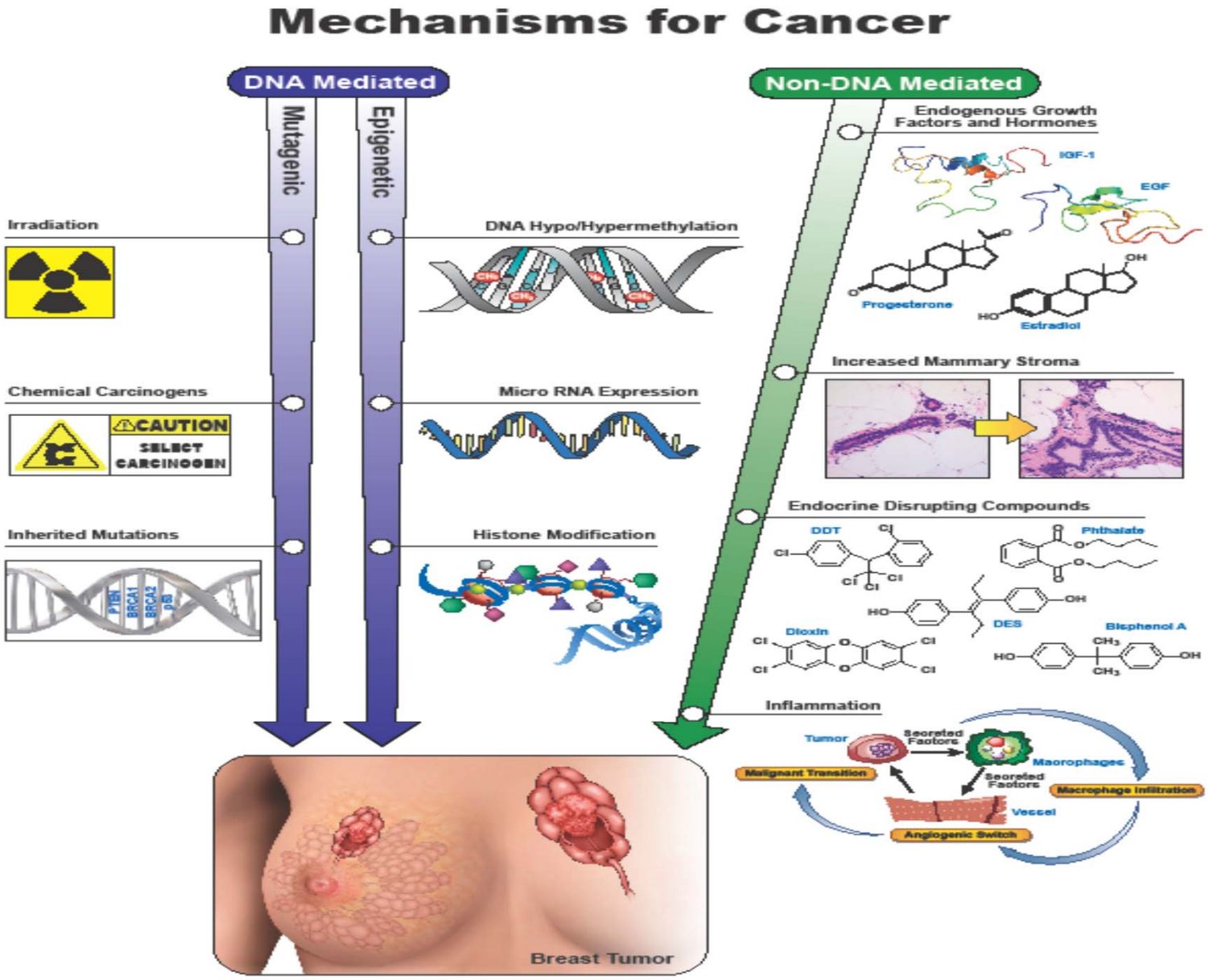




Relative time spent in the different stages of mammary gland development for mice, rats, and humans.



Breast Cancer and the Environment: Prioritizing Prevention



Defining the Environment

- **Lifestyle and behavioral factors**, e.g. alcohol intake & physical activity
- **Chemical agents**, e.g. pesticides, industrial pollutants, consumer products, and medications
- **Physical agents**, e.g. radiation from medical and other environmental sources
- **Social and cultural influences**, e.g. family, community, psychosocial, and societal factors

Evidence from Animal and Human Studies

- **Animal-human paradigm was used to assess factors or exposures in two main categories:**
  1. Recognized/accepted risk factors
  2. Exposures that have some evidence linking them to breast cancer risk
- **Two cross-cutting themes were emphasized:**
  1. Transdisciplinary research
  2. Life-course approach

Areas Where Additional Research is Needed

- Environmental exposures and breast cancer risk overall and:
  - by breast cancer subtype and mammographic density
  - by race and ethnicity
  - in low income communities
- Technology to examine responses to mixtures of environmental exposures
- Monitoring of environmental exposures with rapid feedback to the public
- Methodological issues e.g. risk assessment

Prevention is the key to reducing the burden of breast cancer

Why don't we know more?

- *We have not been looking at environmental exposures at the correct life stage.*
- *We have not examined the correct environmental agents.*
- *We have not asked the right questions about complex mixtures, genetic susceptibility, and breast cancer subtypes.*

Analysis of Federal Research Investments in Breast Cancer & the Environment Research

- ✓ **Etiology Code 2.1:** *Exogenous Factors in the Origin and Cause of Cancer*
- ✓ **Etiology Code 2.3:** *Interactions of Genes and/or Genetic Polymorphisms with Exogenous and/or Endogenous Factors*
- ✓ **Prevention Code 3.1:** *Interventions to Prevent Cancer: Personal Behaviors That Affect Cancer Risk*

ICRP International Cancer Research Partnership

Common Scientific Outline

https://www.icrpartnership.org/CSO.cfm

Portfolio Analysis Summary

- Environmental and prevention studies made up only about 10-11 % of all breast cancer projects funded by the NIH and DoD during the fiscal years examined.

- NGO prevention research comprised less than 7 percent of the total $ spent on breast cancer research.

Recommendations for Improving the Research Process

- Increase support for transdisciplinary research projects on breast cancer and the environment.
- Develop a more diverse community of scientists working on breast cancer and the environment.
- Support the U.S. Government Accountability Office (GAO) recommendation to improve access to comprehensive electronic information on funded health research.
- Develop better coding systems for funded cancer projects.

Recommendations for Improving the Research Process

- Create a mechanism to facilitate joint strategic planning and coordination among government and NGOs.
- Continue and expand the use of advocates and stakeholders in breast cancer and the environment research.
- Support the development of knowledge integration tools in this research area to describe what is known about the environmental causes and prevention of breast cancer. Such tools would facilitate the identification of research gaps and suggest approaches to efficiently fill them.

Committee Membership

- **Non-Federal Representatives (Scientists, Physicians, & other Health Professionals)**
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- Alice Chang, Academy for Cancer Wellness (2010-2011)
- Ysabel Duron, Latinas Contra Cancer
- Karen Miller, Huntington Breast Cancer Action Coalition, Inc. (2010 – 2012)
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Breast Cancer and the Environment: Prioritizing Prevention

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