

New York State

**WOMEN'S HEALTH AND THE
ENVIRONMENT**

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Connections between women's health and environmental factors

- Breast cancer
 - Endometriosis
 - Altered fertility (problems with conception; increased miscarriages)
 - Diabetes
 - Heart disease
 - Parkinson's and other neurodegenerative disorders
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- Fetal development (reproductive, mammary, neural, metabolic)

Types of Environmental Toxicants:

Endocrine Disrupting Compounds

- Personal care products
- Hormone supplements
- Detergents and other cleaning products
- Plastics and plastic additives
- Flame retardants
- Pesticides and herbicides
- Industrial chemicals
- Metals

Types of Environmental Toxicants:

Genotoxic Chemicals

- Industrial chemicals
- Organic solvents
- Products of combustion
- Dyes
- Pharmaceuticals

Types of Environmental Toxicants:

Radiation

- Ionizing radiation
 - Military release
 - Accidental release
 - Medical radiation
 - Screening and diagnosis
 - Treatment
- Non-ionizing radiation
 - Electromagnetic Fields (EMFs)

Major Messages

- Very low doses may exert big effect
- Mixtures matter
- Timing and duration of exposures also matters
- Interactions between genetic factors (or lifestyle factors) and environment may be key

Very low doses may exert big effect

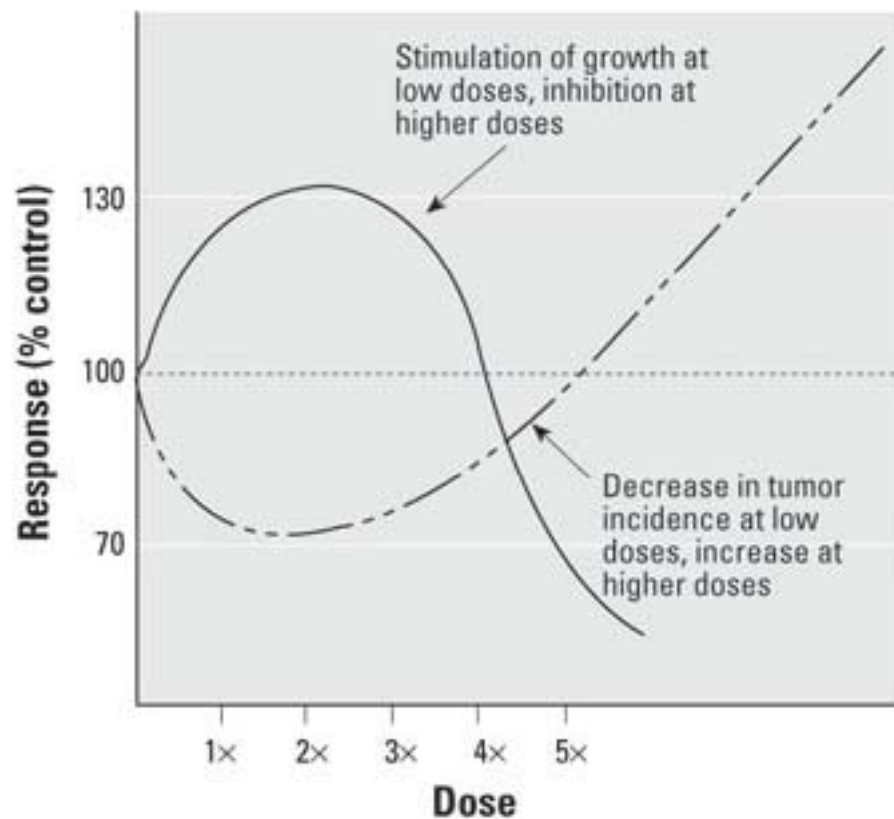
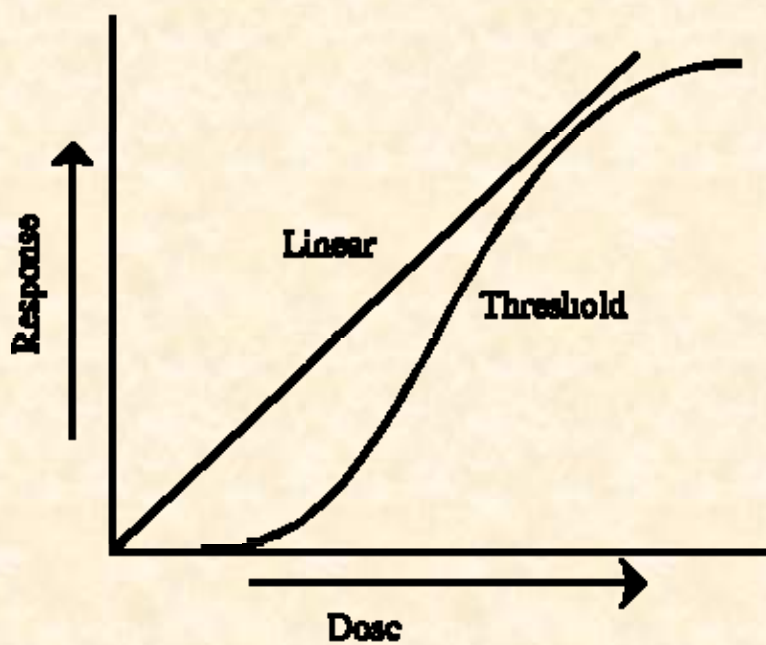


Figure 1. Nonmonotonic dose response for growth or cancer incidence.

Mixtures matter

- Cancel out $1 + [-1] = 0$
- Additive $1 + 2 = 3$
- Synergistic $1 + 2 = 5$

Timing and duration of exposures also matters

- Fetal period/early childhood ***
- Puberty/adolescence
- Pregnancy

Interactions may be key

- Environmental chemicals with
 - Race/ethnic
 - Reproductive
 - Social
 - Lifestyle

e.g., Millikan et al. 2000

Interactions may be key

Radiation with

– Gene profiles

e.g., Turnbull et al. , 2006

Berrington de Gonzales et al. , 2009

ESTROGENS AND PROGESTINS

DES
Oral Contraceptives
HRT
Estrogens & Placental Hormones in Personal Care Products

Food Additives

Pesticides

DDT/DDE and PCBs

Sunscreens

XENOESTROGENS AND OTHER EDCs

Phthalates

Bisphenol A

Parabens

Alkylphenols

Dioxins

PAHs

Tobacco Smoke

Metals

**Breast Cancer(s)
Risk**

1,3-Butadiene

PVC

Benzene

Aromatic Amines

Organic Solvents

Ethylene Oxide

OTHER CHEMICALS OF CONCERN

Non-Ionizing EMFs

Ionizing Radiation

RADIATION

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Childhood and adolescent exposures

Age: Pre- or post-menopause

Breast Cancer(s) Risk

Occupational exposures

Non-Ionizing EMFs

Ionizing Radiation

RADIATION

Prenatal exposures

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Childhood and adolescent exposures

Early Puberty

BRCA1, BRCA2

Other genetic polymorphisms

Late Menopause

Age: Pre- or post-menopause

Occupational exposures

No Children or Late first Birth

Lack of exercise

Diet

Immigration history

Alcohol

Prenatal exposures

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