Breast Cancer Over Time

Created and controlled by breast cancer survivors to support and assist scientific research on the PREVENTION of breast cancer.
Our Daughters
Our Research Team

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Breast Cancer Over Time

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California Pacific Medical Center Research Institute

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Assistant Director
Breast Cancer Over Time
Normal Human Breast Cells

Propagated as a breast cell culture in Dr. Shanaz Dairkee’s lab at CPMCRI
Healthy Breast Cell Donors
Our Research Question

Does reduced exposure to common chemicals, known as xenoestrogens (XEs), in personal care products curb estrogenic hyper-signaling and its adverse effects on normal cell function within the healthy breast tissue of women volunteers participating in the XE-Low (XEL) intervention?
Preceding studies

HERMOSA Study - 2016
• Community-based participatory research study
• Measured phthalate, paraben, and phenol levels in urine of adolescent girls
• Significant drop after 3 day intervention
• Also funded by CBCRP
Personal Care Products and Breast Cancer Risk

San Francisco-based breast cancer prevention study seeking volunteers who meet all the following criteria:

- Are women 18-50 years old
- Are pre-menopausal
- Have not had any kind of cancer (except basal cell skin cancer)
- Use self-care products (such as shampoo, moisturizer, sunscreen, etc.)

Volunteers will participate in a healthy intervention in which they use paraben- and phthalate-free self-care products provided by the study, and donate samples of blood, urine, and breast cells (via fine needle aspiration) in a medical office in San Francisco. Volunteers receive over $200 worth of locally-made healthy cosmetics and $40 in Peet's cards.

Interested?
Take our Intake Questionnaire at: bit.ly/breastcancerovertime

or contact Samantha Torres:
951.486.8285
storres@breastcancerovertime.org
What xenoestrogens are in the products we use?
Neutrogena Ultra Sheer Dry-Touch Sunscreen, SPF 45

EWG scientists reviewed Neutrogena Ultra Sheer Dry-Touch Sunscreen, SPF 45 for safety according to the methodology outlined in our Skin Deep Cosmetics Database. We assess the ingredients listed on the labels of personal care products based on data in toxicity and regulatory databases, government and health agency assessments and the open scientific literature. EWG's rating for Neutrogena Ultra Sheer Dry-Touch Sunscreen, SPF 45 is 5.

**Ingredient Concerns**

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Concerns</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRAGRANCE</td>
<td>Allergies/immunotoxicity, Miscellaneous, Irritation (skin, eyes, or lungs), Organ system toxicity (non-reproductive), Ecotoxicology</td>
</tr>
<tr>
<td>OXYBENZONE (ACTIVE INGREDIENT)</td>
<td>Enhanced skin absorption, Biochemical or cellular level changes, Allergies/immunotoxicity, Use restrictions, Endocrine disruption, Persistence and bioaccumulation, Developmental/reproductive toxicity, Organ system toxicity (non-reproductive)</td>
</tr>
<tr>
<td>PROPYLPARABEN</td>
<td>Use restrictions, Allergies/immunotoxicity, Endocrine disruption, Developmental/reproductive toxicity, Ecotoxicology</td>
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http://www.ewg.org/skindeep/product/593518/Neutrogena_Ultra_Sheer_Dry-Touch_Sunscreen%2C_SPF_45/#.WgCghBOPKTM
<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Use restrictions, Developmental/reproductive toxicity, Biochemical or cellular level changes, Cancer, Organ system toxicity (non-reproductive)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RETINYL PALMITATE (VITAMIN A PALMITATE)</td>
<td></td>
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<tr>
<td>OXYBENZONE</td>
<td>Enhanced skin absorption, Biochemical or cellular level changes, Allergies/immunotoxicity, Use restrictions, Endocrine disruption, Persistence and bioaccumulation, Developmental/reproductive toxicity, Organ system toxicity (non-reproductive)</td>
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<tr>
<td>OCTINOXATE</td>
<td>Enhanced skin absorption, Biochemical or cellular level changes, Endocrine disruption.</td>
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<tr>
<td></td>
<td>Allergies/immunotoxicity, Persistence and bioaccumulation, Developmental/reproductive toxicity, Organ system toxicity (non-reproductive)</td>
</tr>
<tr>
<td>HOMOSALATE</td>
<td>Enhanced skin absorption. Use restrictions, Organ system toxicity (non-reproductive), Endocrine disruption, Ecotoxicology, Contamination concerns (SALICYLIC ACID, TRIMETHYLCYCLOHEXANOL)</td>
</tr>
</tbody>
</table>

Data: Fair

Data: Good

Data: Fair

Data: Fair
Data Sources


CIR (Cosmetic Ingredient Review). 2006. CIR Compendium, containing abstracts, discussions, and conclusions of CIR cosmetic ingredient safety assessments. Washington DC.


Common Endocrine Disruptors in Cosmetics

- Propylparaben
- Butylparaben
- Isobutylparaben
- Methylparaben
- Ethylparaben
- Benzyl Salicylate
- Triclosan
- Oxybenzone
- Oxtinoxate
- Homosalate
- Cyclopentasiloxone
- BHT
- Lillial butylphenyl methylpropional
Other hazardous chemicals in cosmetics

- DMDM Hydantoin (formaldehyde releaser)
- 2-Bromo-2-Nitropropane-1,3 Diol (formaldehyde releaser)
- Retinyl palmitate (biochemical and cellular level changes)
- Methylisothiazolinone (human immune toxicant - banned in Europe, Germany; restricted in Japan and Canada)
- Cocamide DEA (possible carcinogen, nitrosamine contamination)
- Octisalate (enhanced skin absorption)
Fragrance

- “Trade secret” - Ingredients not disclosed
- Very likely to include phthalates, per EWG
Our Study Protocol

1. Obtain blood, urine, and breast cell samples before and after 28 day XE-low healthy intervention.

2. Test blood for levels of natural hormones

3. Test urine for paraben and phthalate levels

4. Propagate live breast cells and perform tests to measure ERα activation, cell proliferation, and apoptosis signaling (higher levels of which are associated with increased breast cancer risk)
Our Healthy Intervention

• Participants used only XE-low personal care products provided by Breast Cancer Over Time for 28 days between cell donations

• Participants kept logs of all products used for 28 days between cell donations
Analysis and Comparison of Samples

- **Blood**: analyzed for levels of natural hormones (estradiol, progesterone, sex hormone-binding globulin)
- **Urine**: analyzed for paraben and phthalate levels
- **Breast cells**: cultured and tests performed for functional differences in live cells
Results

- **Participants**: no attrition and positive reviews
- **Blood**: hormone levels not significantly different
- **Urine**: significant drops in paraben and phthalate levels after healthy intervention
- **Cells**: differences on functional tests on live cells measuring estrogen receptor isoform levels, cell proliferation, and cell death
Change in XE metabolite levels of urine samples 1 and 2 from XEL volunteers

**POST-MENOPAUSAL (N=8)**

- **Phthalates**
  - MEHHP
  - MEHP
  - MEOHP
  - METP

- **Parabens**
  - Butyl
  - Ethyl
  - Methyl (N=7)
  - Propyl

µg/g creatinine
Exit Surveys

- Very positive experience
- Liked the “healthy” personal care products
- Liked having breast cancer survivor buddies
- Reported starting to read ingredient labels in cosmetics
- Gratified and proud to have donated breast cells for a scientific study
- Felt they were making a difference
- FNAs “not a big deal” - they would do it again
Study Conclusions

• Women will donate normal breast cells for research
• Volunteers will comply with study protocol
• Positive changes to human breast cells are observable after both 14 and 28 day interventions
• Study of responses of HEALTHY LIVING HUMAN BREAST CELLS to environmental exposures is feasible and can provide important information on human breast carcinogenesis
Additional Community Conclusions

• Women want to help in scientific research
• Their participation is meaningful and educational
• Survivors are fantastic recruiters and supporters
• More stringent government regulation of environmental chemicals, including cosmetic products, is essential to public health and must be demanded by all of us!
New Full Study: In Vivo Impact of Estrogen Exposure on the Human Breast

• Funded by California Breast Cancer Research Program (cigarette tax monies)

• 60 participants: 40 “Intervention” and 20 “Controls”

• Nanostring gene expression test added for all participants, both visits

• To volunteer, email Samantha Torres at storres@breastcancerovertime.org or scan our QR code:
Current Legislation to Support

• **California:** [The Cosmetic Fragrance and Flavor Ingredient Right to Know Act of 2019](https://leginfo.legislature.ca.gov/faces/billtext.xhtml?bill_id=201920200SB574) (SB 574)
  - Requires cosmetics companies to report toxic fragrance and flavor ingredients in their products to the California Safe Cosmetics Database within the California Department of Public Health

• **Federal:** [Safe Cosmetics and Personal Care Act of 2019](https://www.congress.gov/bill/116th-congress/house-bill/4296) (H.R. 4296)
  - Requires full fragrance and flavor ingredient disclosure on a company’s website and disclosure of a product’s toxic fragrance and flavor ingredients on the product label
  - Bans from cosmetics 20 chemicals known to be toxic
Acknowledgements

• California Breast Cancer Research Program
• Breast Cancer Over Time funds and volunteers
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• CPMC Foundation
• CPMC Research Institute
• Our dedicated and diligent study participants
• Beauty Counter, Human Gear, Eco-Apothecary, Luminance Skin Care, Bathing Culture
• San Francisco Public Health Foundation

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