### **Studies Link Parabens to Breast Cancer**

Using human breast tissue collected from 40 mastectomies for primary breast cancer in England, results showed that one or more paraben esters were quantifiable in 158/160 (99%) of tissue samples.

L. Barr, G. Metaxas, C.A.J. Harbach, L.A. Savoy and P.D. Darbre, Journal of Applied Toxicology, January 2012

Cosmetic preservatives, parabens, found intact in 18 out of 20 breast tumors.

Darbe et al., University of Reading, UK. Journal of Applied Toxicology, New Scientist, Jan 2004.

San Francisco researchers have discovered that two chemicals commonly used in consumer products, bisphenol A and methylparaben, can interfere will the effectiveness of drugs used to fight breast cancer.

California Pacific Medical Center, San Francisco, 2011

Previously published studies have shown that parabens are able to be absorbed through the skin and to bind to the body's estrogen-receptors, where they can encourage breast cancer cell growth.

New Scientist, January 12, 2004

Parabens are absorbed through the skin and mimic the hormone estrogen.

Routledge et al., 1998

"There is a tremendous amount of concern about falling sperm counts and increases in breast cancer which might result from exposure to estrogens."

Professor John Sumpter, Brunel University, USA

A survey of 215 cosmetics found that 99% of those used on the skin contained parabens.

Pesticide and Toxic Chemical News (October 8, 1998)

99% of cosmetics and personal care products designed to be left on the skin and in 77% of rinse-off products (cleansers and masks) contain Parabens.

Rastogi et al., 1995

#### More than 13,000 products registered with the FDA contain parabens.

S Connor, Science Editor, The Independent UK.

#### Parabens are a known allergen.

Society of American Dermatologists

### Parabens are the most widely used cosmetic preservative in the United States.

Stehlin, Dori. Cosmetic Safety: More Complex Than at First Blush. U.S. Food and Drug Admin. FDA Consumer, Revised May 1995

### Methylparaben stimulates tumor initiating cells in ER+ breast cancer models.

Lillo MA1,2, Nichols C3, Perry C1,2, Runke S4, Krutilina R5,2, Seagroves TN5,2, Miranda-Carboni GA6,2, Krum SA1,2.

J Appl Toxicol. 2017 Apr;37(4):417-425. doi: 10.1002/jat.3374. Epub 2016 Sep 1.

#### Final amended report on the safety assessment of Methylparaben, Ethylparaben, Propylparaben, Isopropylparaben, Butylparaben, Isobutylparaben, and Benzylparaben as used in cosmetic products.

Int J Toxicol. 2008;27 Suppl 4:1-82. doi: 10.1080/10915810802548359.

#### Parabens in male infertility-is there a mitochondrial connection?

Tavares RS1, Martins FC, Oliveira PJ, Ramalho-Santos J, Peixoto FP. Reprod Toxicol. 2009 Jan;27(1):1-7. doi: 10.1016/j.reprotox.2008.10.002. Epub 2008 Oct 21.

### A review of the endocrine activity of parabens and implications for potential risks to human health.

Golden R1, Gandy J, Vollmer G.

Crit Rev Toxicol. 2005 Jun;35(5):435-58.

## Estrogenicity of parabens revisited: impact of parabens on early pregnancy and an uterotrophic assay in mice.

Shaw J1, deCatanzaro D.

Reprod Toxicol. 2009 Jul;28(1):26-31. doi: 10.1016/j.reprotox.2009.03.003. Epub 2009 Mar 20

Paraben esters: review of recent studies of endocrine toxicity, absorption, esterase and human exposure, and discussion of potential human health risks.

Darbre PD1, Harvey PW. J Appl Toxicol. 2008 Jul;28(5):561-78. doi: 10.1002/jat.1358.\

#### Parabens can enable hallmarks and characteristics of cancer in human breast epithelial cells: a review of the literature with reference to new exposure data and regulatory status.

Darbre PD1, Harvey PW.

J Appl Toxicol. 2014 Sep;34(9):925-38. doi: 10.1002/jat.3027. Epub 2014 Jul 22.

# Endocrine disrupters and human health: could oestrogenic chemicals in body care cosmetics adversely affect breast cancer incidence in women?

Harvey PW1, Darbre P. J Appl Toxicol. 2004 May-Jun;24(3):167-76.

Oestrogenic activity of p-hydroxybenzoic acid (common metabolite of paraben esters) and methylparaben in human breast cancer cell lines.

Pugazhendhi D1, Pope GS, Darbre PD. J Appl Toxicol. 2005 Jul-Aug;25(4):301-9.

Exposure to parabens at the concentration of maximal proliferative response increases migratory and invasive activity of human breast cancer cells in vitro.

Khanna S1, Dash PR, Darbre PD. J Appl Toxicol. 2014 Sep;34(9):1051-9. doi: 10.1002/jat.3003. Epub 2014 Mar 20.

Combinations of parabens at concentrations measured in human breast tissue can increase proliferation of MCF-7 human breast cancer cells.

Charles AK1, Darbre PD. J Appl Toxicol. 2013 May;33(5):390-8. doi: 10.1002/jat.2850. Epub 2013 Jan 31.

Parabens enable suspension growth of MCF-10A immortalized, non-transformed human breast epithelial cells.

Khanna S1, Darbre PD. J Appl Toxicol. 2013 May;33(5):378-82. doi: 10.1002/jat.2753. Epub 2012 Jun 29.

Oestrogenic activity of benzyl salicylate, benzyl benzoate and butylphenylmethylpropional (Lilial) in MCF7 human breast cancer cells in vitro.

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### Measurement of paraben concentrations in human breast tissue at serial locations across the breast from axilla to sternum.

Barr L1, Metaxas G, Harbach CA, Savoy LA, Darbre PD. J Appl Toxicol. 2012 Mar;32(3):219-32. doi: 10.1002/jat.1786. Epub 2012 Jan 12.

#### Environmental oestrogens, cosmetics and breast cancer.

Darbre PD1.

Best Pract Res Clin Endocrinol Metab. 2006 Mar;20(1):121-43.

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Chow ET1, Mahalingaiah S2.

Fertil Steril. 2016 Sep 15;106(4):978-90. doi: 10.1016/j.fertnstert.2016.08.020. Epub 2016 Aug 18.

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Seo JE1, Kim S2, Kim BH1.

J Expo Sci Environ Epidemiol. 2016 Jul 20. doi: 10.1038/jes.2016.33. [Epub ahead of print]

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[Article in Polish; Abstract available in Polish from the publisher] Kręcisz B1, Chomiczewska-Skóra D2, Kieć-Świerczyńska M2.

Med Pr. 2015;66(3):327-32. doi: 10.13075/mp.5893.00176.