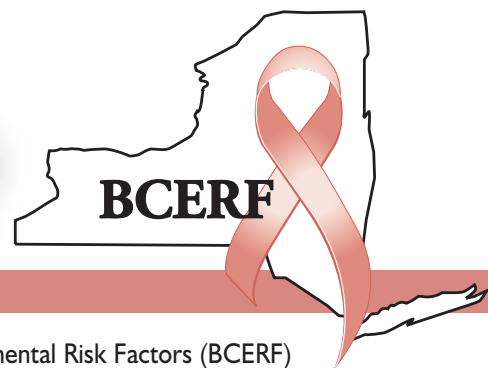


# The Ribbon



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A Newsletter of the Cornell University Program on Breast Cancer and Environmental Risk Factors (BCERF)

Parting Words from Suzanne Snedeker, Associate Director for Translational Research

## Integrity, Innovation, Creativity, Synergy, Commitment...and Thank You

Many of you have received the closure statement I issued in late October in the mail or have seen it on our website. It is reproduced on page 2 of this, our final issue of *The Ribbon* newsletter. My parting words are not going to focus on the final chapter, but rather what is between the bookends.

My time with BCERF has been bracketed by cancer in my Mown family. In late September 1995, less than two months after I moved from North Carolina to Ithaca, New York, my father was diagnosed with colon cancer, and died less than six weeks later on November 11, 1995. It was during his last days when I was with my family in Rhode Island that Dr. June Fessenden MacDonald, the first director of the BCERF program, called me and asked me if I would consider being a part of a new program at Cornell that would address concerns of breast cancer advocates who wanted to know if pesticides and other environmental chemicals were factors in the rising breast cancer incidence and mortality rates seen in many New York State (NYS) counties. To use my knowledge of toxicology to start a cancer prevention program grew out of my desire to both continue my work in breast cancer research and make a difference for those families affected by cancer. I knew how hard it was to lose someone to cancer.

By November 30 of that year, I had drafted a mission statement and scope of work that has guided the program to this day. The core of the program has always been evaluating the strength of the scientific evidence, translating it into educational formats for many different stakeholder groups, and providing forums for all interested stakeholders to openly discuss the merits of emerging evidence. At the bottom of the scope of work, I wrote a short statement that we needed money to print brochures. I was a naïve scientist.

When we were granted funding in the NYS budget in 1996, June told me her first priority was to hire a health educator to develop a newsletter. I thought she was nuts. I knew of no scientific or academic organization that had an ongoing newsletter for the general public. We didn't even have examples of what kind of format to use. Carmi Orenstein, who had a unique background in public health, workplace safety, and environmental public policy, was hired as the newsletter editor, a post she has held for *The Ribbon's* entire publication history. The name, *The Ribbon*, came from

our first logo: a map of New York State draped in a pink ribbon. We later used the concept of the ribbon for one of our first statewide outreach events not to signify the traditional "pink" ribbon, but rather as a ribbon that ties generations of women together: our mothers, daughters, and granddaughters, who may be affected by breast cancer.

*The Ribbon's* format was like no other, using a symposium style to convey the latest emerging research on environmental factors that affected breast cancer risk. The newsletter is only one example of how BCERF transformed traditional print media into an innovative approach. We also used emerging electronic media to provide cancer prevention messages as well as to communicate cancer risk assessment information. When our first website was launched in late 1996, the internet had barely been born. We were thrilled when our first Critical Evaluations, Fact Sheets, and Breast Cancer Maps received a total 450 hits per month. During the month of October 2009, the BCERF web site received 246,851 hits.

In 2007, I approached Dr. Jodi Korich, an educational film producer in our department, about our desire to make a podcast on the breast cancer risk of environmental estrogens. Jodi took us in new directions by producing video clips for young women on estrogens in cosmetics, plastics and laundry detergent for YouTube. But, it took eight months of script writing, storyboard development, and the work of a production team of actresses, animators, and film and audio editors before we had a final product (recently released on DVD as one of our last educational products). This is an example of how an idea became synergized by a marvelous creative team that was committed to reaching young women with ways they could reduce their risk of breast cancer.

I have spent the last several weeks cleaning out offices of other staff members. The files for each project are thick with communications between staff members, collaborators, and advisors drawn from the target populations. They show the

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evolution of a creative idea to a honed product, as well as the evaluation data compiled to measure its usefulness to our target audiences. It's been a hard exercise to cull the files to the few pieces of information we will ultimately archive. What stands out for me is again BCERF's commitment to base our work on the scientific evidence, the creative energy and synergism of the talents of so many staff, and the commitment to work in partnership with our stakeholders.

In my first draft of this letter, I started to compile a list all of the health educators and outreach coordinators, research associates, administrative assistants and managers, student research assistants, web writers, masters, and programmers, collaborators, graphic artists, animators, and film producers that have contributed their talents to our program. I filled half a page. I also started to list all of our partners and stakeholders, including a legion of cancer and environmental advocates, scientists in cancer research and toxicology, teachers, women firefighters, pesticide applicators and horticultural workers, Cornell Cooperative Extension educators, occupational health nurses and physicians, and our many colleagues at the NYS Department of Health and Department of Environmental Conservation. This compilation would fill many chapters. To all of these marvelous individuals and organizations, I must express my deep thanks for your dedication, commitment, and belief in the ability to make "sense of the science" for cancer prevention. I also must thank our directors, Dr. June Fessenden MacDonald, Dr. Rodney Dietert, and Dr. Rodney Page, for your dedication, mentorship, guidance, and most recently for thoughtful leadership during times of difficult decision making.

I mentioned that my years in BCERF have been bracketed by experiencing cancer in my own family. This past February my mother was diagnosed with lymphoma. We will never know the exact cause of her cancer. She reads *The Ribbon* from cover to cover. She read it while going through months of chemotherapy. If in some small way our work over the years has helped other women and men who also read *The Ribbon* to be empowered to make decisions in their personal lives or workplaces to reduce their exposure to environmental chemicals that may affect their cancer risk, then we have been successful. While we write the

closing words in our chapter, we know the final chapter on how chemicals affect the risk of breast cancer and other cancers is far from complete. My final words are thank you. Thank you for being our loyal readers and thank you Carmi, for being a dedicated editor, colleague, and valued friend. 



This article can be found on our website at <http://www.envirocancer.cornell.edu/Newsletter/articles/vl4parting.cfm>

## Dear Friends and Colleagues,

**AS MANY OF YOU ARE AWARE**, earlier this year BCERF had hopeful news that we had been added back to the New York State budget to support 2009-10 activities on the cancer risk of environmental chemicals.

But, as the summer progressed we learned that unanticipated funding difficulties had arisen. We became aware that the funds to support our work were not being released by the New York State Department of Budget. Without the release of these funds, it has not been possible for the Department of Health to write a contract with BCERF to support our 2009-10 workplan.

Based on the information that we had no assurance of funding for this year, I advised our Director, Dr. Rodney Page, that we needed to develop a plan for closing down this part of the BCERF Program. We have informed our colleagues at the Department of Health of our decision.

Both my and Carmi Orenstein's positions will be ending because of our state-funding situation. Carmi and I are devoting our remaining time to wrapping up our outreach and research projects, informing our stakeholders of our situation, and completing activities that are necessary to properly close down this part of the BCERF program. Other part-time staff and our collaborators have been informed that activities and compensation will be ending due to the lack of funding.

It should be noted that Mary Maley and Drs. Carol Devine and Barbour Warren are continuing their research and outreach projects on obesity prevention in humans and companion animals, which are funded through grants from the US Dept. of Agriculture.

This November marks the 14th anniversary of the founding of BCERF. It has been our sincere pleasure to serve the residents of New York State and provide them with high quality translational research and public health education tailored for many different stakeholder groups on environmental chemicals that affect the risk of breast and other cancers. It is with regret that I inform you of our situation, but we close this part of the BCERF Program knowing we have been true to our original mission to bring the best science forward to explain linkages between environmental chemicals and the risk of breast cancer and other cancers, as well as keeping our stakeholders informed and engaged through our web site, *The Ribbon* newsletter, workshops, and the Regional Cancer and Environment Forums.

Please note, as we plan for closure of the state-funded side of BCERF, it is likely that our web site will only be online for several more months. Therefore, we are advising all web users to download PDF files of BCERF materials (e.g. fact sheets, *Briefs*, *The Ribbon* newsletter, Critical Evaluations, etc.), and store these files on your own computers. You may also want to cut and paste the text of any HTML documents you want to preserve for future use into a word processing file (e.g. text from individual *Ribbon* newsletter articles, bibliographies, *Briefs*, etc.).

Thank you for the opportunity of providing you with cancer prevention information.

Sincerely yours,  
Suzanne M. Snedeker, Ph.D.  
Associate Director for Translational Research, BCERF

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# Fall 2009 Regional Cancer and Environment Forum held in Weill Hall on the Cornell Campus

September 22 Forum panel members Anthony Hay, Autumn Stoscheck, and Stephen Penningroth




Speakers engaged with participants on topics such as evidence-based practice for preventive health, BCERF's own work on environmental estrogens, possible water resource issues associated with natural gas drilling, and new evidence linking water and air pollution to breast cancer risk. The eighty participants were professionals and lay people, some local and some coming from surrounding areas from Rochester to Binghamton.

Dr. Rodney Page, *Alexander de Lahunta Chair of Clinical Sciences* in the College of Veterinary Medicine and Director of BCERF welcomed the group and moderated the day. BCERF was pleased to have Dr. Donald Tobias, Executive Director of Cornell Cooperative Extension (CCE) in New York City and currently the Community Engagement Core Program Director for the Clinical and Translational Science Center, Cornell Weill Medical College, speak on "Evidence-Based Practice for Preventive Health: Why Does It Make So Much Sense?" He described the challenges of moving basic research out into the community and the positioning of his New York City staff, based in the land-grant mission as it is uniquely carried out in the city, to facilitate the necessary relationships and activities. "We hire from the neighborhoods and speak five languages: English is our second language." For this role in the unfolding translational research program, CCE educators are engaging with the community in ways ranging from traditional outreach such as health fairs, to monthly videoconferences in which Weill researchers deliver information to African-American churches.

The translational research model Dr. Tobias works to carry out between the medical college and New York City communities presents numerous similarities with BCERF's own model. BCERF also creates a cyclical process by which the community is involved in every stage of making research data accessible for preventive health. Dr. Suzanne Snedeker, Associate Director for Translational Research at BCERF, presented "Lipstick to Laundry Detergents: Avoiding Environmental Estrogens in Everyday Products," a multimedia project which involves young women in creating and disseminating information and strategies for breast cancer risk reduction. Dr. Snedeker presented BCERF's approach for avoiding environmental estrogens in several realms of daily life: cosmetics and personal care products, certain plastics, and estrogenic waste that goes out to the broader environment through detergents and electronics. See the videos and accompanying scientific background at several levels of detail at: <http://envirocancer.cornell.edu/research/endocrine/videos/>

BCERF Forums highlight an issue of local environmental health importance in the region in which the event takes place. Possible water resource issues associated with natural gas

drilling in the Marcellus Shale stood out as the issue to feature while holding the event here in the Southern Tier. The new technique of hydraulic fracturing has generated public questioning about environmental effects. A researcher from the US Geological Survey, William Kappel, provided the technical background for discussion, reviewing all aspects of the technology as well as water issues ranging from sourcing, to contents of the fluids used, to disposal: "no (waste water) system is designed to treat everything, including all that chemistry," he said. A panel of six, including Kappel, Department of Microbiology faculty member Dr. Anthony Hay, Community Science Institute founder Dr. Stephen Penningroth, mother, farmer and community organizer Autumn Stoscheck, Caroline Town Supervisor Don Barber, and aide to Representative Maurice Hinchey, Dan Lamb, expressed their perspectives on gas development in the region.

Dr. Sandra Steingraber, an internationally recognized expert on the environmental links to cancer and human health, and author of the highly acclaimed book, "Living Downstream: An Ecologist Looks at Cancer and the Environment," closed the day with her talk "New Evidence Linking Water and Air Pollution to Breast Cancer." Dr. Steingraber, a Scholar in Residence in the Division of Interdisciplinary and International Studies at Ithaca College and former visiting professor in the BCERF program, proposed five phenomena that are ushering in a new era of research in environment as a determinant of health. Those include: the field of epigenetics (which refers to all modifications to genes other than changes in the DNA sequence itself); new findings in epidemiological research; the particular cancers for which rates continue to rise (those which are not seen as linked to genetic or lifestyle factors such as Non-Hodgkins lymphoma, pediatric brain cancers, and multiple myeloma); biomonitoring efforts in which breakthroughs in analytic chemistry are allowing researchers to determine levels of exposure to chemicals in the population; and the focus on human health effects of climate change. Steingraber referred back to water resource concerns of hydraulic fracturing while she surveyed new evidence of links between environment and breast cancer. She encouraged the group to become educated and not believe we can "opt out of the local water cycle," through buying bottled water. "Because of dermal absorption of contaminants, a ten-minute hot shower is like drinking a half-gallon of water; we are 65% water ourselves and have an intimate relationship with public water systems." 



This article can be found on our website at <http://envirocancer.cornell.edu/program/meetings.cfm>

# Chemicals with Evidence of Breast Carcinogenicity and Consumer Products: Much More Information Needed

By Suzanne Snedeker, Ph.D., Associate Director for Translational Research, BCERF

The National Toxicology Program (NTP) has identified 49 chemicals that are known to induce tumors of the mammary gland in rats and or mice in their animal cancer bioassays (3). Since humans and laboratory animals have a common cancer biology, it is accepted that evidence of cancer risk in laboratory animals predicts cancer risk in humans. Nearly all of these chemicals identified by the NTP have been (through historical use) or are currently present in a variety of products used by consumers (see accompanying Resource Guide). Many of these consumer uses have been noted in the 11th edition of the *Report on Carcinogens* (3), and other scientific sources compiled by BCERF Staff (1).

However, very few of these chemicals that have evidence of breast cancer risk are listed in the National Library of Medicine's (NLM) *Household Products Database* (2). This database lists chemicals by use and by ingredient with information on the specific products that contain these chemicals (see all "\*" entries in the *Found In* column). Therefore, it is a challenge to tell consumers which products (e.g. brand names of products used in the past or currently on the market) contain environmental chemicals that have evidence of breast carcinogenicity. While the NLM's *Household Products Database* is a very useful resource, it is not complete. Neither is the *Report on Carcinogens*, since some product uses of chemicals listed in the *Household Products Database* don't appear in the *Report on Carcinogens*.


Given that both the NTP (which is responsible for conducting the animal cancer bioassays and other cancer testing) and the *Household Products Database* are both under the umbrella of the US Department of Health and Human Services, both organizations could benefit by improving available databases and reports to communicate information on consumer products that

## Resource Guide on Consumer Products Containing Chemicals Known to Induce Mammary Tumors in Cancer Bioassays

CATEGORY	CHEMICAL	FOUND IN
Auto Maintenance	Benzene	Engine degreasers*
Auto Maintenance	Benzene	Gasoline (pumping gas), and exhaust emissions
Auto Maintenance	Benzene	Gasoline (exposure during auto repair work)
Auto Maintenance	C.I. Basic Red 9 monohydrochloride	Anti-freeze (used as pink tint)
Auto Maintenance	1,3-Butadiene	Gasoline (pumping gas) and exhaust emissions
Auto Maintenance	Methylene chloride	Large number of products used in cleaning, degreasing, and lubricating auto parts*
Auto Maintenance	1,2-Dibromoethane (Ethylene Dibromide)	Gasoline (historical use as additive in leaded gasoline)
Auto Maintenance	Chloroprene	Belts, hoses and gaskets used in auto repair
Auto Maintenance	1,2-Dichloroethane	Gasoline (historical use as anti-knock additive in leaded gasoline)
Auto Maintenance	1,2-Dichloropropane	Gasoline (historical use as additive in leaded gasoline)
Auto Maintenance	Hydrazobenzene	Motor oil (used as anti-sludging additive)
Auto Maintenance	5-Nitroacenaphthene	Diesel exhaust
Auto Maintenance	Nitromethane	Vehicle exhaust
Auto Maintenance	2,4-Dinitrotoluene	Automotive lubricants / greases
Pesticides	Dichlorvos	No-pest strips (historical use in fly strips)*
Pesticides	1,2-Dibromo-3-chloropropane	Found in contaminated groundwater in areas of past use (see BCERF Fact Sheet no. 50)
Pesticides	1,2-Dibromoethane (Ethylene DiBromide)	Pesticide fumigant (used up to 1984 on grain, vegetable, fruit, and citrus crops, and golf courses)
Landscaping	5-Nitroacenaphthene	Tree bark mulch
Home Maintenance	Glycidol	Paints and adhesives
Home Maintenance	Benzene	Furniture products used to restore the finish*
Home Maintenance	Benzene	Paints (used in certain tint bases)*
Home Maintenance	1,2-Dichloroethane	Upholstery and carpet cleaners
Home Maintenance	1,2,3-Trichloropropane	Furniture stripping and refinishing products (historical use)
Home Maintenance	1,2,3-Trichloropropane	Paint strippers (historical use)
Home Maintenance	1,3-Butadiene	Flashing cement used for roof repair*
Home Maintenance	Ethylene oxide	Asphalt and concrete driveway cleaner*
Home Maintenance	Ethylene oxide	Paint and varnish strippers*
Home Maintenance	Methylene chloride	Paint and varnish strippers and paint thinners*
Home Maintenance	Methylene chloride	Wood floor cleaners
Home Maintenance	Methylene chloride	Adhesive remover*
Home Maintenance	1,2-Dichloropropane	Spot and stain removers
Home Maintenance	1,2-Dichloropropane	Paint strippers
Home Maintenance	3,3'-Dimethylbenzidine dihydrochloride	Swimming pool test kits
Home Maintenance	o-Toluidine hydrochloride	Swimming pool test kits
Home Maintenance	Methyleugenol	Dryer sheets (as fragrance)
Home Maintenance	C.I. Basic red 9 monohydrochloride	Toilet disinfectants (pink tint)
Home Maintenance	2,4- & 2,6-Toluene diisocyanate	Polyurethane wood finishes, paints, adhesives, and sealants
Arts, Crafts & Hobbies	Benzene	Glue and adhesive remover*
Arts, Crafts & Hobbies	Nitromethane	Model engine fuel*
Arts, Crafts & Hobbies	Ethylene oxide	Glue and adhesive remover*
Arts, Crafts & Hobbies	Chloroprene	Rubber cement
Arts, Crafts & Hobbies	2,2-bis(Bromomethyl)-1,3-propanediol	Solvents used in thermophotographic materials

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CATEGORY	CHEMICAL	FOUND IN
Arts, Crafts & Hobbies	3,3'-Dimethoxybenzidine dihydrochloride	Pigments used in dyes and inks (exposure during mixing pigments and when painting fabrics)
Arts, Crafts & Hobbies	2,3-Dibromo-1-propanol	Solder paste
Arts, Crafts & Hobbies	3,3'-Dimethylbenzidine dihydrochloride	Photography supplies used for developing color photos
Arts, Crafts & Hobbies	3,3'-Dimethylbenzidine dihydrochloride	Dyes and pigments used in arts and crafts
Arts, Crafts & Hobbies	Ethylene oxide	Bee hives (used for sterilization of hives)
Arts, Crafts & Hobbies	Methylene chloride	Artificial snow and frost
Arts, Crafts & Hobbies	Methylene chloride	Contact cement, super glues, and adhesives
Home Office	2,3-Dibromo-1-propanol	Ink-jet printer ink
Home Office	Indium phosphide	Microelectronics (used in making semiconductors)
Pet Care	Nitrofurazone	Pet fish care products*
Pet Care	Nitromethane	Carpet treatment to kill ticks and fleas*
Pet Care	Dichlorvos	Pet collars & deworming medications (historical use)
Lifestyle	Benzene	Tobacco smoke
Lifestyle	1,3-Butadiene	Tobacco smoke
Lifestyle	3,3'-Dimethylbenzidine dihydrochloride	Tobacco smoke
Lifestyle	Ethylene oxide	Tobacco smoke
Lifestyle	Isoprene	Tobacco smoke
Lifestyle	Nitromethane	Tobacco smoke
Lifestyle	o-Toluidine	Tobacco smoke
Lifestyle	Isoprene	Wood and oil fires
Textiles	C.I. Basic red 9 monohydrochloride	Textile dyes
Textiles	C.I. Acid red 114	Textile dyes (for wool, silk, jute and leather)
Textiles	o-Toluidine hydrochloride	Textiles (dye residue)
Textiles	2,3-Dibromo-1-propanol	Clothing (historical use up to 1977 in flame retardants used to treat children's clothing and draperies [TRIS-BP])
Textiles	2,4-Diaminotoluene	Textile dye (silk, wool, furs)
Textiles	o-Nitrotoluene	Textile dye (cotton, wool, and silk)
Food	Benzene	Food with benzoate and ascorbate food additives
Food	1,2-Dichloroethane	Food & water (historical use a pesticide fumigant for spices, grains, mushrooms, peaches & apples)
Food	Hydrazobenzene	Fish & water (bioaccumulates in fish)
Food	Malachite green	Fish (use banned in US in 1983, some reports of trace levels in fish imported from Asia)
Food	Methylene chloride	Decaffeinated coffee (historic use)
Food	Methyleugenol	Flavorings used in jellies, baked goods, beverages, gum, candy, pudding, relish and ice cream
Food	2-Nitropropane	Oils and fats (as contaminate in frying oil, oil-based dressings, and imitation cocoa butter)
Food	o-Toluidine	Black tea (naturally occurring, volatilizes in aroma)
Food	Ochratoxin A	As a fungal contaminant (ochratoxin A is a mycotoxin) found in grains, coffee, beer, wine and dried fruits)
Food	Urethane	Fermented foods (yogurt, soy sauce, olives and certain beers, wine and stone-fruit brandies)
Food storage	1,3-Butadiene	Released from canola oil during heating
Food storage / packaging	2-Nitropropane	Food packaging (used in printing inks, beverage can coatings, laminating adhesives)
Food storage / packaging	2,4- & 2,6-Toluene diisocyanate	Food packaging (polyurethane foam)
Cosmetics & Personal Care	C.I. Acid red 114	Some bubble baths (tint)
Cosmetics & Personal Care	Ethylene oxide	Cosmetics and personal care products
Cosmetics & Personal Care	Glycidol	Milk of Magnesia (used to sterilize)
Cosmetics & Personal Care	Methyleugenol	Essential oils used in massage oils & aromatherapy
Cosmetics & Personal Care	Methyleugenol	Fragrance in personal care products
Cosmetics & Personal Care	2,4-Diaminotoluene	Hair dyes (historical use, banned in 1971)
Personal Care	Methylene Chloride	Spray shoe polishes
Medical Devices	2,4-Diaminotoluene	Meme silicone breast implants
Self-Defense	2-Chloroacetophenone	Mace products
Recreation (Hunting)	2,4-Dinitrotoluene	Ammunition (residue can be left on weapon)

have had or currently contain identified mammary carcinogens. The *Household Products Database* should also provide a link to abstracts on the cancer risk of chemicals listed *Report on Carcinogens*. Beyond these recommendations, currently consumers cannot make informed choices because for most household products in common use (cosmetics are the exception), a comprehensive list of ingredients does not have to be listed on the label. Hence, federal labeling laws do not allow consumers to be equipped with information that enables them to make a choice to avoid products containing ingredients that pose a cancer risk. Beyond this, the next question is, why are we still using so many consumer products with toxins that may pose a risk for breast and other cancers? 

\* Specific products containing these chemicals can be found by searching the *Ingredient category* in the National Library of Medicine's *Household Products Database* at: <http://householdproducts.nlm.nih.gov/>

Dr. Suzanne Snedeker would like to thank Nellie Brown, MS, CIH, Director of Workplace Health and Safety Programs, School of Industrial and Labor Relations, former BCERF research assistant Laschelle Dana Marie Stewart, and former independent study student Michael Goldman, for their contributions in researching consumer uses of the chemicals listed in this table.

**Selected References:**

1. Brown, N. (2009). Chemicals in the Workplace Database, Program on Breast Cancer and Environmental Risk Factors, Cornell University, Ithaca, NY.
2. NLM (2009). Household Products Database, National Library of Medicine, US Department of Health and Human Services, <http://householdproducts.nlm.nih.gov/> (cited November 5, 2009).
3. NTP (2009). Chemicals Associated with Site-Specific Tumor Induction in Mammary Gland, National Toxicology Program, Department of Health and Human Services, <http://ntp.niehs.nih.gov/index.cfm?objectid=E1D18034-123F-7908-7B2C2AE41B1F3778> (cited November 5, 2009).
4. USDHHS (2004). Report on Carcinogens, 11th Edition, Carcinogen Profiles 2004, US Department of Health and Human Services, Public Health Service, and the National Toxicology Program, Research Triangle Park, NC.



This article can be found on our website at <http://www.envirocancer.cornell.edu/Newsletter/articles/vl4consumer.cfm>

# Risk Reduction in School Settings: Avoiding Chemicals that May Present a Breast Cancer Risk

BCERF had planned to produce an *Alert* brochure as the next phase of its efforts to address teachers and breast cancer risk. Because we are not able to continue this project, we offer in this article information we have gathered to date on workplace exposures to select chemicals that may exist in school settings. This information is based on research by BCERF collaborator Nellie Brown, MS, CIH, Director of the Workplace Health and Safety Program with Cornell University - School of Industrial and Labor Relations. Ms. Brown determined that nine National Toxicology Program (NTP) mammary carcinogens were potentially present in school settings, either historically or currently. Formaldehyde was added, due to some limited evidence from human studies of a potential breast cancer risk. Please see the resource list at the end of the article for further details and resources on reducing risks in a variety of these settings. See the EnviroChem and Cancer Database (ECCD) for information on all of the NTP mammary carcinogens: <http://envirocancer.cornell.edu/ECCD/>

*NOTE: exposure scenarios reflect educational settings from kindergarten through high school, including vocational education, and may apply to trade schools. They do not include exposures at the college or university level, such as science classes with laboratory work, scientific research, art, or technology classes. These settings may have these and/or other exposures of concern, but they were not included in our review.*

**Methylene chloride** is a chlorinated solvent to which those in **cosmetology** classes may have been exposed historically through hairsprays. Chlorinated solvents have been phased out due to damage to the ozone layer, as per US Environmental Protection Agency (EPA) requirements. Currently used products should be based on alternative formulations. These include water-based hairspray in pumpspray bottles or alternative propellants for aerosol cans, such as carbon dioxide and isobutane/propane. **Methyleugenol** is a mammary carcinogen that may be in current use in cosmetology settings. It is contained in a wide variety of essential oils used as ingredients in certain hair care products.

**p-Rosaniline hydrochloride** or **C. I. Basic Red 9 Monohydrochloride** may be present in **autoshop**. It is used as a dye in antifreeze and therefore may be encountered during the flushing and replacing of engine coolant/antifreeze from vehicle radiators. It is important for instructors and students to wear protective gloves appropriate for the specific antifreeze (always consult the glove suppliers' charts for information the type of glove that provides adequate protection).

**Glycidol** is a mammary carcinogen which may be encountered in **art class** situations when using epoxy resin systems for paint, lacquer, and ink vehicles, as well as for casting, laminating, adhesives, and molding. Exposure may occur during mixing of two-part epoxy systems. It is important to use local exhaust ventilation in these situations. Silicone may provide an alternative resin systems. Those selecting materials should follow the recommendations of the Art and Creative Materials Institute (ACMI) at <http://www.acminet.org/>

**Art teachers** using polyurethane plastic mold-making materials may be exposed to **2,4- and 2,6-Toluene Diisocyanate (TDI)**. The author of *Artist's Complete Health and Safety Guide*, M. Rossol, recommends that TDI be avoided completely because she believes that art studios are unlikely to have sufficient ventilation to adequately reduce exposure. Alternatives include silicone, as with glycidol. For woodworking using polyurethane varnishes, be sure to use adequate local exhaust ventilation such as a hood or paint booth, or use

alternative varnishes, such as acrylics.

**Maintenance workers** applying paints and sealants by spray or brush used for floor finishes, wood finishes and varnishes (including gym floors), wood and concrete sealants, and sealants for concrete or steel may also be at risk of exposure to TDI. Strategies for avoiding exposure include using alternative paints or varnishes, providing additional general ventilation during the task, and respiratory protection if the ventilation is inadequate. The task should be scheduled when the building is unoccupied to prevent others' exposure.

**Formaldehyde** may be present in multiple situations around schools. In the past, **biology labs** used formaldehyde (as formalin solution) to preserve specimens. Today specimens may be originally preserved with formaldehyde but are washed and packaged in alcohols for shipment to schools. Alternatives that may be used include freeze-dried specimens, plastic models, and dissection videos.

Formaldehyde may also be present in papers of all kinds **throughout the school**. Ventilation at ASHRAE (the American Society of Heating, Refrigerating and Air-Conditioning Engineers at <http://www.ashrae.org/>) recommendations may still not provide sufficient protection for those with severe allergy or for physical handling of materials. For these people, gloves may provide some protection. Or, consider using purchasing specifications to screen out undesirable products and use materials recommended by ACMI. Electronic or online versions of some publications may be available to avoid printed material. To deal with offgassing of formaldehyde from carbonless copy paper forms, new forms should be stored in a well-ventilated area before use. Boxes should be opened to allow forms to offgas before they are brought into an office. **Office workers** can verify that their workspace meets ASHRAE recommendations for ventilation. Using purchasing specifications can help ensure there is no routine exposure to formaldehyde-based paper finishes from various papers, including paper towels.

General exposure to formaldehyde may result from off-gassing from new construction or remodeling materials, such as particle board and plywood. Those responsible for purchasing should use product specifications and commissioning to avoid purchasing materials which offgas or offgas at high rates. There are techniques to "bake off" a building until offgassing is reduced before re-allowing occupancy. Materials should be purchased in advance and stored in areas with significant ventilation to enable offgassing before installation.

In **cosmetology** settings, formaldehyde solutions or

paraformaldehyde blocks may be used as a cold sterilant for items such as combs and for cabinets. Contact your State Board of Cosmetology for alternatives allowed in your state. The NYS Appearance Enhancement License Law (19 NYCRR 160.17) on cleaning, disinfection, or sterilization of implements allows alternatives. These are specified as to their type, usage, and work practices but include a range of disinfectants registered by the EPA, as well as sterilization by autoclaving. Some items may also be used as disposables.

Two mammary carcinogens that may be present in **autoshop** settings and throughout the school are **5-Nitroacenaphthene** and **Benzene**. Exposure to 5-nitroacenaphthene in diesel exhaust may occur during servicing and repair of diesel-powered vehicles. Benzene is present in gasoline and in vehicle exhaust. Local exhaust ventilation should be used in autoshop, including piping from vehicle exhaust directly to the outside. Others on school grounds may be exposed to these chemicals from diesel-powered buses, delivery trucks, cars, or other equipment via building air intakes for HVAC system. In New York State, there is NYS-DEC regulation that forbids idling of heavy-duty vehicles for over five minutes (see <http://www.dec.ny.gov/chemical/8585.html>). New York City Administrative Code is stricter

and states that buses cannot leave their motors running for more than three minutes, and cannot leave them running at all when it is warmer than 40 degrees Fahrenheit outside. Much improvement is needed in the enforcement of this law. Attention must also be paid to avoid any idling near air intakes. The school may choose to adjust the on/off times of the ventilation system so that the system is off while loading or unloading buses.

There may also be general classroom exposure to benzene resulting from emissions from laser printers or photocopiers. To reduce this hazard:

- Keep a distance from printers; don't work right next to a printer or its exhaust.
- Change the carbon cartridge/filter on the exhaust more frequently for high-use photocopiers or printers. High-volume photocopiers can also have their exhaust vented directly to the outside. Typically, as the carbon filter ends its usual life, a variety of contaminants begin to exit through the exhaust including ozone; its odor may be a useful alert that the filter needs changing.
- Check the emission rate information for your printer and make sure that classroom ventilation is adequate, especially

*continued on back page*

## BCERF Website Resources

<http://envirocancer.cornell.edu>

The closure of the state-funded side of BCERF affects the support of our web site. We are taking steps to archive many of our web-based materials, including adding the majority of our publications to Cornell University's Digital Repository, called eCommons. This will allow for long-term preservation of, and access to, many BCERF materials. Once the materials are transferred, you will be able to access them via BCERF's "Collection Home Page" at: <http://ecommons.library.cornell.edu/handle/1813/14164>

### Newly posted educational materials include:

#### • **Breast Cancer and the Estrogen Connection**

USE these handouts to learn how to avoid environmental estrogens in everyday products and how to keep them out of our environment:

- Cosmetics and More Handout (PDF)
- Plastics and Avoiding Bisphenol-A Handout (PDF)
- In the DUMP & Down the DRAIN Handout (PDF)
- Alternatives and Recycling Guide Handout (PDF)
- Videos on the Estrogen Connection (PDF)

<http://envirocancer.cornell.edu/research/endocrine/videos/handouts.cfm>

NOTE: The *Estrogen Connection video clips* on estrogenic ingredients found in *Cosmetics*, *Plastics*, and *What Goes in the Dump* (electronics) and *Down the Drain* (detergents) are found on:

- **BCERF website** <http://envirocancer.cornell.edu/research/endocrine/videos/>  
AND
- **YouTube** (search on "enviroestrogen" at <http://www.youtube.com>).

#### • **Fall 2009 Cancer Forum Summary (also see page 3)**

VIEW the summary of the Fall 2009 Regional Cancer and Environment Forum that took place at Weill Hall on the Cornell University Ithaca Campus on September 22, 2009: <http://envirocancer.cornell.edu/program/meetings.cfm>

#### • **Brief on Soy Phytoestrogens and Breast Cancer Risk**

LEARN about sources of soy phytoestrogens (plant estrogens) in our diets and what is known about their relationship to breast cancer risk. <http://envirocancer.cornell.edu/research/endocrine/BriefSoy.pdf>

#### • **Turf Pesticides and Cancer Risk**

The BCERF Brief for Landscaping Professionals on Understanding the Cancer Risk of Turf and Lawn Care Pesticides (also called the "Turf Brief") includes information on how cancer risk is assessed, how to find out cancer information on pesticides used in turf care and landscaping, and advice on improving communication with co-workers, clients, and the community.

- **DOWNLOAD** the formatted Turf Brief in English (PDF) [http://envirocancer.cornell.edu/Turf/Turf\\_BriefENG.pdf](http://envirocancer.cornell.edu/Turf/Turf_BriefENG.pdf)
- **VIEW** Turf Brief in English (HTML) <http://envirocancer.cornell.edu/turf/BriefEng.cfm>
- **VIEW** Turf Brief in Spanish/Español (HTML) <http://envirocancer.cornell.edu/turf/BriefEsp.cfm>



This article can be found on our website at <http://www.envirocancer.cornell.edu/Newsletter/articles/v14resources.cfm>

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#### Editor

Carmi Orenstein,  
M.P.H., *Assistant  
Director*


#### Design

Westhill Graphics,  
Ithaca, NY

## Risk Reduction in School Settings *continued from page 7*

that it meets ASHRAE recommendations. The manufacturer should be able to provide emission rate information and the EPA has published emission rates for some equipment.

**2,3-Dibromo-1-propanol** is a possible ingredient in ink-jet printer cartridges found **throughout the school** but is of particular concern for those maintaining the printers. Exposure may take place while replacing ink cartridges or due to breakage or leakage of a cartridge. Use purchasing specifications to avoid this ingredient.

Interventions to prevent or reduce these exposures most likely involve multiple individuals in a school setting, including those responsible for purchasing and for custodial and maintenance services. Sometimes it may be necessary to bring in an outside certified industrial hygienist (CIH) to evaluate the indoor environment of a school building. 

## Resources

Brown, N. J. (1987). Health hazard manual for cosmetologists, hairdressers, beauticians and barbers. Cornell University-ILR/Workplace Health and Safety Program (formerly Chemical Hazard Information Program) Available from:  
<http://digitalcommons.ilr.cornell.edu/manuals/6>

Rossol, M. (2001). Artist's complete health and safety guide. (New York: Allworth Press).

McCann, M. (2008). Health hazards manual for artists. (New York: Nick Lyons Books).

US EPA/US DHHS (NIOSH) (1991). Building Air Quality: A Guide for Building Owners and Facility Managers. Downloadable at <http://www.epa.gov/iaq/largebldgs/baqtoc.html>

USEPA et al. (1995). Tools for Schools Action Kit. Downloadable at <http://www.epa.gov/iaq/schools/actionkit.html>

US EPA (2001). Mold remediation in schools and commercial buildings. Downloadable at [http://www.epa.gov/mold/mold\\_remediation.html](http://www.epa.gov/mold/mold_remediation.html)

 A full PDF of this newsletter is available at <http://envirocancer.cornell.edu/Newsletter/pdf/v14i3.pdf>

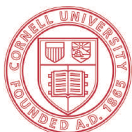
 This article can be found on our website at <http://www.envirocancer.cornell.edu/Newsletter/articles/v14school.cfm>

**Erratum:** Due to a printing error, an article in the Volume 14, Number 2 issue of *The Ribbon* was missing its byline. The author of the article on page 3, "The Pine River Statement: Human Consequences of DDT Use," is Suzanne Snedeker, Ph.D., Associate Director for Translational Research, BCERF.



**Cornell University**  
*Program on Breast Cancer and  
Environmental Risk Factors*  
Vet Box 31  
College of Veterinary Medicine  
Cornell University  
Ithaca, NY 14853-6401

Phone: (607) 254-2893  
Email: [breastcancer@cornell.edu](mailto:breastcancer@cornell.edu)  
Web: <http://envirocancer.cornell.edu>



Cornell University