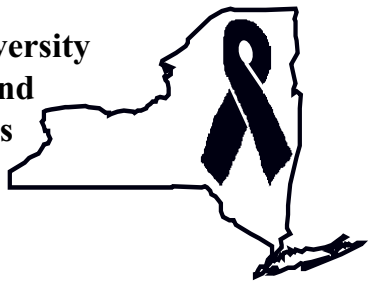
The Ribbon

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



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Family History and Breast Cancer Risk: Genetics, Lifestyle, Environment, or All of the Above?

Many women know that a "family history" of breast cancer presents a woman with an increased risk of breast cancer. Epidemiological studies tell us that having a "first-degree relative," — that is, a mother, sister, or daughter — who was diagnosed with breast cancer before age 60, means that a woman has twice the likelihood of developing breast cancer compared to a woman who has no first-degree relatives with the disease. If there are two first-degree relatives with breast cancer, a woman's risk is four to six times that of a woman with no first-degree relatives with the disease.

What explains the fact that breast cancer can "run in the family?" There have been dramatic recent advances in understanding several "breast cancer genes," including BRCA1 and BRCA2, and their range of possible mutations. With the publicity surrounding these findings, there may be a tendency to assume that strong family histories of breast cancer result from genetically inherited predisposition alone.

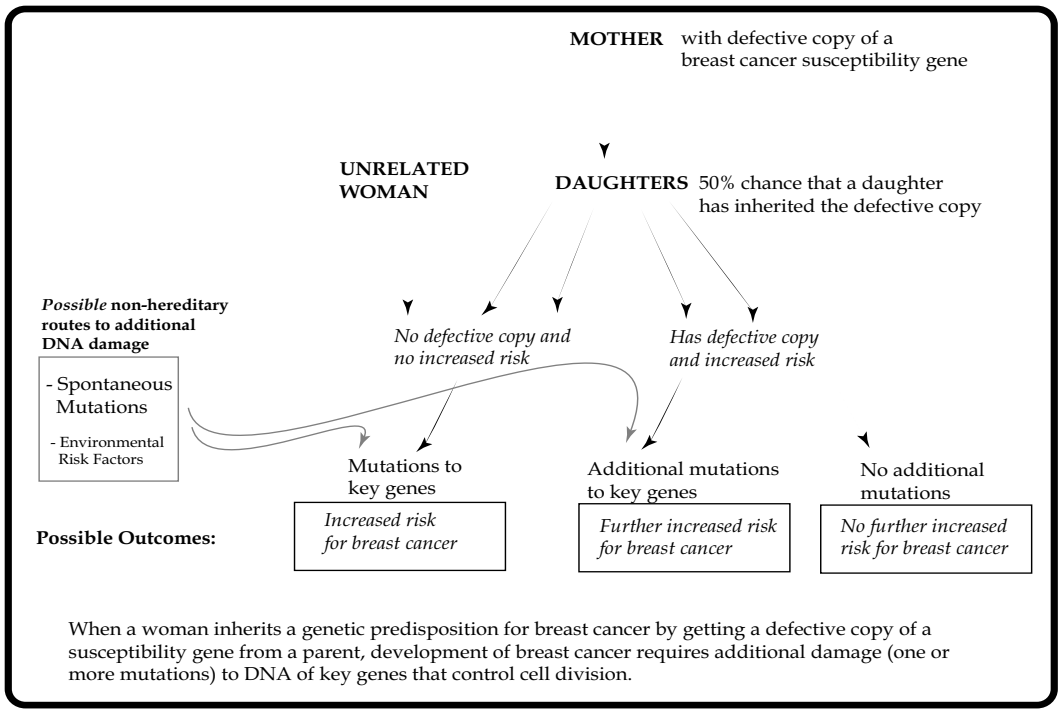
Scientists can confidently say that inherited genetic alterations account for 5 - 10% of breast cancer in the population. However, the prevalence of these genetic alterations among various populations is not well understood, nor is the actual lifetime risk of developing breast cancer for an individual carrier who has inherited a genetic alteration. Recent studies have resulted in a risk estimate much lower than previously thought for BRCA1 and BRCA2 mutation carriers. While earlier studies based on subjects from high-risk families produced lifetime risk estimates of 85% for BRCA mutation carriers, a newer study based on a wider community estimates the risk to be 56%.

When considering family history as a risk factor for breast cancer, there are many ways in which genetically inherited predisposition may be involved, including: the gene alterations mentioned above; other inherited syndromes such as one which causes increased sensitivity to ionizing radiation; or a risk factor like tallness, which has consistently been shown to be associated with breast cancer risk. Scientists are also studying other genes, such as those related to endogenous hormonal activity.

Cancer is always 'genetic' in that it involves the accumulation of mutations in key genes that control cell division. These mutations can be inherited, occur spontaneously when a cell makes a mistake in copying its DNA, or, can be induced by environmental agents. Therefore, there are other explanations for family clustering of breast cancer which may not involve inherited genetic predisposition. Other possible explanations which involve some established or possible environmental risk factors for breast cancer include:

1) **Environmental, occupational, or household carcinogens to which multiple family members or generations may have been exposed.** As in-progress epidemiological studies on breast cancer and environmental risk factors, such as the Long Island Breast Cancer Study Project and the Agricultural Health Study, begin providing results, more may be known about geographically-limited chemical exposures and breast cancer risk. These studies are taking extensive personal histories and analyzing a range of biological and environmental samples from participating households. These data will make a large contribution to what is known to date about pesticide and other chemical exposure and breast cancer risk.

2) **Shared dietary patterns which either increase or decrease risk.** Eating habits are closely tied to family and culture. Epidemiological studies have shown that certain diets are associated with increased or decreased breast cancer rates, and migration studies have shown that Asian women originating from populations with lower risk of breast cancer have an increased risk following migration to the U.S. Many researchers ascribe this shift to dietary changes, although other environmental factors have not been ruled out. With the many disparate food cultures in the U.S., it can be assumed that, to a certain extent, families share those aspects of diet that are either protective or increase the risk of breast cancer.



When a woman inherits a genetic predisposition for breast cancer by getting a defective copy of a susceptibility gene from a parent, development of breast cancer requires additional damage (one or more mutations) to DNA of key genes that control cell division.

The workplace and household are other possible sources of shared exposures to carcinogens. The National Toxicology Program (using animal studies) has identified 35 mammary carcinogens. These chemicals are found in a range of industrial, occupational, and household settings. Some of the mammary carcinogens include certain solvents, dyes, and pharmaceuticals. Further research is needed to identify the extent of exposure to these chemicals and any effects on breast cancer risk. Several studies have identified specific occupations that have a small increased risk of death due to breast cancer. These include female meat-wrappers, polyvinylchloride (PVC) fabricators, nurses and dental hygienists, printers and cosmetologists. Hopefully, these studies and other existing data will spur additional research which provide more information leading to policies resulting in reduced exposures.

3) **Other culturally-shared patterns of behavior, such as age at first birth and breastfeeding**. The age at which a woman gives birth to her first child is associated with breast cancer risk (early first birth being protective). In recent generations, there may be a family pattern for age at the birth of the first child; for example, a family of highly educated women who delay childbearing. Likewise, a culturally-influenced practice such a breastfeeding may follow patterns in families. Some studies have found breastfeeding to be a protective factor against breast cancer. Patterns of weight gain in mid-life, which has shown to be associated with breast cancer risk, may also "run in families," due to certain dietary and physical activity patterns.

Breast cancer has multiple, interacting factors, and family members may share many of the genetic, reproductive, dietary, and environmental risk factors.

In their study of "Relative Weight, Weight Change, Height and Breast Cancer Risk in Asian-American Women," Regina G. Ziegler and her research associates found striking relationships between height and breast cancer risk, weight and breast cancer risk, and recent weight gain and breast cancer risk. Since this population's breast cancer risk differences cannot be explained by genetic predisposition, their study has important, immediate implications for risk reduction. They urge, "further examination of the complex inter-relationships between body size and shape, diet, physical activity, and endogenous hormone levels ..."

Modifying factors — that is, those factors that influence whether or not another risk factor for breast cancer results in the disease for an individual — may play a role in whether a person who is genetically predisposed develops breast cancer. In a major study which resulted in lowered estimates of breast cancer risk for BRCA1 and BRCA2 carriers, the data suggests that there is much more variability than previously thought in whether a carrier develops breast cancer. What could explain this variability? The authors suggest that "(t)his variation may be due to chance, to genetic and environmental modifying factors, or to both. The study of families (who are carriers of BRCA mutations) with an apparently low risk of cancer may help elucidate such modifiers ..."

In discussing this and other recent BRCA1 and BRCA2 studies, Bernadine Healey, former director of the National Institute of Health, wrote in the May 15, 1997 *New England Journal of Medicine,* "(t)hese observations, taken together, underscore the role of modifying factors, whether genetic, hormonal, dietary or environmental, in determining whether a given BRCA mutation causes cancer."

These recent findings and hypotheses show that all the many types of research investigating the pathways to breast cancer — animal toxicological studies, the various types of epidemiological studies, as well as the mechanistic approaches, such as molecular genetics — all complement each other and are critical for eventual prevention of breast cancer, both in families with a strong history of breast cancer, and for those breast cancer cases that occur in women with no family history of the disease, which is greater than 85% of women who have breast cancer.

ICET Symposium: The Science That Drives Policy

A Resounding Success

This year's 1997 Institute for Comparative and Environmental Toxicology (ICET) Symposium , "The Science that Drives Policy: Pesticides, Diet and Breast Cancer Risk," cosponsored by BCERF, was a resounding success. There was a day and a half of informative lectures, piercing questions, and brisk dialogue.

The diverse audience of 143 participants included researchers, public health educators, breast cancer activists, business representatives, government officials, legislative and agency staff, media representatives, and the general public. In addition to actively participating in symposium sessions, participants continued their discussions on the relationship of pesticides and diet to breast cancer in the hallways, during meal-times and into the evening hours. This free exchange of information between scientists and non-scientists was basic to the success of the symposium, suggesting that the format used could serve as a model for future meetings on science and policy.

This unique format included plenary sessions with talks on cancer risk assessment, diet and breast cancer, and pesticides and breast cancer, as well as interactive workgroup sessions. In addition, participants chose from one of three workgroup topics: Assessing Cancer Risk, Communicating Risks, and Public Policy Options. Through thoughtful discussion, each workgroup identified and prioritized relevant issues. Despite the complexity of these topics, the groups each worked toward developing consensus and recommendations in these areas. Workgroup recommendations were presented at the concluding session of the symposium. These draft workgroup recommendations will be available on BCERF's World Wide Web site in the near future. For a paper copy, contact Cindy Wright, 215 Rice Hall, Cornell University, Ithaca, NY 14853-5601.

The symposium organizing committee was chaired by Suzanne Snedeker, BCERF Research Project Leader and member of ICET. Both ICET and BCERF are programs within Cornell's Center for the Environment.

"We Need to Know"

Ad Hoc Discussion Group

"Learning Together"

The most recent BCERF Ad Hoc Discussion Group meeting was an abbreviated meeting held in conjunction with another event: the 1997 Institute for Comparative and Environmental Toxicology (ICET) Symposium on *The Science that Drives Policy: Pesticides, Diet and Breast Cancer Risk.* Following a report by June Fessenden MacDonald, Director of BCERF, this breakfast meeting on September 30 featured short presentations by: John Galivan, who has acted as Director of the Breast Cancer Research Education Project at the New York State Department of Health, and will be the Commissioner of Health's designee when the Health Research Science Board convenes; Bill Smith of Cornell University's Pesticide Management Education Program; and Bob Haggerty of the New York State Department of Environmental Conservation. Updates of the three projects they represent are presented below.

Status Report of the Breast Cancer Research Education Project, Health Research Science Board

John Galivan, Director,
Division of Molecular Medicine, Wadsworth Center,
NYS Department of Health

The Health Research Science Board is in the process of being formed under amendment of Article 24 of the NYS Public Health Law. The Board will have eleven members appointed by the Governor and the leadership in the Senate and Assembly. There will also be five non-voting members who are representatives of the NYS Departments of Health and Environmental Conservation, the Cornell University Institute for Comparative and Environmental Toxicology, a survivor of breast cancer, and a survivor of testicular or prostate cancer. At the time of writing, the Board is partially filled and is expected to be completed and to convene by the end of this year.

It will be the responsibility of the Board to review the current status of breast cancer research and data. They will also review requests to the Commissioner of Health for access to the Pesticide Use and Sales Registry by qualified investigators. The Board shall also review the correlation between pesticide use and pesticide exposure and will evaluate the utility of the pesticide data generated by the Pesticide Use and Sales Registry.

A major activity of the Board will be to solicit, receive and review applications for funds to conduct research on breast cancer. Following review, they will recommend support of specific projects that will be recommended to the Commissioner by the Health Research Science Board. All funds for these research projects shall be derived from the kind generosity of the citizens of New York State who donated through the breast cancer tax check-off of the New York State Income Tax. It is expected that the first year of activities will be devoted to defining the areas of research to be supported and to establishing the review process. It is estimated that the recruitment of funds in the first year of the tax check-off will exceed $670,000.

Update on Software Development for the Pesticide Use and Sales Registry

William Smith, Senior Extension Associate,
Pesticide Management Education Program (PMEP),
Cornell University

PMEP has made significant progress in its involvement in developing the pesticide use and sales reporting database. Necessary equipment has been purchased, including a site-license server and accessories. The five-member project team has moved to new facilities within the Department of Entomology in Comstock Hall at Cornell. PMEP has recently hired four new personnel to work on the project with Robert Warfield, the Database Manager: an office systems specialist and two programmer/analysts and a senior programmer/analyst.

The development of the data model for the pesticide use and sales database has been completed. It is undergoing

review by New York State Department of Environmental Conservation personnel, and source code writing is pending upon approval of the model. File specifications have been written to accept electronic reporting by those that have the capability to do so. The project will be ready to accept data from vendors on January 1, 1998.

Report on the Pesticide Use and Sales Registry

Robert Haggerty, Supervisor of the Pesticide Reporting Section, NYS Department of Environmental Conservation

Staffing. The central office staff is now at full strength, with eleven people. Six of the eleven positions are non-technical staff, such as clerks and secretaries. The final steps to fill the regional positions are in process. Once everyone is on board, there will be twenty-one staff working in the Pesticide Reporting Section: eleven in the central office and ten in the regions.

Pilot Study of Hand-Held Computers. The Pesticide Reporting Section staff are working with the Governor's Office for Technology to institute a hand-held computer (HPC) pilot program. Eight "Region 7" pesticide firms will participate in the pilot program. A "kick-off" meeting was held on September 3, 1997 in Syracuse. The pilot program runs from September 22-October 10.

Request for Proposals (RFP) for Keypunching Data. This document will be used to hire the data entry firm to input the information from the estimated 80 million records expected from the regulated community.

Draft Technical and Administrative Guidance Memo (TAGM) Documents. Notice of the draft TAGM was published in the *Environmental Notice Bulletin* on August 20, and mailed to many groups and associations, as well as people who have called in and requested a copy. Respondents had until September 19 to send written comments, and the final document is now being prepared. A second supplementary draft TAGM is in early development.

Reporting From Changes for 1998 Under Discussion. The Pesticide Reporting Section staff are working with the Governor's Office for Technology to institute a scannable reporting form pilot program. The intention of this program is to design a scannable reporting form and run a test pilot to determine the feasibility of using the form for the 1998 reporting year.

Outreach. Recent outreach has included the New York State Fair, the New York State Farm Show, the Cornell University Turfgrass Short Course, the Central New York Flower and Garden Show, and the Cornell Research Turfgrass Field Days. Participants had the opportunity to ask questions about the Pesticide Reporting Law (PRL), and copies of the new PRL brochure were distributed.

Calls continue to come in daily with questions on the PRL. Concerned people are encouraged to call the toll-free number at 1-888-457-0110. Please leave a message and someone will return the call as soon as possible.

Mark Your Calendars!!!

The next Ad Hoc Discussion Group meeting will take place on Friday, February 27, 1997 in Room 711A of the Legislative Office Building, Albany NY from 11:00am to 4:00pm.

Ad Hoc Discussion Group meetings are open to any and all stakeholders to come together to discuss issues related to breast cancer and environmental risk factors.

Carmi Orenstein, MPH

Extension Project Leader

Carmi Orenstein, MPH, is BCERF's Extension Project Leader. In this role, Carmi is responsible for both outreach and education activities for BCERF. She is also the editor and chief writer for the BCERF newsletter, the Ribbon.

Carmi, a public health educator by training, first developed an interest in women's health and the environment as an undergraduate in the University of California at Santa Cruz's interdisciplinary environmental studies program. Immediately after receiving her bachelor's degree, she worked with a grassroots occupational safety and health organization which provided education and support services for those with occupational illnesses or injuries. She continued her education at UCLA, receiving her master's degree in public health education, with an emphasis on occupational health. She completed her traineeship at the National Institute for Occupational Safety and Health (NIOSH), helping NIOSH's Division of Safety Research initiate a new information dissemination effort.

Before joining BCERF, Carmi was an occupational health educator for Cornell University's School of Industrial and Labor Relation's extension program. Working out of the Buffalo office, Carmi designed and delivered workplace safety and health programs around the state on topics such as ergonomics, HIV and other bloodborne pathogens, occupational stress, and communicating safety and health.

Her activities with BCERF include coordinating the three statewide training programs that took place in the past year, and presentations on BCERF activities and breast cancer risk reduction to a wide range of groups. She works closely with Cornell Cooperative Extension (CCE) Associations and other educational partners to help enable these professionals to understand breast cancer risk factors and incorporate breast cancer risk reduction activities into their ongoing work. Carmi will be assisting with two CCE pilot educational projects that will be starting up in Nassau and Ulster counties, and providing intensive support to efforts of other counties and other educational partners. She also is responsible for networking with breast cancer advocacy groups, agricultural groups, the media, and community leaders and other policy makers.

Her continuing professional interests involve innovative public health education projects which address the whole continuum from personal health behaviors to environmental and policy change. She enjoys working within BCERF's unique model linking research, outreach and education, and is interested in how this model can be replicated for other environmental and public health programs.

The Ribbon is published by the Cornell Program on Breast Cancer and Environmental Risk Factors in New York State. Comments are welcome; contact the Editor

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October 22 Satellite Videoconference
Our Daughters, Our Selves:
Breast Cancer Risk Reduction at Home and in the Community

On October 22, BCERF had its second satellite videoconference of the year. This videoconference, entitled "Our Daughters, Our Selves: Breast Cancer Risk Reduction at Home and in the Community," was designed for groups of professionals and community members to participate together and engage in breast cancer risk reduction planning activities. Medical and public health researchers and professionals, teachers, coaches, and environmental educators provided both technical information and practical ideas for incorporating risk reduction into their ongoing work. Dietary changes and reduced exposure to home and garden pesticides and other chemicals were the main risk reduction strategies highlighted in this videoconference. 'Downlink' participants very enthusiastically engaged with those on the program, demonstrated by the number of phone calls and faxes which came in.

Thirty Cornell Cooperative Extension Associations hosted the videoconference, some co-hosting the event with educational partners such as the New York State Department of Health Breast Health Partnerships. Other 'downlink' sites included several coalition members of the Northern Appalachian Leadership Initiative on Cancer (NALIC) which covers parts of New York, Pennsylvania, and Maryland.

This videoconference marks the end of an intensive statewide training year for BCERF. Now that initial training has taken place and our educational partnerships have been further developed, BCERF's education component will emphasize support of regional and community activities in breast cancer risk reduction, pilot programs, and stepped-up production of supportive educational materials.

If you are interested in purchasing a tape of the October 22 BCERF satellite videoconference, "Our Daughters, Our Selves: Breast Cancer Risk Reduction at Home and in the Community," please call Glen Palmer at Cornell Media Services (607) 255-8162 or e-mail at grp2@cornell.edu

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Please mark the appropriate request, print your name and address and mail or fax to:

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110 Rice Hall, Cornell University
Ithaca, NY 14853-5601
Phone: (607) 254-2893; FAX: (607) 255-8207
E-Mail: breastcancer@cornell.edu.

PLEASE SEND ME THE FOLLOWING FACT SHEETS:

__*Fact Sheet #1*--Phytoestrogens and Breast Cancer

—*Fact Sheet #2*--DDT, DDE and the Risk of Breast Cancer

__*Fact Sheet #3*--Understanding Breast Cancer Rates

__*Fact Sheet #4* --Reducing Pesticide Exposure in the Home and Garden: Alternatives and Proper and Legal Use Resource Sheet

__*Fact Sheet #5*--The Biology of Breast Cancer

NAME_____

Address_____

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Telephone _____ Fax _____ Email _____

—add me to your mailing list

—send me a copy of the BCERF Information Sheet

WHAT'S NEW "ON THE WEB"

http://www.cfe.cornell.edu/bcerf/

All BCERF fact sheets are now on-line. You can link to them directly from the BCERF home page. The three most recent fact sheets are *Phytoestrogens and Breast Cancer, Understanding Breast Cancer Rates* and *Reducing Pesticide Exposure in the Home and Garden: Alternatives and Proper and Legal Use Resource Sheet*. Future fact sheets will be put on-line as they become available. The recently updated BCERF brochure and information sheet can now be found on our homepage: click on "Program Information Sheet and Brochure." The abstracts from the ICET Symposium "The Science that Drives Policy: Pesticides, Diet and Breast Cancer Risk" are also now on-line (see <http://www.cfe.cornell.edu/bcerf/ICETabst.html>).

The latest (1989-93) NYS DOH Breast Cancer incidence and mortality maps have just been added and can be reached via our homepage. Finally, the BCERF searchable bibliographic database called "The Environment Risk Factors Database" now has over 1300 references to research papers dealing with breast cancer and environmental risk factors including pesticides, other chemicals, and diet.

Rachel Clark, BCERF "Webmaster"

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