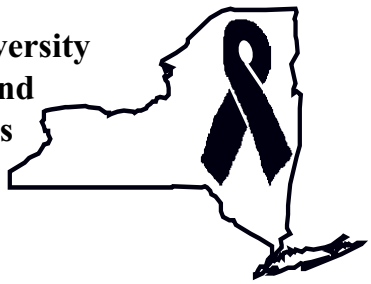
The Ribbon

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



Volume 2, Number 3, Fall 1997

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Do We Need To Be Concerned About Environmental Chemicals and Breast Cancer?

An Interview with Dr. Suzanne M. Snedeker, BCERF Research Project Leader

When BCERF was established in November 1995, one of the requests from the Ad Hoc Discussion Group of stakeholders was that science-based information be made available to advance our understanding of any relationship between environmental risk factors, including pesticides and breast cancer. In response, Dr. Snedeker and her post-doctoral fellows (Drs. Serge Wandji and Renu Gandhi) are undertaking critical evaluations of environmental chemicals, in particular pesticides, and translating this data into information for the public, policymakers, healthcare professionals and other scientists.

What kinds of relationships between environmental chemicals and breast cancer are you studying?

SMS: There are several ways that chemical exposure may affect breast cancer risk. First there are "complete" carcinogens that can take the cells through the entire multi-step process of malignant tumor development. Although there are chemicals that have been identified as complete breast carcinogens in experimental animal studies, very few pesticides are in this category. One example is the insecticide dichlorvos which is on our priority list of pesticides to evaluate.

Chemicals, including some pesticides, also can act as a co-carcinogen or tumor promoter. The insecticide DDT is an example. Experimental animals that were fed a known breast carcinogen, and then given DDT, developed breast tumors earlier than when the carcinogen was given alone. But, when DDT was given alone, it did not induce breast tumors in these animals. We don't know how all tumor promoters work, but many enhance the progression of mutated cells to invasive cancer cells.

An area that is receiving an enormous amount of attention is the possibility that environmental chemicals affect breast cancer risk by acting as 'estrogen mimics' or 'endocrine-disruptors.' Estrogen is important in stimulating cell division in the breast, and this cell division is important in the cancer process. Estrogen works through a receptor, with estrogen acting as a key, and the receptor acting as the lock. A chemical that acts like estrogen can also fit in the "lock", and interacts with the receptor. A chemical that mimics estrogen, or affects hormonal pathways that increase the level of estrogen available to the breast, could have the potential to affect breast cancer risk. There are new initiatives to test pesticides for estrogenicity, and efforts to improve and validate estrogenicity tests. Right now, we have

limited data on which pesticides are estrogen mimics, and which aren't. Most of the pesticide estrogen mimics are weaker than the estrogen made by our bodies, so we need more research on the long-term effects of exposure to weak environmental estrogens. Some forms of DDT are estrogenic, while other forms are not. Methoxychlor is a pesticide currently in use that is a weak estrogen mimic. Other pesticides are not estrogenic mimics, but may affect the metabolism of estrogen, and may affect levels of estrogen available to the breast.

From the over 6500 pesticides used in NYS, how did you select the ones to be evaluated?

SMS: Our current work, called "translational research," concentrates on assembling a database and doing critical evaluations of 32 pesticides and their relationship, if any, to breast cancer. The ones we are currently completing, or that we will start review this fall are listed in Table 1.

We began with several categories, such as high-use pesticides, formerly-used pesticides persistent in the environment, those currently used in large quantities, those found to contaminate water supplies or to have frequent food residue tolerance violations, those known to be estrogenic or endocrine-disrupting, and those shown to be breast carcinogens in experimental animal studies. Over 60 pesticides were nominated by various Cornell faculty, other scientists, state and federal agencies, and the BCERF Ad Hoc Discussion Group. Pesticides falling into multiple categories were given the highest priority. This prioritization is an on-going process and we really welcome input.

How do you evaluate these pesticides?

SMS: We use a "strength of evidence" approach to evaluate all available scientific evidence of whether a pesticide can cause breast cancer or affect breast cancer risk. We search out all sources of scientific studies using computerized literature searches. But we go beyond the studies found in scientific journals, and this is one of BCERF's unique contributions. We seek out the "gray literature." For example, before a company can register a pesticide, the Environmental Protection

TABLE 1

High Priority Pesticides Currently Under Review	High Priority Pesticides to be Reviewed
Alachlor, Metoachlor --High use herbicides, nominated by DEC	Aldicarb
Atrazine, Simazine, Cyanazine --High use herbicides, water contaminates	Azinphosmethyl
Chlordane, Heptachlor --Persistent insecticides used for termite control	Captan
Dichlorvos --Widely-used insecticide, know mammary carcinogen inexperimental animals	Carbaryl
DDT/DDE --Persistent Insecticide use for Mosquito and Lice Control	Carbofuran
Lindane --Lice shampoos, suspected endorcine-disruptor	Chlorpyrifos
Methoxychlor --Agricultural and home garden insecticide (rose dust), estrogen mimic	Diazinon
2,4-D --High use herbicide; non-Hodgkin's lymphoma	Dibromochloropropane
	Dicofol
	Dieldrin
	Endosulfan
	Ethylene dibromide
	Hexachlorobenzene
	Malathion
	Manocozeb
	Parathion
	Pendimethalin
	Phosmet
	Prometon
	Pyrethrins/Pyrethroids
	Toxaphene

Agency (EPA) requires that the cancer-causing potential be evaluated in long-term experimental animal studies. Few of these industry-sponsored studies are published in the open scientific literature. By both contacting industry representatives, and through the Freedom of Information Act, we acquire summaries of this research from EPA, and incorporate them into our evaluations. We include many types of studies in the evaluations, including human studies, experimental animal studies and related studies which may provide evidence of how a chemical may affect breast cancer risk. For any given pesticide critical evaluation, we have anywhere from 30 to over one hundred studies to evaluate. The bibliography for each study is entered into a searchable, computerized database found on the BCERF website.

What kinds of information do BCERF critical evaluations contain?

SMS: The completed critical evaluation contains relevant technical information, such as the chemical's technical and trade names, uses, and regulatory status. It gives an in-depth evaluation of all studies which looked at breast cancer and summarizes the information available on cancer at other sites. We also identify further avenues for research, make recommendations to policy-makers, and provide a complete, annotated bibliography.

Are these critical evaluations available?

SMS: The critical evaluations completed to date are undergoing peer review this summer. We have a network of Cornell and other scientists who review the documents for scientific merit and make recommendations for revisions. We will then post the evaluation on the BCERF world wide web site for 30 days for comment. At the same time we are translating this data into informational fact sheets for the public. Watch *The Ribbon* and our web site for their availability.

Have you found any relationships between the pesticides you have evaluated and breast cancer?

SMS: To date, we have not found sufficient evidence that any of the pesticides we have evaluated directly, by themselves, cause breast cancer in humans. To rate a pesticide as a "human breast carcinogen" we need strong evidence that known exposures to a pesticide consistently results in a higher incidence of breast cancer in humans. In many cases, no human studies exist, so we have to rely on animal studies and related mechanistic studies to evaluate the potential of a chemical to affect breast cancer risk.

DDT is one of the few pesticides for which we have some human data. Its persistence lets researchers compare the levels in the blood or fat of women with and without breast cancer. However, some of the studies have serious limitations and, taken together, provide equivocal evidence. There is some evidence that DDT may be a tumor promoter. Another study reported that the estrogenic form of DDT could support the growth of estrogen-dependent breast tumors in mice. This is an important finding, since over 30% of breast tumors depend on estrogen for growth. Though one of the forms contained in the DDT sprayed in the 1940's to 1970's was estrogenic, the most prevalent form of DDT in the environment today is not estrogenic, but actually an "anti-androgen." Androgens are male sex hormones. How anti-androgens affect breast cancer risk is not known.

In our evaluations of the triazine pesticides — **atrazine, simazine, and cyanazine** — we have to rely on sources other than human studies for data to make our evaluation. Though atrazine is one of the highest used herbicides in the US, no studies have evaluated the potential for atrazine to cause breast cancer in women exposed to this pesticide. There is sufficient evidence that atrazine induces benign and malignant breast tumors in long-term studies in rats. The mechanism by which atrazine causes breast cancer in rats is not known. Although atrazine is not an estrogen mimic, there is some evidence that it may affect the levels of other hormones. Studies are being conducted to determine if this "endocrine disruption" may explain the higher incidence of breast tumors in some animals. There is also evidence that atrazine affects hydroxylation pathways for estrogen. Studies to see whether the ratio of a form of estrogen called "16-alpha-hydroxyestrone" to "2-hydroxyestrone" in the urine of women can be used to predict breast cancer risk are part of the Long Island Breast Cancer Study Project.

Cyanazine's primary use is as a corn herbicide. Registration was withdrawn by its manufacturer in 1995, and it will no longer be produced after 1999. Simazine is still used as a herbicide, especially on corn and some fruit crops. Compared to atrazine, there are few animal studies that have evaluated the cancer-causing potential of cyanazine and simazine, and most are only available in summary form in unpublished reports. Only one study for each of these chemicals reported an increased incidence of malignant breast

tumors in rats. The potential for simazine or cyanazine to act as co-carcinogens, tumor promoters, or to affect hydroxyation pathways for estrogen has not been evaluated.

Chlordane and heptachlor are persistent insecticides that were used primarily against termites and are now banned. There is not enough evidence to show that either chlordane or heptachlor by itself is a human breast carcinogen. We have virtually no data on women with known exposures to these chemicals and their incidence of cancer. The human studies that have looked at levels of the chlordane metabolite, oxychlordane or heptachlor-epoxide, a break-down product of heptachlor, in women with and without breast cancer, have shown inconsistent results. There is no evidence of chlordane or heptachlor causing breast tumors in experimental animals.

However, there is evidence that these chemicals have the "potential" to affect breast cancer risk. Chlordane is not an estrogen mimic when tested by itself, but it may enhance the ability of other environmental chemicals to mimic estrogen. If this possibility is confirmed, it reinforces the need to evalute the estrogencity of pesticides in combinations. Animal studies suggest chlordane exposure may compromise the body's immune system, which may affect the body's defenses against cancer. Chlordane and heptachlor epoxide can also stimulate the activity of liver microsomal enzymes that affect the breakdown of estrogen, and clearance. But, we need to know more about the different metabolites generated, and their capacity to affect breast cancer risk.

Why are there so few human studies on breast cancer?

SMS: Research on women's diseases have only recently received attention and funding from federal, and private granting agencies, including the relationship of pesticides to breast cancer risk. We expect an explosion of information in the next 3-5 years, and BCERF will be ready to incorporate these new studies into our database, revised critical evaluations and informational fact sheets.

Do we need to be concerned about exposure to these pesticides?

SMS: Of concern with some pesticides is their persistency — for example, chlordane can persist in the soil for over 20 years after application, and some forms of DDT are still found in the environment. There is also the issue of water contamination — the triazine pesticides have been found to have contaminated water sources in some communities, especially in the mid-west. Occupational exposures clearly present opportunities for direct exposure to pesticides. BCERF is also concerned about the possibilities for exposure through home and garden use of pesticides. For example, methoxychlor is a pesticide that is a weak estrogen that is contained in rose dust, and 2,4-D is commonly used to control crab grass. We are evaluating both pesticides. The education component of the BCERF program is currently working on a resource sheet, "Reducing Pesticides Exposure in the Home and Garden: Alternatives and Legal and Proper Use" that will be available soon to direct New York citizens to good information.

Are there other chemicals besides pesticides that we should be concerned about?

SMS: Yes. We are seeking funding to critically evaluate chemicals including those the National Toxicology Program (NTP) has already determined to be mammary carcinogens, based on animal studies. I am especially interested in halogenated hydrocarbons, used in a wide array of solvents found in the home and workplace. So far, 35 mammary carcingens have been identified by the NTP, and only five are pesticides or soil fumigants. Other NTP mammary carinogens include chemicals used in manufacturing rubber, vinyl, polyurethane foams, benzene-based dyes, and some pharmaceuticals, as well as the solvents. Our knowledge of actual occupational exposures to these mammary carincinogens and breast cancer risk is limited because so few studies have been conducted to date. For other chemicals there is evidence from a few studies of increased breast cancer risk or mortality with occupational exposures to some organic solvents, several metals and acid mists. So, we really have to consider a wide number of chemicals when evaluating enviromental risk factors and breast cancer risk.

In closing, I'd like to emphasize that our evaluation and translation work provides both scientists and non-scientists with a unique body of information to which they would otherwise not have easy access. The public plays a vital role in the research process — it is due to the public's demand that there is increased funding for breast cancer research, especially in neglected areas, such as the role of environmental factors in breast cancer.

Research at Cornell: Making Sense of the Estrogen Puzzle

Being situated within Cornell University provides BCERF many opportunities for interaction with researchers engaged in breast cancer-related projects. In addition, BCERF can help bring together various Cornell scientists, through its formal and informal interactions, and through its identification of knowledge gaps.

Dr. Rodney Dietert, Professor of Immunogenetics and former director (August 1992 to August 1997) of the Institute for Comparative and Environmental Toxicology (ICET) discusses this strength of the BCERF program: "BCERF is helping to attract researchers to a variety of issues related to breast cancer and women's health. Many work in highly relevant disciplines, using powerful techniques and innovative technologies. By helping to match expertise among Cornell Ithaca and New York City researchers, and others, as well as promoting funding opportunities, we are able to contribute to research needed to fill the knowledge gaps. And until we fill the gaps we will not have timely answers to the questions at hand."

"We are eager to see collaborations develop to better integrate expertise on both Cornell campuses" -- Norman R. Scott, Vice President for Research and Advanced Studies

ICET director, Dr. David Wilson, Professor of Biochemistry, Molecular and Cell Biology, agrees and hopes ICET will continue to use this model to create interdisciplinary programs dealing with other important toxicological issues.

The Estrogen Puzzle

Many of these questions concerning breast cancer and environmental risk factors relate to the role of both endogenous and exogenous estrogens (those produced within the body, and those from the outside) in breast cancer, and the issue of potentially endocrine-disrupting chemicals. Scientists are working on new ways to detect these substances and better understand their effects within the body.

Two projects at Cornell which relate to this very important and rapidly-evolving area of research are led by Dr. John D. Henion, Professor of Toxicology in the Diagnostic Laboratory of the New York State College of Veterinary Medicine, and Dr. Leon Bradlow, Director of the Murray Rayburn Laboratory of Biochemical Endocrinology at the Strang Cancer Research Laboratory.

Dr. John D. Henion, New York State College of Veterinary Medicine

The research group led by Dr. Henion has developed techniques using combinations of instruments, for detecting and measuring minute quantities of chemicals in a variety of materials (environmental samples, and human, animal, and plant materials). Dietert comments that, "the new techniques developed by Henion are recognized worldwide as breakthroughs in ultra-trace analytical procedures. This research group offers the opportunity to investigate potential links between specific chemicals, level of exposure, and health outcomes, including breast cancer."

Henion's laboratory is interested in developing rapid methods for identifying and quantifying steroid hormones, including estrogens, directly from urine and blood. They use a technique known as atmospheric pressure ionization (API) mass spectrometry, in combination with high pressure liquid chromatography (HPLC) to directly separate, identify and quantitate these compounds from biological samples. These new methods replace traditional methods, which were time-consuming and involved many more steps. In addition, the ability of Henion's group to use special tandem mass spectrometric techniques, or "MS/MS," provides them with added selectivity, sensitivity, and structural information which were not available with earlier instruments. Rapid analysis techniques provide precise information that allows the researchers to create a "steroid profile" for any individual.

Dr. Henion's group is interested in the quantitation of steroid hormones and their conjugates for several reasons, both in clinical and research laboratories. They are particularly interested in the estrogens and their relationship to human breast cancer. At the same time they are also interested in the benefits for many women of estrogen replacement therapy.

Dr. Geoffrey Rule, post-doctoral associate in Henion's research group, describes the group's interest in the application of their work to breast cancer risk reduction. "An important question regarding these estrogens, their precursors, and their metabolites, might be whether certain compounds and metabolites are more influential

in alleviating the various disease states as opposed to increasing a woman's risk of getting breast cancer." The lab is currently working on what they call "rapid extraction and high-throughput techniques," — or, 400 samples per day extracted and analyzed — to look at multiple endogenous steroids.

Recognizing the amount of study needed to thoroughly understand the relationship of the various forms of estrogen and their metabolites to breast cancer risk, he goes on to say, "it is our hope that through collaborative efforts we will be able to use our high-throughput sample preparation capabilities and the unique advantages of our analytical techniques for large numbers of real samples."

Dr. H. Leon Bradlow, Strang Cancer Research Laboratory

The research group led by Dr. Leon Bradlow is making an exciting contribution to the study of environmental factors and breast cancer, because they have identified specific metabolites of estrogen that are implicated in the breast cancer process. Of the two primary estrogen metabolites, one appears to be associated with increased breast cancer risk, and one appears not to be harmful. Research from Dr. Bradlow's group suggests that the estrogen metabolite called "16-alpha-hydroxyestrone" may be "genotoxic" to breast cells, while "2-hydroxyestrone," a non-active form of estrogen, is not. The group is researching both dietary and environmental chemical exposure effects on estrogen metabolism and breast carcinogenesis.

Current research in Bradlow's lab examines the effect of a specific dietary compound on the breast cancer process. Research Associate Dr. Daniel Sepkovic explains, "After identifying the estrogen metabolites, we then use naturally-occurring chemoprotective agents to alter estrogen metabolism in favor of less harmful metabolites." This naturally-occurring agent is called indole-3-carbole (I3C), and is found in cruciferous vegetables like broccoli, cauliflower, kale, brussels sprouts, turnips, rutabaga and cabbage. Studies by Bradlow and his colleagues have shown that I3C plays a protective role against mammary tumorigenesis in rodent studies, and that I3C induces the "good" estrogen metabolism in human studies.

Dr. Sepkovic goes on to say that "the opportunities for reduction of hormonally-related breast cancer will be significant if estrogen metabolism can be altered by the naturally-occurring dietary compounds that we are currently testing."

Dr. Bradlow's group is also looking at the effects of organochlorine pesticides such as DDT, atrazine, kepone, and hexachloride. Their studies look at how exposure to these chemicals may affect the production of estrogen metabolites, demonstrating that environmental chemicals do not have to be 'estrogen mimics' to affect estrogen metabolism, and possibly breast cancer risk. They have found that several common pesticides change estrogen metabolism in breast cell cultures by increasing the production of "16-alpha-hydroxyestrone" and reducing the production of "2-hydroxyestrone." The higher the ratio of "16-alpha-hydroxyestrone" to "2-hydroxyestrone," the greater the effect on breast cell proliferation, development and promotion, and therefore, Bradlow's group proposes, the higher the risk of breast cancer.

> "Researchers at the College of Veterinary Medicine are uniquely positioned to support research involving analytical and toxicological methodologies to help unravel answers to this important human health problem" -- Donald F. Smith, Dean of the College of Veterinary Medicine

Dr. Bradlow's group works in close collaboration with many of Strang's researchers. Close collaborators include Dr. Jack Fishman, Director of Research, Dr. Michael Osborne MD, President, and Drs. Andrew Dannenberg and Nitin Telang, of Strang Cancer Prevention Center.

Toward Solving the Puzzle

"The combination of these types of expertise," says Dietert, "particularly in concert with careful epidemiological studies, offers the best opportunity to implicate or exonerate specific environmental risk factors in breast cancer risk."

Dr. Jerome J. DeCosse, Lewis Thomas Professor of Surgery at the New York Hospital-Cornell Medical Center in New York City, is enthusiastic about the implications for these types of research. Dr. DeCosse is a BCERF 'core member;' he was appointed by the Medical College Dean to coordinate activities between BCERF and Cornell Medical Center. He says, "these studies of the metabolic pathways of estrogen will serve the women of New York, ultimately leading to a better understanding of breast cancer, and means of risk reduction."

The Science that Drives Policy:

Pesticides, Diet and Breast Cancer Risk
SEPTEMBER 29-30, 1997
Triphammer Lodge and Conference Center, Ithaca, NY

A Symposium with Workgroups on:
• Assessing Cancer Risks
• Communicating Risks
• Developing Policy Options

Conference program directed to scientists, medical, public health, and corporate professionals, policy makers, risk communicators, and the general public

Monday, September 29

Cancer Risk Assessment in the Wake of the Delaney Clause
(Speaker to be arranged)

Testing for Pesticide Estrogenicity
Rochelle Tyl, Research Triangle Institute

Pesticide Residue Tolerances in Food: The 1996 Food Quality Protection Act
Joseph Hotchkiss, Cornell University

Early Life Exposures and Risk of Breast Cancer
Nancy Potischman, National Cancer Institute

Vegetables, Fruits, and Associated Nutrients: Relationship to Breast Cancer Risk
Jo Freudenheim, SUNY, Buffalo

Nutrition and Breast Cancer: Results from the Cornell-China-Oxford Project
Banoo Parpia, Cornell University

The Real Breast Cancer Risks: Getting the Right Word Out
Jane Brody, *The New York Times.*

Tuesday, September 30

What Women Can Do to Reduce the Risk of Breast Cancer
Graham Colditz, Harvard University

Pesticides and Breast Cancer Risk
Marilie Gammon, Columbia University

For information contact:
Cindy Wright,
215 Rice Hall, Cornell University,
Ithaca NY 14853-5601
Phone: (607) 255-8008; Fax: (607) 255-8207
email: clw3@cornell.edu
Internet: http://www.cfe.cornell.edu/bcerf/

Workgroup Information

Three workgroups will run concurrently following each Plenary Session. These workgroups will provide the opportunity to talk about and identify issues of concern, discuss areas of agreement and disagreement, and formulate recommendations and plans for action. Participants are encouraged to pre-register for one of the three Workgroups. Titles of the Workgroups and suggested topics of discussion are listed below.

A. Determining Cancer Risk

Participants will consider how estrogenicity should be used in determining cancer risk, what evidence is needed to show/determine that environmental estrogens do effect breast cancer risk, and what factors besides estrogenicity needs to go into the cancer risk equation.

B. Communicating Risks

Participants will explore the "right-to-know" issues about pesticide residues in food, what information is needed to limit exposure to pesticides, as well as information needed to make choices to select foods that may reduce cancer risk.

C. Developing Policy Options

Participants will discuss how, without the Delaney Clause, judgments should be made that a chemical poses a cancer risk, what factors should go into the risk-benefit analysis used in setting pesticide tolerances, and when do the benefits outweigh the risks in setting policy.

Sponsored by the Insititute for Comparative and Environmental Toxicology (ICET), the Program on Breast Cancer and Environmental Risk Factors in New York State (BCERF), both programs within Cornell's Center for the Environment, and by Texaco, Inc. and Bristol Myers-Squibb, through their membership in CUPCET (Cornell University Program on Comparative and Environmental Toxicology)

"We Need to Know"

Ad Hoc Discussion Group

"Learning Together"

BCERF brought its Ad Hoc Discussion Group meeting to Western New York for the first time on June 25, 1997. BCERF thanks Senator Mary Lou Rath and her District Director Sharon Rich for their invitation and organizational work, and the University of Buffalo for hosting the meeting. Senator Rath's office also organized a breakfast preceding the meeting, for Western New Yorkers to learn more about BCERF.

To open the meeting, director June Fessenden MacDonald reviewed the progress of the BCERF program, giving a status report on projects and publications, and highlighting recent and upcoming meetings. She then provided an opportunity for participants to identify their issues of concern.

BCERF associate director Ann Lemley gave the first presentation, discussing "Drinking Water Quality — How To Make Decisions." She discussed the different water quality issues one might face, depending on whether the source is a municipal supply or a private well. Because much of New York State relies on private water supplies, Ann's Water Quality Program at Cornell has extensive experience assisting with the decision-making involved in using well water. Ann highlighted six types of water treatment methods, describing their appropriate uses, and any disadvantages. Anyone wanting to learn more can contact Cornell Cooperative Extension to order their "Water Treatment Notes," a series of fact sheets produced by the Water Quality Program.

This Ad Hoc meeting provided the opportunity for representatives from five different breast cancer groups from around the state to describe their histories and what they do. Gunther Fishgold, representing 1-in-9, spoke first, highlighting the group's Pesticide Education Project, a series of forums around the state targeting the general public.

Sarah Degnan of the Breast Cancer Network of Western New York spoke next, describing her groups array of activities. She was especially enthusiastic to report that many of their members had completed "Project Lead,' the intensive breast cancer activist training program sponsored by the National Breast Cancer Coalition.

Meg Ambry, Education/Outreach Coordinator for the Ithaca Breast Cancer Alliance, reported for her group. She described the fast-moving history of the group, beginning with a handful of newly-diagnosed women, and the comprehensive services it provides today. She explained that what her group emphasizes is choices for women with breast cancer, and "Choices" is what they have appropriately named their newsletter.

Next, the group watched a video sent by Lorraine Pace, who is a Breast Cancer Education Specialist at the Stony Brook Health Sciences Center, and activist in several Long Island groups. The video was a television report on the issue of elevated breast cancer rates on Long Island and their possible connection to pesticide use.

Finally, the group watched a video sent by Rosemarie Williams, president of the Cancer Awareness Coalition of New Paltz. In it, Rosemary discussed her group's major projects: education about health risks and the promotion of legislation for public health.

Bill Smith and Robert Warfield then reported on their progress developing software for the Pesticide Use and Sales Registry. Robert used flow diagrams to describe the variables in the data collection and features that the software must contain. Bob Haggerty of the NYS Department of Environmental Conservation gave his update on progress the DEC has made on The Registry since the last ad hoc meeting. He described several means of assistance for compliance with the program: a detailed and specific document called a Technical and Administrative Guidance Memorandum (TAGUM); the continuation of the toll-free hotline (888-457-0110), and a future world wide web site.

The next Ad Hoc Discussion Group meeting will take place on Tuesday, September 30, 1997 at the Triphammer Lodge and Conference Center, Ithaca, NY from 7:00am to 8:15 am. This meeting is being held in conjunction with the 1997 ICET Symposium on "The Science that Drives Policy: Pesticides, Diet and Breast Cancer Risk", September 29-30. 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.

Suzanne M. Snedeker, Ph. D.

Program Leader for BCERF Critical Evaluation Database

Dr. Suzanne Snedeker is Assistant Professor of Environmental Toxicology and Health in the Division of Biological Sciences at Cornell University, BCERF Research Project Leader, and original webmaster of the BCERF internet homepage. Suzanne received her bachelor's degree in Nutritional Sciences at Cornell, then went on to earn her doctoral degree in nutrition at the University of Wisconsin, Madison. Before joining BCERF in 1995, she held a number of positions in nutritional sciences, toxicology and cancer biology. She was an Assistant Professor and Director of the Graduate Program for the Program in Nutrition and Dietetics at the University of Texas Health Science Center, and then completed fellowships at the National Institute for Environmental Health Sciences (NIEHS) in heavy metal toxicology and in mammary gland biology. She then worked as a Biologist in the National Toxicology Program at NIEHS, on large-scale, multi-generational animal studies that evaluated the effect of estrogenic and anti-androgenic xenobiotics on reproductive toxicology and incidence of reproductive cancers.

As BCERF Research Project Leader, her responsibilities include: preparing critical evaluations of the scientific literature on the relationship of prioritized pesticides to the risk of breast cancer; establishing a bibliographic environmental risk factors database; and translating the scientific data into usable information . (See lead article for more information on this project.)

Suzanne's research interests include evaluating the potential for environmental chemicals found in the home, workplace and hazardous waste sites, to affect the risk of hormonally mediated cancers, especially breast cancer. She is also interested in science communication, including using innovative electronic methods to disseminate information on environmental chemicals across scientific disciplines, and the translation of research findings for non-scientists. Other research interests include the effects of chronic, low-dose exposure to estrogenic and anti-androgenic environmental contaminants on reproduction and incidence of breast and reproductive cancers, and the regulation of cell proliferation in the uterus and mammary gland by peptide growth factors and steroid hormones.

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

Cornell University
Program on Breast Cancer and Environmental Risk Factors in New York State
110 Rice Hall, Cornell University
Ithaca, NY 14853-5601
Phone: (607) 254-2893; FAX: (607) 255-8207
E-Mail: breastcancer@cornell.edu.

—add me to your mailing list

—send me a copy of the BCERF Information Sheet

NAME_____

Address_____

_____

_____

Telephone _____ Fax _____ Email _____

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

PLEASE SEND ME THE FOLLOWING FACT SHEET WHEN AVAILABLE:
__Atrazine and Breast Cancer Risk
__Chlordane and Breast Cancer Risk
__Cyanazine and Breast Cancer Risk
__Estrogen and Breast Cancer
__Heptachlor and Breast Cancer Risk
__Simazine and Breast Cancer Risk
__The Biology of Breast Cancer

WHAT'S NEW "ON THE WEB"

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

BCERF now has a searchable bibliographic database with over 900 references. Go to <http://www.cfe.cornell.edu/bcerf/libsearch.html> or get there through BCERF's home page link. This resource was developed by Alan Ni, Cornell Center for the Environment, Jason Howe, BCERF Research Assistant, and Suzanne Snedeker, BCERF Research Project Leader. You can search this database by subject, title word or author. These searchable references from scientific literature will be of use to researchers, educators, and interested citizens.

Information is now 'on-line' on the upcoming conference "The Science that Drives Policy: Pesticides, Diet and Breast Cancer Risk" that will take place on September 29-30, 1997 <http://www.cfe.cornell.edu/bcerf/ICETsymp.html>. (See page 7)

The Conferences and Workshops page <http://www.cfe.cornell.edu/bcerf/conf.html> has been updated with new hyperlink to other sites that list additional conferences and workshops.

A new and important link has been added to the Breast Cancer Statistics, Incidences, and Rates page <http://www.cfe.cornell.edu/bcerf/link.stat.html>. We now have a link to The North American Association of Cancer Registries (NAACR) Home Page. You can download cancer incidence data for much of the US and Canada from this site.

Rachel Clark, BCERF "Webmaster"

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

Editor
Carmi Orenstein, M.P.H., Extension Project Leader
Associate Editor and Designer
Carin Rundle, Administrative/Outreach Coordinator

Cornell University
Program on Breast Cancer and Environmental Risk Factors in New York State
110 Rice Hall, Cornell University
Ithaca, NY 14853-5601

Phone: (607) 254-2893
FAX: (607) 255-8207
E-Mail: breastcancer@cornell.edu.

Cornell Cooperative Extension