STUDENTS AND SCIENTISTS BREAST CANCER ENVIRONMENTAL RESEARCH PROGRAM

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Great Neck Breast Cancer Coalition and Huntington Breast Cancer Action Coalition

With our environment deteriorating exponentially, it is imperative that other organizations allow students to gain similar experience of participating in environmental research, not only to encourage them to pursue this field, but to use them as liaisons between the scientific community and the general public as well.

Great Neck Breast Cancer Coalition
Student Perspective—Heidi Park

- I interned at the Soto-Sonnenschein Laboratory in Tufts University on a scholarship provided by the GNBCC.
- The researchers at the lab were kind enough to take time out of their busy schedules to teach me about the effects of endocrine disruptors on our bodies, particularly the role Bisphenol-A (BPA) had on mammary gland development.
- BPA is a xenoestrogen that is found in plastics and epoxy resins.
- Researchers at the lab linked fetal exposure to environmentally relevant low BPA to abnormal mammary gland development in mice.

Figure 1 *Courtesy of the Soto-Sonnenschein Laboratory*

Pictures of harvested mice mammary glands. The one on the left was harvested from a mouse who received no BPA injections and the other one was harvested from one who had received 250 ng BPA/kg bw/day. The difference between the two glands is obvious even to the naked eye. The one on the right clearly has more ductal structures than the one on the left.

- Another study showed that fetal exposure to environmentally relevant low BPA in rats caused them to develop lesions upon exposure to a carcinogen, something that was not observed in the vehicle rats.

Figure 2 *Courtesy of the Soto-Sonnenschein Laboratory*

Pictures of rat mammary glands treated with increasing doses of BPA (A—2.5, B—250, C—1000). The cancerous lesions have been highlighted by arrows.

- I was shocked and immediately decided to get involved with the cause.
- Before I went to Tufts University, Laura Weinberg, the President of the GNBCC, forwarded me the studies that the staff at the lab had conducted. It was one thing to read the studies. It was quite another thing to actually see the slides and feel the tumors for myself. It only made me more determined to make a difference. That is why I believe that a student-scientist research program is so important.
- I will always value my experience at the lab and highly recommend it to other students.
- I would like to take this opportunity to thank Laura Weinberg for making this program possible. I'd also like to thank all of the researchers at the lab for making my stay so enjoyable. I would especially like to thank Dr. Soto, Dr. Sonnenschein, Dr. Maricel Maffini and Laura Vandenberg for overseeing the production of this poster.

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Community Outreach
(Why it is important to reach out to high school students)

Tehreem receives a certificate upon satisfying her apprentice program. Shown here with Dr. Russo, Dr. Sheriff, Dr. Pereira, Patricia Russo and staff at Fox Chase.

- Unfortunately, BPA and Dioxin, among other endocrine disrupting chemicals are still ubiquitous throughout our environment. Most of the general public is not aware of the harmful nature of these chemicals.
- Allowing students to participate in environmental research gives them first-hand experience in observing the scientific basis behind the argument that many pollutants in the environment are responsible for the rising rates of cancer.
- The knowledge gained by this type of experience in the lab can never be replaced by a mere classroom lecture.
- The scientific community is not that accessible to the general public.
- Students can serve as liaisons between the scientific community and the general public.
- The public as a whole is conventionally critical, especially of the media.
- The public tends to be more easily swayed when the message comes from the younger generation. Subsequently, students would be an ideal source of spreading the message on how imperative it is to prevent the state of our environment from deteriorating any further.
- Students are members of the next generation to inhabit the Earth, and thus by enabling them to become aware of the extent of the devastation that mankind is bringing upon itself, it motivates them to become active supporters of maintaining a safe environment.

Student Heidi Park is depicted with fellow GNBCC scholarship winner Jon Salm, GNBCC President Laura Weinberg, and L.I. Neighborhood Network's Beth Fiteni at a presentation about the effects of the environment on our health.

Huntington Breast Cancer Action Coalition
Student Perspective—Tehreem Rehman

Working in a high tech lab is every aspiring scientist's dream. Now being able to do that during high school is absolutely amazing. At Fox Chase Cancer Center (FCCC), I learned how to do scientific techniques such as RNA and DNA extraction from rat tissue, preparing the RNA for microarray analysis, and culturing breast epithelial cells. It was thanks to Dr. Jose Russo and my mentors Patricia A. Russo and Dr. Julia Pereira that I was able to learn such a breadth of information within a mere four weeks.

However, working in a lab taught me more than simply how to follow protocols. I learned about the fallacy of the stereotypical scientist with the crazy hair and dazed look. I became aware that rather than secluding themselves, scientists are continuously engaging in lively discussions with each other in order to exchange information and ideas, and in essence, build upon current scientific knowledge.

And while I was able to use scientific instruments whose cost just made my mouth fly open every time I heard those four or five-digit numbers, I was also able to learn a great deal about the current precarious state our earth is now in. I was taught how we are all constantly eating, breathing, and even, storing, chemicals - many of which are suspected to be carcinogens.

In regards to the causes of breast cancer, I learned that exposure to endocrine disrupting compounds during critical periods of development, such as dioxin, are believed to play a major role. While working at FCCC, I was given a rude awakening of the endangerment of the human race and how we are fully responsible for this.

Whereas my mentors taught me how to do all the scientific methodology, I learned these life lessons from the researcher whom I had stayed with – Dr. Fathima Sheriff. It was a great experience to be able to listen to her perspective on the current state of the environment, while eating extremely delicious Sri Lankan food at the dinner table

And of course, if it weren't for Karen Miller and the Huntington Breast Cancer Action Coalition, none of this experience would have been possible. It was mainly because of her that we were able to overcome all the obstacles that were initially preventing me from going to FCCC, and then after the internship, learn about how the research that is being done in these labs is actually being applied to women with breast cancer.

Over the past several years, more and more animal species are becoming extinct or developing abnormal behavior and physical characteristics, such as deformed genitalia. Correspondingly, ovarian cancer, prostate cancer, breast cancer and infertility continue to become more common among humans. If more and more of our fellow mammals are becoming extinct, it makes one wonder why the same thing can't eventually happen to us?

MCF10F Breast Epithelial Cells – p157
Magnification 20X

MCF10F Breast Epithelial Cells – p155
Magnification 10X

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