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13. ABSTRACT (Maximum 200) During the preceding year, the Duke Breast Cancer Tissue Repository collected breast cancer tissue from 126 patients undergoing surgery for a primary breast cancer. This compares to 124 entries in the first year of the repository. As before, nearly all of these tissues were both snap frozen in liquid nitrogen and embedded in gelatin for special applications. In 120 patients, serum and peripheral white cells were collected prior to surgery. An additional bank of normal plasma and white cells has been collected during the previous year. The Department of Defense Repository has provided tissues and blood to multiple investigators within Duke and in other U.S. institutions. The Repository has supported the Duke Specialized Project of Research Excellence (SPORE) and the Duke Comprehensive Cancer Center in a joint effort to establish a breast cancer genetics program at Duke. For this endeavor, the Repository has provided phlebotomy and blood storage for research studies looking at new genes and genetic loci in candidate families.				
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Introduction

The purpose of the Breast Tissue Repository at Duke University is to provide a resource of tissue from breast cancer patients, patients with benign breast diseases, and normal material from women undergoing cosmetic surgery. In addition, control plasma and genomic DNA from normal individuals is provided to researchers at Duke and in other US institutions. The Repository serves investigators within Duke University and collaborators at other institutions, depending upon availability and priority. The Repository is intended for high-volume use and is not used as an archive of clinical material. Exploratory molecular and genetic investigations are the most appropriate use of this facility; detailed follow-up for clinical correlation is not provided. The Repository will collect material in a tailor-made fashion for special applications or studies initiated by Duke investigators.

During the past two years, the Breast Tissue Repository has grown and has become a well used resource for Duke investigators. Selected researchers from other institutions have requested material. We were successful in our application for a Specialized Program of Research Excellence (SPORE) in Breast Cancer which began in October of 1995. This program has catalyzed breast cancer research at Duke and has opened up a variety of new applications for the Repository.

Body of Renewal

Inventory Summary

As of September, 1996 the Repository has collected samples from 1055 patients. This includes samples from 704 patients banked since 1988 and an additional 351 patients since the Repository was funded by the Department of Defense. Several additional features have been added since DOD funding began last year: 1) Two hundred samples have been frozen in gelatin (OCT) for in-situ applications, 2) Normal white blood cells are now available for each tumor banked, 3) A plasma repository has been added which includes both pre-operative and follow-up blood. This plasma bank now has 285 patient entries. The following table displays the range of histologies which have been collected during the past two years of funding.

Table 1. Histology of samples collected between 9-1-94 and 9-1-96

Histology	Number Acquired
Normal	25
Invasive Ductal (NOS)	148
Invasive Lobular	20
Specialized Histologies (medullary, etc)	9
Benign (eg, fibroadenoma)	1
Pure noninvasive (DCIS)	9
Miscellaneous (recurrent, etc)	28

Summary of Usage

Usage of the Repository remains high and has increased since the Duke SPORE was funded. Overall, several thousand samples have been distributed to investigators. In two cases, we have done specialized collections for specific studies. Dr. Kent Weinhold was provided with fresh tumor samples and heparinized blood from 83 patients over the past 2 years in order to isolate tumor infiltrating lymphocytes and peripheral T and B cells. Drs. Andrew Futreal and Joellen Schildkraut have received blood from kindreds ascertained through the SPORE which are neither BRCA1 or BRCA2 linked. These families are part of an effort, supported by supplemental funds from the NCI to the Duke Cancer Center, to isolate BRCA3 and other susceptibility genes for breast cancer. These studies have just begun, but will accelerate during the coming year. Dr. Randy Jirtle has been provided with freshly drawn and heparinized blood to determine plasma levels of TGF β ; thus far, Dr. Jirtle has received 276 pre-operative and post-operative blood samples. Dr. H. Kim Lyerly has received 17 fresh tumors for isolation of tumor cells and infection with vectors expressing cytokine genes. The following table summarizes the routine usage of Repository material.

Table 2. Summary of Routine Usage during the past year (Sept 95-Sept 96)

Investigator	Affiliation	Number of Samples Provided
Dr. Jeff Marks	Surgery, Duke	450
Dr. Andrew Futreal	Surgery, Duke	54
Dr. Robert Ochs	Scripps Institute	150
Dr. Randy Jirtle	Radiation Oncology, Duke	140
Dr. Kent Weinhold	Surgery, Duke	45
Dr. Andrew Berchuck	Ob-GYN, Duke	76
Dr. Alex Miron	Surgery, Duke	60
Dr. Laura Hale	Pathology, Duke	11
Dr. Kim Lyerly	Surgery, Duke	6
Dr. Charles Greenberg	Medicine, Duke	70

Expanding Role for the Department of Army Repository at Duke

As noted above, the Repository has assisted the Cancer Center and the SPORE in Breast Cancer with research in the molecular genetics of breast cancer. Personnel in the Repository assisted in family recruitment (phone interviews), obtained general research consent for blood storage and obtained blood samples. This activity contributed to the discovery of BRCA2 by investigators at Duke and collaborating institutions in November of 1995. As part of the SPORE, we are offering genetic testing to large numbers of women who have a high "prior probability" of carrying a mutation in BRCA1 or BRCA2. The phlebotomist from the Repository is drawing the blood for this research. We expect that several families will be identified in which there is neither a mutation in BRCA1 or BRCA2. In these kindreds, linkage might turn up new susceptibility genes. To conduct

linkage and gene discovery in these families, the Repository will assist our genetic researchers in obtaining complete family histories, finding family members and obtaining blood after informed consent. In each case, expert genetic counseling will be provided by the Cancer Center and SPORE personnel so that Repository personnel will only need to provide consent for the actual phlebotomy. However, the Repository will assist with family ascertainment, blood drawing, transportation of blood samples, storage and preparation.

At this point, testing for BRCA1 and BRCA2 has begun. We will be testing families with high prior probabilities first and will likely begin to identify candidate kindreds for new gene discovery by the end of this year. I expect this activity will increase during the rest of next year.

Relation of the Army Repository to the Duke SPORE in Breast Cancer and to the Comprehensive Cancer Center Genetic Supplement

The NIH requires that each SPORE in Breast Cancer include a Tissue Repository which must be a line-item in each SPORE budget. We proposed to delete this line item and rely upon the Army Repository entirely; this was administratively refused. Therefore, we proposed an addition to the Army Repository to provide specialized services peculiar to the SPORE. These peculiar services provided by the SPORE tissue bank are as follows: 1) provision of established cell lines to investigators, 2) attempt to culture breast cancer in-vitro and in immune compromised animals, 3) provision of animals bearing human tumor grafts from established cell-lines, and 4) provision of a specialized window-chamber preparation to investigators studying aspects of breast tumor physiology (eg., angiogenesis, macromolecule delivery, etc.). We recently expanded the tissue service within the SPORE to include an animal facility for pre-clinical drug testing by re-budgeting from other sources. In no way does the tissue bank within the SPORE overlap with the Army-sponsored Repository. However, the Army Repository supports and augments the SPORE-sponsored bank and SPORE research.

The Cancer Center recently received notice of supplemental funding to begin a genetics program at Duke, concentrating on breast cancer genetics. This funding will support genetic epidemiology, family ascertainment, a familial data-base, and laboratory-based linkage and cloning projects. The Army Repository is in an ideal position to support this new research effort by providing phlebotomy services, assisting in family member identification and in the storage and handling of blood samples. The Army Repository complements this research perfectly.

Conclusions

The Department of the Army Breast Cancer Tissue Repository at Duke University is a high-volume resource which has served investigators in a variety of departments and Programs within Duke Medical Center. In future years, the Repository will serve the new genetic research within the Duke SPORE in Breast Cancer and within the Cancer Center. The Repository has provided specialized collection services to investigators who require

freshly collected and sterile samples, blood from normal control women and blood for gene discovery research. The Repository interdigitates with the SPORE Core Tissue Resource by providing clinical tissues for storage and distribution (Army Repository) while the SPORE provides cell and animal resources for local investigators.

Submitted by

A handwritten signature in black ink that reads "J. Dirk Iglehart". The signature is written in a cursive style with a large initial "J" and a long horizontal stroke at the end.

J. Dirk Iglehart, M.D.
Principal Investigator