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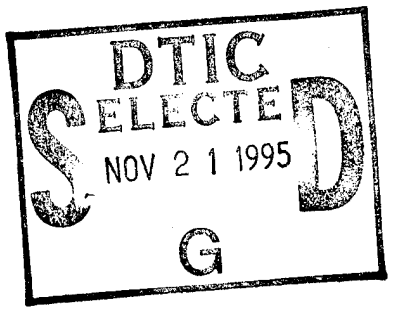

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13. ABSTRACT *(Maximum 200 words)*

During the first year of existence of the University of Michigan Human Breast Cell/Tissue Bank and Data base, we have accomplished many of the goals that were originally set forth in our Statement of Work. We have developed and implemented a system for procuring breast cancer specimens for our bank in a way that does not compromise the diagnostic value of the specimens. We have developed a system to bank paraffin embedded tissues, frozen specimens, and viable breast cancer cells in ways that allow for distribution to breast cancer researchers. We have also developed new human breast cancer cell lines that are available to researchers who use this resource. We have developed a comprehensive data base that links tumor specimens with clinical data, demographic data and family history data without compromising the confidentiality of the patient and have developed an administrative structure for distribution of these cells and tissues. A World Wide Web page for advertising of this resource and for on-line ordering of breast cancer cells and tissues is under construction. Thus, we are well on our way to developing a unique resource that will provide badly needed human breast cancer specimens to breast cancer researchers.

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Stephen P. Ellis 9/26/95

PI - Signature Date

Stephen Ethier, Ph.D.

Human Breast Cancer Cell / Tissue Bank and Database

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INTRODUCTION

The major goal of the work that is supported by this DOD infrastructure grant is to develop a human breast cancer cell/tissue bank and data base to facilitate distribution of fresh breast cancer specimens to breast cancer researchers in our own institution and throughout the country. Over the past year, we have worked to develop this resource and have begun to distribute breast cancer cells and tissues to numerous investigators. Many aspects of this resource are unique. For example, we are the only such tissue bank that can provide both normal and neoplastic breast epithelial cells in a viable state suitable for in vitro studies as well as for the more common molecular biological applications. We can provide frozen sections and touch preps of fresh breast cancer specimens in addition to the more common paraffin embedded sections from fixed tissue. We also can provide clinical data on the patient sample including all of the common clinical information such as, estrogen and progesterone receptor statues, lymph node status, and we also provide data on expression of certain oncogenes and tumor suppresser genes. Finally, we are the only resource that works to establish and provide to the scientific community, new human breast cancer cell lines that are cultured under growth factor-defined conditions and which come with a full array of cellular and molecular data. Furthermore, cells from these lines can be provided at early passage levels thus, providing a better model of breast cancer cell growth in vivo.

We are well on our way to developing a unique human breast cell/tissue bank and data base that provides novel and important cells and tissues to many breast cancer researchers.

BODY

During the past year, much work has been done to address and complete the tasks that were originally laid out in the Statement of Work. Therefore, this report will comment on the progress as it relates to each of those tasks.

Task 1. Establish logistic methods for insuring that every human breast cancer specimen that has tissue remaining following evaluation by the Surgical Pathologist is routed to the Cancer Biology laboratory for tissue preparation, cell isolation and cyropreservation in the cell bank. Over the past year, we have set up a tissue procurement program that is coordinated by Dr. Tom Frank in the Department of Pathology. A full time procurement technician has been hired and trained and it is his responsibility to track surgery schedules, be present in the surgical pathology suite when specimens arrive, and work with the attending Pathologist to procure as much left over tissue as possible after all diagnostic criteria have been met. Further, the procurement technician has the added responsibility of obtaining these tissues using sterile technique as sterility is required for the isolation of viable cells from these tissues. Isolation of viable cells is required for the establishment of new human breast cancer cell lines, and also for banking of

fresh cells for distribution. In addition to procuring these specimens, this technician has obtained the relevant clinical data from patient records and has entered it into our data base. He has also cut new histological sections for evaluation of erbB-2 and p53 expression in these breast cancer tissues. Finally, the procurement technician has retrieved paraffin blocks of breast cancer specimens the cells from which had been previously banked, and added both clinical data and immunohistochemical data on these specimens.

During this first year of work, the tissue procurement group has banked 166 specimens as paraffin embedded tissues with corresponding normal tissue. There are now 72 banked specimens that have corresponding immunohistochemical data, and 52 banked frozen tumor specimens. During this year, we have also procured an additional 50 human breast cancer specimens for banking as viable cells. This brings the total of this resourse to over 100 specimens banked.

Thus, the procurement effort has gone quite well, and we are now well set up to obtain all relevant breast cancer specimens from our institution.

Task 2. Establish methods for histologic evaluation of parameters not ordinarily evaluated for human breast cancer specimens, for all specimens that yield cells that are stored in the tissue bank. These include immunohistochemical evaluation of expression levels of p53 protein, EGFR receptor and HER-2/neu receptor. Progress toward this task was discussed briefly above. In addition to routine histopathologic analysis done on all breast cancer specimens, all breast cancer specimens that are part of our cell/tissue bank are now evaluated separately for expression of erbB-2 and p53. As mentioned above, we now have 72 banked breast cancer specimens with data on erbB-2 and p53 in addition to the routine histopathologic information.

Task 3. Establish logistic methods for routine blood drawing of all breast cancer patients whose cells are preserved in the bank, in order to isolate and immortalize lymphocytes from these patients. This is the one task where little progress has been made thus far. The logistical problems of obtaining an additional blood draw only from patients whose cells and tissues are procured has proven more difficult that was initially thought. Furthermore, the status of the laboratory at the University of Michigan that routinely immortalizes lymphocytes is uncertain at this time. Finally, we have yet to have a request for immortalized lymphocytes from breast cancer patients. Therefore, work on this task has been put aside for now, and will become a priority for year two of this grant.

Task 4. Establish a computerized data base for all patients whose cells are currently stored in the cell bank and for all future patients whose cells/tissues are banked. The data base

will contain all pertinent family history data, all data obtained from histopathologic evaluation of the breast cancer specimen, the location and status of the patients' cells and tissues stored in the bank. Experimental data obtained by individual investigators using banked samples will also be entered into the data base. The data base will be set-up in a way that allows investigators to access patient data without compromising the privacy and confidentiality of the patient. Progress on establishment of the data base has been outstanding during year one. The work of Mr. Erdwing Coranado, who is partially supported by this grant, has been outstanding and we now have a very elegant and powerful computerized data base. The current data base is divided into sections that contain; demographic data for all patients whose cells and tissues are banked, pathological data for all specimens, data on the availability of fresh cells, and family history data for patients whose cells and tissues have been banked. The various parts of the data base are connected in ways that allow multiparameter searches of our entire data base. This allows us to provide the kinds of specimens that investigators request for specific subsets of patient samples.

During the construction of this data base, many precautions have been taken to protect the identity of patients whose cells/tissues are banked. First, the server that contains the data base is heavily password protected. In addition, each patient sample in the bank is assigned a unique number that cannot be linked to the patients' identity. Thus, any clinical data that is provided with the specimen is only linked to that unique number.

The data base, as it now stands, is a powerful supplement to the cell/tissue resource and allows us to fulfill specific needs of many breast cancer researchers.

Task 5. Set up and implement the administrative plan for distribution of cells and tissues stored in the bank to other investigators at the University of Michigan as well as other Cancer Centers throughout the mid-west and the country. During the first year, we developed an ordering procedure for the distribution of cells and tissues in the bank. The order form that was developed sets limits on availability of various specimen types. In addition, we have set up priority criteria that will drive decisions to disburse cells/tissues in the event that availability of particular specimens becomes limited.

During year one of this grant, we have only advertised the existence of this facility within our own institution and word has also spread by word of mouth. Despite the limited knowledge of the existence of this resource, we have disbursed a reasonable number of samples during the first year. Thus, we have distributed 52 ampoules of viable breast cancer cells and 118 tissue culture dishes of breast cancer cell lines to 13 different laboratories. The Pathology group has processed 36 specimens for distribution to various laboratories here on campus. Thus, we are well on our way to fulfilling our mission of making human breast cancer cells and tissues available to breast cancer researchers.

A major focus of year two will be directed toward making more investigators aware of the availability of breast cancer cells and tissues from this resource. We are currently in the process of building a world-wide-web page that describes the resource, provides a menu of available services and provides an on-line order form. The address of this web page is: http://www.cancer.med.umich.edu/umbnkdb.html . As soon as this page is completed, it will be linked to the University of Michigan Cancer Center Web page and it will also be linked to other tissue bank home pages that are on the World Wide Web. We expect that over the next year, our tissue bank will become more widely recognized and the ease of on-line ordering of specimens will cause our disbursement efforts to increase dramatically. We will, of course, also continue to procure new specimens and add them to our bank during year two of the grant.

CONCLUSIONS

In summary, the first year of this project has been quite successful with much progress made toward four of the five specific tasks outlined in the Statement of Work. We feel strongly that the cell and tissue bank that we are developing provides many unique features to breast cancer researchers and will make a strong contribution to many areas of breast cancer research.