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## COMPREHENSIVE POSTDOCTORAL TRAINING PROGRAM IN BREAST CANCER BIOLOGY

### INTRODUCTION

The Comprehensive Postdoctoral Training Program In Breast Cancer Biology has successfully completed its second year. The goal of the program is to significantly extend our existing, highly successful Doctoral Training Program in Tumor Biology and several Cancer Center mechanisms that provide traditional postdoctoral training and junior faculty career development. The education and training of new investigators is essential to our progress in the prevention, detection, diagnosis, and treatment of breast cancer. The Postdoctoral Training Program in Breast Cancer provides comprehensive career development and integrates interactive research in the basic biology of breast cancer, formal and informal course work in key areas, and individualized guidance in career development. The program is enriched with both new and existing courses of interest to postdoctoral fellows covering scientific writing, teaching methodologies, scientific resources and technologies for cancer research, ethics in science, career development seminar series, and provides a firm foundation in the skills needed to succeed in a career science, as well as a focused research experience in basic breast cancer biology in a strong laboratory environment. Additional programmatic activities include monthly Oncology Grand Rounds, weekly Tumor Biology Seminar Series, and weekly journal clubs. The program makes use of the existing organizational structure of the Interdisciplinary Doctoral Training Program in Tumor Biology and incorporates a multi-disciplinary faculty who are devoted to research and education in breast cancer.

Postdoctoral fellows are given the opportunity to seek research and career advice from a number of senior faculty. The further development of this structured Tumor Biology Postdoctoral training program will provide excellent preparation for successful careers in cancer research.

### BODY

#### *Training and Research Accomplishments*

The accomplishments of this program include the recruitment and progress of postdoctoral fellows. In the past 10 years, over 100 postdoctoral fellows have been trained by our Tumor Biology program preceptors. These fellows have an outstanding record of research productivity and peer-reviewed publication, and over 50% of them have obtained academic faculty level positions.

In the first year of the program, two postdoctoral fellows, Fadwa Attiga, Ph.D. and Tushar Deb, Ph.D., were recruited to the program. Dr. Attiga has successfully completed her postdoctoral fellowship in Dr. Stephen Byer's lab, researching the cross

regulation between the IKK and the beta-catenin signaling pathways in breast and colon cancers. Her research topics include study of how different kinases regulate the level of oncogene beta-catenin in tumor cells and identification of the key players in the signaling cascades that alter the beta-catenin protein level and transcriptional activity in tumors. Dr. Deb, has completed his first year of research in the program in Dr. Robert Dickson's lab. The main focus of Dr. Deb's research is to explore the EGF cell-survival signaling in transgenic MMTV-c-Myc mammary epithelial cells. Proto-oncogene c-Myc sensitizes apoptosis in absence of serum in these cells. The specific role of a calmodulin dependent kinase in this survival signaling is also being explored.

Two postdoctoral fellows, Marcia Noble, Ph.D., and Kerrie O'Brien, Ph.D., were recruited into the second year of the program. Dr. Noble began her postdoctoral fellowship in September 2001, under collaborative mentorship of Dr. Michael Johnson and Dr. Robert Dickson. Dr. Noble's research focus is on the mechanism of VEGF to promote breast cancer metastases in transgenic mouse models. Dr. O'Brien began her fellowship in March 2002 under mentorship of Dr. Robert Clarke. Dr. O'Brien's research focuses on the resistance to retinoids in breast cancer. A third postdoctoral fellow, Constanze Hample, has been recruited into the program and will begin her fellowship in September 2002 with Dr. Stephen Byers.

As noted earlier, our Postdoctoral Program incorporates elements of our existing Tumor Biology Ph.D. program, as well as new, Postdoctoral Training-specific elements as a part of a Breast Cancer Prevention Track. In addition to the existing courses offered through the Interdisciplinary Doctoral Training Program in Tumor Biology, new course components have recently been incorporated into the Breast Cancer Prevention Track. In addition to the existing core course work of the Interdisciplinary Doctoral Training Program in Tumor Biology, new course components have been incorporated into the Breast Cancer Prevention track in Spring 2002. These include a course in Biostatistics, *Applied Biostatistics*, that has been refocused on statistical design and methodology for research rather than biostatistics theory, and a Cancer Genetics course, *Genetics, Health, and Society in the 21<sup>st</sup> Century*, which focuses on practical and ethical questions raised by genetic information and technology. Both courses had a very successful first year and will continue to be offered. A new course in Genetics, *Human and Microbial Genetics*, has been developed and will be offered in the Fall.

### KEY ACCOMPLISHMENTS

- *Recruitment of Trainees and Progress of Trainees:*
  - Two postdoctoral fellows have been recruited into class #2 of the Comprehensive Postdoctoral Training Program In Breast Cancer Biology: Marcia Noble, Ph.D., and Kerrie O'Brien, Ph.D. Dr. Noble began the program in September, 2001 in Dr. Michael Johnson's and Dr. Robert Dickson's laboratories and Dr. O'Brien began March, 2002 in Dr. Robert Clarke's laboratory.
  - Dr. Deb, from class #1, has successfully entered into his second year in the program studying breast cancer biology.

- Dr. Attiga, from class #1, completed her first year with Dr. Stephen Byers and is currently on maternity leave.
- *New Courses:*
  - A new course, *Human and Microbial Genetics*, will be offered in the fall.
  - Two courses, *Applied Biostatistics* and *Genetics, Health and Society in the 21<sup>st</sup> Century* both had a very successful first semester and will continue to be offered.

### REPORTABLE OUTCOMES

- *Publications:*
  - **Fadwa Attiga, Ph.D. –**  
Attiga, F. (2001). "Tumor necrosis factor alpha regulates NF $\kappa$ b and beta catenin signaling in colon cancer cells." (In Preparation).
  - **Noble M, Rosfjord E, Deming S, Chepko G, Johnson MD, Merlino GT, and Dickson RB.** Induction of angiogenesis-dependent metastasis in a bitransgenic VEGF-c-Myc model of mammary cancer. *Nature Medicine* (in preparation).
- *Abstracts:*
  - **Deb, T, and Dickson, R.** Calmodulin as a positive modulator of EGF survival signaling in MMTV-C-MYC mouse mammary epithelial cells. *DOD ERA of Hope Meeting*, Orlando, FL, 2002.
  - **Noble M, Rosfjord EC, Sharp R, Merlino G, and Dickson RB.** Ectopic VEGF expression promotes metastasis in bitransgenic breast cancer model. *DOD ERA of Hope Meeting*, Orlando, FL, 2002.
  - **Teo M, Attiga F, Jarret C, and Byers S.** Cytokine Regulation of  $\beta$ -catenin signaling. *Fourth Annual Lombardi Research Fair*. Georgetown University Medical Center, Washington, D.C. 2002.

### CONCLUSIONS

The goal of the program is to significantly extend our existing, highly successful Postdoctoral Training Program in Cancer with a new specialization in Breast Cancer Biology. We have successfully completed our first year of the Comprehensive Postdoctoral Training Program in Breast Cancer Biology and have two postdoctoral fellows who are now entering their second year of research. We have recruited two new postdoctoral fellows to the program.