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Quantitative Histopathology of Breast Carcinoma In Situ

[We will develop computer-aided methods for analysis of biopsy specimens to improve the prognosis of breast cancer.]

It is estimated that, in New Jersey during the year 2000, there will be 6,400 new cases of breast cancer resulting in 1,400 deaths (Cancer Co-A, volume 50 pages 7-33, 2000)

We will develop computer-aided methods for prognosis of breast cancer. Our goal is provide an objective and reliable method to determine which breast lesions will progress to aggressive cancers and which will not, using computers to analyze microscopic images of biopsy specimens.

The number of suspicious breast lesions that need to be evaluated is growing rapidly as the mean age of the populations increase, and screening by mammography and self-examination become more common. Accurate prognosis is important since it affects medical therapeutic decisions. Currently, pathologists base prognosis of breast lesions, in part, on microscopic examination of specimens. However, some lesions are difficult for pathologists to evaluate, such as ductal carcinoma in situ, in which cancer cells are found exclusively within the ducts. We intend to develop a computer system to measure microscopic images of breast specimens and use the measurements to devise formulas that will help the pathologists to evaluate ductal carcinomas in situ.

In a small-scale experiment, we determined that our computer system could measure specimens and could correctly classify them into the same low and high-grade categories as done by a pathologist. These results suggest that our computer system can be used for prognosis. (1) analyzing a larger number of specimens, and (2) choosing 5 year-old archived specimens in which the patient outcome is known will do this. The result will be a formula that can be used for prognosis of new cases of breast ductal carcinoma in situ.