

Glimmer of Hope Foundation purchases Camera Equipment for Hillman Cancer Center. Non-restrictive purchase so all cancer patients will benefit.

Despite tremendous progress in the management of breast cancer, dormant cancer cells persist and can reactivate years after apparently successful treatment. In the last 5 years, new insights about normal tissue repair and cancer have led to the hypothesis that adult stem cells and dormant cancer cells have much in common. Drug doses which would kill dormant tumor cells would also kill normal adult stem cells. In breast cancer, we hypothesize that these protected cells are the dormant cancer cells responsible for recurrence. The big problem, then, is how to target protected dormant tumor cells without causing irreversible damage to the adult stem cells that maintain and repair the body.

The recent discovery that some cancers make themselves therapy-resistant by activating genes that play their most important role in the developing embryo, gives us a new target of therapy. In our current work we are testing the ability of embryonic pathway targeted compounds to increase the effectiveness of existing chemotherapy. These experiments are performed on tumor cells collected from patients and grown in the laboratory, and on treated patient tumor samples injected into immune deficient mice that are capable of growing human cancers. These experiments look at tumor kill, and also determine whether normal stem cells, such as those which make blood, are spared. In order to document tumor growth and quantify the amount of cellular death and the expression of cellular proteins, we use an inverted microscope to record these changes daily. Most of the time, we have tens to hundreds of cell cultures to photograph, daily generating hundreds of megabytes of image data and necessitating the use of specialized cameras and software to process and analyze what it means.

Our laboratory experiments are inherently translational, which means that they are basic science studies that are designed to address a problem of immediate importance in the clinic. These studies have the potential to directly benefit patients with therapy resistant breast cancer at any level of disease stage and are expected to advance the field of breast cancer research by unraveling the relationship between self-protection, cancer dormancy and recurrence.