

Improving the development of new cancer models using an advanced biomedical imaging method

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Scientists at the University of Arizona Cancer Center and the Moffitt Cancer Center, led by Dr. Robert Gillies, have demonstrated that an advanced magnetic resonance imaging (MRI) method can non-invasively evaluate the cellular proliferation of tumor models of breast cancer. This quantitative imaging method evaluates the diffusion of water in tumor tissue, which correlates with the growth rates of the tumor models. The results, which appear in the November 2012 issue of *Experimental Biology and Medicine*, can contribute to the development of new tumor models for cancer research.

"In the absence of imaging such as we describe here, developers of tumor models are flying blind" says Dr. Gillies. "In this study, we show that the behavior of water in tissues can provide important information about tumor development. More specifically, the mobility of water is inhibited by biological barriers such as cell membranes, so that decreased mobility can be used as a measure of cell density and proliferation in tumor models."

The development of new tumor models is a high priority for current cancer research. Yet creating new pre-clinical tumor models from cancer cells obtained from patients is a laborious process with a low potential for success. Dr. Marty Pagel, co-investigator on the study states that "noninvasive, quantitative imaging techniques have potential to accelerate and improve the success of establishing new tumor models for

innovative cancer studies."

Dr. Steven R. Goodman, Editor-in-Chief of [Experimental Biology and Medicine](#) said "This exciting study by Gillies and colleagues demonstrates that a Diffusion Weighted [MRI technique](#) provides a quantitative measure of tumor development in models of breast cancer. Such a non-invasive method will allow for the development of new tumor models that can be used for the development of improved therapies for breast cancer".

Provided by Society for Experimental Biology and Medicine

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