Non-Invasive Near-Infrared Quantitative Tomography and Agents for Quantification of Early Anti-Angiogenic Treatment Efficacy

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1 Abstract

A critical issue for ensuring the success of developing new anti-cancer therapies is the establishment of non-invasive assessments of disease-related vascularity and therapeutic response in oncologic models of disease. The methods and results can have wide applicability in areas of vascular biology and assess the efficacy of therapeutics in a range of ischemic, inflammatory, infectious, and immune disorders.

2 Materials and Methods

AngioSense® 680

AngioSense 680 (PerkinElmer) is a biocompatible, highly fluorescent, macromolecular (250,000 daltons) imaging agent that remains localized in the vasculature for extended periods of time and in areas of increased vascular leakage.

Caliper measurements FMT Imaging

Assessments Caliper measurements FMT Imaging

Results were confirmed by imaging ear venules (left) showing localization exclusively in the vasculature at 1 hr, with extravasation into the surrounding tissue apparent at 24 hr.

3 Results

A normal 9L tumor-bearing mouse i.v. was injected with AngioSense. Tumor sections were stained with anti-CD31 antibody, and fluorescence measured. The relationship between tumor volume and AngioSense fluorescence was linear through day 21, after which tumor volumes were statistically smaller in the treated animals.

4 Discussion

It is widely recognized that an important aspect of drug development is the ability to accurately measure the efficacy of therapeutic interventions. PerkinElmer is developing novel technologies that can be used to quantify and image the presence of vascular alterations in tumor xenografts.

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