

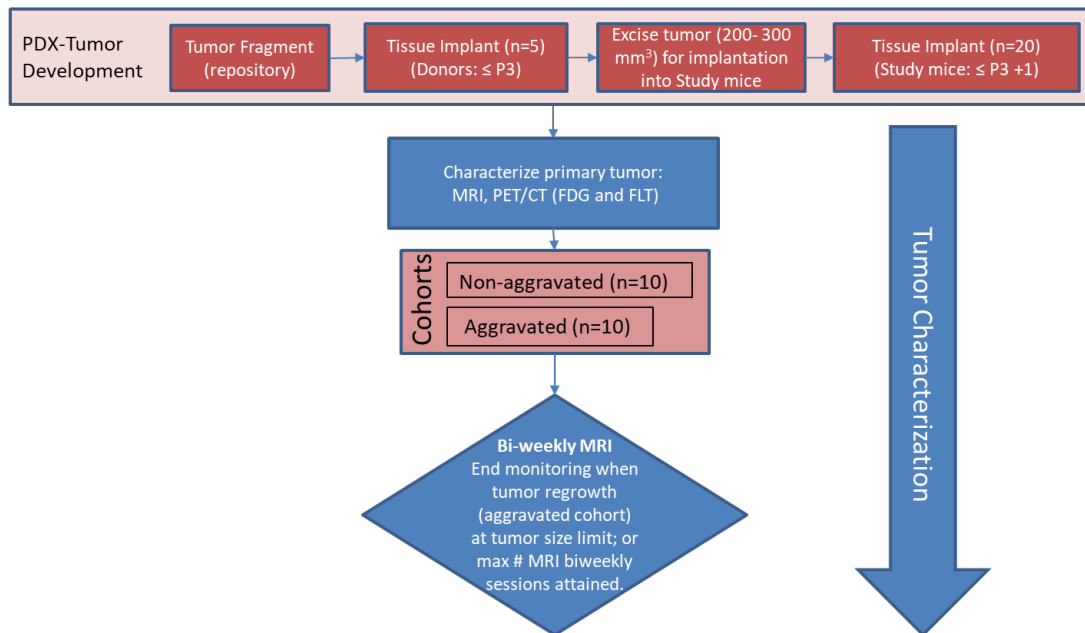
**Imaging tissue characterization of a patient derived
xenograft model of adenocarcinoma pancreas: PDMR-
833975-119-R**

Summary

Characterization of tissue using *in vivo* non-invasive imaging is the foundation of Radiology and is clinically used for detection and measurement of disease burden in oncology. With the migration of imaging to digital media the possibility for advanced mathematically based imaging biomarkers was realized. As part of this endeavor, researchers have developed various algorithms using neural networks, and classification techniques to improve tissue characterization (morphological changes). However, large datasets are a requirement in this research endeavor in part due to the genomic heterogeneity of tumors in the same histologic classification – many tumors from different patients are required to have enough with the same genomic characteristics to adequately evaluate the range of imaging variability for a specific genomic pattern. Pre-clinical animal models of patient derived xenografts may be an important resource by providing collections with a more homogenous tumor genome across the collection with companion extensive tumor genomic characterization available, allowing determination of the variability of imaging characteristics for that pattern in different individuals. This dataset of a patient derived xenograft model adenocarcinoma pancreas [PDMR: 833975-119-R](#) can be used for training algorithms for evaluating variations in tissue texture with respect to tumor growth and regrowth after surgical resection.

In this study we performed a detailed imaging characterization (workflow below) of this model, details are provided in the attached standard operating procedures. Tumors in half of the mice were resected in the range 200-300 mm³ size; tumors in the other half were allowed to grow until it was necessary to euthanize them because of tumor size.

Workflow: Characterization of PDX primary tumor



T2w MRI at 56 days post implant demonstrated a heterogenous tumor with an apparent central hemorrhage and the implant appears to have a defined capsule. On day 98 (post-implant) the tumor increased in size (618%) with very similar imaging characteristics as displayed on day 56.

In contrast, the regrowth following surgical resection of the primary xenograft (105 days post resection) is homogenous, but also appears to have a well-defined capsule.

PET/CT Characterization of the primary tumor: Baseline PET (SOP attached) were performed when tumor reached an approximate 200 mm³. Average SUVbw_max values (n=5) were calculated; [¹⁸F]FDG: 1.8 ± 0.2 and [¹⁸F]FLT: 2.8 ± 0.7.

The imaging characteristics of this model, which is available from the National Cancer Institute Patient-Derived Models Repository (<https://pdmr.cancer.gov/>), is highly favorable for preclinical research studies when used in conjunction with non-contrast T2 weighted MRI.

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Data Access

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Data Type	Download all or Query/Filter
Images (DICOM, 1.6 GB)	  (Download requires NBIA Data Retriever)
PDMR Patient Specimen (external)	
Standard Operating Procedure 50101: MRI T2 Weighted Non-Contrast Protocol: Single Mouse Pulmonary Gated and Multi-Mouse Non-Gated	
Standard Operating Procedure 50102: Positron Emission Tomography (PET) imaging protocol	

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Detailed Description

Detailed Description

Image Statistics	
Modalities	MR, SR

Number of Subjects	20
Number of Studies	101
Number of Series	182
Number of Images	3017
Images Size (GB)	1.7 GB

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Data Citation

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