Imaging characterization of a metastatic patient derived model of bladder cancer: BL0293F (PDMR-BL0293-F563)

Summary

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Pre-clinical animal models of spontaneous metastatic cancer are infrequent; the few that exist are resource intensive because determination of the presence of metastatic disease, metastatic burden, and response to therapy normally require animal sacrifice and extensive pathological examination. We recently identified and characterized a patient derived xenograft model with metastatic potential, bladder xenograft BL0293-F563, developed by Jackson Laboratories and the University of California at Davis. In this study we performed a detailed imaging characterization of this model, which develops spontaneous liver and bone metastases. Using non-contrast T2 weighted MRI, hepatic metastases were demonstrated in over 70% of animals at 52 days post tumor implantation without resection of the xenograft and in 100% of animals at day 52 following resection of the xenograft. T2w turbo spin echo (T2wTSE) sequence was applied in the coronal view with a repetition time (TR) 5333ms, echo time (TE) 65ms, with an in-plane pixel of 0.180 × 0.180 mm2. A Spectral Presaturation with Inversion Recovery (SPIR) sequence (Philips Healthcare, Best, The Netherlands) was used to suppress the fat component and assist in distinguishing fat from cystic mass and tumor tissue. In a group of animals receiving one cycle of effective chemotherapy ([Temozolomide; (50 mg/kg; PO, QDx5)] plus [(veliparib, a poly (ADP-ribose) polymerase inhibitor) (7.75 mg/kg; PO; BIDx7)]), no animals demonstrated metastasis by imaging. 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 of metastatic disease when used in conjunction with non-contrast T2 weighted MRI.

Acknowledgements

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Data Access

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The National Cancer Institute (NCI) has developed a national repository of Patient-Derived Models (PDMs) comprised of patient-derived xenografts (PDXs), in vitro patient-derived tumor cell cultures (PDCs) and cancer associated fibroblasts (CAFs) as well as patient-derived organoids (PDOrg). These models serve as a resource for public-private partnerships and for academic drug discovery efforts. These PDMs are clinically-annotated with molecular information and made available in the Patient-Derived Model Repository. Data related to the specific subjects in this Collection can be found at:

- PDMR-BL0293-F563

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The NCI Cancer Research Data Commons (CRDC) provides access to additional data and a cloud-based data science infrastructure that connects data sets with analytics tools to allow users to share, integrate, analyze, and visualize cancer research data.

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- Imaging Data Commons (IDC) (Imaging Data)

Detailed Description

Detailed Description

Image Statistics	
Modalities	MR
Number of Patients	19
Number of Studies	66
Number of Series	131
Number of Images	2222
Images Size (GB)	3.2

This Standard Operating Procedure (SOP) describes the procedures for animal handling and monitoring, anesthesia, daily MRI QC/QA, and MRI sequences for single and multi-mouse imaging for detection and monitoring of tumors and metastatic lesions. This SOP is used/performed by the Small Animal Imaging Program (SAIP) at NCI-Frederick, Frederick National Laboratory for Cancer Research.

In addition to images, this collection may include Raw Data Storage SOP Class instances with **MR Modality**, generated by a Philips MR scanner; this data is not useful to anyone without the proprietary software to interpret it.

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Publication Citation

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