Reviewer's report

Title: Tumour size measurement in a mouse model using high resolution MRI

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Reviewer: Jason A Koutcher

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In the reviewer’s experience, the major obstacle to obtaining an accurate estimate of tumor volume at small volumes – both in vivo and ex vivo – is the skin contribution. This is not addressed. Did the authors dissect the skin from the ex vivo sample? Was the skin included for the in vivo studies. Skin thickness in a mouse is about 1 mm – if we deal with the tumor thickness, there are two layers of skin in each direction on a picture or between the calipers, which for a tumor of ~ 20mg (~3.5 mm), could add a major difference to the result.

The authors state that they could not go below 700um because of gradient strength. We have gone below that but the main issue then is SNR and the length of time one needs to acquire signal. To go to a slice thickness of 300-500um leads to a major increase in acquisition time. This is pertinent to the comment that the authors make in the conclusion of the abstract that this study could be part of a metabolic, diffusion ore perfusion study. This seems unlikely. The authors state that studies took 10-50 minutes. The contribution of this paper is when tumors were small – presumably these had the longer imaging time. Since the DCE-MRI, DWI and metabolic studies all take considerably longer than imaging, if one has spent 25-35 minutes on imaging, it is not likely that one could add on one of the highly desirable functional images mentioned.