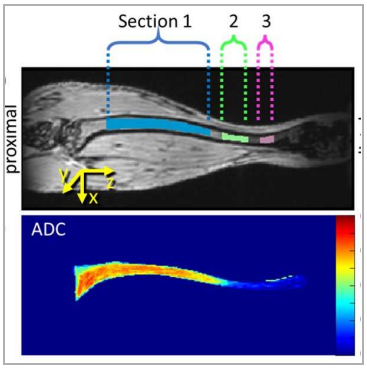

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Apparent Diffusion Coefficient Measurement of Myelofibrosis in Mouse Tibia

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DISCLAIMER

The ADC PIP claims hold when:

- **Scanner hardware, diffusion weighted image (DWI) data acquisition method and parameters, image reconstruction, and data-reduction procedures are equivalent (or superior) to those detailed in section III.**
- **Use of the same animal model and interventions to induce myelofibrosis are performed as detailed in section V.**
- **ADC change is assessed on an individual animal basis where each animal undergoes identical procedures on the same MRI system over longitudinal timepoints.**

OPEN ACCESS

DOI: dx.doi.org/10.17504/protocols.io.rm7vzb1z2vx1/v1

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Protocol status: Working
We use this protocol and it's working

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Keywords: mouse tibia, myelofibrosis model, apparent diffusion coefficient, preclinical imaging protocol, technical repeatability

ABSTRACT

The goal of this Co-Clinical Imaging Research Program (CIRP) pre-clinical imaging protocol (PIP) is to provide detailed description of key steps used to achieve a stated level of technical repeatability (precision) embodied in “Claims”, for MRI measurement of apparent diffusion coefficient (ADC) in tibia bone marrow of myelofibrosis mouse models. This pre-clinical imaging procedure document will be referred to as a “profile” and adheres to a PIP MRI template provided in: https://www.protocols.io/workspaces/pre-clinical-imaging-protocols. This profile details procedures for ADC measurement from diffusion weighted imaging (DWI) acquisition and image processing in MF mouse tibia to achieve stated performance claims. Tibia bone marrow composition in MF mouse models has gradation going from proximal to distil ends of the tibia, therefore separate claims are made for volume of interest (VOI) analysis of ADC maps for each of three distinct sections along the length of the tibia (see Figure 1):

Section 1 (proximal)º VOI (~4-5mm^3) within 9mm of proximal end of tibia

Section 2 (transition)º VOI (~0.4-0.5mm^3) from 10 to 12mm of proximal end of tibia

Section 3 (distil)º VOI (~0.1-0.2mm^3) from 13 to 14mm of proximal end of tibia

Claim 1:A measured change in the mean ADC in Section 1 VOI of MF mouse model tibia that exceeds ±0.037µm^2/ms indicates a true biological change has occurred in the tibia bone marrow with 95% confidence.

Claim 2:A measured change in the mean ADC in Section 2 VOI of MF mouse model tibia that exceeds ±0.087µm^2/ms indicates a true biological change has occurred in the tibia bone marrow with 95% confidence

Claim 3:A measured change in the mean ADC in Section 3 VOI of MF mouse model tibia that exceeds ±0.030µm^2/ms indicates a true biological change has occurred in the tibia bone marrow with 95% confidence

ATTACHMENTS

UMich_ADC_SOP-Profile_20230214.pdf