

Fluorine Imaging

Mirko Meißner

Due to the lack of MR visible fluorine in living organisms there is no background ^{19}F -signal in MR images. Hence, a detected signal doubtlessly originates from previously injected fluorinated contrast agents, which makes them highly interesting for molecular imaging. We are currently working on several attempts to construct fluorinated contrast agents which can be targeted to activated platelets. In particular, liposomes are excellent carrier particles which can be filled with a variety of contrast media and functionalized by coupling them to specific antibodies. We have constructed liposomes filled with trifluoroacetic acid and performed first in vitro experiments regarding their stability and detectability. Our first image is shown in Fig. 1. A second attempt towards constructing targeted fluorinated contrast agents is the usage of perfluorocarbon ether nanoemulsions. A first experiment was the intramuscular injection of the untargeted emulsion into the legs of a mouse (Fig. 2) as well as the intravenous injection into the tail vein of another mouse. Thus, these fluorinated contrast agents are detectable with MR. Our effort is currently concentrated on getting these agents targeted to activated platelets.

Fig. 1: Trifluoroacetic acid encapsulated into liposomes (Phantom).

Fig. 2: A proton image (left) showing the legs of a mouse, a fluorine image (middle) showing the injected perfluorocarbon ether nanoemulsion and an overlay of both images (right) showing the anatomical location of the contrast agent.