—Photogravure—

Detection of Atherosclerotic Lesions in Apolipoprotein E Knockout Mice Using USPIO-Enhanced Magnetic Resonance Imaging

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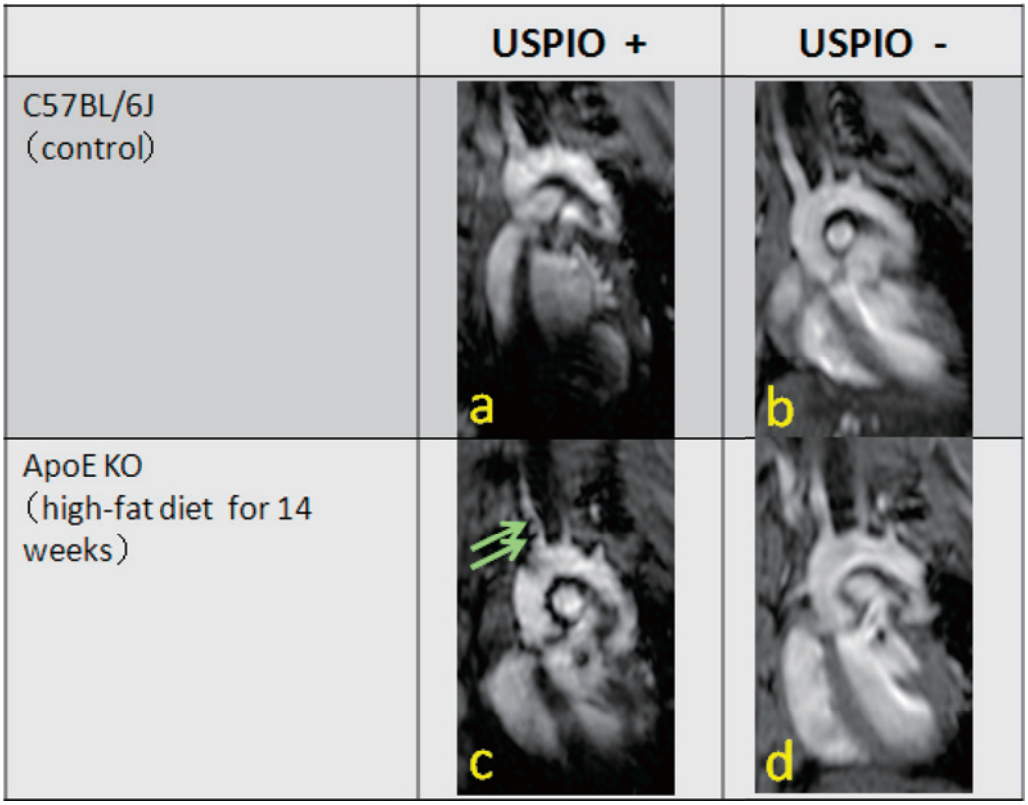

Fig. 1

Atherosclerosis is a cardiovascular disease with an accompanying inflammatory response, in which macrophages play an important role. Magnetic resonance imaging (MRI) using ultrasmall superparamagnetic iron oxide (USPIO) particles as a contrast agent has been used in several inflammatory diseases. The USPIO taken up by macrophages reduces the signal intensity on MRI images. Using USPIO-enhanced MRI at 7 T, we could detect atherosclerotic lesions in the brachiocephalic artery of apolipoprotein E (ApoE) knockout (KO) mouse fed a high-fat diet as a model of atherosclerosis.

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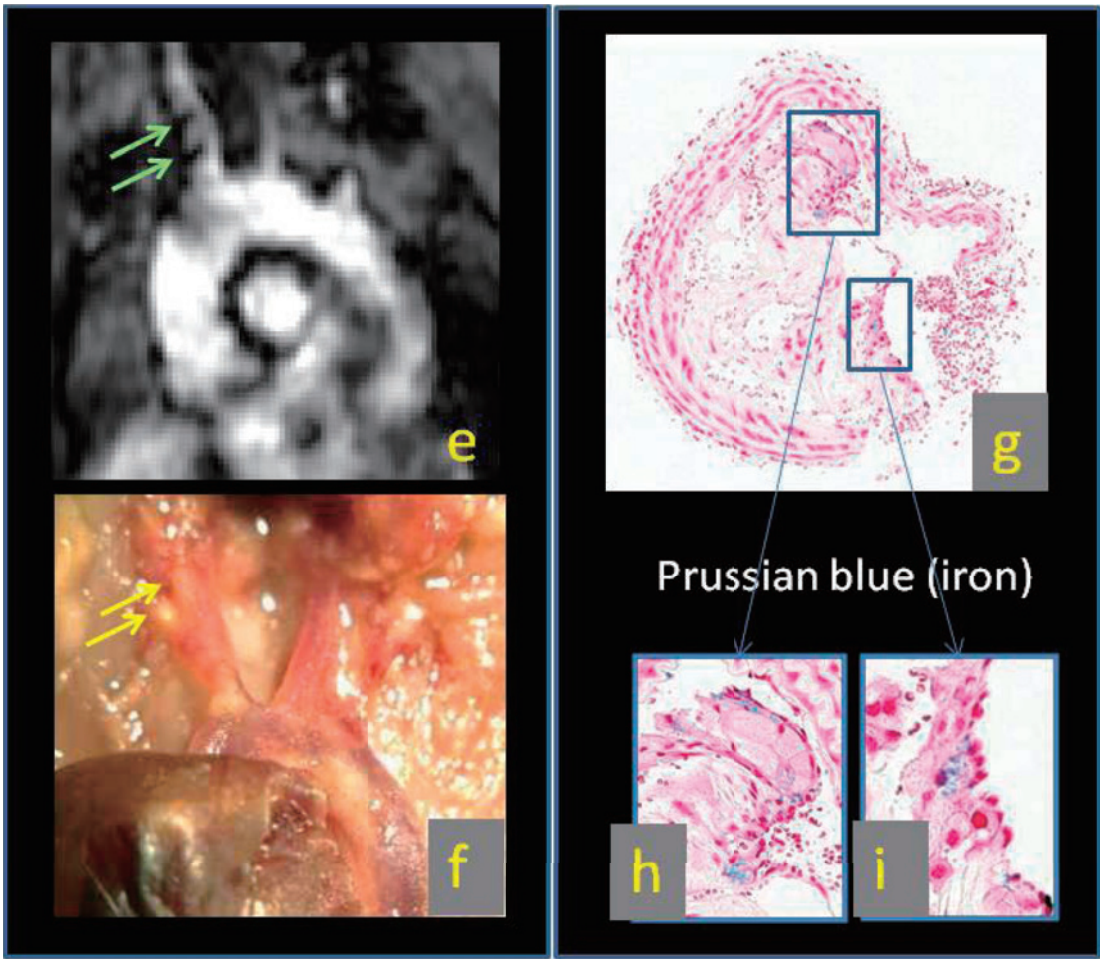

Fig. 2

Fig. 1 Two-dimensional cardiac-triggered time-of-flight MR angiography of the aortic arch in (a) C57BL/6J mouse injected with USPIO (USPIO+), (b) C57BL/6J mouse as control (USPIO−), (c) ApoE KO injected with USPIO, (d) ApoE KO as control. USPIO (15 mg Fe/mL) was injected through the tail vein on 2 consecutive days (0.1 mL/day). Two days after the second injection, MRI scans were performed. The arrows in (c) indicate the atherosclerotic lesions.

Fig. 2 Enlargement (e) of **Fig. 1**-(c) and corresponding macroanatomy (f) of the heart and aorta harvested from the same mouse after the MRI scan. The locations of the signal voids **(green arrows)** in (e) are consistent with lipid deposition **(yellow arrows)** in (f). Histopathologic examination showed lipid accumulation in the arterial intima (g), and Prussian blue stain indicated the presence of iron particles in the lesions (h) (i).

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