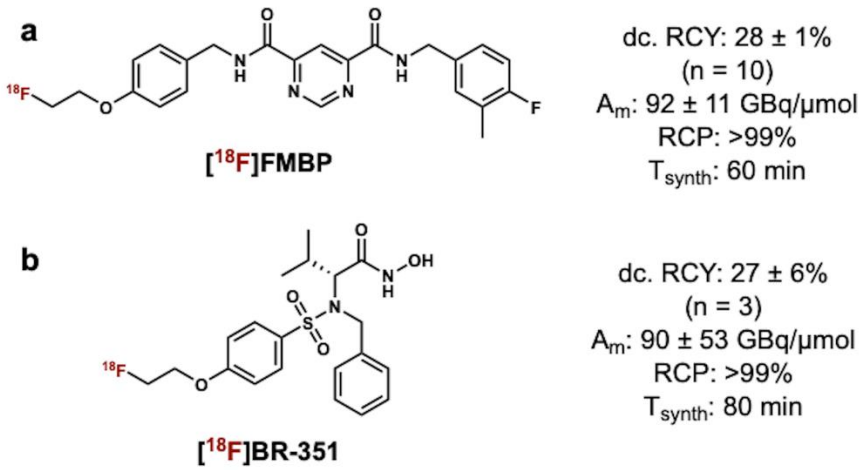

Figure 1. Structure of target radiotracers. **(a)** [^{18}F]FMBP **(b)** [^{18}F]BR-351.

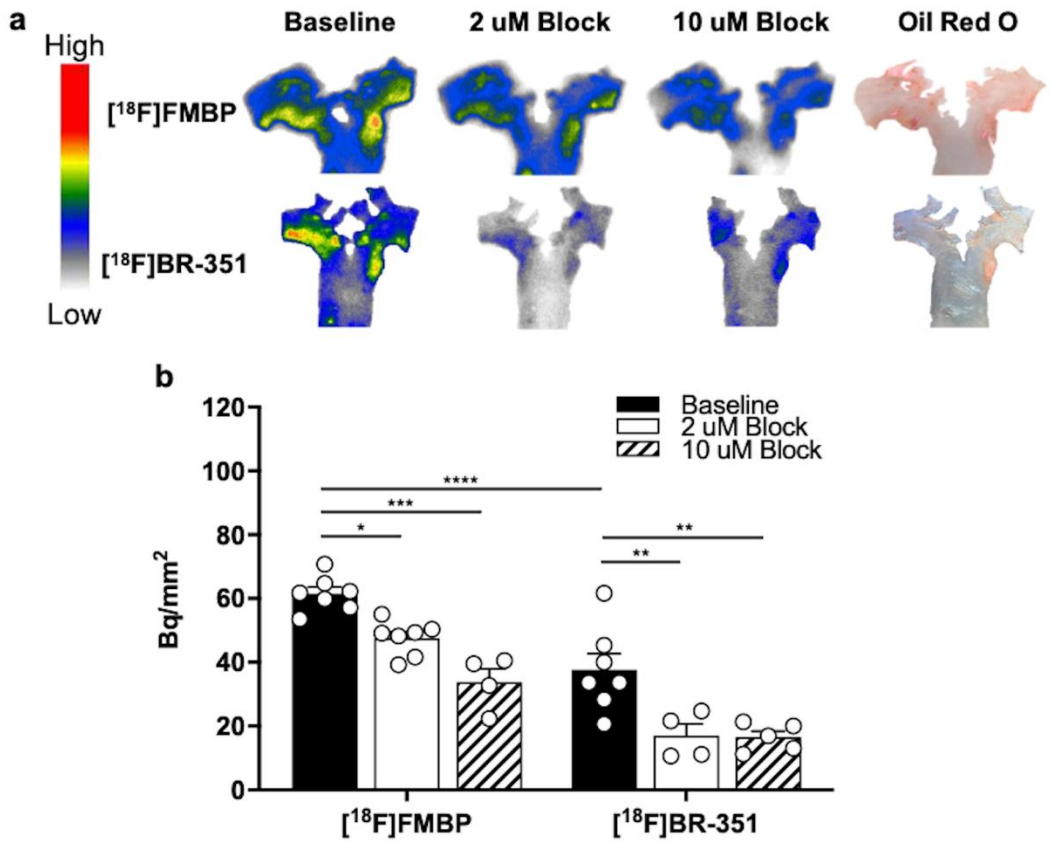

Figure 2. *In vitro* target specificity and co-localization with lipid content in atherosclerotic aortae. **(a)** Representative *ApoE*$^{-/-}$ aortic *en face in vitro* autoradiographs 1 h after incubation with 45 kBq [^{18}F]FMBP or [^{18}F]BR-351. Homologous blocking was performed by co-incubation of 2 µM and 10 µM non-radioactive FMBP or BR-351. Corresponding bright-field images of ORO stains are shown. Note the slight fold in the [^{18}F]BR-351 aorta under 10 µM blocking conditions. **(b)** [^{18}F]FMBP and [^{18}F]BR-351 aortic lesion uptake. Two-way ANOVA: ****$P < 0.0001$, ***$P = 0.0001$, **$P < 0.0046$, * $P = 0.0363$, $n = 4$–7 per group.

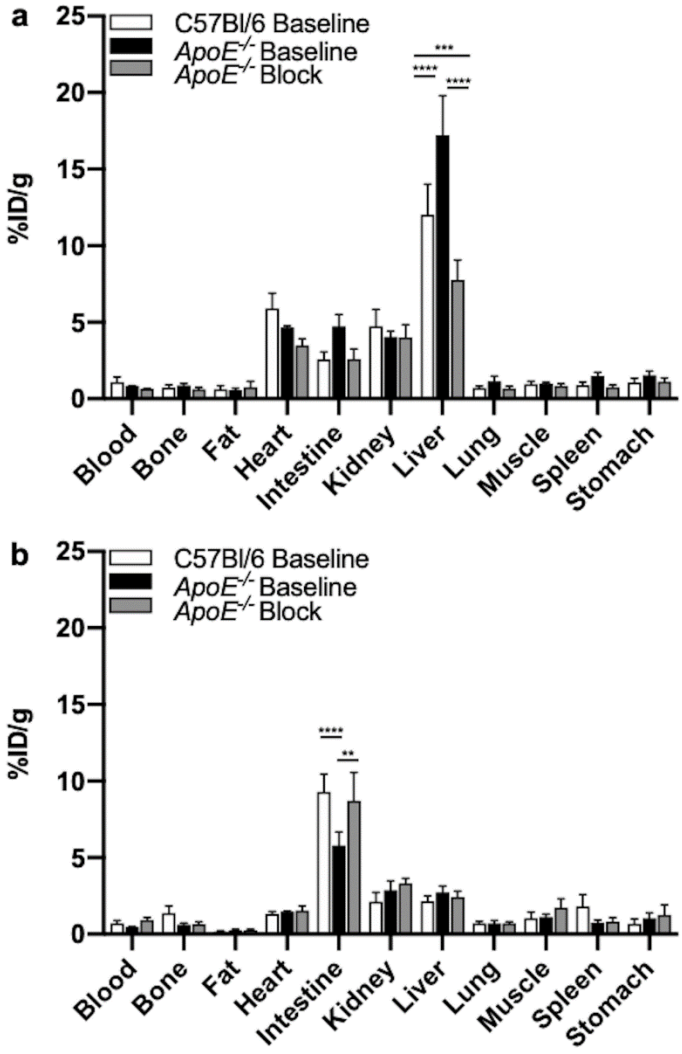

Figure 3. *Ex vivo* biodistributions 30 min after intravenous radiotracer administration (15 MBq) via the lateral tail vein. **(a)** [^{18}F]FMBP. Two-way ANOVA: ****$P < 0.0001$, ***$P = 0.0007$. **(b)** [^{18}F]BR-351.Two-way ANOVA: ****$P < 0.0001$, **$P = 0.0011$, n = 6-7 per group (n = 2-3 for blood, heart, and muscle).

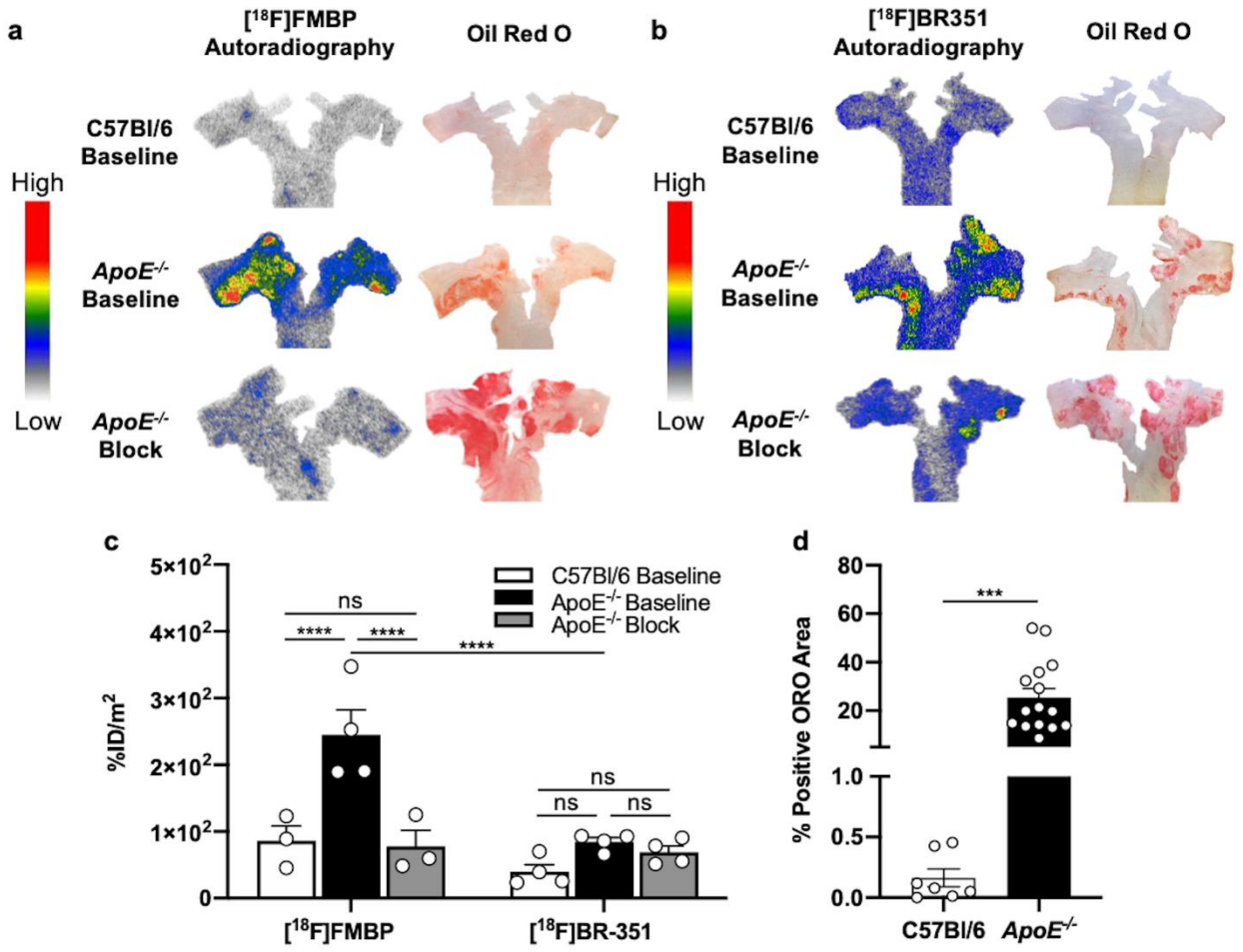

Figure 4. *Ex vivo* autoradiographic lesion uptake, specific binding, sensitivity to atherosclerotic tissue, and extent of lipid accumulation. **(a/b)** Representative aortic *en face ex vivo* autoradiographs 30 min after intravenous injection of 15 MBq [^{18}F]FMBP or [^{18}F]BR-351 in C57Bl/6 and *ApoE*$^{-/-}$ mice via the lateral tail vein. Blocking was performed with non-radioactive FMBP or BR-351 (5 mg/kg, IP, maximum FMBP solubility) 30 minutes prior to tracer administration. Corresponding bright-field images of ORO stains are shown. **(c)** [^{18}F]FMBP and [^{18}F]BR-351 aortic lesion uptake. Two-way ANOVA: ****P <0.0001, ns = not significant, n = 3–4 per group. **(d)** Quantification of percentage positive ORO areas in C57Bl/6 and *ApoE*$^{-/-}$ (baseline + block) mice. Unpaired t-test: ***P = 0.0002, n = 7-15 per radiotracer.

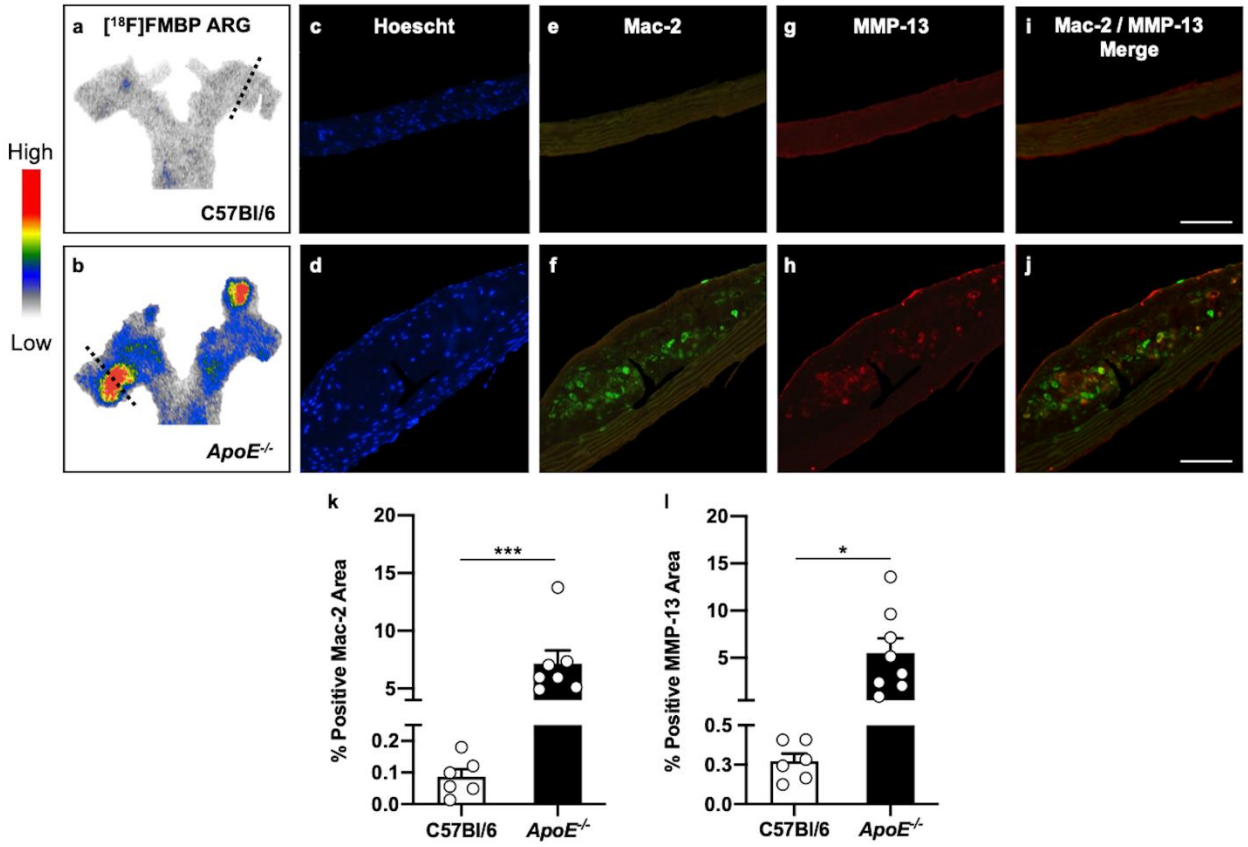

Figure 5. Immunofluorescent staining of atherosclerotic lesions detected by [^{18}F]FMBP *ex vivo* autoradiography. **(a/b)** Selected [^{18}F]FMBP *ex vivo* autoradiographs in C57Bl/6 and *ApoE*$^{-/-}$ mice. Corresponding composite images of cross-sections following immunofluorescent staining for **(c/d)** Hoescht, **(e/f)** Mac-2, and **(g/h)** MMP-13. **(i/j)** Mac-2 and MMP-13 merge. Scale bar = 100 µm. **(k/l)** Quantification of percentage positive Mac-2 and MMP-13 areas in *ApoE*$^{-/-}$ and C57Bl/6 mice. Unpaired t-test: ***P = 0.0001, *P = 0.0127, n = 6–8 per group.