Tumour-associated macrophages (TAMs) are associated with tumour growth and metastatic spread. Breast cancer tumours can be comprised of up to 50% TAMs and their presence is correlated with a poor outcome. Cell tracking with MRI can be used to image TAMs. Previous studies have shown that iron oxide particles (USPIO) administered intravenously (IV) are preferentially taken up by TAMs and that signal loss on MR images corresponds to TAMs identified by histopathology. Fluorine-19 (\textsuperscript{19}F) MRI is another method being developed to track and quantify cells in vivo. \textsuperscript{19}F has some major advantages, with the ability to image perfluorocarbon (PFC)-labeled cells with high specificity due to the lack of endogenous fluorine in biological tissues. Most importantly, \textsuperscript{19}F MRI is quantitative, since the signal intensity is linearly related to the number of \textsuperscript{19}F atoms. We have determined previously that \textsuperscript{19}F-based MRI is a more accurate means to determine TAM content, due to lack of blooming artifact as observed with iron-based imaging. Because of this, \textsuperscript{19}F-based MRI was employed in this study to detect differences in TAM infiltration between three models of breast cancer. Isogenic murine breast cancer cells (1) 4T1, (2) 168FARN and (3) 67NR were injected orthotopically into the inguinal mammary fat pad in female BALB/c mice. These cell lines represent models that closely mimic human, end-stage breast cancer with differing metastatic potentials (high, low and no metastatic potential, respectively). All imaging was performed at 3 weeks post cancer cell implantation on a 9.4T (Tesla) small animal scanner with a custom built dual \textsuperscript{1}H/\textsuperscript{19}F birdcage coil. Images were acquired 24-48 hours post IV injection of a PFC imaging agent. All images were acquired using a balanced steady state free precession (bSSFP) pulse sequence. A \textsuperscript{1}H/\textsuperscript{19}F overlay was composed for anatomical reference. The 4T1 tumours were significantly larger ($p<.01$) than the 168FARN/67NR tumours at end point. Lung metastases were visualized in the 4T1 group and no metastases were detectable in the 168FARN or 67NR groups with \textsuperscript{1}H MRI. \textsuperscript{19}F signal was detected in all three tumour types. A significant difference ($p<.05$) in \textsuperscript{19}F atom content was found between the 4T1 and the 168FARN/67NR tumours.