

## Supplementary Figure Legends

**Figure S1: Identification of the mouse anatomy from US images.** The lymph nodes (labeled as LN) are seen as hypoechoic bean-shaped regions in the US image. In the imaging plane other anatomical features, such as the trachea (labeled in red) can be also identified. Scale bar is 1 mm.

**Figure S2: MAPS allow differentiation of delivery and molecular interactions.** (a) Overlaid ultrasound and photoacoustic images showing silica-coated nanoplates drain throughout the normal lymph node (dashed cyan outline) (32). Note that in this case the strong signal is associated only with drainage of the nanoparticles. (b) In contrast, the signal from MAPS is constrained to only the location where a molecule of interest is expressed - in this case, a micrometastasis in the right lymph node that was confirmed by both the bioluminescence signal and the immunohistochemistry. Scale bar is 1 mm.