Supplemental Figure Legends

**Supplemental Figure S1.** Imaging and ROI analysis of *ex vivo* tumor and normal tissues. Pseudocolored heat maps of Odyssey images (top), photographs (bottom left,) and H&E (bottom right) are shown for each representative dog. ROIs were chosen within gross tumor (black) and gross normal (yellow) tissue samples. Arrow marks the imaging region on Patient 7. Patient tumor type and TBR information is shown in Table 1.

**Supplemental Figure S2**. ROI analysis of *ex vivo* and *in situ* tumor and normal tissues. Odyssey images are shown as heat maps, with color bars at right of each panel showing quantitation of fluorescence intensity. ROIs were chosen within gross tumor (black) and gross normal (yellow) tissue samples. Where more than one tissue type was represented in the normal tissue sample, the ROI was chosen to best represent the environment of the tumor; therefore in patient 23 (dermal squamous cell carcinoma) the comparator ROI includes skin, while in patients 22 and 26 (cancers embedded in fatty tissue) the comparator ROI includes fat. The skin in cases such as these would be either excised as part of *en bloc* resection or drawn back from the surgical field. The *in situ* NIR images are shown as raw monochrome images, captured using 40 msec integration time. The tumor ROIs are shown in red, and the normal tissue ROIs are shown in yellow. In cases where tumors were removed *en bloc*, imaging was done after tumor removal and sectioning of the mass. Areas of gross tumor were avoided to ensure the normal ROIs represented uninvolved tissue; however these were drawn as close as practical to the tumor in order to assess contrast that is useful to the surgeon during resection. As with the *ex vivo* imaging, the tissue in which the tumor was embedded was chosen for the ROI.