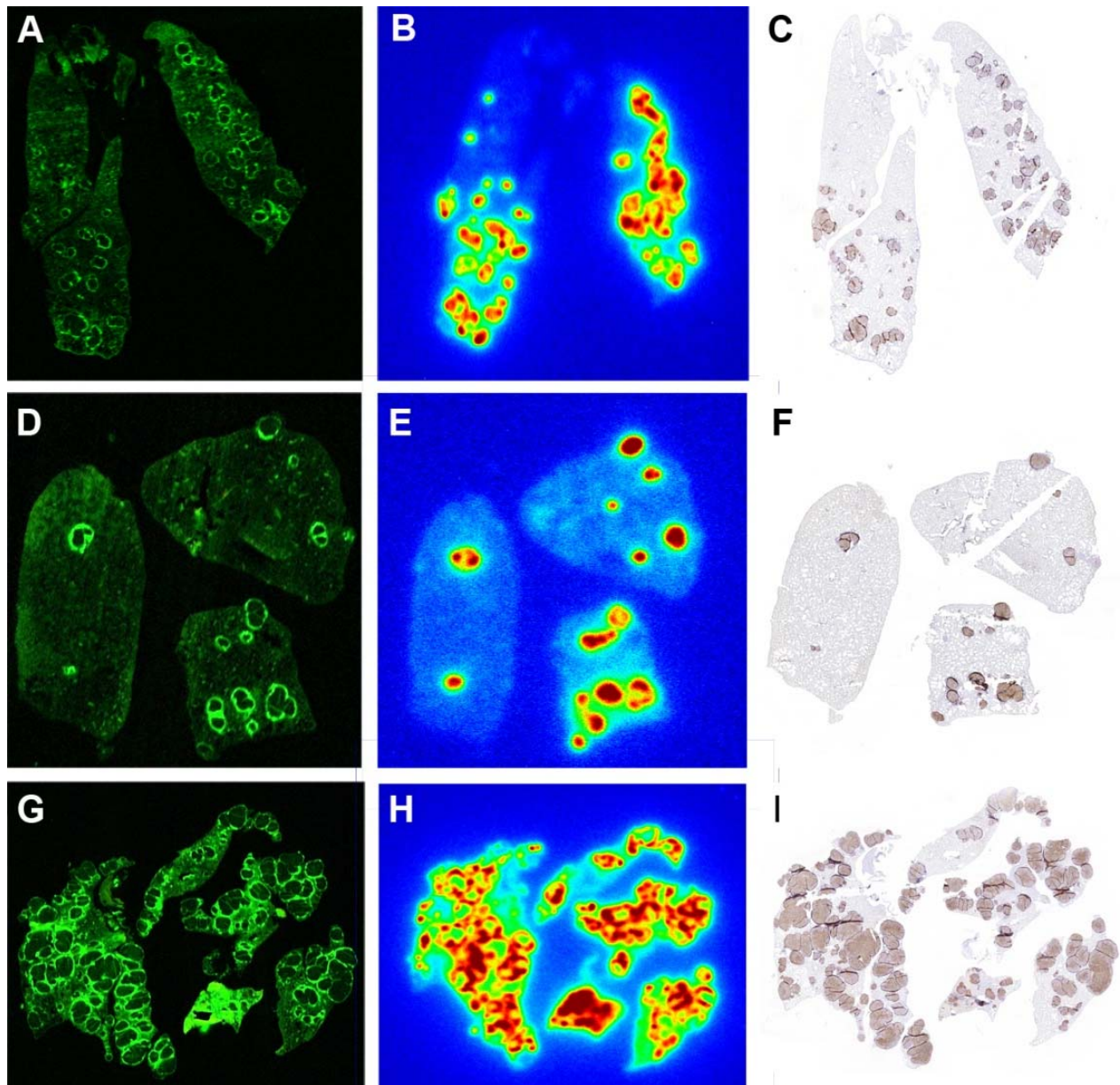
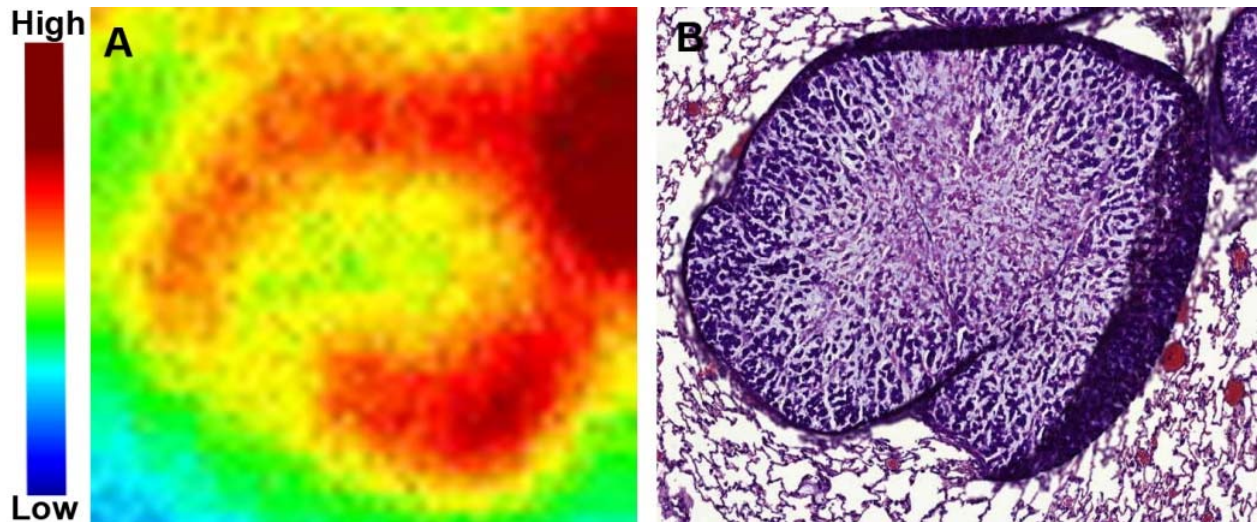


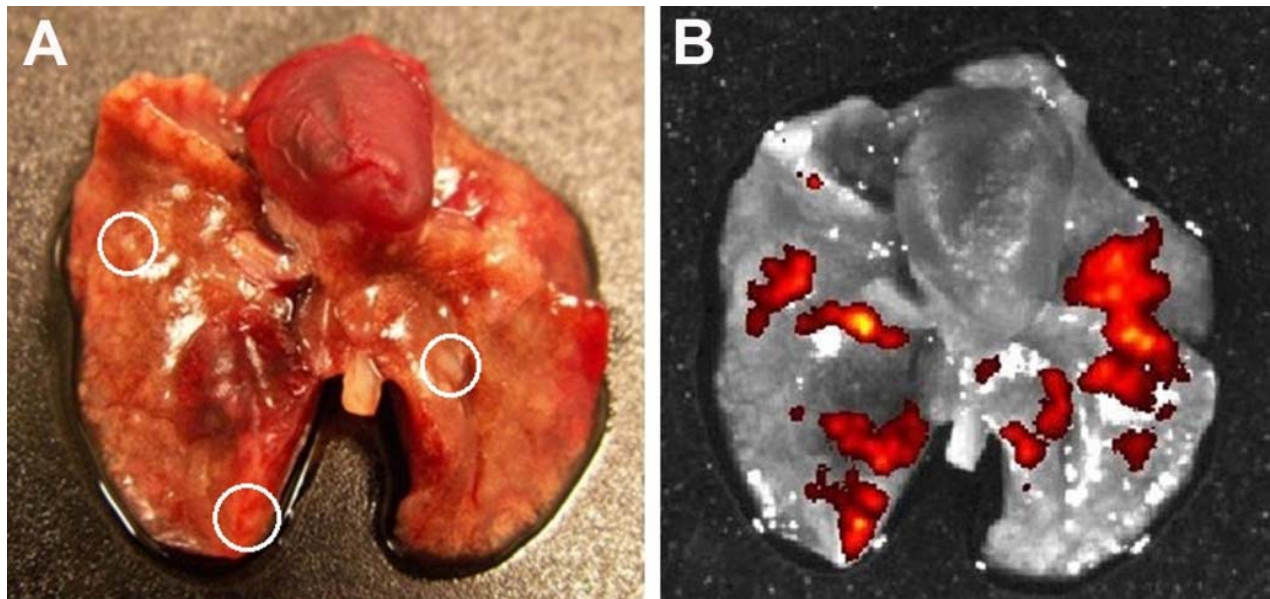
Supplemental Figure 1: Overview of dual-modality imaging (upper row, microSPECT/CT; lower row, Odyssey fluorescence imaging of resected lungs) in mice after 2 (A, D), 3 (B, E), and 4 (C, F) weeks of tumor growth.



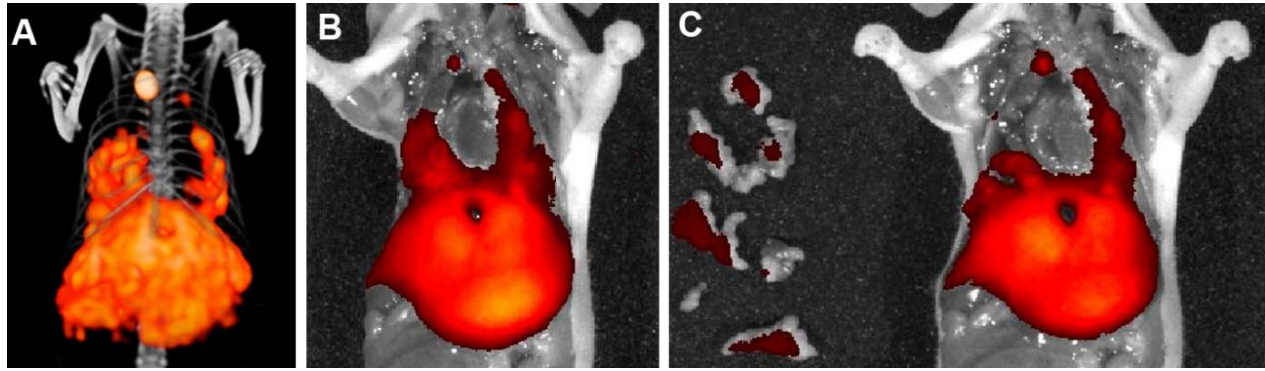
Supplemental Figure 2: Representative examples of sets (fluorescence imaging, autoradiography, and CEA staining) of adjacent slices of pulmonary metastases from mice from week 2 (A-C), week 3 (D-F), and week 4 (G-I). Fluorescence imaging with a flatbed fluorescence scanner and autoradiography of 5- μ m sections of lung tissue show the colocalization of dual-labeled labetuzumab in CEA-expressing tumor lesions. During the experiment, the tumors showed increasing central necrosis, and therefore uptake of dual-labeled labetuzumab was mainly in the periphery of the tumor lesions (Supplemental Fig. 3).



Supplemental Figure 3: Autoradiography shows mainly uptake of dual-labeled labetuzumab in the periphery of the tumor lesion (A). Extensive central necrosis is seen after 3 weeks of tumor growth on the corresponding H&E-stained slide (B).



Supplemental Figure 4: *Ex vivo* example of the resected lungs and heart after 2 weeks of tumor growth. Pulmonary tumor lesions are now visible with the naked eye (white circles); however, CEA-targeted fluorescence imaging reveals multiple additional superficial pulmonary tumor lesions (histologically confirmed).



Supplemental Figure 5: Image-guided surgery after 4 weeks of tumor growth: microSPECT/CT (A), fluorescence imaging (B), and fluorescence imaging after partial resection of tumor nodules (C). Because of the high tumor density, a complete resection of all tumor nodules was not possible in this case.

Supplemental Table 1: Biodistribution of ^{111}In -labetuzumab-IRDye800CW

	Week 1	Week 2	Week 3	Week 4
Blood	16.5 (2.8)	12.1 (3.4)	9.3 (1.8)	7.7 (1.3)
Muscle	1.3 (0.1)	0.9 (0.3)	0.7 (0.1)	0.6 (0.3)
Heart	6.8 (2.0)	6.3 (2.4)	4.8 (0.8)	3.2 (1.5)
Spleen	14.6 (3.5)	9.4 (3.0)	9.0 (2.6)	7.6 (3.8)
Pancreas	2.3 (0.4)	1.9 (0.6)	1.5 (0.3)	1.1 (0.5)
Kidney	6.7 (1.0)	5.5 (1.0)	4.2 (0.9)	3.7 (1.7)
Liver	10.0 (2.0)	9.6 (2.6)	9.6 (2.7)	10.5 (5.1)
Stomach	2.5 (0.3)	1.8 (0.4)	1.5 (0.3)	1.2 (0.6)
Duodenum	5.3 (1.1)	3.9 (1.3)	3.5 (0.9)	2.8 (1.3)
Tumor	N.A.	N.A.	17.2 (5.4)	16.5 (4.4)
Values are expressed as mean (\pm SD) %ID/g. Tumor uptake could not be reliably quantified after 1 and 2 weeks of tumor growth.				