

# Supplementary Materials: Comparative Radioimmunotherapy of Experimental Melanoma with Novel Humanized Antibody to Melanin Labeled with <sup>213</sup>Bismuth and <sup>177</sup>Lutetium

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**Table S1.** Statistical comparison of antibody uptake between mouse and humanized 8C3 antibody.

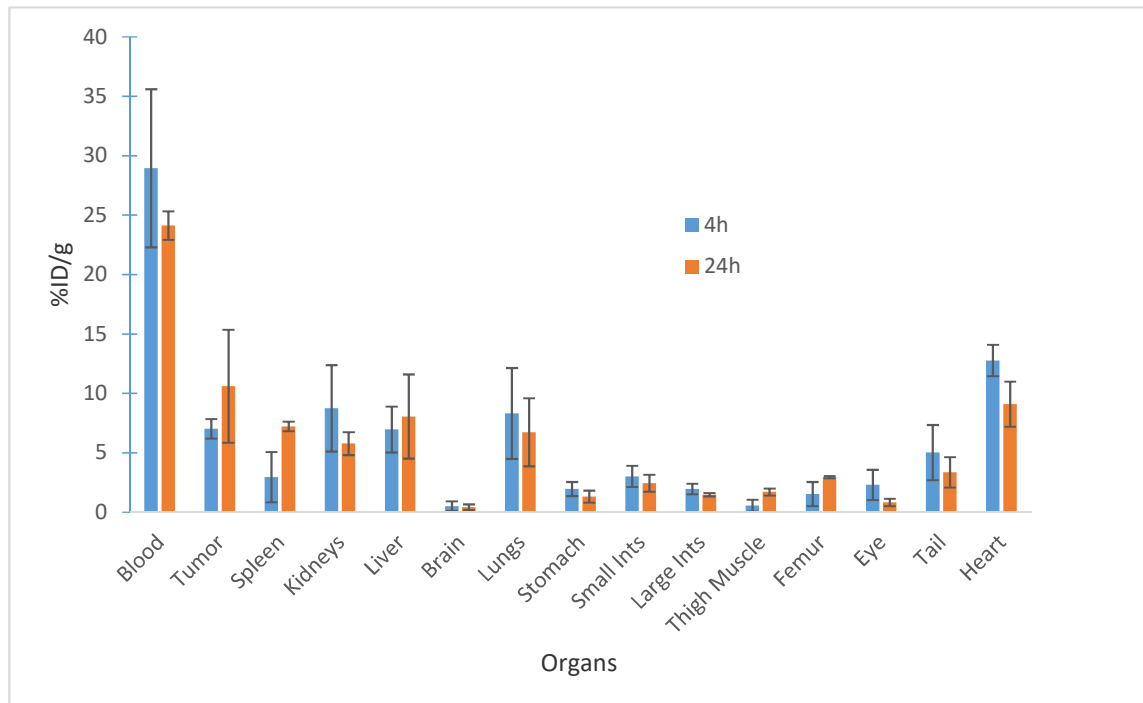
Organ	Mouse Ab %ID/g	Human Ab %ID/G	p value	stat
Blood	31.3933519	24.118107	0.0391	*
Tumor	15.193809	10.6030806	0.4419	ns
Spleen	9.51605417	7.21729285	0.2564	ns
Kidneys	7.67318241	5.77245188	0.2271	ns
Liver	10.1497756	8.05200569	0.3093	ns
Brain	0.44544925	0.42564811	0.9893	ns
Lungs	11.4052144	6.72586198	0.1085	ns
Stomach	1.82375371	1.31886843	0.1609	ns
Small Ints	3.26209637	2.43430403	0.0129	*
Large Ints	2.10842766	1.47324529	0.1331	ns
Thigh Muscle	1.92528808	1.70014015	0.4481	ns
Femur	3.14234705	2.95363782	0.8756	ns
Eye	1.06341217	0.81492002	0.3639	ns
Tail	4.24436179	3.34845973	0.8023	ns
Heart	9.49981318	9.08266293	0.7636	ns

**Table S2.** Absorbed doses in cGy/37 MBq to the normal organs and melanoma tumors in an adult man delivered by <sup>213</sup>Bi and its daughters.

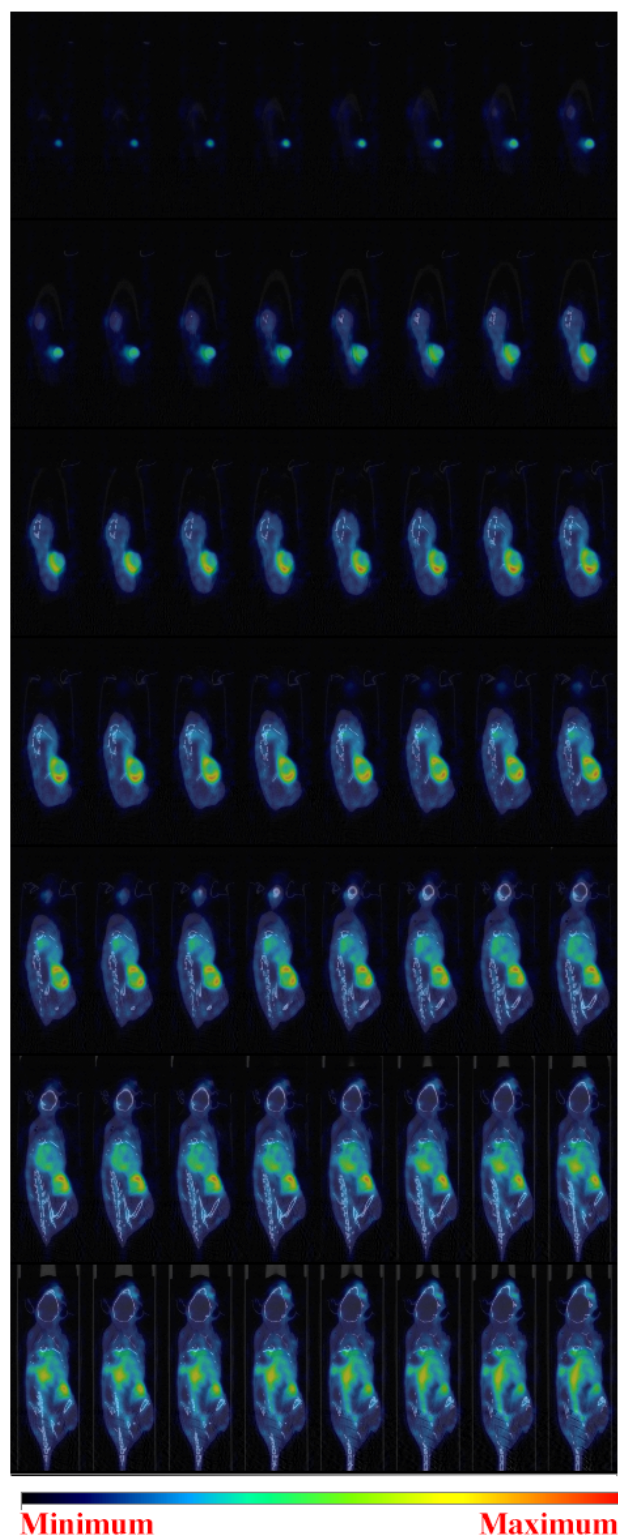
Target Organ	Alpha	Beta	Photon	Total	(Numeric)
Adrenals	$7.19 \times 10^{-2}$	$1.34 \times 10^{-2}$	$1.77 \times 10^{-3}$	$8.70 \times 10^{-2}$	0.087
Brain	$2.08 \times 10^{-3}$	$3.87 \times 10^{-4}$	$6.90 \times 10^{-4}$	$3.15 \times 10^{-3}$	0.00315
Breasts	$7.19 \times 10^{-2}$	$1.34 \times 10^{-2}$	$1.27 \times 10^{-3}$	$8.65 \times 10^{-2}$	0.0865
Gallbladder Wall	$7.19 \times 10^{-2}$	$1.34 \times 10^{-2}$	$1.97 \times 10^{-3}$	$8.72 \times 10^{-2}$	0.0872
Lower Large Intestine Wall	$7.19 \times 10^{-2}$	$1.34 \times 10^{-2}$	$2.16 \times 10^{-3}$	$8.74 \times 10^{-2}$	0.0874
Small Intestine	$7.19 \times 10^{-2}$	$1.34 \times 10^{-2}$	$2.40 \times 10^{-3}$	$8.76 \times 10^{-2}$	0.0876
Stomach Wall	$7.19 \times 10^{-2}$	$1.34 \times 10^{-2}$	$1.93 \times 10^{-3}$	$8.72 \times 10^{-2}$	0.0872
Upper Large Intestine Wall	$7.19 \times 10^{-2}$	$1.34 \times 10^{-2}$	$2.29 \times 10^{-3}$	$8.75 \times 10^{-2}$	0.0875
Heart Wall	$4.35 \times 10^{-2}$	$8.09 \times 10^{-2}$	$1.57 \times 10^{-3}$	$6.74 \times 10^{-2}$	0.00674
Kidneys	$1.88 \times 10^{-2}$	$3.46 \times 10^{-3}$	$1.41 \times 10^{-3}$	$2.36 \times 10^{-2}$	0.0236
Liver	$4.67 \times 10^{-2}$	$8.68 \times 10^{-3}$	$1.40 \times 10^{-3}$	$5.68 \times 10^{-2}$	0.0568
Lungs	$5.09 \times 10^{-3}$	$9.47 \times 10^{-4}$	$1.22 \times 10^{-3}$	$7.26 \times 10^{-3}$	0.00726
Muscle	$2.16 \times 10^{-3}$	$4.02 \times 10^{-4}$	$1.38 \times 10^{-3}$	$3.94 \times 10^{-3}$	0.00394
Ovaries	$7.19 \times 10^{-2}$	$1.34 \times 10^{-2}$	$2.22 \times 10^{-3}$	$8.75 \times 10^{-2}$	0.0875
Pancreas	$1.08 \times 10^{-4}$	$1.99 \times 10^{-5}$	$1.63 \times 10^{-3}$	$1.76 \times 10^{-3}$	0.00176
Red Marrow	$1.04 \times 10^{-1}$	$9.44 \times 10^{-3}$	$1.72 \times 10^{-3}$	$1.15 \times 10^{-1}$	0.115
Osteogenic Cells	$8.05 \times 10^{-1}$	$2.31 \times 10^{-2}$	$2.10 \times 10^{-3}$	$8.30 \times 10^{-1}$	0.830
Skin	$7.19 \times 10^{-2}$	$1.34 \times 10^{-2}$	$9.55 \times 10^{-4}$	$8.62 \times 10^{-2}$	0.0862
Spleen	$1.39 \times 10^{-3}$	$2.57 \times 10^{-4}$	$1.27 \times 10^{-3}$	$2.91 \times 10^{-3}$	0.00291
Testes	$7.19 \times 10^{-2}$	$1.34 \times 10^{-2}$	$1.53 \times 10^{-3}$	$8.68 \times 10^{-2}$	0.0868
Thymus	$7.19 \times 10^{-2}$	$1.34 \times 10^{-2}$	$1.55 \times 10^{-3}$	$8.68 \times 10^{-2}$	0.0868
Thyroid	$7.19 \times 10^{-2}$	$1.3 \times 10^{-2}$	$1.55 \times 10^{-3}$	$8.68 \times 10^{-2}$	0.0868
Urinary Bladder Wall	$7.19 \times 10^{-2}$	$1.34 \times 10^{-2}$	$2.05 \times 10^{-3}$	$8.73 \times 10^{-2}$	0.0873
Uterus	$7.19 \times 10^{-2}$	$1.34 \times 10^{-2}$	$2.30 \times 10^{-3}$	$8.75 \times 10^{-2}$	0.0875
Total Body	$7.41 \times 10^{-2}$	$1.38 \times 10^{-2}$	$1.42 \times 10^{-3}$	$8.93 \times 10^{-2}$	0.0893
Centigray-equivalent dose per 37 MBq administered, alpha multiplier = 5					
Tumor	$2.93 \times 10^{-1}$	$3.02 \times 10^{-3}$	$1.32 \times 10^{-3}$	$2.98 \times 10^{-1}$	0.298

**Table S3.** Absorbed doses in cGy/37 MBq to the normal organs and melanoma tumors in an adult man delivered by  $^{177}\text{Lu}$ .

Target Organ	Beta	Photon	Total	(Numeric)
Adrenals	$2.21 \times 10^{-1}$	$2.69 \times 10^{-2}$	$2.48 \times 10^{-1}$	0.248
Brain	$1.17 \times 10^{-2}$	$1.13 \times 10^{-2}$	$2.29 \times 10^{-2}$	0.023
Breasts	$2.21 \times 10^{-1}$	$1.65 \times 10^{-2}$	$2.38 \times 10^{-1}$	0.238
Gallbladder Wall	$2.21 \times 10^{-1}$	$2.86 \times 10^{-2}$	$2.50 \times 10^{-1}$	0.250
Lower Large Intestine Wall	$2.21 \times 10^{-1}$	$3.17 \times 10^{-2}$	$2.53 \times 10^{-1}$	0.253
Small Intestine	$2.21 \times 10^{-1}$	$3.51 \times 10^{-2}$	$2.56 \times 10^{-1}$	0.256
Stomach Wall	$2.21 \times 10^{-1}$	$2.71 \times 10^{-2}$	$2.48 \times 10^{-1}$	0.248
Upper Large Intestine Wall	$2.21 \times 10^{-1}$	$3.32 \times 10^{-2}$	$2.54 \times 10^{-1}$	0.254
Heart Wall	$1.33 \times 10^{-2}$	$2.32 \times 10^{-2}$	$3.65 \times 10^{-2}$	0.037
Kidneys	$6.90 \times 10^{-2}$	$2.10 \times 10^{-2}$	$9.00 \times 10^{-2}$	0.090
Liver	$1.49 \times 10^{-1}$	$2.05 \times 10^{-2}$	$1.69 \times 10^{-1}$	0.169
Lungs	$1.18 \times 10^{-2}$	$1.84 \times 10^{-2}$	$3.02 \times 10^{-2}$	0.0302
Muscle	$1.58 \times 10^{-2}$	$1.93 \times 10^{-2}$	$3.51 \times 10^{-2}$	0.0351
Ovaries	$2.21 \times 10^{-1}$	$3.32 \times 10^{-2}$	$2.54 \times 10^{-1}$	0.254
Pancreas	$1.09 \times 10^{-3}$	$2.48 \times 10^{-2}$	$2.59 \times 10^{-2}$	0.0259
Red Marrow	$1.64 \times 10^{-1}$	$2.38 \times 10^{-2}$	$1.88 \times 10^{-1}$	0.188
Osteogenic Cells	$7.12 \times 10^{-1}$	$4.43 \times 10^{-2}$	$7.56 \times 10^{-1}$	0.756
Skin	$2.21 \times 10^{-1}$	$1.25 \times 10^{-2}$	$2.34 \times 10^{-1}$	0.234
Spleen	$7.90 \times 10^{-3}$	$1.89 \times 10^{-2}$	$2.68 \times 10^{-2}$	0.0268
Testes	$2.21 \times 10^{-1}$	$2.11 \times 10^{-2}$	$2.42 \times 10^{-1}$	0.242
Thymus	$2.21 \times 10^{-1}$	$2.26 \times 10^{-2}$	$2.44 \times 10^{-1}$	0.244
Thyroid	$2.21 \times 10^{-1}$	$2.30 \times 10^{-2}$	$2.44 \times 10^{-1}$	0.244
Urinary Bladder Wall	$2.21 \times 10^{-1}$	$2.92 \times 10^{-2}$	$2.50 \times 10^{-1}$	0.250
Uterus	$2.21 \times 10^{-1}$	$3.39 \times 10^{-2}$	$2.55 \times 10^{-1}$	0.255
Total Body	$2.32 \times 10^{-1}$	$2.16 \times 10^{-2}$	$2.53 \times 10^{-1}$	0.253
Tumor	$3.14 \times 10^{-1}$	$2.23 \times 10^{-2}$	$3.36 \times 10^{-1}$	0.336



**Figure S1.** Preliminary biodistribution of  $^{111}\text{In}$ -h8C3 in B16-F10 tumor-bearing mice.



**Figure S2.** microSPECT/CT Slice imaging of  $^{111}\text{In}$ -h8C3 in B16-F10 tumor-bearing mouse at 24 h post injection.