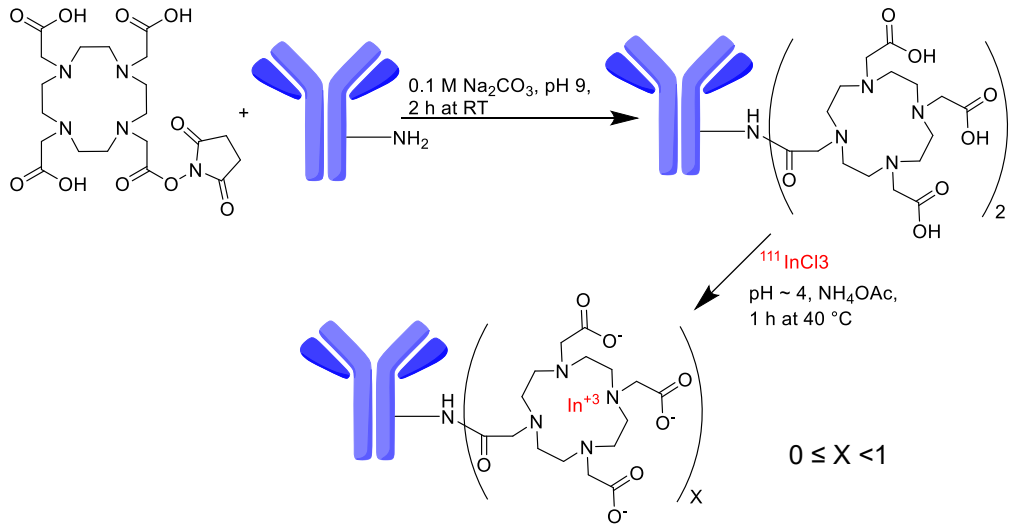
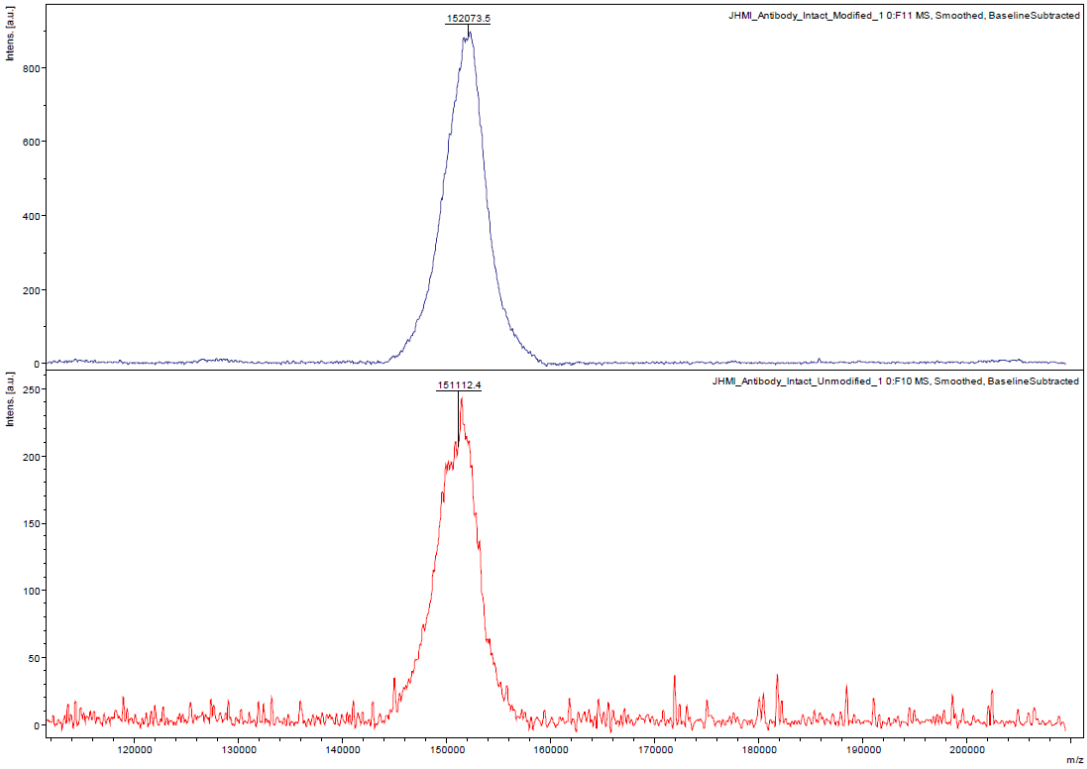
SUPPLEMENTAL DATA

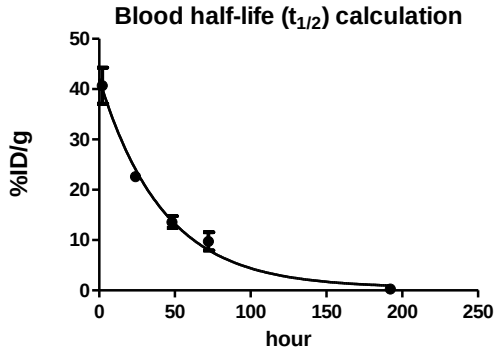
SUPPLEMENTAL FIGURE 1. Synthesis and radiolabeling of DOTA-5D3.



SUPPLEMENTAL FIGURE 2. MALDI-TOF spectra of DOTA-conjugated 5D3 (top) and unmodified 5D3 (bottom).

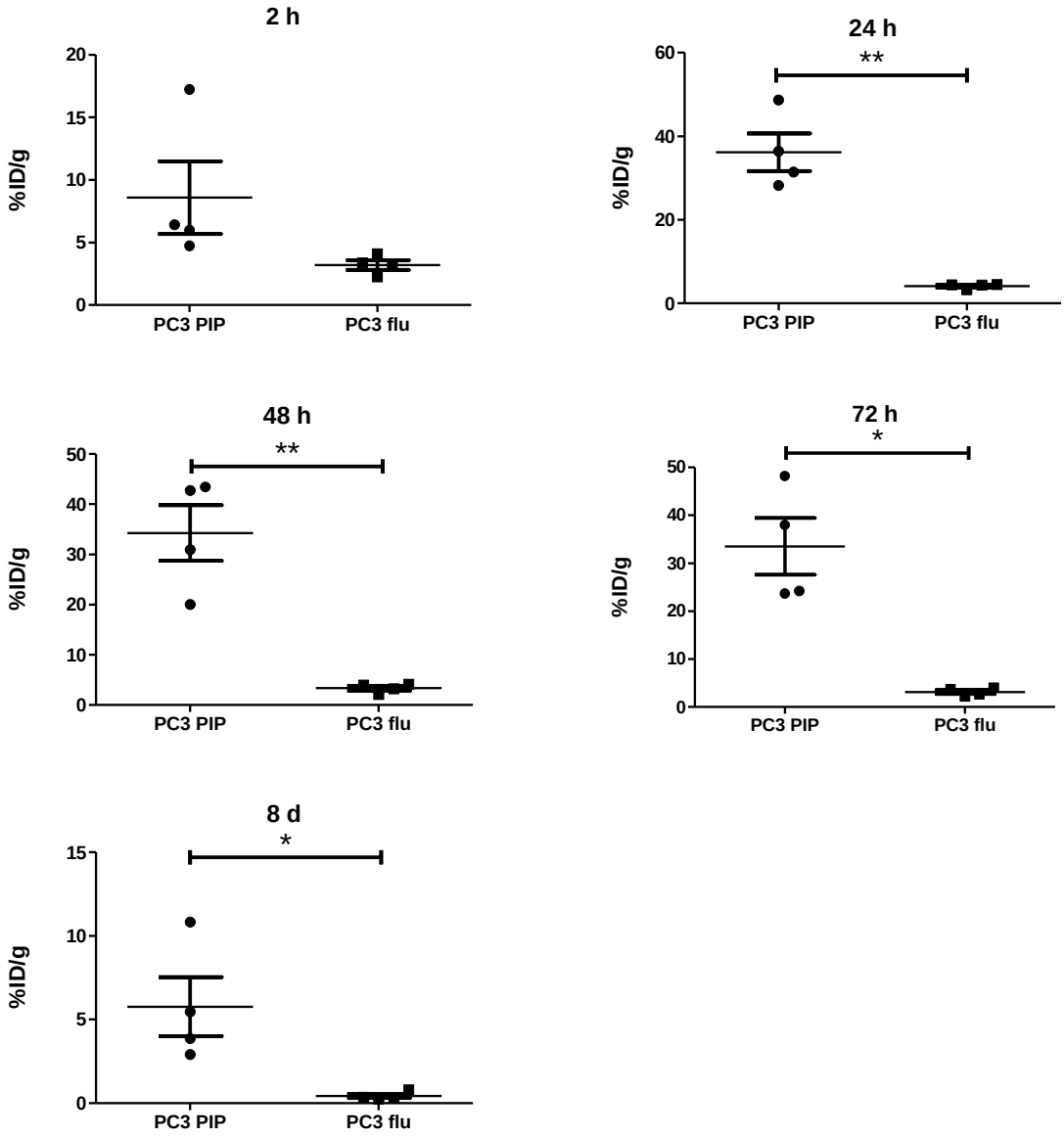


SUPPLEMENTAL FIGURE 3. Plot for blood half-life calculation of ^{111}In-DOTA-5D3 (n = 4 per time point), $t_{1/2}$ 29.21 h (assuming initial blood activity [Y_0] = 40.70 ± 7.16 %ID/g at 2 h; monoexponential time-activity curve from GraphPad Prism).

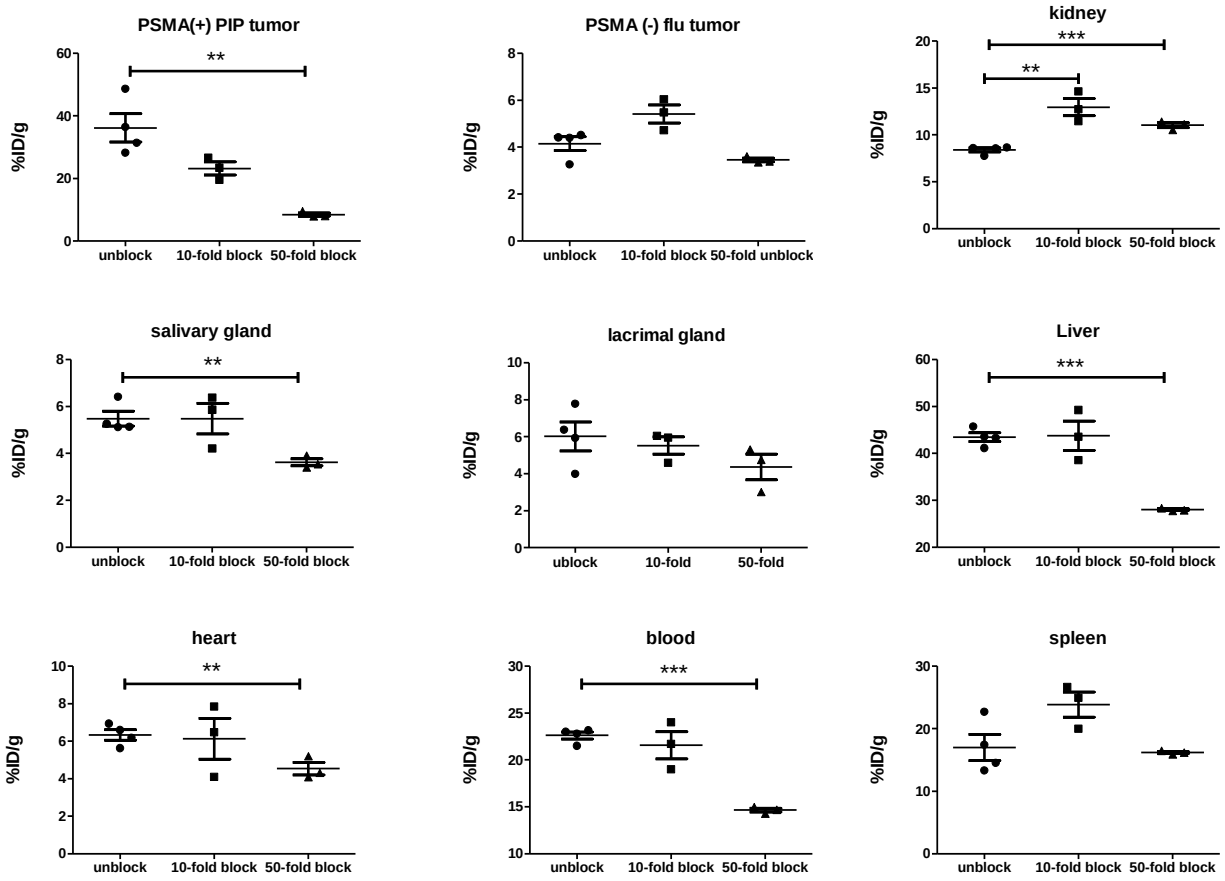


K is the rate constant, expressed in reciprocal of the X axis time units	0.02 to 0.03
Half Life ($t_{1/2}$) is in hour. It is computed as ln(2)/K	22.16 to 42.84
Tau is the time constant, expressed in the same units as the X axis. It is computed as the reciprocal of K	31.97 to 61.81
Goodness of Fit	
Degrees of Freedom	16
R^2	0.94

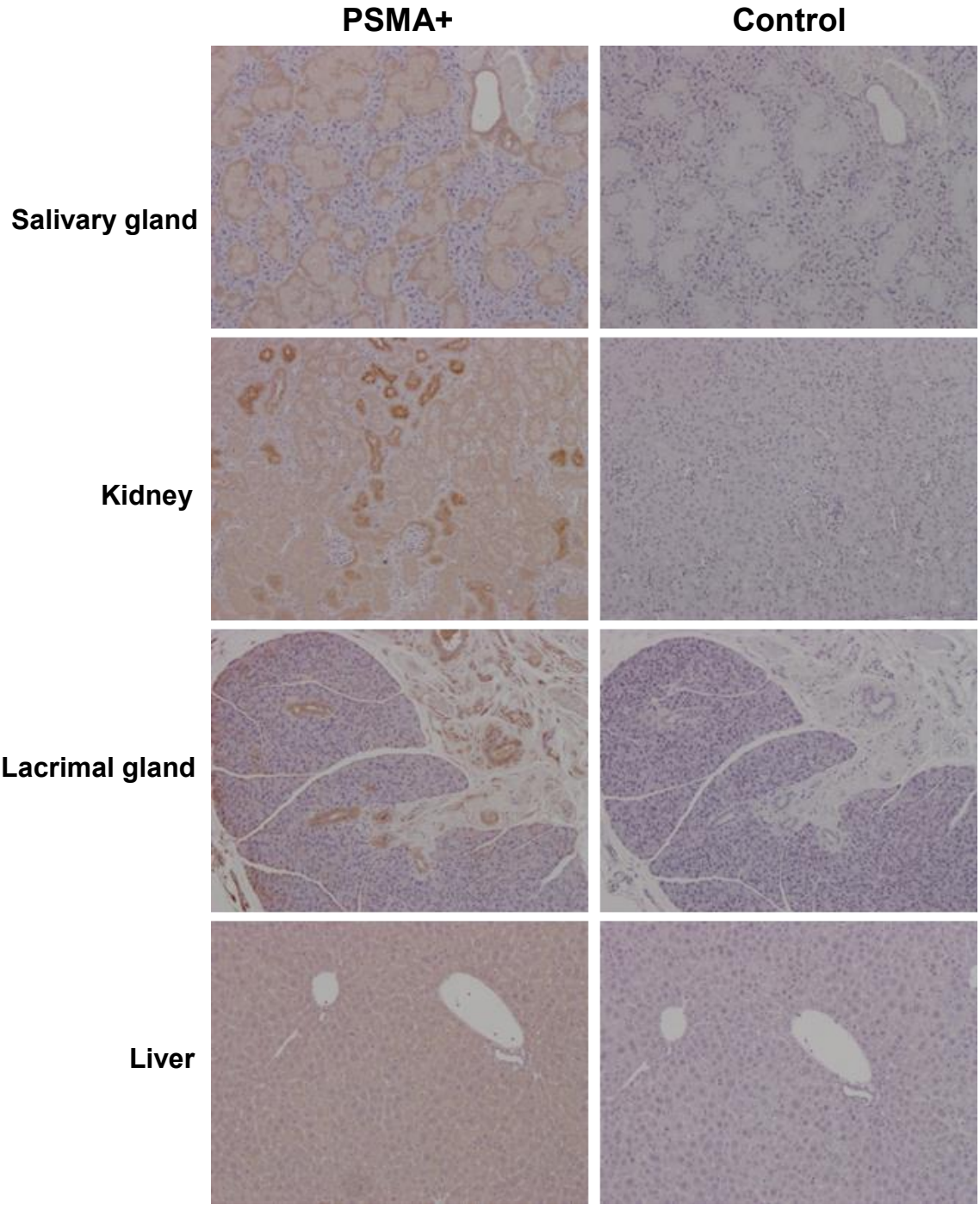
SUPPLEMENTAL FIGURE 4. %ID/g (Mean ± SEM) PSMA(+) PC3 PIP and PSMA(-) PC3 flu during 2 h- 8 d post-injection of ^{111}In-DOTA-5D3. One sample paired two-tailed t-test (Ref: Supplemental Table 2) (*, *P* <0.05; **, *P* <0.01).



SUPPLEMENTAL FIGURE 5. %ID/g (Mean ± SEM) of the selected organs without and with blockade (10-fold or 50-fold unlabeled mAb) at 24 h post-injection of ^{111}In-DOTA-5D3. Unpaired two-tailed t-test either between unblock to 10-fold block or unblock to 50-fold block (Ref: Table S3) (**, *P* <0.01; ***, *P* <0.001).



SUPPLEMENTAL FIGURE 6. IHC of PSMA expression of 10% formalin fixed tissue sections of kidney, salivary glands and lacrimal glands and liver using a murine antiPSMA-mAb at 20 x magnification obtained from the same tumor bearing model [PC3 PSMA(+) PIP and PSMA(-) PC3 flu] used for the biodistribution study. Negative control (Control): without antiPSMA-mAb staining.



SUPPLEMENTAL TABLES

SUPPLEMENTAL TABLE 1. Cell uptake and internalization data for PSMA(+) PC3 PIP and PSMA(-) PC3 flu cell line (% incubated dose per 0.5× 10^6 cells).

Time	PSMA(+) PC3 PIP	PSMA(-) PC3 flu	Cell lysate	Glycine wash
10 min	44.27 ± 1.99	0.13 ± 0.02	38.23 ± 1.65	6.37 ± 0.35
30 min	49.04 ±1.38	0.16 ±0.01	44.04 ±1.56	7.25 ±0.21
60 min	55.29 ± 1.65	0.24 ± 0.02	50.18 ± 2.72	4.02 ± 0.14
24 h	54.64 ± 1.12	0.93 ± 0.04	52.17 ± 1.17	5.52 ± 2.26

SUPPLEMENTAL TABLE 2. Cell uptake data for PSMA(+) LNCaP and PSMA(-) PC3 cell (% incubated dose per 0.5× 10^6 cells).

Time	LNCaP	PC3
30 min	14.65 ± 0.4	0.15 ± 0.01
60 min	23.37 ± 0.80	0.22 ±0.01
24 h	50.71 ± 0.65	0.35 ± 0.02

SUPPLEMENTAL TABLE 3. Tissue biodistribution of ^{111}In-DOTA-5D3 and PSMA(+) tumor-to-normal tissue ratios in male NOD-SCID mice bearing PSMA(+) PC3 PIP and PSMA(-) PC3 flu tumors in either flank. Data are shown as %ID/g, expressed as mean ± SEM.

Tissue	**2 h**	**24 h**	**48 h**	**72 h**	**8 d**
blood	40.70 ± 7.16	22.62 ± 0.75	11.39 ± 4.68	9.74 ± 3.62	0.53 ± 0.58
heart	10.65 ± 1.45	6.33 ± 0.56	2.99 ± 1.29	2.76 ± 1.07	0.19 ± 0.13
lung	17.26 ± 2.22	12.91 ± 1.58	8.00 ± 1.79	5.38 ± 1.69	0.49 ± 0.24
liver	52.26 ± 13.43	43.44 ± 1.87	34.47 ± 8.01	27.24 ± 3.12	6.18 ± 0.60
stomach	2.29 ± 0.68	2.76 ± 0.45	1.48 ± 0.54	1.31 ± 0.34	0.13 ± 0.10
pancreas	2.76 ± 0.14	2.66 ± 0.54	1.39 ± 0.35	1.24 ± 0.30	0.13 ± 0.08
spleen	16.99± 4.18	15.83 ± 2.22	16.22 ± 6.99	14.65 ± 0.55	6.48 ± 2.08
fat	1.10 ± 0.59	2.13 ± 0.64	0.93 ± 0.44	0.87 ± 0.13	0.10± 0.09
kidney	8.77 ± 1.06	8.40 ± 0.42	5.76 ± 0.87	5.52 ± 0.53	0.77 ± 0.15
muscle	0.73 ± 0.15	1.02 ± 0.08	0.66 ± 0.19	0.64 ± 0.20	0.06 ± 0.05
small intestine	8.62 ± 1.70	5.90 ± 1.53	2.78 ±1.17	2.14 ± 0.78	0.28 ± 0.20
salivary glands	3.73 ± 0.92	5.48 ± 0.63	2.93 ±1.03	2.98 ± 0.32	0.33 ± 0.19
lacrimal glands	3.72 ± 0.70	6.02 ± 1.57	3.54 ± 1.90	3.45 ± 0.86	0.26 ± 0.18
bone	4.00 ± 0.85	3.78 ± 0.17	2.36 ±0.37	2.13 ± 0.56	0.47 ± 0.06
PC3 PIP	5.72 ± 0.87	36.19 ± 9.00	34.27 ± 11.11	33.53 ± 11.80	5.77 ± 3.53
PC3 flu	3.21 ± 0.76	4.15 ± 0.59	3.34 ± 0.95	3.15 ± 0.87	0.43 ± 0.25
tumor/blood	0.20 ± 0.11	1.60 ± 0.39	2.82 ± 0.70	3.51 ± 0.15	9.07 ± 2.59
tumor/liver	0.44 ± 0.31	0.84 ± 0.22	3.57 ± 2.28	1.25 ± 0.52	0.98 ± 2.28
tumor/spleen	0.48 ± 0.20	2.28 ± 0.39	2.12 ± 1.42	1.94 ± 0.52	1.00 ± 1.42
tumor/kidney	0.95 ± 0.53	4.32 ± 1.08	5.89 ± 1.46	5.97 ± 1.53	7.08 ± 1.46
tumor/muscle	11.74 ± 6.89	35.66 ± 9.21	51.74 ± 5.68	51.90 ± 3.66	92.63 ± 5.68
tumor/ salivary glands	2.24 ± 1.10	6.75 ± 2.16	12.51 ± 0.77	11.04 ± 2.70	17.00 ± 0.77
tumor/ lacrimal glands	2.39 ± 1.73	6.72 ± 3.79	2.69 ± 1.87	9.62 ± 1.68	24.60 ± 1.87
tumor/ flu tumor	1.82 ± 0.27	8.79 ± 2.03	10.16 ± 0.60	10.52 ±1.06	13.26 ± 0.60

SUPPLEMENTAL TABLE 4. Tissue biodistribution of ^{111}In-DOTA-5D3 at 24 h post-injection without and with excess of non-radiolabeled 5D3 in 10- and 50-fold excess used for blocking to determine binding specificity. Male NOD-SCID mice bearing PSMA(+) PC3 PIP and PSMA(-) PC3 flu tumors in either flank were used. Data are show as %ID/g, expressed as mean ± SEM; sm. int. = small intestine, saliv. gland = salivary glands, lacrim. glands = lacrimal gland.

Tissue	24 h	24h Blocking 0.1 mg	24h Blocking 0.5 mg
blood	22.62 ± 0.75	21.58 ± 2.50	14.66 ± 0.36
heart	6.33 ± 0.56	6.14 ± 1.90	4.54 ± 0.59
lung	12.91 ± 1.58	11.38 ± 1.93	6.70 ± 0.53
liver	43.44 ± 1.87	43.78 ± 5.36	28.00 ± 0.29
stomach	2.76 ± 0.45	3.20 ± 1.04	1.72 ± 0.28
pancreas	2.66 ± 0.54	2.35 ± 0.50	1.61 ± 0.21
spleen	15.83 ± 2.23	23.87 ± 3.47	16.20 ± 0.29
fat	2.13 ± 0.64	1.79 ± 0.51	1.21 ± 0.62
kidney	8.40 ± 0.42	12.96 ± 1.59	11.03 ± 0.46
muscle	1.02 ± 0.08	1.26 ± 0.26	0.83 ± 0.19
small intestine	5.90 ± 1.53	7.75 ± 1.61	4.28 ± 1.19
salivary glands	5.48 ± 0.63	5.48 ± 1.13	3.62 ± 0.27
lacrimal glands	6.02 ± 1.57	5.52 ± 0.81	4.37 ± 1.20
bladder	4.27 ± 0.19	4.73 ± 0.71	2.65 ± 0.57
bone	3.78 ± 0.17	5.10 ± 1.21	3.88 ± 0.42
PC3 PIP	36.19 ± 8.90	23.20 ± 3.56	8.45 ± 0.92
PC3 flu	4.15 ± 0.59	5.42 ± 0.66	3.46 ± 0.14
tumor/blood	1.60 ± 0.39	1.07 ± 0.04	0.56 ± 0.05
tumor/liver	0.84 ± 0.22	0.53 ± 0.02	0.30 ± 0.03
tumor/spleen	2.28 ± 0.39	0.97 ± 0.03	0.52 ± 0.07
tumor/kidney	4.32 ± 1.08	1.79 ± 0.07	0.76 ± 0.06
tumor/muscle	35.66 ± 9.21	18.50 ± 1.43	10.53 ± 2.79
tumor/salivary glands	6.75 ± 2.16	4.27 ± 0.33	2.34 ± 0.32
tumor/lacrimal glands	6.72 ± 3.79	4.20 ± 0.24	2.10 ± 0.91
PIP/flu	8.79 ± 2.03	4.29 ± 0.51	2.44 ± 0.17

SUPPLEMENTAL TABLE 5. Complete list of tissue biodistribution of ^{111}In-DOTA-5D3 in male tumor free CD-1 mice (n = 4). Data are % ID/g, expressed as mean ± SD)

Tissue	2 h	24 h
Blood	30.68 ± 3.02	12.51 ±0.58
Heart	8.28 ± 1.26	3.71 ±0.26
Lung	14.39 ± 3.22	7.35 ± 0.90
Liver	33.25 ± 6.96	18.97 ± 1.81
Stomach	1.59 ± 0.18	1.50 ± 0.06
Pancreas	2.76 ± 0.21	1.95 ± 0.189
Spleen	24.75 ± 8.44	15.44 ±2.86
Fat	0.68 ± 0.32	0.51 ± 0.47
Kidney	7.66 ± 0.63	4.55 ± 0.11
Muscle	0.81 ± 0.13	1.15 ± 0.07
Small intestine	5.77 ± 1.32	3.53 ± 0.58
Salivary glands	2.94 ± 0.72	3.39 ± 0.43
Lacrimal glands	2.97 ± 0.65	4.11 ± 0.68
Bladder	2.06 ± 0.61	3.08 ± 0.92
Bone	4.21 ± 0.36	2.91 ± 0.50

SUPPLEMENTAL TABLE 6. Time-Integrated Activity Coefficients (TIACs) (Human Organs)

Organ	Organ Reference Mass in Olinda or ICRP publications (g)	Integrated Activity Coefficients (*h*)	
		^{111}In	^{177}Lu
Red Marrow	1300	0.42	0.51
Heart	250	0.34	0.42
Lungs	800	2.07	2.61
Liver	1400	15.24	20.96
Stomach	140	0.05	0.07
Pancreas	85	0.03	0.05
Spleen	150	0.66	1.07
Fat	14600	3.74	4.92
Kidneys	275	0.43	0.57
Muscle	28000	4.37	5.94
Small Int.	600	0.60	0.76
Cortical Bone	4400	2.74	3.80
Trabecular Bone	1100	0.69	0.95
Urinary Bladder Wall	47.6	0.03	0.05
Parotid Glands	50	0.04	0.05
Submandibular Glands	25	0.02	0.03
Lacrimal Glands	0.21*	0.0002	0.0003

*Reference mass for lacrimal glands is calculated from the CT drawn volumes of nine patients in the DCFPyL study (*1*); reference mass for fat, cortical bone, trabecular bone (*2*) and parotid glands and submandibular glands (*3*).

SUPPLEMENTAL TABLE 7. Human Organ Absorbed Doses

Target organs	**Organ Dose (mGy/MBq)**	
	^{111}In	**^{177}Lu**
Adrenals	0.10	0.01
Brain	0.01	0.0008
Breasts	0.02	0.003
Gallbladder Wall	0.16	0.02
LLI Wall	0.02	0.002
Small Intestine	0.05	0.08
Stomach Wall	0.05	0.02
ULI Wall	0.05	0.01
Heart Wall	0.08	0.05
Kidneys	**0.12**	**0.17**
Liver	**0.52**	**0.97**
Lungs	0.12	0.23
Muscle	0.03	0.02
Ovaries	0.02	0.003
Pancreas	0.10	0.06
Red Marrow	**0.04**	**0.04**
Osteogenic Cells	0.12	0.25
Skin	0.01	0.002
Spleen	**0.18**	**0.51**
Testes	0.01	0.0009
Thymus	0.03	0.003
Thyroid	0.01	0.002
Urinary Bladder Wall	0.02	0.01
Uterus	0.02	0.003
Total Body	0.04	0.05
Lacrimal glands	**0.03**	**0.12**
Parotid glands	**0.03**	**0.10**
Submandibular glands	**0.04**	**0.14**

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