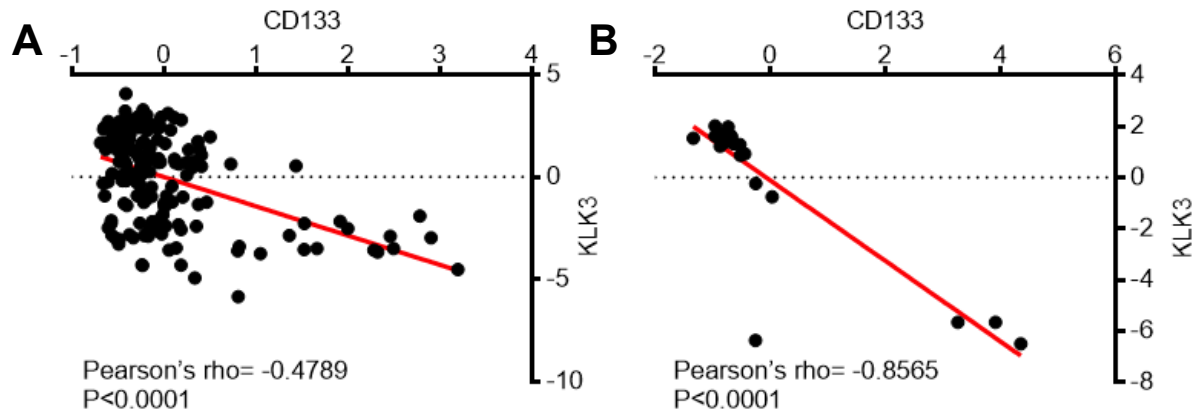
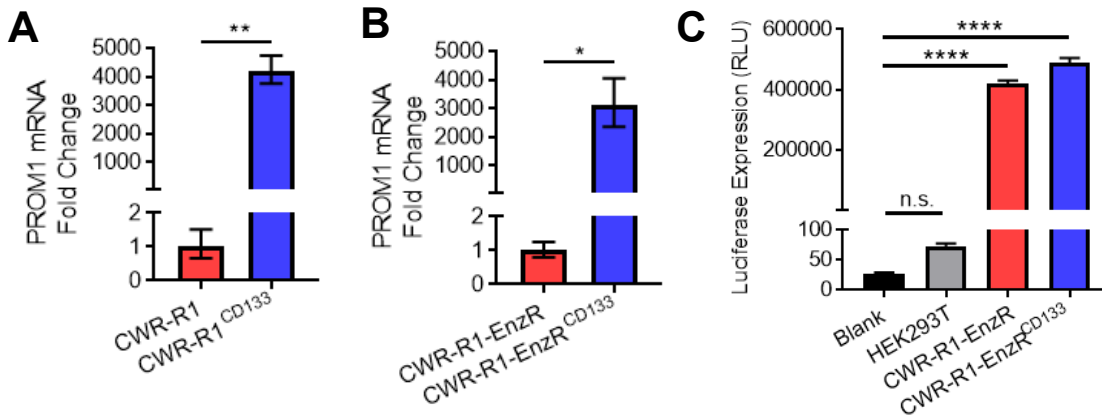


Supplementary Data.

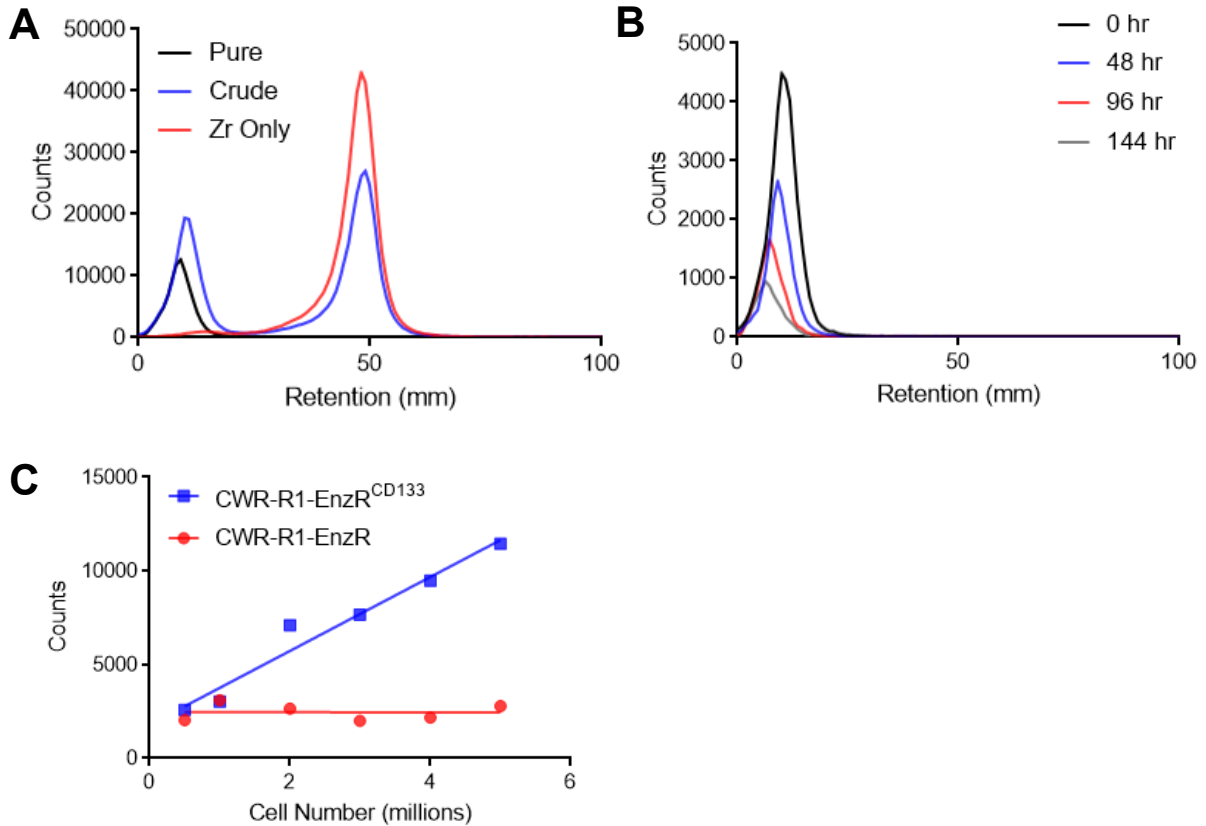
**Figure S1. CD133 expression is inversely correlated with PSA expression in PCa patients and LuCaP xenografts.** **A)** There was a negative overall correlation between CD133 and PSA expression (Pearson correlation,  $r=-0.4789$ ) in patient tumors, and **B)** there was a negative overall correlation between CD133 and PSA expression (Pearson correlation,  $r=-0.8565$ ) in LuCaP PDX models.



**Figure S2. Confirmation of CD133 and luciferase expression of cells prior to xenograft implantation.** **A)** CD133 is artificially overexpressed in transduced CWR-R1 cells, **B)** CD133 is artificially overexpressed in transduced luciferase-expressing CWR-R1-EnzR cells, **C)** Verification of luciferase expression in CWR-R1-EnzR derived cell lines.



**Figure S3. Characterization of [<sup>89</sup>Zr]Zr-HA10 IgG. A)** A representative radio-TLC chromatogram of a sample preparation including un-conjugated Zr<sup>4+</sup> standard, crude [<sup>89</sup>Zr]Zr-HA10 IgG, and pure [<sup>89</sup>Zr]Zr-HA10 IgG. **B)** Overlaid radio-TLC chromatograms of [<sup>89</sup>Zr]Zr-HA10 IgG in 1% BSA in PBS at 0, 48, 96, and 144 h post-preparation (purity >96% in all samples). **C)** The immunoreactivity of [<sup>89</sup>Zr]Zr-HA10 IgG was assessed by using antigen-specific cellular binding assays using CD133-positive cells (CWR-R1-EnzR<sup>CD133</sup>) and CD133-negative cells (CWR-R1-EnzR). The CD133-positive cell line demonstrated a concentration-dependent increase in immunoreactive fraction compared to the CD133-negative cell line, indicating high specificity of [<sup>89</sup>Zr]Zr-HA10 IgG for the CD133 antigen (p=0.0006).



**Table S1. Ex vivo biodistribution data.** Complete biodistribution of [<sup>89</sup>Zr]-HA10 IgG administered via tail vein into mice bearing subcutaneous CWR-R1-EnzR<sup>CD133</sup> or CWR-R1-EnzR xenografts.\*

Organ	CWR-R1-EnzR <sup>CD133</sup>		CWR-R1-EnzR	
	24 h (n=4)	72 h (n=3)	24 h (n=4)	72 h (n=4)
<b>Blood</b>	8.64±2.39	2.87±1.49	7.64±1.01	2.30±1.47
<b>Heart</b>	2.87±0.33	1.99±0.12	2.65±0.73	1.87±0.17
<b>Lung</b>	2.36±0.56	1.26±0.12	2.32±0.92	1.36±0.13
<b>Liver</b>	5.31±1.39	5.38±0.73	5.63±1.02	6.56±2.27
<b>Spleen</b>	5.21±2.32	3.97±2.20	7.18±1.57	5.40±2.25
<b>Intestines</b>	1.91±0.45	1.23±0.40	3.04±0.48	1.45±0.41
<b>Kidney</b>	2.68±0.55	2.34±0.08	2.74±0.46	2.15±0.30
<b>Muscle</b>	1.14±0.54	0.96±0.58	1.27±0.20	0.63±0.25
<b>Bone</b>	2.46±0.14	1.88±0.24	2.44±0.68	2.10±0.32
<b>Tumor</b>	6.06±2.00	12.74±6.19	4.58±1.25	4.30±0.50
<b>Tumor/Blood</b>	0.70±0.12	5.56±4.24	0.60±0.13	2.40±1.16
<b>Tumor/Muscle</b>	5.52±0.64	18.51±16.50	3.60±0.82	7.52±2.96

\*The data are expressed as the mean %ID/g±SD. The errors for tumor/blood and tumor/muscle ratios are calculated as the geometric mean of the standard deviations.