Supporting Information for

Original article

Photo-induced crosslinked and anti-PD-L1 peptide incorporated liposomes to promote PD-L1 multivalent binding for effective immune checkpoint blockade therapy

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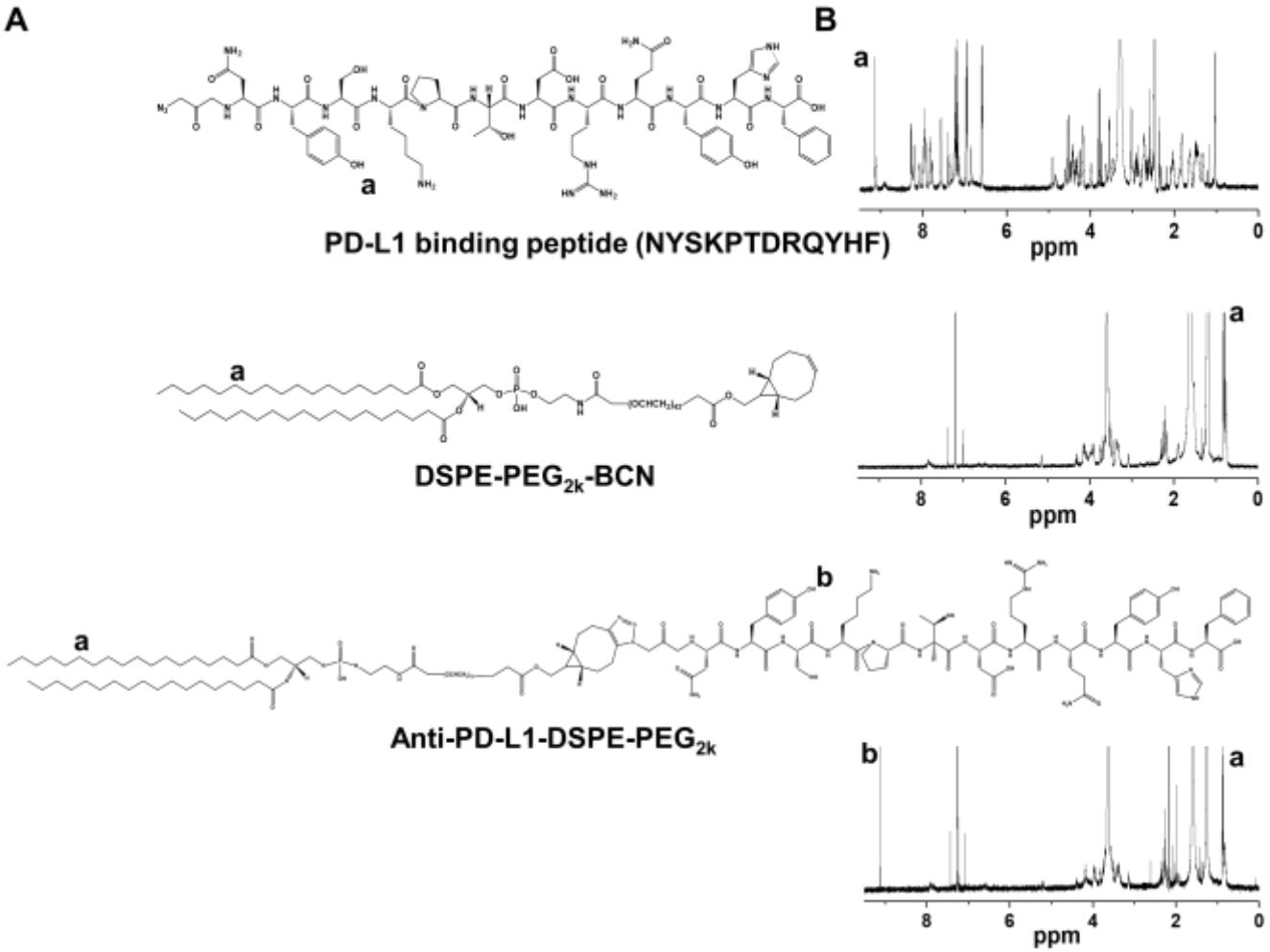

Figure S1 (A) Synthetic scheme to prepare anti-PD-L1-DSPE-PEG_{2k}. (B) ^{1}H NMR spectrum of PD-L1 binding peptide, DSPE-PEG_{2k}-BCN and anti-PD-L1-DSPE-PEG_{2k}.

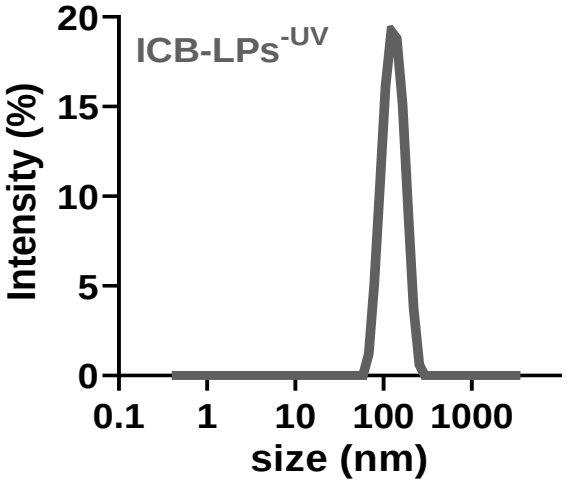

Figure S2 Size distribution of ICB-LPs^{-UV} in saline (1 mg/mL).

Table S1 Diameter, PD-L1 binding peptide contents, formulation efficiency and zeta potential of PEG-LPs, ICB-LPs^{-UV} and ICB-LPs^{+UV}

	Diameter (nm)	PD-L1 binding peptide contents (mol%)	Formulation efficiency (%)	Zeta potential (mV)
PEG-LPs	105.8 ± 1.23	-	-	−42.2 ± 0.289
ICB-LPs^{-UV}	134.3 ± 4.82	9.76 ± 0.147	97.6 ± 0.15	−2.97 ± 0.175
ICB-LPs^{+UV}	157.7 ± 1.04			−3.31 ± 0.219

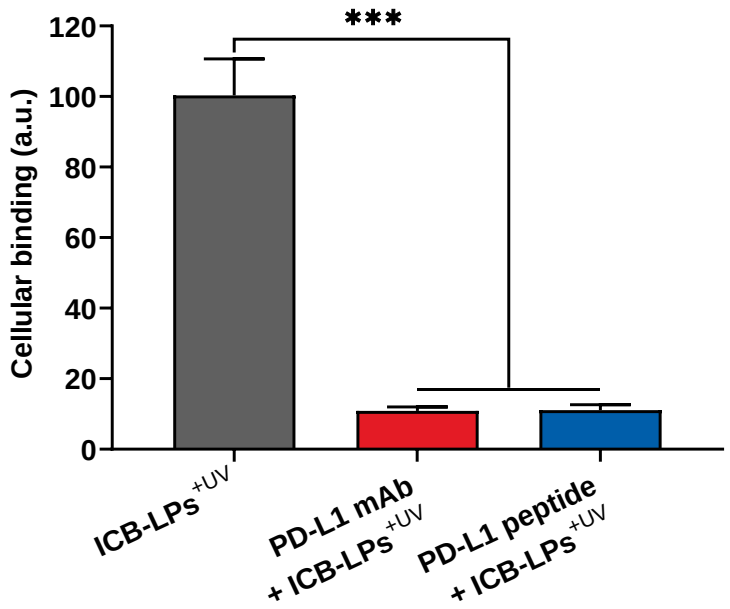

Figure S3 Cellular binding of ICB-LPs^{+UV} in the naive, or PD-L1 mAb- or PD-L1 peptide-treated CT26 cancer cells. Data are presented as mean ± SD (n =5); ***P<0.001 *vs.* Control or indicated.

Table S2 Pharmacokinetics (PK) parameters of area under the curves (AUC) and half-life ($t_{1/2}$) of PEG-LPs, ICB-LPs^{-UV} and ICB-LPs^{+UV} in BALB/c mice. DiD-labeled PEG-LPs, ICB-LPs^{-UV} and ICB-LPs^{+UV} (1 mg/kg) were intravenously injected into BALB/c mice, and blood samples were collected from mice *via* cardiac puncture after deep anesthesia at pre-determined times.

	Area under the curves (AUC)	**Half-life ($t_{1/2}$)**
PEG-LPs	84.18 ± 12.62	4.12 ± 0.42
ICB-LPs^{-UV}	129.1 ± 17.03	6.55 ± 1.1
ICB-LPs^{+UV}	199.6 ±17.84	18.3 ± 2.1

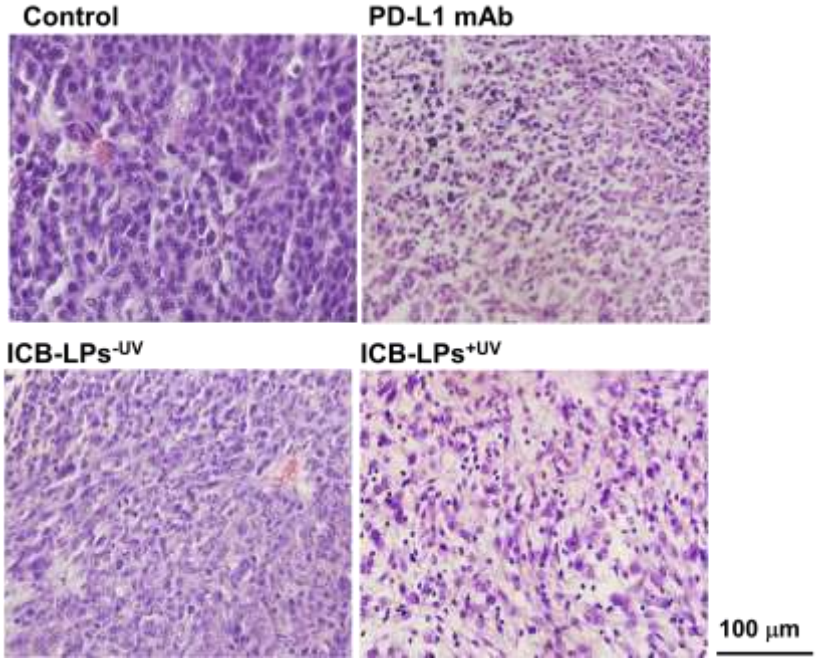

Figure S4 Tumor tissues stained with H&E on 18 days after treatment with saline, PD-L1 mAbs, ICB-LPs^{-UV} or ICB-LPs^{+UV}.

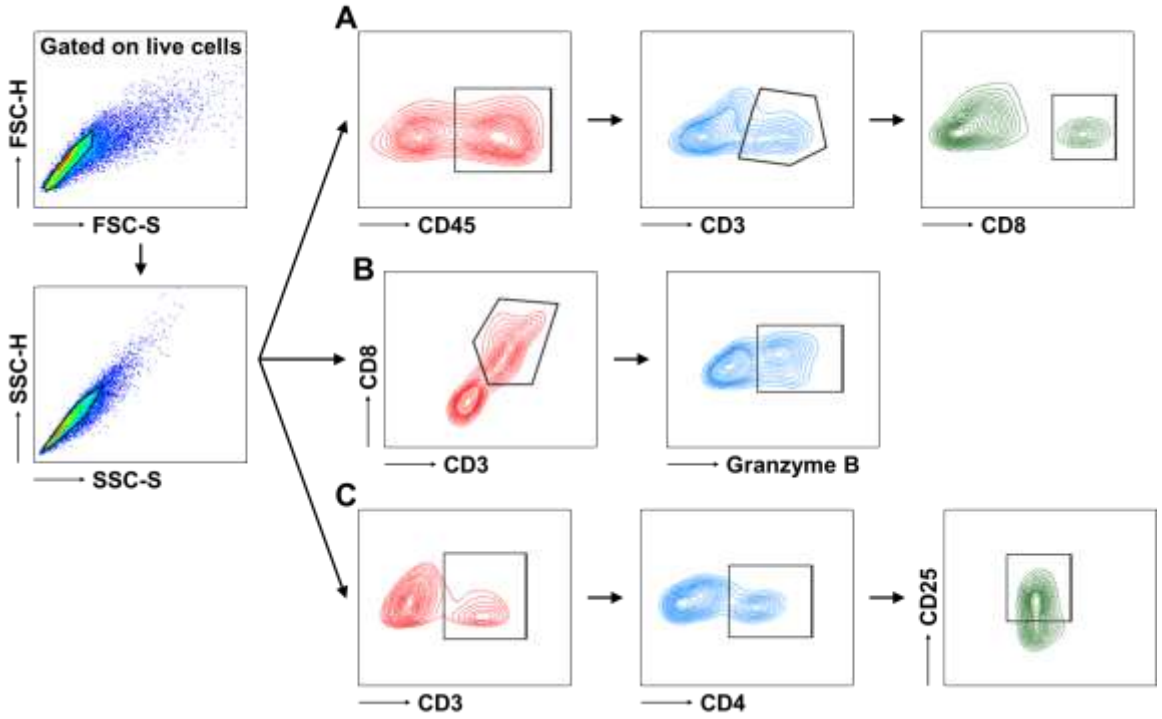

Figure S5 The flow cytometric gating strategy to analyze the (A) cytotoxic T lymphocytes (CTLs; $CD45^+CD3^+CD8^+$), (B) granzyme B (GrzB)-secreting $CD8^+$ T cells and (C) regulatory T cells (Treg; $CD3^+CD4^+CD25^+$) within the tumor tissues. FSC x SSC gating was used to obtain live cells and singlets based on granularity and size.

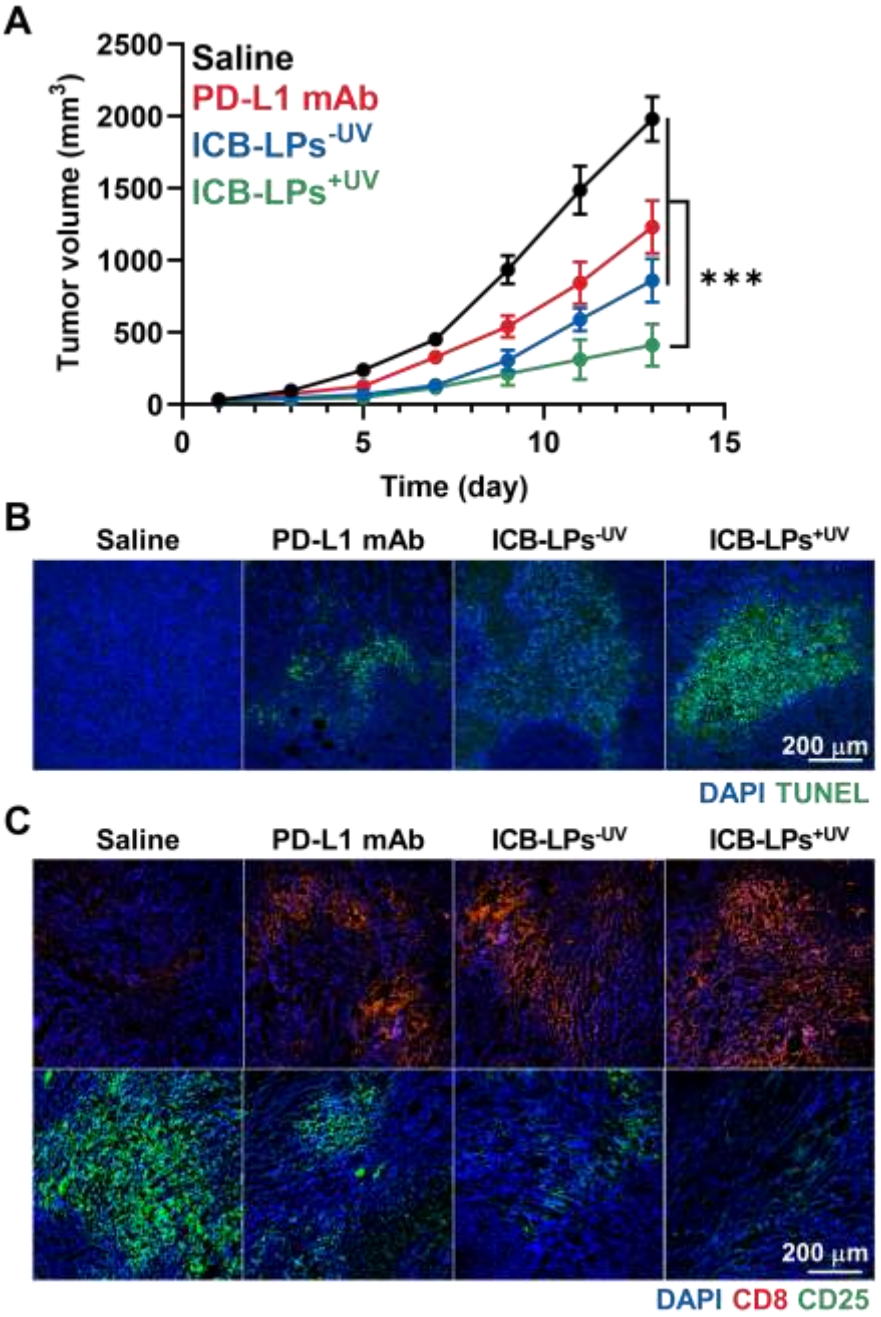

Figure S6 (A) Tumor growth of 4T1 breast tumor-bearing mice during treatment (n=5). Saline, PD-L1 mAbs (10 mg/kg), or equivalent 1 mg/kg dose of ICB-LPs^{-UV} or ICB-LPs^{+UV} were intravenously injected into the mice once every 3 days. (B, C) Tumor tissues stained with (B) TUNEL, or (C) CD8 or CD25 on 18 days after treatment with saline, PD-L1 mAbs, ICB-LPs^{-UV} or ICB-LPs^{+UV}. Data are presented as mean ± SD (n = 5); ***P<0.001 *vs.* Control or indicated.