**Fig. 1.** PD-L1 expression on neutrophils at different time points after CLP surgery and in different locations at 24 h after surgery.

**Different time points (A):**

CLP vs. Sham for all time points, $p < 0.001$

CLP 12 h vs. CLP 18 h, $p=0.02$; CLP 12 h vs. 24 h, $p < 0.001$; CLP 18 h vs. CLP 24 h, $p < 0.001$.

**Different location (B):**

BM vs. Blood, BM vs. PC, Blood vs. PC, $p < 0.001$.

BM = bone marrow; CLP = cecal ligation puncture; PC = peritoneal cavity;

PD-L1 = programmed death receptor 1 ligand 1.
Fig. 2. Comparison of CD11a, CD11b, CD16, CD18, CD54, CD62L, CD64, and CCR2 between neutrophils from sham operated mice, PD-L1⁺ and PD-L1⁻ neutrophils from CLP mice.

Percentage:

CD11a (A): Sham vs. PD-L1⁺, $p = 0.048$; SHAM vs. PD-L1⁺, $p < 0.001$; PD-L1⁻
vs. PD-L1\(^+\), \(p < 0.001\);

CD11b (B): Sham vs. PD-L1\(^-\), \(p = 0.413\); SHAM vs. PD-L1\(^+\), \(p = 0.939\); PD-L1\(^-\) vs. PD-L1\(^+\), \(p = 0.457\);

CD16 (C): Sham vs. PD-L1\(^-\), \(p < 0.001\); SHAM vs. PD-L1\(^+\), \(p < 0.001\); PD-L1\(^-\) vs. PD-L1\(^+\), \(p < 0.001\);

CD18 (D): Sham vs. PD-L1\(^-\), \(p = 0.233\); SHAM vs. PD-L1\(^+\), \(p = 0.725\); PD-L1\(^-\) vs. PD-L1\(^+\), \(p = 0.130\);

CD54 (E): Sham vs. PD-L1\(^-\), \(p = 1.000\); SHAM vs. PD-L1\(^+\), \(p = 0.881\); PD-L1\(^-\) vs. PD-L1\(^+\), \(p = 0.881\);

CD62L (F): Sham vs. PD-L1\(^-\), \(p = 0.006\); SHAM vs. PD-L1\(^+\), \(p < 0.001\); PD-L1\(^-\) vs. PD-L1\(^+\), \(p = 0.001\);

CD64 (G): Sham vs. PD-L1\(^-\), \(p < 0.001\); SHAM vs. PD-L1\(^+\), \(p < 0.001\); PD-L1\(^-\) vs. PD-L1\(^+\), \(p < 0.001\);

CCR2 (H): Sham vs. PD-L1\(^-\), \(p < 0.001\); SHAM vs. PD-L1\(^+\), \(p < 0.001\); PD-L1\(^-\) vs. PD-L1\(^+\), \(p = 0.020\).

**MFI:**

CD11a (A): Sham vs. PD-L1\(^-\), \(p = 0.041\); SHAM vs. PD-L1\(^+\), \(p < 0.001\); PD-L1\(^-\) vs. PD-L1\(^+\), \(p = 0.044\);

CD11b (B): Sham vs. PD-L1\(^-\), \(p = 0.874\); SHAM vs. PD-L1\(^+\), \(p = 0.960\); PD-L1\(^-\) vs. PD-L1\(^+\), \(p = 0.914\);

CD16 (C): Sham vs. PD-L1\(^-\), \(p = 0.022\); SHAM vs. PD-L1\(^+\), \(p < 0.001\); PD-L1\(^-\) vs. PD-L1\(^+\), \(p < 0.001\);
CD18 (D): Sham vs. PD-L1\(^-\), \(p < 0.001\); SHAM vs. PD-L1\(^+\), \(p < 0.001\); PD-L1\(^-\) vs. PD-L1\(^+\), \(p = 0.006\);
CD54 (E): Sham vs. PD-L1\(^-\), \(p = 0.044\); SHAM vs. PD-L1\(^+\), \(p < 0.001\); PD-L1\(^-\) vs. PD-L1\(^+\), \(p < 0.001\);
CD62L (F): Sham vs. PD-L1\(^-\), \(p = 0.480\); SHAM vs. PD-L1\(^+\), \(p = 0.652\); PD-L1\(^-\) vs. PD-L1\(^+\), \(p = 0.796\);
CD64 (G): Sham vs. PD-L1\(^-\), \(p < 0.001\); SHAM vs. PD-L1\(^+\), \(p < 0.001\); PD-L1\(^-\) vs. PD-L1\(^+\), \(p = 0.005\);
CCR2 (H): Sham vs. PD-L1\(^-\), \(p = 0.002\); SHAM vs. PD-L1\(^+\), \(p = 586\); PD-L1\(^-\) vs. PD-L1\(^+\), \(p = 0.005\).

CCR2 = C-C chemokine receptor type 2; PD-L1 = programmed death receptor 1 ligand 1.
Fig. 3. Migratory ability of neutrophils isolated from sham operated mice, PD-L1\(^+\) and PD-L1\(^-\) neutrophils from CLP mice.

CLP vs. Sham, \( p = 0.003 \) (A); PD-L1\(^+\) vs. PD-L1\(^-\), \( p = 0.013 \) (B).

CLP = cecal ligation puncture; PD-L1 = programmed death receptor 1 ligand 1.
Fig. 4. Expression of MHC class II molecule, CD40, CD80, and CD86 on neutrophils isolated from CLP mice.

MHC-II (A): 0 h vs. 12 h, \( p = 0.421 \); 0 h vs. 18 h, \( p = 0.111 \); 0 h vs. 24 h, \( p < 0.001 \); 12 h vs. 18 h, \( p = 0.022 \); 12 h vs. 24 h, \( p < 0.001 \); 18 h vs. 24 h, \( p < 0.001 \);

CD40 (B): 0 h vs. 12 h, \( p = 0.907 \); 0 h vs. 18 h, \( p = 0.019 \); 0 h vs. 24 h, \( p < 0.001 \); 12 h vs. 18 h, \( p = 0.025 \); 12 h vs. 24 h, \( p < 0.001 \); 18 h vs. 24 h, \( p < 0.001 \);

CD80 (C): 0 h vs. 12 h, \( p = 0.831 \); 0 h vs. 18 h, \( p = 0.018 \); 0 h vs. 24 h, \( p < 0.001 \); 12 h vs. 18 h, \( p = 0.029 \); 12 h vs. 24 h, \( p < 0.001 \); 18 h vs. 24 h \( p = 0.018 \);

CD86 (D): 0 h vs. 12 h, \( p = 0.807 \); 0 h vs. 18 h, \( p = 0.185 \); 0 h vs. 24 h, \( p < 0.001 \); 12 h vs. 18 h, \( p = 0.273 \); 12 h vs. 24 h, \( p < 0.001 \); 18 h vs. 24 h \( p < 0.001 \).

CLP = cecal ligation puncture; MHC = major histocompatibility complex.
Fig. 5. Influence of PD-L1 on neutrophils from CLP mice on lymphocyte apoptosis.

A. Direct vs. Indirect, \( p < 0.001 \); Direct vs. Sham, \( p < 0.001 \); Indirect vs. Sham, \( p = 0.015 \);

B. Co-PD-L1 vs. Co-Isotype, \( p < 0.001 \); Co-PD-L1 vs. Sham, \( p = 0.530 \);

Co-PD-L1 vs. PD-L1, \( p = 0.117 \); Co-PD-L1 vs. Isotype, \( p = 0.633 \); Co-Isotype vs. Sham, \( p < 0.001 \); Co-Isotype vs. PD-L1, \( p < 0.001 \); Co-Isotype vs. Isotype, \( p < 0.001 \); Sham vs. PD-L1, \( p = 0.033 \); Sham vs. Isotype, \( p = 0.273 \); PD-L1 vs. Isotype, \( p = 0.264 \).

CLP = cecal ligation puncture; PD-L1 = programmed death receptor 1 ligand 1.
Fig. 6. PD-L1 expression on neutrophils from patients with severe sepsis, sepsis after PCNL for infectious kidney stone, tumor and healthy volunteers.

Severe sepsis vs. Kidney stone, $p = 0.009$; Severe sepsis vs. Tumor patients $p < 0.001$; Severe sepsis vs. Volunteers, $p < 0.001$; Kidney stone vs. Tumor patients $p = 0.550$; Kidney stone vs. Volunteers, $p = 0.314$; Tumor patients vs. Volunteers, $p = 0.980$.

PCNL = percutaneous nephrolithotomy; PD-L1 = programmed death receptor 1 ligand 1.
Fig. 7. The correlation of neutrophil PD-L1 with marker of immunosuppression and disease severity by linear regression analysis.

A. Neutrophil PD-L1 & Lymphocyte PD-1, \( p = 0.139 \); B. Neutrophil PD-L1 & Monocyte HLA-DR, \( p = 0.010 \); C. Lymphocyte PD-1 & Monocyte HLA-DR, \( p = 0.255 \). D. Neutrophil PD-L1 & APACHE II score, \( p = 0.021 \); E. Neutrophil PD-L1 & SOFA score, \( p < 0.001 \); F. Neutrophil PD-L1 & MODS, score \( p < 0.001 \).

APACHE = acute physiology and chronic health evaluation; HLA-DR = human leukocyte antigen DR; MODS = multiple organ dysfunction syndrome; PD-1 = programmed death receptor 1; PD-L1 = programmed death receptor 1 ligand 1; SOFA = sequential organ failure assessment.
Fig. 8. Disease severity, duration of mechanical and LOS in ICU in patients with different PD-L1 level on neutrophils.

* $p < 0.05$ by Mann-Whitney $U$ test.

A. APACHE II score, $p = 0.002$; B. SOFA score, $p = 0.001$; C. MODS score, $p < 0.001$; D. mechanical ventilation, $p = 0.033$; E. LOS, $p = 0.060$.

APACHE = acute physiology and chronic health evaluation; HLA-DR = human leukocyte antigen DR; ICU = intensive care unit; LOS = length of stay; MODS = multiple organ dysfunction syndrome; PD-L1 = programmed death receptor 1 ligand 1; SOFA = sequential organ failure assessment.