CRITICAL CARE

LETTER

Contribution of activated platelets to plasma IL-27 levels

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In a recent issue of *Critical Care*, Wong and colleagues [1] demonstrated that the serum concentration of IL-27 in critically ill children was a predictor of infection. Our study aims at determining whether platelet activation contributes to the elevated plasma IL-27 concentration. Here we demonstrate that activation of platelets with thrombin receptor activating peptide (TRAP) significantly increased IL-27 levels in supernatants (Figure 1a). Moreover, B cells incubated *in vitro* with supernatants from activated platelets upregulated membrane expression of CD86, which was restored to baseline when B cells were pre-incubated with a gp130 blocking antibody (Figure 1b). Our data strongly suggest that platelet activation contributes, along with classical sources [2], to elevated plasma levels of IL-27. Recent advances place platelets as an important link between innate and adaptive immunity [3]. Indeed, platelets modulate their inflammatory response after sensing the presence of an infectious agent [4]. Therefore, platelet activation could contribute to increased plasma concentrations of IL-27 along with cytokines such as soluble CD40L [5], and thus may contribute towards immune dysregulation in patients with sepsis.

Abbreviations
IL, interleukin; TRAP, thrombin receptor activating peptide.

Competing interests
The authors declare that they have no competing interests.

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References

1. Wong HR, Cvijanovich NZ, Hall M, Allen GL, Thomas NJ, Freishtat RJ, Anas N, Meyer K, Checchia PA, Lin R, Bigham MT, Sen A, Nowak J, Quasney M, Henricksen JW, Chopra A, Banschbach S, Beckman E, Harmon K, Lahni P, Shanley TP: **Interleukin-27 is a novel candidate diagnostic biomarker for bacterial infection in critically ill children.** *Crit Care* 2012, **16:**R213.
2. Wojno ED, Hunter CA: **New directions in the basic and translational biology of interleukin-27.** *Trends Immunol* 2012, **33:**91-97.
3. Semple JW, Italiano JE Jr, Freedman J: **Platelets and the immune continuum.** *Nat Rev Immunol* 2011, **11:**264-274.
4. Berthet J, Damien P, Hamzeh-Cognasse H, Pozzetto B, Garraud O, Cognasse F: **Toll-like receptor 4 signal transduction in platelets: novel pathways.** *Br J Haematol* 2010, **151:**89-92.
5. Lorente L, Martín MM, Varo N, Borreguero-León JM, Solé-Violán J, Blanquer J, Labarta L, Díaz C, Jiménez A, Pastor E, Belmonte F, Orbe J, Rodríguez JA, Gómez-Melini E, Ferrer-Agüero JM, Ferreres J, Llimiñana MC, Páramo JA: **Association between serum soluble CD40 ligand levels and mortality in patients with severe sepsis.** *Crit Care* 2011, **15:**R97.

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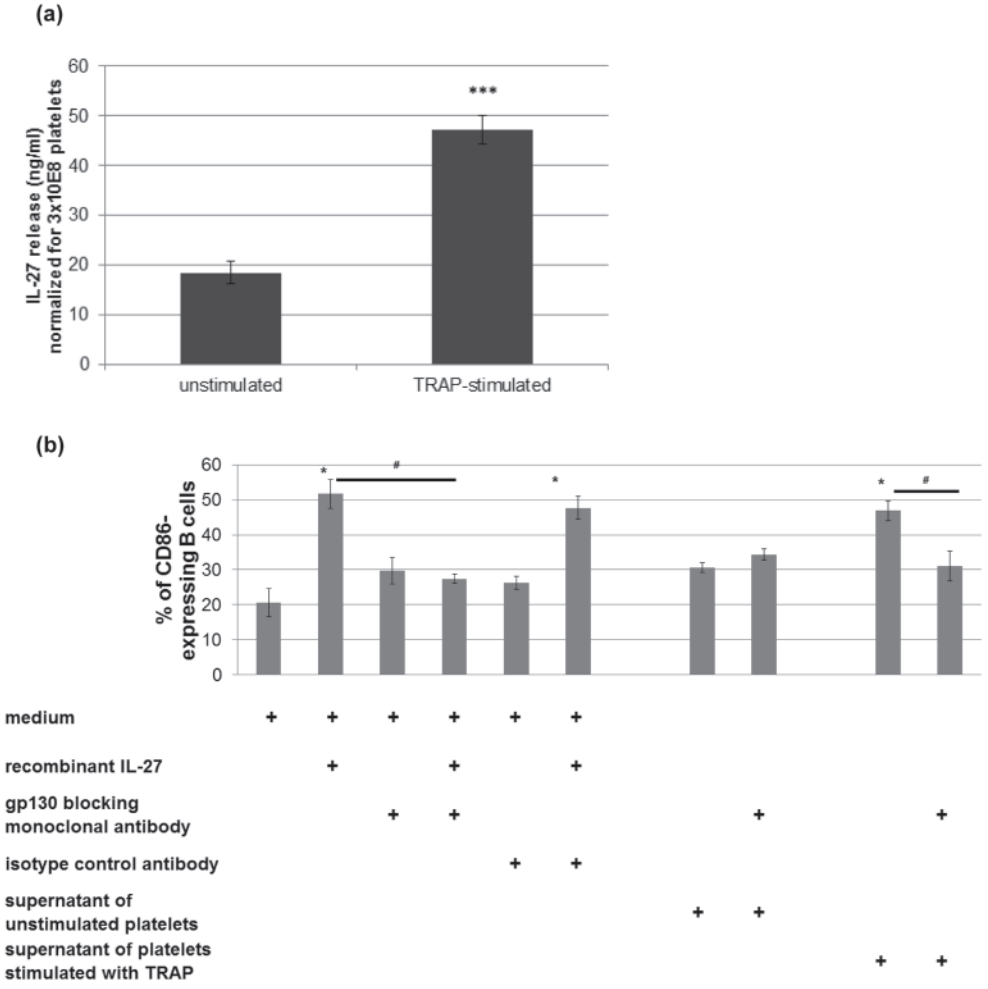

Figure 1. Activated platelets release abundant and functional IL-27. (A) Platelets from apheresis platelet concentrates (n = 11) were stimulated with TRAP-SFFLRN peptide (50 μg/ml, 30 minutes; Sigma-Aldrich, Saint-Quentin Fallavier, France); negative controls were not stimulated. IL-27 concentration in platelet supernatants was determined using a commercial enzyme-linked immunosorbent assay kit (RnD Systems Europe, Lille, France). Thrombin receptor activating peptide (TRAP) stimulation significantly increased IL-27 release from 18.42 ± 2.28 ng/ml to 47.17 ± 2.99 ng/ml (***$P < 0.0005$, *t*-test). **(B)** Then, the influence of IL-27-rich platelet supernatants on the expression of the activation marker CD86 was assessed *in vitro* on five independent highly purified blood B lymphocyte sets by means of flow cytometry, in duplicate for each condition. As a control, each set of B cells was incubated in minimal medium for 48 h with recombinant IL-27 (10 ng/ml; RnD Systems). We found that, in contrast to supernatants of non-activated platelets, supernatants of activated platelets provoke a significant increase in CD86 expression on B cells from 21 to 47% (*$P < 0.05$, *t*-test). CD86 expression was restored to baseline when B cells were pre-incubated with an antibody blocking the gp130 subunit of the IL-27 receptor (0.5 μg/ml; clone 28126, RnD Systems; #$P < 0.05$, *t*-test). Results are presented as mean values ± standard deviations.