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Modified C-reactive protein interacts with platelet glycoprotein Ibα

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Abstract:
Herein, we investigated the possible mechanisms by which recombinant modified CRP (m_rCRP) modulates blood platelet function. Modified CRP could activate blood platelets and stimulate their adhesion and aggregation in the absence of any other physiological stimuli. Preincubation of isolated blood platelets with m_rCRP at a concentration as low as 2 μg/ml resulted in significant platelet degranulation (fraction of CD62-positive platelets increased 2-fold, $p < 0.0002$), and at concentrations of 20 μg/ml and 100 μg/ml, increased exposure of the platelet procoagulant surface was observed (expression of annexin V-positive platelets increased to 5.7 ± 1.0% and 10.4 ± 2.2%, respectively, $p < 0.03$, *vs*. 2.9 ± 0.2% in control). Furthermore, m_rCRP (100 μg/ml) strongly augmented spontaneous and ADP-induced fibrinogen binding to platelets ($p < 0.05$), platelet adhesion to fibrinogen and platelet aggregation. Using the Biacore™ surface plasmon resonance technique and glycoprotein Ibα (GPIbα) immobilized on the sensor surface, we demonstrated direct binding between platelet GPIbα and m_rCRP. Binding of m_rCRP to GPIbα and C1q was also observed by ELISA, irrespective of the immobilized ligand. These outcomes strongly support a role of the GPIb-IX-V complex in the interactions of m_rCRP with blood platelets.

Key words:
C-reactive protein, glycoprotein Ibα, platelet activation, procoagulant activity, aggregation, adhesion, surface plasmon resonance