The role of GPIIb-IIIa in modulation of adhesion reactions. J.G. Mattson (1), R.K. Easter (2), R. Peterson (2), R. Lafavre (1) and J. Oda (1). (1) Department of Clinical Pathology, William Beaumont Hospital, Royal Oak, MI, U.S.A. (1), (2) Medical Technology Program, Michigan State University, East Lansing, MI, U.S.A. and Biomedical Engineering Laboratory, Rice University, Houston, TX, U.S.A. (3)

We have previously reported that patients with Glanzmann's thrombasthenia (GT) fail to adhere to a carbon-fomnvar surface and undergo contact-induced shape change in a non-flow system. The ability of ADP to reverse this adhesion defect suggested that it may be secondary to defective dense granule release rather that a direct requirement for GPIIb-IIIa. To further assess the role of GPIIb-IIIa in adhesion, we examined the effect of two mouse monoclonal antibodies to the GPIIb-IIIa complex, AP2 (IgG, kappa) from T. Runicki, Milwaukee Blood Center and MA36 (IgM, lambda) from D. Peterson, Rice University. AP2 (1:100 dil) and MA36 (1:200 dil) both completely abolished aggregation by ADP, collagen and epinephrine and prevented clot retraction. In a transmission EM (TEM) whole mount assay of adhesion and contact-induced shape change, both antibodies inhibited platelet attachment to the substrate and impaired spreading in those few platelets that did attach. This antibody-induced adhesion defect was reversed by the addition of 2x10-6 M ADP just prior to exposure of platelets to the activating surface. In parallel studies, antibody treated platelets demonstrated a dose-related effect in ATP release as measured in a luminogorrector with total absence of release at antibody dilutions that abolished aggregation. We have previously shown that ADP-induced absence of binding of exogenous fibrinogen was demonstrated in antibody treated platelets induced to spread by ADP stimulation. These studies to suggest that GPIIb-IIIa is involved in adhesion in non-flow systems, as suggested by the altered adhesion seen in GT platelets, adhesion and adhesion-induced shape change can be supported by ADP stimulation in the absence of fibrinogen binding to GPIIb-IIIa.