

## **78c Micropatterned Surfaces for Controlling Cell Adhesion and Rolling**

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The current practice to study the adhesive interactions of leukocytes or platelets under flow is to coat substrates with adhesion proteins by simple adsorption or incorporation into a phospholipids bilayer and then perfuse isolated cells over the coated substrate in a flow perfusion assay. Although these methods have led to a wealth of knowledge on the molecular interactions that mediate leukocyte and platelet adhesion and rolling under flow, potential drawbacks include (a) protein molecules are randomly distributed on the surface; (b) only a single protein concentration can be studied at a time; and (c) only a single protein can be studied. Many studies could benefit from the use of substrates in which adhesion proteins are patterned into well-defined microenvironments, and multiple proteins or protein concentrations are patterned simultaneously. In this paper we describe a method to fabricate protein pattern surfaces for use in cell rolling studies. Using microfluidic channels we were able to fabricate parallel lines of adhesion proteins (P-selectin and E-selectin) to control the location and speed at which leukocytes roll. We also demonstrate that this technique can also be applied to platelet rolling on von Willebrand factor (vWf).