4.1 INTRODUCTION

When a blood vessel wall is damaged, platelets are exposed to a variety of activating agents including collagen. The adhesion of platelets to vascular subendothelium is a critical initial step in haemostasis and thrombosis. Collagens of the subendothelium are major determinants of the thrombogenicity of the blood vessel wall. The interaction of platelets with collagens is a complex process since collagen is not only a potent platelet agonist but also an adhesive protein. When platelets encounter fibrillar collagen they do not just adhere but, following adhesion, undergo a complex series of intracellular reactions which result in platelet activation, secretion of the contents of the granules and the induction of surface receptor sites.
for adhesive proteins, which reinforce the initial mechanisms of adhesion and mediate platelet aggregation.

Platelet/collagen adhesion can be classified into two categories: primary adhesion and secondary reinforcing adhesion. Primary adhesion can be categorised into divalent cation-independent and Mg²⁺-dependent adhesion.

Monomeric and fibrillar collagens effectively support platelet adhesion, whereas the native, triple-helical structure of collagen and the polymerisation of the monomeric collagen are required for collagen-induced platelet aggregation and secretion.

Various mechanisms and receptor populations may be involved in both these processes (Figure 1). The relationship between the various receptors and the mechanisms is still not fully understood. The initial interaction between the subendothelium and the quiescent platelets in flowing blood is thought to occur via von-Willebrand-factor (vWf) bound to collagen on the subendothelium and GPIb on the platelet (for detailed information see chapter 7).

Over the years a large number of molecules have been proposed as direct platelet/collagen receptors but recently these have been narrowed down to a few:

- $\beta_1$ integrin
- CD36
- GPVI
- P65

and, indeed, may involve a complex containing these components.

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**Figure 1:** Model for collagen binding to platelets and the various binding proteins involved.