

ISOLATION AND PURIFICATION OF THE A2 DOMAIN OF VON WILLEBRAND FACTOR FOR NANOTECHNOLOGICAL APPLICATIONS

Αγγλική Περίληψη

The vWF is a multimeric glycoprotein which mediates the formation of thrombus at the sites of vascular injury and under high shear stress conditions. So far the biological properties of vWF have been elucidated in terms of genetic regulation, biosynthesis and molecular interactions. Also the three-dimensional structures of selected domains of vWF have been determined, but the structure-activity relationship of these domains has not been fully clarified yet, due to the complexity and the size of the molecule of vWF. Recent studies suggested that interaction between domains A1 and A2 can be responsible for the inhibition of platelet adhesion. It is suggested that the binding of the A1 domain to the GPIb α receptor inhibits proteolysis of the A2 domain, which prevents the formation of complex A1-GPIb α . Therefore, studying the mechanism of formation of the A1-A2 complex could help in the design of novel antithrombotic drugs. The human gene encoding the A2 domain of vWF was cloned and expressed in a bacterial system and the recombinant protein of the A2 domain was isolated and overexpressed in the absence of post-translational modifications that take place *in vivo*, and then it was successfully purified. The recombinant A2 domain is now available in large quantity and with high purity, ready to be used. Later on, the interaction between A1 and A2 domains of vWF on biocompatible nano-surfaces could be studied, and the possible antithrombotic activity of this complex could be assessed. The results of these experiments could be useful in the development of new antithrombotic agents.