PREFACE

Caldesmon is one of the most abundant proteins detected in smooth muscle and in a number of non-muscle cells. It binds actin, myosin, tropomyosin and calmodulin and is believed to play in smooth muscle a regulatory role similar to that of troponin in striated muscle. Two closely-related isoforms of caldesmon being the products of an alternative splicing of a single gene, have been identified. The high molecular weight (H-CaD) isoform is expressed predominantly in smooth muscle, whereas the low molecular weight (L-CaD) isoform is found in non-muscle tissues and cells. Neither of the two isoforms has been detected in skeletal muscle which makes caldesmon a useful marker for monitoring of various pathological states, especially in diagnosis of tumors with smooth muscle cell-like differentiation. Non-muscle and smooth muscle isoforms of caldesmon seem to perform different roles *in vivo*. Smooth muscle caldesmon is known to inhibit the ATPase activity of actomyosin in a Ca^{2+}-calmodulin-regulated manner and together with tropomyosin is a mediating factor for Ca^{2+}-dependent inhibition of smooth muscle contraction. Non-muscle caldesmon is a regulatory factor in the microfilament network and is thus involved in the assembly and stabilization of microfilaments and thus in actin cytoskeleton remodelling. However, after a few decades of intensive studies, many questions concerning the fine molecular mechanism of caldesmon *in vivo* function remain still unresolved.

Keywords: caldesmon, structure, smooth muscle, regulation of contraction, cell and tissue distribution