IN VITRO ANALYSIS OF THE BIOLOGICAL ACTIVITY OF RGD PEPTIDES AND A DEMONSTRATION OF THEIR IN VIVO ABILITY TO INHIBIT PRIMARY TUMOUR GROWTH

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The RGD sequence present in a variety of extracellular matrix proteins is known to mediate cell-substratum interactions. The aim of our study was to determine if synthetic RGD peptides can influence the adhesion and viability of Ab melanoma cells in vitro and the growth of an Ab tumour in vivo. We found that synthetic RGD peptides inhibit the adhesion of Ab melanoma cells to fibronectin. Analysis of direct cytotoxicity showed no effect of polyRGD on the viability of Ab cells in a medium supplemented with 10% serum but in the same conditions the anti-adhesive effect of poly RGD was still visible. We compared the cytotoxicity of poly RGD and GRGDNP peptide (as a cytotoxic reference) on Jurkat cells. The results indicated the significant cytotoxicity of GRGDNP and the weak cytotoxicity of poly RGD, but only in serum-free conditions. In 10% serum none of the peptides were cytotoxic. We analysed the in vivo activity of the poly RGD peptide, which was characterised by strong anti-adhesive properties. Poly RGD, when incubated with Ab cells prior to injection, caused a significant inhibition of primary tumour growth manifested in a reduction of tumour volume and a longer survival time. Therefore, we postulate that the anti-tumour effect observed in the Ab Bomirski melanoma model is rather due to the anti-adhesive than cytotoxic activity of the poly RGD peptide.