

Within the cell, caspase-2 probably fulfills several functions. Caspase-2 can be involved in apoptosis induction, DNA repair as well as cell cycle regulation. Caspase-2 has the character of initiator and also executioner caspase. A stimulus for caspase 2 activation can be oxidative stress or DNA damage. Caspase-2 is activated by cleavage during an interaction with protein complexes. One of protein complexes, i.e. PIDDosome, is made of protein PIDD, RAIDD and pro-caspase-2. Within the PIDDosome, caspase-2 is activated. Activated caspase-2 occurs in a short S form and in long L form. L form of caspase-2 has proapoptotic effects and S form of caspase-2 has antiapoptotic effects. Caspase-2S has been only detected on mRNA level but not on protein level. The main role of caspase-2L is apoptosis induction in normal and tumor cells. Caspase-2 in tumour cells is activated by extrinsic as well as intrinsic apoptotic pathway. Apoptosis induction by caspase-2 is for example studied in connection with breast cancer treatment with taxanes. Caspase-2 ability of apoptosis induction in cancer cells independently of p53 protein is employed in cancer treatment including overcoming the resistance to apoptosis induction which is based on losing p53 activity. Caspase-2 is involved in apoptosis induction by different mechanisms depending on the type of cell. Precise mechanisms, by which caspase-2 is activated, and precise mechanisms, by which caspase-2 induces apoptosis, remain unknown till now.