Anti-apoptotic mechanism of silkworm hemolymph in staurosporine-induced apoptosis

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There exist some common pathways in apoptosis despite a wide range of inducing signals, and mitochondria play a crucial role especially by releasing cytochrome c into cytosol, which forms complex with Apaf-1 to turn on the caspase cascade reaction[1]. Silkworm hemolymph (SH) has shown anti-apoptotic activities in mammalian[2] and insect cell apoptosis[3], and five 30kDa proteins in SH are the major inhibitors of apoptosis. Here we developed anti-apoptotic mechanism of SH in staurosporine-induced HeLa cell apoptosis. SH did not directly inhibit caspase-3 and caspase-9 activities in cell-free reaction, but rather increased caspase activities by improving caspase reaction condition. This supports the claim that anti-apoptotic effect of SH lies in further upstream events than caspase activation. Cytochrome c release and the translocation of Bax to mitochondria after staurosporine treatment were blocked by SH. This indicates that SH affects a step above Bax translocation such as Bax conformational change by Bid in staurosporine-induced HeLa cell apoptosis. SH effects on cytosolic calcium concentration, generation of reactive oxygen species, and mitochondrial membrane potential were also determined.

References

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