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Role of Caspases and Reactive Oxygen Species in Rose Bengal-Induced Toxicity in Melanoma Cells

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Abstract

Objective
We have previously shown that Rose Bengal (RB) alone, not as a photosensitiser, could induce apoptotic- and non-apoptotic cell death in different melanoma cell lines. To clarify RB-induced toxicity mechanisms, role of caspases and reactive oxygen species (ROS) were studied in melanoma cells.
Materials and Methods
Human melanoma cell lines, Me 4405 and Sk-Mel-28 were cultured in DMEM medium. Cell viability was quantitated by MTT assay. Apoptotic cells were determined using PI staining of DNA fragmentation by flow cytometry (sub-G1 peak). Role of caspase were studied using the pan-caspase inhibitor z-VAD-fmk. ROS was measured using DCF-DA by flow cytometry analysis.
Results
This study showed that while z-VAD-fmk completely inhibited apoptosis of melanoma induced by tumor necrosis factor (TNF)-related apoptosis-inducing ligand (TRAIL), it only partially blocked RB-induced apoptosis in Me4405 and Sk-Mel-28 melanoma cell lines. RB also increased ROS production in melanoma cells but pretreatment with antioxidant γ-glutamylcysteinylglycine (GSH) could not decrease RB-induced toxicity.
Conclusion
Both caspase-dependent and -independent pathways were induced by RB in melanoma cells. RB-induced generation of ROS does not play a significant role in RB-induced toxicity and it is independent of ROS production in melanoma cells.

Keywords: Caspases, Melanoma, Rose Bengal, ROS.

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