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The antioxidant protein PARK7 plays an important role in cell resistance to cisplatin induced apoptosis in case of clear cell renal cell carcinoma

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Chear cell renal cell carcinoma (ccRCC) is the most malignant tumor in the adult kidney. Many factors are responsible for the development and progression of this tumor. Increased reactive oxygen species (ROS) accumulation and altered redox status have been observed in cancer cells and this biochemical property of cancer cells can be exploited for therapeutic benefits. In earlier work, we identified and characterized protein DJ-1 (PARK7) as an oxidative stress scavenger in renal cells exposed to oxidative stress. To investigate whether the PARK7 or other oxidative stress proteins play a role in the renal cell carcinoma and its sensitivity or resistance to cytostatic drug treatment, differential proteomics analysis was performed with cell models for clear cell renal carcinoma (Caki-2 and A498). Cells were treated with cisplatin and differentially expressed proteins were investigated. The cisplatin treatment resulted in an increase in ROS accumulation and ultimately apoptosis of Caki-2 and A498 cells. In parallel, the apoptotic effect was accompanied by a significant down regulation of antioxidant proteins especially PARK7. Knockdown of PARK7 using siRNA and over expression using plasmid highlighted the role of PARK7 as a key player in renal cell carcinoma response to cisplatin induced apoptosis. Over expression of PARK7 resulted in significant decrease in apoptosis, whereas knockdown of the protein was accompanied by an increase in apoptosis in both Caki-2 and A498 cells treated with cisplatin. These results highlight for the first time the important role of PARK7 in cisplatin induced apoptosis in clear renal cell carcinoma cells.

Biography

Marwa Eltoweissy has completed her PhD at the age of 30 through a scholarship and cooperation work between faculty of Science, Alexandria University, Egypt and Rheinische Friedrich-Wilhelms-University Medical Center Bonn, Institute for Physiology II, Germany. She achieved postdoctoral studies at the Gastroenterology and Endocrinology department, Georg-August University Medical Center, Göttingen, Germany. She received the Doctor of Natural Sciences (Dr. rer. nat.) degree through her work at the Nephrology and Rheumatology department, Georg-August University Medical Center, Göttingen, Germany. She works as a major scientific researcher at the later department and as an Assistant Professor of Physiology at the Zoology department, Alexandria University, Egypt. She has published more than 30 papers in reputed journals and is serving as a reviewer for privileged journals.

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