OMICS Group Conferences
Accelerating Scientific Discovery
3rd World Congress on
Cell Science & Stem Cell Research
November 20- 22, 2013 DoubleTree by Hilton Baltimore-BWI Airport, USA

Modulated electrothermia – inducer of immunogenic cell-deaths in cancer

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Abstract

There are increasing evidence that certain type of anticancer therapeutical methods can induce a special form of programmed cell death, triggering immune response against the tumor. Recent years a new concept of immunogenic cell death (ICD) has emerged. Apoptotic cell death has a vital importance in this process. Modulated electrothermia (oncothermia, OTM, [1]) is a long time applied tumor treatment modality in the human clinical practice. Our recent investigations revealed some immunological aspect of oncothermia treatment taking into a hypothetical consideration that OTM can induce a special form of immunogenic cell death. In our study we used a nude mouse (BalbC/nu/nu) xenografted by HT29 cell line to both femoral regions. One of those ~1 cm diameter tumors were treated by single shot OTM for 30 minutes. The sampling was made as a time course. Tumor samples were analyzed using different kind of methods, including histomorphology, immunohistochemistry, TUNEL assay, and human gene chip. We found that OTM induces massive programmed cell death in the tumors proven by TUNEL assay. Large number of apoptotic bodies was observed by histomorphology. Our investigation had proved immunogenicity of this process; measured the dynamic changes of the key molecular pattern of ICD (calreticulin, HMGB1, HSP70, HSP90 DR5). These experimental findings can base developing immunotherapeutical approach of OTM, allowing systemic immune action against metastases too.

Biography

Andocs, G., DVM is a researcher-veterinarian, and had been conducted scientific research work in many fields of science including radiobiology, nuclear medicine, pharmacokinetics and bioelectromagnetism. He is an author and coauthor of more than 15 papers and presently working in the Department of Veterinary Clinical Medicine, Tottori University, Japan introducing the oncothermia method into the veterinary practice.