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Resveratrol anti and pro-tumorigenic behavior in breast cancer cells (MCF7): COX2 and PGE2 role

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Introduction: Natural drug as resveratrol was known to possess breast cancer prevention activity by stimulating autophagy vacuolization but it is often difficult to determine if this is a protumorigenic or antitumorigenic. So it is considered as a double sward agent should be administered with caution. The difference in resveratrol effect at high concentration than the lower one was examined on breast cancer cells (MCF7).

Methods: Low (10 µg per ml) and high (50 µg per ml) concentrations of resveratrol were analyzed for their survival and cell cycle effects. Moreover, their autophagic behavior was examined by LC3B immunofluorescence assay and the western blotting of LC3B, MCL1 and Beclin1 were done. Caspase 3 and DNA degradation were also assayed along with oxidative stress markers GSH and MDA. The inflammatory mediators as COX2 and PGE2 and the angiogenic marker VEGF were determined as well.

Results: The pro-tumorigenic effect was pronounced at resveratrol high dose with accumulation of cells toward S and G2/M phases of cell cycle. Moreover, the high dose induced giant cell (2 cell fusion) formation, LC3B increased, MCL1 and Beclin1 decreased expressions. The decrease in caspase 3 activity, MDA content and the increase of reduced GSH was significant at high dose than the low one. Surprisingly selective induction of COX2 expression and PGE2 secretion was exhibited at resveratrol high dose. High dose resveratrol preserve its anti-angiogenic effect with significant decrease of VEGF release into the outer media and significant increase of NO content.

Conclusion: Resveratrol is not a safe natural alternative to hormone replacement therapy and could be a promoter or protector of breast cancer depending on concentration used. The cellular adaptation to the glucose deprivation state induced by resveratrol encompasses the interplay between cell cycle, apoptosis, autophagy and angiogenesis and the dynamic switches in COX2 function that finally results in fine-tune of signaling networks to meet the ever-changing demands of the tumor.

Biography

Mariam Ahmed Fouad has completed her Masters' degree from Faculty of Pharmacy, Cairo University and currently she is a Doctoral Student in Cancer Biology Department- Pharmacology Unit-Egyptian National Cancer Institute. She is an Assistant Lecturer of Pharmacology, Drug Monitoring and Tissue Culture Specialist. She has published a paper in *Human and Experimental Toxicology Journal*-SAGE publishing and has been serving as a Reviewer for couple of papers for the same journal. She has achieved 'The British University in Egypt (BUE)' Prize in the innovation of new trends and methods for colon cancer prevention and treatment suitable for the developing countries.

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