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INFLUENCE OF EXTRACELLULAR PROTEIN ON THE CYTOPROTECTIVE EFFECTS OF TWO MODEL PHYTOCHEMICALS

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Introduction: Consumption of antioxidant compounds in the diet may provide cytoprotection against oxidative damage associated with diseases or exposure to toxic agents. We have investigated the influence of extracellular protein-binding on the cytoprotective properties of two free-radical-scavenging natural products: quercetin (Q) and epigallocatechin-3-gallate (EGCG). Cytoprotection was determined by the ability of Q/EGCG to reduce the toxicity elicited by the oxidant *tert*-butyl hydroperoxide (t-BHP) in human hepatoma HepG2 cells.

Methods: Confluent monolayers of HepG2 cells were exposed to t-BHP for five hours in the absence or presence of Q or EGCG in serum-free medium or medium containing low [2%(v/v)] or high [10%(v/v)] levels of serum, after which cell damage was assessed by neutral red uptake. Values are presented as mean \pm SD of 3 – 7 independent experiments. Statistical analyses were performed by unpaired t-tests.

Results: The results are displayed below; EC50 is the concentration of antioxidant that reduced the toxicity of t-BHP by 50%. Initial studies confirmed that the presence of serum (up to 10% v/v) was without effect on HepG2 viability. Furthermore, Q and EGCG were not toxic (up to a concentration of 100 μ g/mL) under any of the culture conditions. Q protected against the toxicity of t-BHP in a concentration-dependent manner, the potency of which was significantly reduced in the presence of high levels of serum ($P < 0.001$); the presence of low serum was without effect. The results obtained with EGCG were in line with those obtained with Q, although there appeared to be a concentration-dependent effect of serum.

Conclusion: The cytoprotective effects of Q and EGCG are modified by the presence of extracellular protein.

Biography

Maha Hashim has completed her PhD at the age of 39 years from The University of Nottingham, UK. She worked as a lecturer at AL-Kindy Faculty of Medicine, Baghdad University for 10 years (1999-2009). She participated with three members in biochemistry department / AL-Kindy Faculty of Medicine in accomplishment of practical biochemistry textbook for second-class students at in 2000. She worked as main consultant for 2 years (2001-2003) at Research Centre and Veterinary Medicine Production / Ministry of Industry in Iraq. She worked as external lecturer at Pharmacy department / AL-Mansour Institute / Baghdad for one year.

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Antioxidant	EC50 value (μ g/mL)		
	No serum	+ low serum	+ high serum
Q	17.9 \pm 1.8	16.1 \pm 2.4	39.9 \pm 4.5
EGCG	23.4 \pm 7.2	51.2 \pm 8.3	84.4 \pm 7.4