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Cellular and molecular actions of growth factors

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Growth factors and their receptors are important signaling molecules, which are involved in the regulation of cell growth. There are different types of growth factors causing different responses and there are many overlapping responses from some types. Epidermal Growth Factor (EGF) stimulates the phosphorylation of the ribosomal protein S6, whereas the activation of its receptor (EGFR) is associated with metastasis, poor prognosis and chemotherapy resistance. This receptor is over expressed in epithelial malignancies. Transforming Growth Factor Beta (TGF β -1) is a multifunctional type involved in the regulation of growth and differentiation of both normal and transformed cells and overexpressed in hepatocellular carcinoma tissues. A significantly higher serum level of EGF and TGF- β 1 was recently found in patients with hepatocellular carcinoma compared to their level in patients with chronic hepatitis C infection and control subjects. The levels of phosphorylated EGFR in hepatocellular carcinoma and chronic hepatitis C patients showed a highly significant difference between patients. Taken together, EGF and its phosphorylated form can be used as sensitive biomarkers for the diagnosis and prognosis of these diseases. In conclusion, various growth factors are involved in different biological processes, some of which have a clinical importance in disease.

Biography

Mahmoud Balbaa is a Professor of Biochemistry in Faculty of Science at Alexandria University, Egypt. He used to be a Head of the Department of Biochemistry at the same faculty from 2007 to 2009. He obtained his PhD degree from Hokkaido University, Japan in 1988 and worked in the field of protein phosphorylation, enzyme characterization in disease and enzyme inhibition at Faculty of Science, Alexandria University. He worked as a Professor of biochemistry in Beirut Arab University (2009–2014) and University of Qatar (2002–2006). In addition, he was a Postdoctoral Fellow of Hokkaido University School of Medicine and Faculty of Medicine, University of Toronto. He published more than 45 papers and serving as a Reviewer in some peer review journals. He is a Member of the Editorial Board of Biochemistry & Physiology: Open access.

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