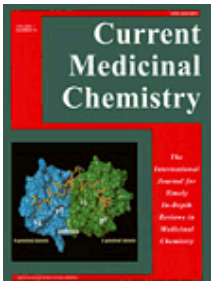
Anti-Cancer Therapeutic Approaches

Anti-Cancer Therapeutic Approaches Based on Intracellular and Extracellular Heat Shock Proteins



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Source: Current Medicinal Chemistry, Volume 14, Number 27, November 2007 , pp. 2839-2847(9)

Publisher: Bentham Science Publishers

Abstract:

Stress or heat shock proteins (Hsps) Hsp90, Hsp70 and Hsp27 are chaperones that assist the proteins in their folding, stability, assembly into multi-protein complexes and transport across cellular membranes. The expression of some of them is highly induced in response to a wide variety of physiological and environmental insults. Hsps have a dual function depending on their intracellular or extracellular location. Intracellular Hsps have a protective function. They allow the cells to survive to lethal conditions. The cytoprotective functions of Hsps can largely explain by their anti-apoptotic properties. Hsp90, Hsp70 and Hsp27 can directly interact with different proteins of the tightly regulated programmed cell death machinery and thereby block the apoptotic process at distinct key points. In cancer cells, where the expression of Hsp27, Hsp70 and/or Hsp90 is frequently abnormally high, they participate in oncogenesis and in resistance to chemotherapy. Therefore, the inhibition of Hsps has become an interesting strategy in cancer therapy. In contrast to intracellular Hsps, extracellular located or membrane-bound Hsps mediate immunological functions. They can elicit an immune response modulated either by the adaptive or innate immune system. In cancer, most immunotherapeutical approaches based on extracellular Hsps exploit their carrier function for immunogenic peptides. This review will discuss this different and often paradoxical

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approaches in cancer therapy based on the dual role of Hsps, protective/tumorigenic versus immunogenic.

See original abstract

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