Membrane heat shock protein 70: a theraanostic target for cancer therapy.

Abstract:
Members of the 70 kDa stress protein family are found in nearly all subcellular compartments of nucleated cells where they fulfil a number of chaperoning functions. Heat shock protein 70 (HSP70), also termed HSPA1A, the major stress-inducible member of this family is overexpressed in a large variety of different tumour types. Apart from its intracellular localization, a tumour-selective HSP70 membrane expression has been determined. A membrane HSP70-positive tumour phenotype is associated with aggressiveness and therapy resistance, but also serves as a recognition structure for targeted therapies. Furthermore, membrane-bound and extracellularly residing HSP70 derived from tumour cells play pivotal roles in eliciting anti-tumour immune responses. Herein, we want to shed light on the multiplicity of different activities of HSP70, depending on its intracellular, membrane and extracellular localization with the goal to use membrane HSP70 as a target for novel therapies including nanoparticle-based approaches for the treatment of cancer. This article is part of the theme issue 'Heat shock proteins as modulators and therapeutic targets of chronic disease: an integrated perspective'.