



# Autophagy: Chapter 21. Hypoxia-Induced Autophagy Promotes Tumor Cell Survival

*Qipeng Zhang, Ke Zen*

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Macroautophagy (hereafter referred to as autophagy) is a highly conserved biological process that degrades and recycles damaged, misfolded proteins or long-lived organelles. Previous studies show that hypoxia is common in solid tumors, and that hypoxia-induced autophagy is also found in these tumor cells. This chapter summarizes the recent literature on hypoxia-induced autophagy and reviews the prosurvival role of hypoxia-induced autophagy. We first review the mechanism of hypoxia-induced autophagy, and then analyze the several aspects of the protective role of this autophagic response for tumor cells: hypoxia-induced autophagy prolongs the lifespan of tumor cells, stimulates a more aggressive phenotype, and elevates the incidence of metastasis. Furthermore, hypoxia-induced autophagy enhances the resistance of tumor cells to cancer therapy. Potential autophagy inhibitors, including pharmacological inhibitors and siRNA or microRNA of autophagic genes, are reviewed and listed in the chapter. In summary, hypoxia-induced autophagy promotes tumor cell survival. There is evidence of a tumor-suppressive role of autophagy in tumorigenesis, and the often observed autophagic cell death in extreme stress conditions is also discussed in this chapter. These phenomena can be attributed to the outcome of failed autophagic adaptation.



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