Phototheranostics to modulate tumor hypoxia and overcome treatment resistance

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Abstract: The tumor microenvironment (TME) plays a critical role in cancer progression and treatment response. The crosstalk between cancer cells and non-cancerous cells present in the tumor, such as fibroblasts and vascular cells, can facilitate tumor growth, suppress immune response, and imped the delivery of anti-cancer agents. Additionally, biochemical and biophysical features of the TME such as tumor hypoxia, acidosis, and high aerobic glycolysis, are distinct from normal tissue. Therefore, targeting the TME is a promising approach to improve cancer diagnosis and therapy. In this talk, I will present our recent research on phototheranostics, which are designed to diagnose tumors, modulate the hypoxic TME, and overcome treatment resistance associated with hypoxia. Our findings suggest that targeting the TME is an effective way to achieve precise tumor imaging and enhanced therapy.