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# Optical molecular imaging for tumor detection and image-guided surgery

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## ABSTRACT

We have witnessed rapid development of fluorescence molecular imaging of solid tumors for cancer diagnosis and image-guided surgery in the past decade. Many biomarkers unique to cancer cells or tumor microenvironment, such as cell surface receptors, hypoxia, secreted proteases and extracellular acidosis have been characterized, and can be used to distinguish cancer from normal tissue. A variety of optical imaging probes have been developed to target these biomarkers to improve tumor contrast over the background tissue. Unlike conventional anatomical and molecular imaging technologies, fluorescent imaging method benefits from its safety, high-spatial resolution and real-time capability, and therefore, has become a highly adoptable imaging method for tumor detection and image-guided surgery in clinics. In this review, we summarize recent progress in ‘always-ON’ and stimuli-activatable fluorescent imaging probes, and discuss their potentials in tumor detection and image-guided surgery.

**KEYWORDS:** cancer molecular imaging, stimuli-responsive nanomaterials, tumor microenvironment, cancer diagnosis, image-guided surgery

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