



Theragnostic Nanomedicine

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Recent advances in nanotechnology and biotechnology have contributed to the development of multifunctional nanoparticles that enable the targeted delivery of imaging agents and therapeutic agents for biomedical applications. Compared to small molecules (e.g., imaging agents and therapeutic agents), nanoparticles possess unique characteristics such as multi-functionality, multi-valency and long circulation time in the blood. As a result, nanoparticles hold great potential in the future biomedical field as novel molecular imaging, diagnostics, and the drug delivery system. Moreover, the combination of both imaging agents and therapeutic agents within a single nanoplatform, often referred to as theragnostic nanomedicine, make it possible not only to provide useful information for monitoring drug delivery, drug release, and therapeutic efficacy of drug, but to also perform diagnosis and therapy simultaneously. Theragnostic nanoparticles containing diagnostic and therapeutic function allow in vivo real-time imaging of the diseased site, monitoring the biodistribution of drug and determining the optimal therapeutic efficacy following treatments. These features can allow clinicians to select optimal therapeutic options for personalized medicine.