



Polymer Modified Nanoparticles as Contrast Agents for the Non-invasive Measurement of pH *in vivo*

Stephen G. Boyes

Summary: A non-invasive and accurate method for *in vivo* pH measurements

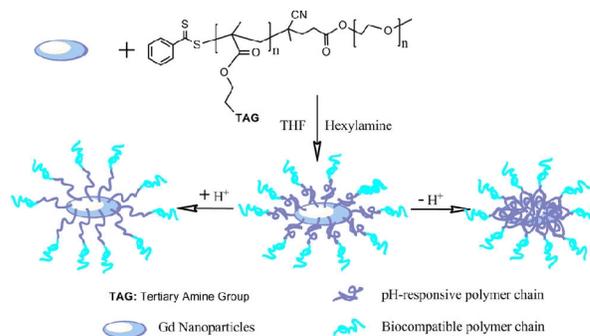
Description: A low extracellular pH (pHe) in many solid cancer tumors is an important factor in producing more aggressive cancer phenotypes and in causing metastasis of the primary carcinoma, both of which are leading causes of cancer morbidity and mortality. Thus, the ability to measure tumor pHe *in vivo* using a non-invasive technique that provides high spatiotemporal resolution has the potential to improve cancer treatments. In this work, a novel pH responsive nanoscale multimodal contrast agent has been developed for magnetic resonance imaging (MRI) and computed x-ray tomography (CT). The imaging agents are based on hybrid gadolinium-iodine nanoparticles that have been surface modified with pH responsive multifunctional polymers. They have molecular targeting capabilities and demonstrates large changes in relaxivity to improve both the selectivity and sensitivity of *in vivo* pHe measurement. This means that the growth of tumor and the effectiveness of the cancer treatments can be determined much sooner than is currently available and these treatments would be able to be adjusted for greater efficacy. In addition there are many other diseases (e.g., diabetes, pulmonary hypertension, cardiac disease, etc.) that involve the development of hypoxic conditions and, consequently, *in vivo* acidic pH.

Main Advantages of this Invention

- Flexible construct
- Can be used to treat a wide variety of diseases
- Uses imaging instruments that are already available in hospitals

Potential Areas of Application

- Personalized medicine
- Monitoring of cancer treatments
- Potential to apply to any disease causing inflammation



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Intellectual Property Status: US utility patent application pending (#14/642,464)

Opportunity: We are seeking an investor or strategic partner to help develop this portfolio.

For more information contact:

William Vaughan, Director of Technology Transfer

Colorado School of Mines, 1500 Illinois Street, Guggenheim Hall Suite 314, Golden, CO 80401

Phone: 303-384-2555; e-mail: wvaughan@mines.edu