



University of Central Florida

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Detect Free Radicals and Monitor Chronic Inflammation Without Adverse Side Effects

UCF researchers have created a stable, effective, cerium oxide nanoparticle-based therapeutic device designed to treat patients with a broad range of ailments—including cancer chemotherapy, transplants or prosthetic devices, and ailments with a pro-inflammatory component, such as Crohn's disease, inflammatory bowel disease, arthritis, ulcerative colitis, multiple sclerosis, and Alzheimer's—while causing no adverse side effects or toxicity.

While cerium oxide (nanoceria) can detect an excess of reactive oxygen species—also known as ROS or free radicals—that indicate areas and levels of inflammation, free-flowing nanoceria is toxic to the human body, a factor severely limiting its therapeutic use in the past. Now, a new therapeutic device encapsulates nanoceria in a way that retains its ability to detect ROS while providing an imaging component, to monitor levels of inflammation when treating patients with pro-inflammatory ailments. Because this therapy is classified as an implantable prosthetic, rather than a drug, its process for adoption and availability to patients is faster and simpler.

Technical Details

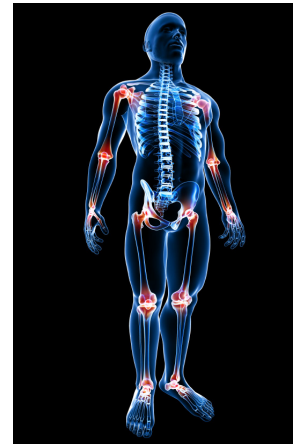
This new device, a nano-sized encapsulated unit comprised of two separate compartments, each externally permeable, contains nanoceria in one and a fluorophore imaging agent in the other. Nanoceria, when in the presence of excess ROS, affects the fluorophore by altering its level of fluorescence emission (increase or decrease in the signal measured via optical methods), altering its magnetic relaxation (increase or decrease in the signal assessed via MRI), or altering other properties such as X-ray contrast. The combined detection and imaging components provide a method for monitoring ROS levels indicating inflammation.

UCF Inventors

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Keywords

cancer, nanoceria, ROS, reactive oxygen species, inflammation, cancer chemotherapy, transplants, prosthetic devices, Crohn's disease, inflammatory bowel disease, Alzheimer's disease, multiple sclerosis, free radicals



Benefits

- Widely effective
- Non-toxic
- Not subject to extensive drug testing and approval process

Applications

- Alzheimer's disease
- Cancer chemotherapy
- Transplants or prosthetic devices
- Crohn's disease
- Inflammatory bowel disease
- Arthritis
- Multiple sclerosis
- Ulcerative colitis

Tech Fields

Cancer, Nanotechnology

If you or your company are interested in this opportunity, Contact:

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