Ready to start planning your care? Call us at 800-525-2225 to make an appointment.
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Smart Imaging Agents

One main topic of our lab is to develop novel imaging agents that only produce a signal once they have interacted with their designated target. The most prominent example are fluorochromes, which are quenched (no signal) when in proximity of their target but whose signal is recovered once they separate from each other, induced by enzymatic cleavage. The main advantage of such agents is the reduced background signal and thus the increased signal-to-noise ratio and the ability to indicate a molecular activity in contrast to the pure presence of a protein.

We are developing activatable imaging agents in various forms.

Activatable nanoparticles

Recent developments in the disciplines of materials science, physics, chemistry, and biology have led to the formation of the field of nanotechnology. Defined as the manipulation of matter on the atomic and molecular scale, nanotechnology holds great promise for medicine and also some challenges. For the purposes of detecting (diagnostic) and treating (therapeutic) disease, a wide variety of nanotechnological constructs have been proposed, built, and tested. In this group of projects, we are developing molecular imaging agents that seek to couple the unique magnetic, physical, and chemical properties emergent at the nanoscale with disease-relevant triggers. These include magnetic resonance, optical and radiological imaging constructs that reveal the presence and enable stratification of malignancy. Additionally, we are investigating the further derivatization of activatable imaging agents with delivery of cancer-specific treatments to create theranostic agents that deliver treatment and can at the same time be detected with imaging modalities (PET, MRI, etc.).

We are currently working on:

- an activatable nanoparticle for MRI
- a microenvironment-responsive, self-reporting nanoparticle for advanced therapies
- Cerenkov-based nanoparticle systems
- demasking concepts

Small molecule systems

Here small molecular agents are undergoing enzymatic conversion to produce a signal. These signals can be detected with optical imaging, MRI, or nuclear medicine. Some of these agents are also geared toward therapy (prodrug concept). All of the agents are synthesized at Memorial Sloan Kettering, either in the lab or in collaboration with core facilities.

All our agents are geared toward clinical translatability, one major interest being prostate cancer diagnosis and therapy.

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