

Real-Time Radiochromic Dosimeter (RTRD)

Overview of Technology:

Researchers at University Health Network have recently developed an innovative optical dosimeter platform for real-time monitoring of radiation dose delivered to radiotherapy patients at a specific point. Radiotherapy quality assurance is being widely accepted by radiation oncologists and physicists as a necessary step in the treatment process of each individual patient. This dosimeter will attend to the growing need to monitor dosage during radiotherapy treatment of cancer. Ideally, the radiation dose measured in a patient should be correlated with the treatment plan in order for the treatment to be effective and safe. This technology is expected to be a disruptive addition to the current radiation dosimeter market as well as enabling an entire new class of radiotherapy techniques.

Other unique advantages of this platform are its magnetic resonance (MR)-compatibility, water equivalent composition, and real time read out capabilities. Furthermore, it is a passive dosimeter because of the optical media used. As a result the overall signal to noise (SNR) is improved greatly by simply adjusting the amount of interrogating light and can be read out a multitude of times without any deterioration of the information. Development efforts are currently underway to optimize the probe design for low cost manufacturing.

This technology is patent protected in the United States of America and is available for exclusive global licensing.

Related Publications:

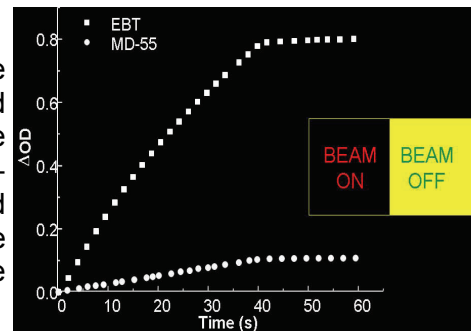
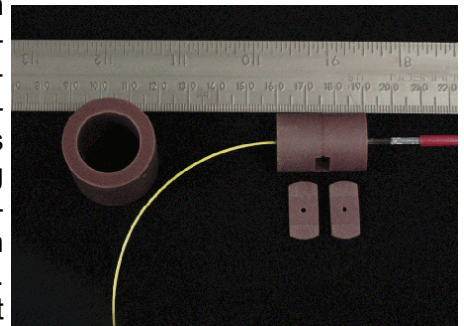
- Rink, A., Vitkin, I.A., and Jaffray, D.A. Suitability of radiochromic medium for real-time optical measurements of ionizing radiation dose. *Med Phys.* **32(4)**, 1140-55 (2005)
- Rink, A., Vitkin, I.A., and Jaffray, D.A. Characterization and real-time optical measurements of the ionizing radiation dose response for a new radiochromic medium. *Med Phys.* **32(8)**, 2510-6 (2005)
- Rink, A., Vitkin, I.A., and Jaffray, D.A. Energy dependence (75 kVp to 18 MV) of radiochromic films assessed using a real-time optical dosimeter. *Med Phys.* **34(2)**, 458-463 (2007)

Patent:

US7,399,977 - Issued Jul 15 2008

Inventors:

Alexandra Rink, David Jaffray, Alex Vitkin



Change in OD with Exposure and Time

UHN Reference # - 3002