

Postdoctoral Fellow, Research Scientist and Instructor in Biomedical Research and Medical Physics

We are looking for skilled and enthusiastic candidates to fill Postdoctoral Fellow, Research Scientist, and Instructor positions in the Biomedical Imaging and Radiation Technology Laboratory (BIRTLab). **Our mission is to innovate, develop, and apply biomedical technology to empower cancer research.** Successful candidates will be joining our team to work on one of the following projects to a) establish novel in vivo optical imaging systems for 3D in vivo cell tracking, b) radiation guidance, or c) determine therapeutic efficacy of an emerging radiation cancer therapy, FLASH.

Specifically, the project a) involves developing an ultra-sensitive fluorescence lifetime single pixel imaging (SPI) system to overcome the limitations of conventional imaging techniques in detecting low-level in vivo optical signals emitted from luminescent cells. The primary objective of this project is to achieve 3D in vivo cell tracking to understand the migration patterns of cancer cells and the responses of immune cells to therapeutic interventions. This will facilitate the development of cancer therapies. The project will encompass the establishment of an optical SPI system, image reconstruction algorithm, and related biological experiments.

The project b) aims to develop 3D bioluminescence and fluorescence tomography as an advanced image-guided system for enabling high-precision radiation delivery in animal models. The 3D optical tomography is expected to overcome the challenge of locating soft tissue target or tumors using conventional X-ray image, reduce radiotherapy research uncertainties, and provide quantifiable treatment outcome. The imaging capabilities of the optical tomography are particularly important at the present time when radiation is being tested not only for its efficacy as a local control agent but also as an effective modulator with other systematic therapy. This project will include the development of the tomography system, 3D optical reconstruction algorithm, and biological experiments.

The project c) aims to determine if FLASH increases the tolerance of a late-responding organ vs. radiation therapy at a conventional dose rate. FLASH radiotherapy has sparked tremendous interest in the radiation oncology community due to its potential to reduce normal tissue toxicity without compromising tumor control; however, toxicity data for late-responding organs are lacking. The findings will significantly enhance our understanding of radiation-induced toxicity in late-responding organs, facilitating the translation of FLASH-RT into clinical practice and informing the design of future clinical trials. The project will encompass the radiation dosimetry, in vivo dose and dose rate verification, FLASH system commissioning, and evaluation of biological responses to radiation.

These projects are multi-disciplinary and integrate engineering, algorithm development, optics, radiation physics, biology, and industrial components.

BIRTLab provides an outstanding environment to grow candidates toward successful careers.

- Lab director Dr. Wang works tirelessly with candidates to ensure they meet their career goals. Through attentive guidance, he encourages members to think creatively and develop their own research projects. All activities are supported by extramural funding through the NIH and Texas CPRIT.

- Successful members are also eligible for basic clinical medical physics training and a tuition fee waiver to enroll in a certificate program with CAMPEP-accredited courses, which covers medical physics didactic elements for people who enter the medical physics profession through an alternative pathway.

Multi-disciplinary projects, a strong research environment, and the medical physics pathway together provide a unique opportunity to prepare the candidate for careers in academia and industry, or to become a professional medical physicist in the U.S.

Candidates with established experience in **computational imaging, analytical calculation, numerical algorithm, tissue optics, biomedical optical system design and development, radiation physics and dosimetry are desired**. Candidates who hold Ph.D degrees in optics, physics, mathematics, biomedical engineering are encouraged to apply. Further details about the BIRTLab and projects can be found at <https://www.utsouthwestern.edu/labs/birt/>

Position and compensation are based on candidates' experience and NIH scale with competitive benefits. Interested candidates should send a statement of interest, CV, and the contact of 3 references to:

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