Stephenson School of Biomedical Engineering Seminar Series Presents

SYNERGIZING PHOTOTHERAPY AND IMMUNOTERAPY FOR METASTATIC CANCERS

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Biomedical Education and Research
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1:30 p.m.

Friday, September 6, 2019 | OMU, Associates Room (Third Floor, North)

BIO:

Dr. Wei Chen received his Ph.D. degree in theoretical high-energy particle physics from the University of Oregon in 1988. He changed his research focus from particle physics to cancer in 1994. In 1999, Chen joined the UCO faculty. During the past 25 years, he has been working on novel cancer therapies. He is the co-inventor of laser immunotherapy (LIT), a novel treatment method for metastatic cancers. Chen and his collaborators have developed LIT from a simple benchtop concept to a potential bedside clinical tool, with promising outcomes in preliminary clinical trials for melanoma and breast cancer. He has published more than 150 peer-reviewed articles and has been awarded nine U.S. patents. He has received more than $7 million in research and education funding. Awards include the 2008 U.S. Professor of the Year award, 2011-2012 U.S. Fulbright Lecturing/Research Award, 2012 Medal for Excellence in Teaching from the Oklahoma Foundation for Excellence and 2012 SPIE Educator Award.

ABSTRACT:

Metastasis causes 90% of cancer-related deaths. Cancer develops due to the failure of the host immune surveillance and defense system. Because of the immunological root cause of cancers, immunotherapy has been considered as the most promising treatment modality. The 2018 Nobel Prize in Physiology or Medicine, awarded to the "discovery of cancer therapy by inhibition of negative immune regulation", epitomized the importance of cancer immunotherapy. My research group has been working in the past 25 years in developing a novel approach, laser immunotherapy (LIT), to synergize phototherapy and immunotherapy to fight against cancers by activating, enhancing, and directing the host immune system. LIT uses the combination of local laser irradiation and local administration of an immunological stimulant to induce tumor-specific immune responses. Our pre-clinical studies and preliminary clinical trials showed that LIT could not only destroy the treated primary tumors but also eradicate untreated metastatic tumors at distant sites, leading to long-term survival and tumor resistance. In this talk, the history and current status of cancer, and the history of cancer immunotherapy, will be briefly introduced. Then, LIT – its components, procedures, and mechanism – will be presented. The results of our preliminary clinical studies on melanoma and breast cancer, as well as the recent results on LIT treatment of pancreatic cancer in animal studies, will be discussed. If time permits, I will also talk about our research on developing nanoplatforms to synergize photothermal, photochemical, and photoimmunological interactions for cancer treatment.

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