Emergence of Stem-Like Cells in Prostate Cancer Drug Resistance

with Dr. Richard Jove
Vaccine & Gene Therapy Institute of Florida
(VGTI Florida)

Webinar Date:
March 18, 2014 from 12:30—1:30p.m.

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Topic:
Dr. Richard Jove will present information on how precision medicine can improve upon conventional medicine. In particular, how innovative targeted therapy is the solution to prostate cancer which is resistant to traditional therapy.

Prostate cancer is the most common cause of cancer-related death among males in the United States. Previous studies have indicated a major role for Androgen Receptor (AR) as well as Signal Transducer and Activator of Transcription 3 (STAT3) proteins in prostate cancer. AR is important for prostate cancer progression, and androgen deprivation often leads to drug resistance and eventual cancer recurrence. Activation of STAT3 in tumor cells prevents apoptosis and promotes cell proliferation. In the tumor microenvironment, STAT3 activation enhances angiogenesis and suppresses anti-tumor immune responses. Communication between tumor cells and stromal cells in the tumor microenvironment, by inflammatory cytokines like interleukin (IL)-6, results in a feed-forward loop that enhances cancer progression and confers resistance to therapy. Recently, we have uncovered another critical role for STAT3 in cancer progression and resistance to therapy. Our results demonstrate that blockade of AR mediates activation of STAT3 signaling through up-regulation of IL-6, which is associated with development of a stem-like cancer cell phenotype. Conversely, inhibition of the IL-6/STAT3 pathway diminishes the stem-like cancer cell population, and results in reduced tumor growth. These findings provide new mechanistic insights into the role of STAT3 activation upon AR blockade on prostate cancer relapse and drug resistance. We further propose inhibition of STAT3 signaling in combination with anti-androgens as a potential strategy to prevent emergence of drug-resistant recurrent prostate cancer.

Speaker:
Dr. Richard Jove is the president and director of VGTI Florida. He received his pre-doctoral training at Columbia University and his post-doctoral training at Rockefeller University. He began his independent research career at the University of Michigan Medical School in Ann Arbor, where he was also Director of Molecular Oncology. Dr. Jove has also held positions at the H. Lee Moffitt Comprehensive Cancer Center, Beckman Research Institute and the NCI Comprehensive Cancer Center. His group was the first to directly link STAT3 signaling to cancer and immune evasion, as well as validate STAT3 as a new molecular target for cancer therapy.

Company Description:
VGTI Florida, established in 2008, is a non-profit biomedical research institute dedicated to the study of the human immune system and its role in disease. Research at VGTI Florida is aimed at development of vaccines, immunotherapy and other targeted molecular and cellular therapies that boost the immune system. This research is focused on cancer, infectious diseases as well as other diseases impacted by deficient immune systems and aging. VGTI Florida is located at the Tradition Center for Innovation in Port St Lucie, Florida.

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