PULSUS
WWW.PULSUS.COM

EMERGING DISEASES AND PREVENTIVE MEDICINE

Targeting KRAS mutant cancer cells by inducing a cytotoxic oxidative stress

Dos Sarbassov

ABSTRACT

Kirsten rat sarcoma (KRAS) mutant cancers represent highly malignant oncologic disorders with a poor clinical outcome that are common in pancreatic, colorectal, and lung human cancers. There are no effective therapies have been developed to treat the KRAS mutant cancers, because it encodes a small GTPase that does not provide any distinctive "druggable" pocket for its targeting. Thus, a specific targeting of this highly malignant oncogenic pathway is one of the most challenging and demanding tasks in oncology. Accelerated growth of cancer cells sets a distinct metabolic surge that drives elevated glycolytic consumption of glucose by cancer cells defined as the Warburg effect. Addiction to glucose is advantageous for tumorigenesis but it becomes a major flaw for cancer cells under glucose deprivation that is highly relevant to the KRAS mutant cancer cells. A glucose addiction renders the cancer cells sensitive to glucose starvation by causing dramatic metabolic stress impending an imminent apoptotic cell death. The apoptotic event is triggered by metabolic stress linked to ATP depletion. Consequently, it leads to the aberrant mitochondrial function and causes an excessive generation of reactive oxygen species (ROS). The robust and sustained production of ROS is a key factor leading to cytotoxicity of the glucose deprived cancer cells.

BIOGRAPHY

Dos Sarbassov works at the Department of Biology, Nazarbayev University, Nur‑Sultan, Kazakhstan.

PUBLICATIONS

Dos Sarbassov, Phosphorylation and regulation of Akt/PKB by the rictor-mTOR complex

Dos Sarbassov, mTOR interacts with raptor to form a nutrient-sensitive complex that signals to the cell growth machinery

Dos Sarbassov, Prolonged rapamycin treatment inhibits mTORC2 assembly and Akt/PKB

Dos Sarbassov, Growing roles for the mTOR pathway

Dos Sarbassov, Rapamycin derivatives reduce mTORC2 signaling and inhibit AKT activation in AML

International Conference on Oncology and Cancer, Webinar | June 02, 2020

Department of Biology, Nazarbayev University, Nur‑Sultan, Kazakhstan

Citation: Dos Sarbassov, Targeting KRAS mutant cancer cells by inducing a cytotoxic oxidative stress, International Conference on Oncology and Cancer, Webinar, June 02, 2020, 03