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Annual Congress on

Cell Science, Stem Cell Research & Pharmacological Regenerative Medicine

November 29-30, 2017 | Atlanta, USA

Novel, non-toxic rifamycin that reverse drug resistance in cancers through modulation of oxidative stress: Dual mode of action

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We have discovered a novel chemosensitizer (RTI-79, a rifamycin-derivative) with a broad spectrum of action that includes ovarian cancer and double and triple hit non-Hodgkin's lymphoma. RTI-79 is relatively non-toxic and has favorable *in vivo* safety and pharmacokinetic (PK) profiles. RTI-79 in combination therapies is effective in multiple drug resistant cancers in mouse models. RTI-79 works by dramatically increasing intracellular reactive oxygen species (ROS), primarily superoxide, through redox cycling. The level of ROS induction is directly correlated with drug sensitivity. Importantly, RTI-79 also triggers the unfolded protein response (UPR) that results in increased ubiquitination and loss of Nuclear factor erythroid–related factor 2 (Nrf2), the primary sensor for intracellular ROS. Thus, RTI-79 both increases ROS and squelches Nrf2's ability to respond to ROS. This unique mechanism provides a broad and novel approach for the very safe application of RTI-79 and other rifamycin, in treating drug resistant cancers.

Speaker Biography

Seyed H Mousavi-Fard has a demonstrated history of working in the higher education academia. He has advanced experimental skills in diverse fields ranging from Diagnostics, Molecular and Cellular Biology, Genetics, Cancer Biology and Virology area. He is a Research Professional with a PhD in Medical Sciences focused on Cancer Biology from Texas A&M University System Health Science Center, College of Medicine. He is effectively collaborating with several scientists with minimal supervision. He is responsible for study protocol design and maintenance, data generation and collection, resulting in expedited study completion and data output in undertaking projects.

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