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Novel biological pathways linking diabetes to colorectal cancer

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NADPH oxidase (NOX) enzymes are a family of heme-containing transmembrane proteins whose basic function is ROS production. In fact, diabetes has been shown to increase the generation of reactive oxygen species (ROS) and NOX-generated ROS have been linked to injury to various organs including the colon. Our main aim is to explore the mechanism by which diabetes-induced ROS accelerate colorectal tumor development and burden. Our results showed that treatment with high glucose and/or high insulin lead to a decrease in AMPK activity, increase in mTOR activity, ROS production and 8-oxodG adducts in CaCO2 and Ht-29 cells. High glucose and high insulin treatment also affected the cells' proliferation, migration and invasion properties. Our results also show that metformin and/or rapamycin treatments reverse those effects. Moreover, results from APC mice treated with metformin further exhibited the ability of this drug to attenuate NOXs expression caused by diabetes. These results reveal a novel molecular mechanism involved in colorectal cancer in diabetic patients and potential therapeutic methods for controlling CRC aggressiveness.

Biography

Fatima A Mohsen is currently a PhD student at the University of Strasbourg, France in collaboration with the American University of Beirut, Lebanon. She has published a research paper as a result of her Master's thesis project attained from the Lebanese University, Lebanon.

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