DukeNUS Medical School

Signature Seminar Series (Virtual)

Lipid Peroxidation, Lipohormesis And Lipotoxicity In Pancreatic Beta Cells

ABOUT THE LECTURE

Little is known about the impact of lipids, phospholipid turnover and metabolism within membranes of insulin granules in pancreatic beta cells. We report that increasing levels of glucose and saturated fatty acids affect beta cell function and viability in a biphasic manner: non-cytotoxic levels of glucose and palmitic acid induce a hormetic response, which augments insulin secretion. In contrast, high levels synergistically attenuate insulin secretion and progressively cause apoptotic beta cell death. Both the hormetic and detrimental processes are tightly linked to membrane phospholipid remodeling, enhanced lipid peroxidation and activation of PPARδ. The basis of these interactions includes enzymatic and non-enzymatic metabolism of polyunsaturated fatty acids and the emergence of mediators (e.g., 4-hydroxynonenal) that act at low levels as activating ligands of PPARδ, while being cytotoxic alkylating agents at high levels. In addition, monounsaturated fatty acids, products of desaturation of saturated fatty acids by the enzyme SCD1, protect the cells by enhancing the incorporation of saturated fatty acids into triglycerides and their sequestration in newly formed lipid droplets.

Speaker: **Prof Shlomo Sasson, PhD**
Director
Singapore-HUJ Alliance for Research & Enterprise
SHARE/CREATE
Singapore



Host: **Prof Patrick Casey**
Senior Vice Dean, Research
Duke-NUS Medical School

Date: **Tuesday, 29 June 2021**

Time: **3.00 PM - 4.00 PM**

Zoom Details: https://nus-sg.zoom.us/j/88019030053?pwd=M0oyYUgrZFZycmY3MTJHUmZwUEs2Zz09
Meeting ID: 880 1903 0053
Passcode: SSS2021
(Note: Please rename your login name to include your institution to facilitate admission)

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ABOUT THE SPEAKER

Shlomo Sasson, PhD, is the Director of SHARE in the CREATE programme. He graduated from the Hebrew University of Jerusalem (HUJI). Following a post-doctoral training at the University of Rochester (NY, USA) in 1984. He joined the Department of Pharmacology of HUJI Faculty of Medicine, and has been involved in diabetes research. His group discovered the autoregulation of glucose uptake, developed bi-functional antihyperglycemic compounds and recently has studied the role of lipid turnover in beta cells.