

International Conference on

Lipid Science & Technology

November 30 - December 02, 2015 San Francisco, USA

Novel revelations in familial hypercholesterolemia and physiological anticoagulant lipids

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Lipids play pivotal role in the preservation of homeostasis in the physiological milieu. However, certain diseased states detrimentally affect the metabolism of lipids in turn disconcerting the fulcrum of homeostasis. Case in point, heterozygous familial hypercholesterolaemia (HeFH) a genetic disorder associated with considerable morbidity and mortality. The most common defect is loss-of-function (LOF) mutations in the low-density lipoprotein (LDL) receptor alleles (over 1600 mutations having been reported). Other more infrequent causes of FH are defects in apolipoprotein B (ApoB), (the protein in the LDL particle that binds to the LDL receptor) and gain-of-function (GOF) mutations in the pro-protein convertase subtilisin/kexin type 9 (PCSK9). In the first part of the disquisition, we appraise the effect of two new mutations on different protein-structural levels, identified in the LDL-receptor and PCSK9 genes in two Omani Arab families diagnosed with FH, according to Simon-Broome criteria, employing *in silico* tools. We also assess the mode of inheritance of these two mutations. The fact that lipids also exhibit cardio-protective activity is not a very well-investigate niche. The second part of the discourse is dedicated to the recently discovered anticoagulant effect of acylcarnitines. Our studies show that acylcarnitines inhibit factor Xa-initiated clotting. Inhibition of factor Xa by acylcarnitines is greater for longer acyl chain lengths. Mechanistic studies show that 16:0 acylcarnitine has anticoagulant activity in the absence of factor Va or phospholipids. Surface plasmon resonance investigations revealed that 16:0 acylcarnitine binds to factor Xa, and that binding is independent of the γ -carboxy glutamic acid domain.

Biography

Yajnavalka Banerjee obtained his PhD from the National University of Singapore (NUS) and received his postdoctoral training at the reputed The Scripps Research Institute, La Jolla USA and Max-Planck Institute for Biophysical Chemistry Göttingen, Germany. He is currently, Associate Professor of Biochemistry in the College of Medicine and Health Sciences, SQU in Oman. He has published more than 40 papers in reputed internationally refereed journals and, is on the editorial board six journals. Banerjee also has two patents related to anticoagulant peptides.

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