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2nd International Conference and Expo on

Lipids: Metabolism, Nutrition & Health

October 03-05, 2016 Orlando, USA



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Novel ways of lipid loading cells to study macrophage functions

Generation of foam cells, an essential step for reverse cholesterol transport (RCT) studies, uses the technique of receptor Gdependent macrophage loading with radiolabeled acetylated low density lipoprotein (Ac-LDL). In this study, we used the ability of a biologically relevant detergent molecule, lysophosphatidylcholine (LysoPtdCho), to form mixed micelles with cholesterol or cholesteryl ester (CE) to generate macrophage foam cells. Fluorescent or radiolabeled cholesterol/LysoPtdCho mixed micelles were prepared and incubated with RAW 264.7 or mouse peritoneal macrophages. Macrophages incubated with cholesterol or CE (unlabeled, fluorescently labeled or radiolabeled)/LysoPtdCho mixed micelles accumulated CE as documented by microscopy, lipid staining, labeled oleate incorporation, and by thin layer chromatography (TLC). Such foam cells unloaded cholesterol or CE/LysoPtdCho micelles would offer advantages over existing methods. Using this technique we demonstrated that such macrophages mimicked biological properties attributed to cholesterol loaded macrophages. Earlier, we had used similar technique to enrich cells with beta carotene. We suggest that this novel technique of delivering macromolecules to the cells could be further manipulated to deliver other hydrophobic large molecular cargos to the cells.

Biography

Sampath Parthasarathy MBA, PhD, was instrumental in the development of the concept of oxidized LDL and its contribution to atherosclerosis, a major form of cardiovascular disease. He is currently at the University of Central Florida as the Florida Hospital Chair in Cardiovascular Sciences and the Associate Dean of Research. He has published over 250 articles and has served on numerous Editorial Boards and NIH committees. He has been continuously funded by NIH and other agencies for over 30 years and was awarded the Distinguished Service Award by the American Heart Association, by the American Association of Cardiologists of Indian Origin and from SASAT International. He is also the recipient of the prestigious van Deenen Memorial Award for Lipids and the Ranbaxy Award for excellence in Cardiovascular Research.

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