



**DEPARTMENT OF CHEMISTRY
PONDICHERRY UNIVERSITY**

Invites you to the lecture on

"Endogenous lipid antigens"

By

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Bangalore, India.

Date: 6th August, 2013

Time: 4.00 pm

Venue: Department of Chemistry, PU

(Prof. K. Anbalagan)
(HOD)

**PROFESSOR & HEAD
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(Dr. C. Sivasankar)
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Endogenous lipid antigens

Abstract

Lipids once treated as energy reservoirs now discovered to play a more important role in biology. Lipids mostly contain a glycerol backbone, with two alcohol groups esterified with long chain fatty acids and one alcohol group is attached to a polar head group like phosphate, phosphocholine, phosphoserine or phosphoethanolamine. These lipids nicely fit in the grooves of CD1 family of proteins. CD1 family contains five members namely CD1a, CD1b, CD1c, CD1d and CD1e. In the first work we identified lipids that bind to CD1d and stimulate immune system. We extracted lipids from mouse thymocytes and isolated them to different fractions each containing an individual class of lipids. The most active fraction found to contain lyso plasmalogen phosphoethanolamines. To understand the importance of plasmalogens, we generated DHAPAT KO mice. DHAPAT is an essential enzyme for the biosynthesis of plasmalogens. Bone marrow chimera analysis and intrathymic injection experiments on wild type and KO mouse confirmed that there is a blockage in the maturation of iNKT cells in KO mouse and hence their count is less compared to the wild type mice. We argued that plasmalogens are important for thymic maturation of iNKT cells.

In the second work we identified that CD1 proteins are widely expressed on cancer cells. We identified that cancer cells stimulated better than healthy B cells during our experiments. To identify the source of stimulation we extracted lipids and isolated them to different fractions depending upon their polarity. The most active fraction found to contain an ether phospholipid. This lipid was extracted in large scale and isolated by preparative HPLC for the NMR analysis. Both MS and NMR analysis confirmed that the lipid molecule contains a methyl group attached to the phosphate head contrary to the conventional phospholipid. A synthetic lipid standard produced in this regard matched with the chromatographic, spectroscopic and biological behavior of the endogenous antigen.