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Throughput assay to examine nanostructures on the plasma membrane of immune cells

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Lipid raft nanostructures are present on the plasma membrane of plant and animal cells. Lipid rafts enriched in sterols, saturated lipids and cell-specific signaling receptors play an important role in cell-cell adhesion, cell signaling and vesicular trafficking. Proteins present in these nanostructures are potential targets for delivery of drugs and therapeutics into the cell interior. To facilitate the identification of target proteins it will be helpful to use throughput methods to isolate and examine their compositional heterogeneity. In addition, understanding the compositional and structural characteristics of these naturally occurring nanoparticles may inspire their fabrication. Currently synthetic nanoparticles used for drug delivery are less likely to meet the clinical expectations due to their toxicity and immunogenicity. Therefore, need of the hour is to fabricate natural bio-inspired nanoparticles incapable of generating immune and toxic effects. We have isolated lipid rafts from cultured T cell line by a detergent-free method and examined these nanoparticles by flow cytometer. Using this throughput method we have analyzed lipid rafts of >100 nm size and detected the presence of proteins in them. While this research is geared to understand the role of lipid rafts in cellular functions, we hope to explore its possible use as natural nanoparticle for drug and vaccine delivery.

Biography

Anil K. Bamezai has completed his Ph.D. at All India Institute of Medical Sciences, New Delhi, India and postdoctoral studies from Harvard University School of Medicine, Boston, Massachusetts, USA. He is an associate professor of Biology at Villanova University, in the greater Philadelphia area, Pennsylvania, USA. He has published 25 peer-reviewed articles, 8 book/conference periodical chapters. Recently, he has served as a guest editor of the journal "Immunology, Endocrinology and Metabolic agents in Medicinal Chemistry" and edited a volume titled "Lipid rafts and Signaling".

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