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A Novel Nano-Formulation Rich in α -Eleostearic Acid Mitigates Molecular Parameters Aggravated by Hyper-Sensitizing Allergens: Focus on Translational Research

Debjyoti Paul^{1,2,5*}, Krishnendu Manna³, Aaveri Sengupta³, Sayani Mukherjee¹, Sanjit Dey³, Prasanta Kumar Bag⁴ and Pubali Dhar^{1,2}

¹Laboratory of Food Science & Technology, Food & Nutrition Division, University of Calcutta, India

²Centre for Research in Nanoscience & Nanotechnology, University of Calcutta, India

³Department of Physiology, University of Calcutta, India

⁴Department of Biochemistry, University of Calcutta, India

⁵Division of Molecular Medicine, Bose Institute, India

Background: Empirical evidences to establish the higher bio-functionality of therapeutic lipids of nano-templated systems are starkly lacking. In this context, this work presents encouraging **real-time findings** against both **in vivo and ex vivo inflammation models** for a therapeutic lipid, **alpha-eleostearic acid (ESA)**, encapsulated in a novel and thoroughly characterized bio-compatible **nano-emulsion (NE)** system (particle sizes less than 200 nm).

Methods: A protocol involving high pressure homogenizer was developed to fabricate novel formulations of ESA and was characterized with standardized methods of DLS and TEM. Molecular biological tools and assays were employed to arrive at a definite conclusion.

Results: Among the treated experimental groups, the pro-inflammatory profile was found to be significantly mitigated in the hypersensitized rats administered with 0.25% ESA-NE formulation. ESA NE also restored the cell cycle phases of splenocytes to normal conditions and in a more emphatic manner as compared to ESA CE. The short-term effect of the formulations in the isolated human PBMCs challenged with and without lipopolysaccharide (LPS) for cell-surface bio-marker (CD 14, CCR5/CD195) expressions, also revealed novel findings.

Conclusion: The novel ESA NE formulation shows lot of palpable promise for clinical applications against pathogenic and delayed type-hypersensitivity.

Biography:

Dr. Debjyoti Paul is presently a post-doc in the laboratory of Sr. Professor Parimal Chandra Sen, Molecular Medicine division of the Bose Institute, Centenary Campus, located in Kolkata, India. Dr. Paul did his Ph.D. from the University of Calcutta in nano-formulations of therapeutic conjugated linolenic acid isomer, and has provided one of the earliest evidences of such lipids as nano-systems in ameliorating bio-molecular parameters against, diabetes, pathogenic mitogens and allergens. He has also been a pioneer in putting forward a stable formulation system to emulsify such PUFAs for clinical applications that can be nano-sized without leading to the formation of undesirable lipid-artifacts. His present focus is in developing nano-carriers to deliver novel drugs against mi-RNAs associated with Triple Negative Breast Cancer Cells.