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Role of macrophage in the regulation of hepatocyte fat metabolism

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Macrophage secretory products contribute to the pathogenesis of chronic liver diseases by sensing danger signals from damaged cells under pathogenic inflammatory conditions like fatty liver or infection. Liver resident Kupfer cells activate in ammosome and caspase-1 to proteolyse cytokines IL-1 and IL-18. The endogenous interleukin-1 receptor antagonist (IL-1Ra), secreted by activated monocytes and macrophages binds to IL-1 receptors & prevents IL-1 from sending a signal to that cell. Our study is designed to understand the molecular basis of inflammatory condition developed during fatty liver diseases which regulates hepatocyte fat metabolism. Cultured human THP-1 cells were differentiated into macrophages and stimulated by LPS to treat with BSA-Palmitate. The cytokines in THP-1 conditioned media (CM) were probed by ELISA or HPLC. HepG2 cells were treated with the CM & BSA-Palmitate. Fatty acid oxidation (FAO) was measured in HepG2. Fat deposition was qualitatively determined by Oil Red O and Triglyceride (TG) accumulation assay. Total RNA from HepG2 cells were isolated to probe gene expressions by RTqPCR. Some expressed proteins were determined by qPCR and immune-blotting. Recombinant IL-1 decreased FAO which was dose dependently reversed by IL-1Ra in HepG2 cells. IL-1Ra enriched CM from LPS stimulated THP-1 macrophage increased rate of FAO and prevented IL-1 dependent decrease in FAO. The intracellular triglyceride levels were accordingly modulated. Thus, IL-1Ra has an important role in controlling the fat accumulation and its metabolism in HepG2 cells. Recombinant IL-1Ra can play a potential role in blocking inflammatory induced IL-1 dependent liver inflammation and combat the inflammatory condition developed during fatty liver diseases.

Biography

Susmita Chandra has completed her PhD during 2011 from Jadavpur University, Kolkata, India. She is working as a Post-doctoral Fellow at Cell Biology and Physiology Division of Indian Institute of Chemical Biology. She has 10 published papers in reputed journals and has presented her research contribution in a number of national and international conferences. Her previous and current research contribution encompasses mainly different areas of drug development studies.

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