

Lipid droplets are both highly oxidized and Plin2-covered in hepatocytes of diet-induced obese mice

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[Ver número de ResearchID y ORCID de Web of Science](#)

APPLIED PHYSIOLOGY NUTRITION AND METABOLISM

Volumen: 45

Número: 12

Páginas: 1368-1376

DOI: 10.1139/apnm-2019-0966

Fecha de publicación: DEC 2020

Tipo de documento: Article

[Ver impacto de la revista](#)

Abstract

Chronic high-fat diet feeding is associated with obesity and accumulation of fat in the liver, leading to the development of insulin resistance and nonalcoholic fatty liver disease. This condition is characterized by the presence of a high number of intrahepatic lipid droplets (LDs), with changes in the perilipin pattern covering them. This work aimed to describe the distribution of perilipin (Plin) 2, an LD-associated protein involved in neutral lipid storage, and Pliny, which favors lipid oxidation in LD, and to evaluate lipid peroxidation through live-cell visualization using the lipophilic fluorescent probe C11-BODIPY581/591 in fresh hepatocytes isolated from mice fed a high-fat diet (HFD). Male C57B1/6J adult mice were divided into control and HFD groups and fed with a control diet (10% fat, 20% protein, and 70% carbohydrates) or an HFD (60% fat, 20% protein, and 20% carbohydrates) for 8 weeks. The animals fed the HFD showed a significant increase of Plin2 in LD of hepatocytes. LD from HFD-fed mice have a stronger lipid peroxidation level than control hepatocytes. These data provide evidence that obesity status is accompanied by a higher degree of lipid peroxidation in hepatocytes, both in the cytoplasm and in the fats stored inside the LD.

Novelty

Our study shows that lipid droplets from isolated hepatocytes in HFD-fed mice have a stronger lipid peroxidation level than control hepatocytes.

C11-BODIPY581/591 is a useful tool to measure the initial level of intracellular lipid peroxidation in single isolated hepatocytes.

Perilipins pattern changes with HFD feeding, showing an increase of Plin2 covering lipid droplets.

Palabras clave

Palabras clave de autor:[lipid droplets](#); [perilipins](#); [inflammation](#); [obesity](#); [lipid metabolism](#); [lipid peroxidation](#)

KeyWords Plus:[FATTY LIVER-DISEASE](#); [INSULIN-RESISTANCE](#); [HEPATIC STEATOSIS](#); [PROTEIN](#); [PEROXIDATION](#)

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Financiación

Entidad financiadora	Número de concesión
FONDECYT from the National Commission for Scientific and Technological Research Chile (CONICYT)	1171485 1181774 1191078

[Ver texto de financiación](#)

Editorial

CANADIAN SCIENCE PUBLISHING, 65 AURIGA DR, SUITE 203, OTTAWA, ON K2E 7W6,
CANADA

Información de la revista

- **Impact Factor:** [Journal Citation Reports](#)

Categorías / Clasificación

Áreas de investigación: Nutrition & Dietetics; Physiology; Sport Sciences

Categorías de Web of Science: Nutrition & Dietetics; Physiology; Sport Sciences

Información del documento

Idioma: English

Número de acceso: WOS:000596591500008

ID de PubMed: 32585124

ISSN: 1715-5312

eISSN: 1715-5320