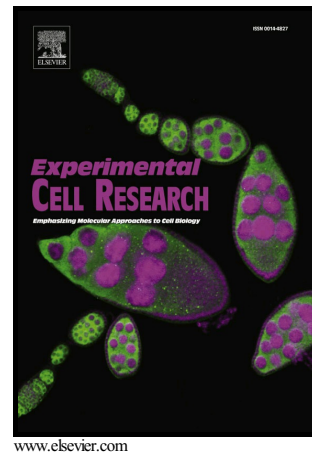


# Author's Accepted Manuscript

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Frauke Beilstein, Véronique Carrière, Armelle Leturque, Sylvie Demignot



PII: S0014-4827(15)30103-8  
DOI: <http://dx.doi.org/10.1016/j.yexcr.2015.09.018>  
Reference: YEXCR10060

To appear in: *Experimental Cell Research*

Received date: 14 September 2015  
Accepted date: 26 September 2015

Cite this article as: Frauke Beilstein, Véronique Carrière, Armelle Leturque and Sylvie Demignot, Characteristics and functions of lipid droplets and associated proteins in enterocytes, *Experimental Cell Research*, <http://dx.doi.org/10.1016/j.yexcr.2015.09.018>

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## Characteristics and functions of lipid droplets and associated proteins in enterocytes

Frauke Beilstein<sup>a,b</sup>, Véronique Carrière<sup>a</sup>, Armelle Leturque<sup>a</sup>, Sylvie Demignot<sup>a,b,\*</sup>

<sup>a</sup> Sorbonne Universités, UPMC Univ Paris 06, Inserm, Université Paris Descartes, Sorbonne Paris Cité, UMR\_S 1138, Centre de recherche des Cordeliers, F-75006, Paris, France

<sup>b</sup> EPHE, Ecole Pratique des Hautes Etudes, Laboratoire de Pharmacologie Cellulaire et Moléculaire, F-75014, Paris, France

\* Correspondence to:

UMR\_S1138, Centre de Recherche des Cordeliers,

15 Rue de l'Ecole de Médecine,

75006 Paris, France

Telephone number: +33(0)144272411

Fax number: +33(0)143251615

E-mail address: sylvie.demignot@crc.jussieu.fr (S. Demignot)

Abbreviations: 3BHS1, 3- $\beta$ -hydroxysteroid dehydrogenase 1; ACSL, acyl-CoA synthetase long-chain; apoB48, apolipoprotein B48; ATGL, adipose triglyceride lipase; CE, cholesterol esters; CGI-58, comparative gene identification-58; CIDE, cell death-inducing DFF45-like effector; DGAT, diacylglycerol acyltransferase; DHB2, 17 $\beta$ -hydroxysteroid dehydrogenase 2; ELMOD2, ELMO domain-containing protein 2; ER, endoplasmic reticulum; FA, fatty acid; HCV, hepatitis C virus; HDL, high density lipoproteins; HSL, hormone sensitive-lipase; LD, lipid droplet; MGL, monoacylglycerol lipase; MGAT, monoacylglycerol acyltransferase; MTP, microsomal triglyceride transfer protein; Plin, perilipin; PL, phospholipids; SCFA, short chain fatty acid; TG, triglycerides; TRL, triglyceride-rich lipoproteins

### ABSTRACT

Cytosolic lipid droplets (LDs) are observed in enterocytes of jejunum during lipid absorption. One important function of the intestine is to secrete chylomicrons, which provide dietary lipids throughout the body, from digested lipids in meals. The current hypothesis is that cytosolic LDs in enterocytes constitute a transient pool of stored lipids that provides lipids during interprandial period while lowering chylomicron production during the post-prandial phase. This smoothens the magnitude of peaks of hypertriglyceridemia. Here, we review the composition and functions of lipids and associated proteins of enterocyte LDs, the known physiological functions of LDs as well as the role of LDs in pathological processes in the context of the intestine.

Key words: lipid droplet, enterocyte, intestine, chylomicron, triglyceride-rich lipoprotein

### Physiological functions of lipid droplets in enterocytes

One of the major functions of the intestine is to absorb nutrients, including lipids. The absorption of dietary lipids occurs mainly in the jejunum, a part of the proximal small intestine, and this is performed by enterocytes as a highly specialized and complex process (for review, see [1, 2]). Briefly, dietary lipids (mainly triglycerides (TG), but also cholesterol esters (CE) and phospholipids (PL)) are digested in the upper part of the small intestine into fatty acids (FAs), monoacylglycerols, lysophospholipids and cholesterol. The digested lipids present in the lumen of the jejunum are taken up by enterocytes mostly by passive diffusion but also by transporters. Inside the cell, TG and PL are

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