

Effect of conjugated linoleic acid on asolecitin liposomes dynamics

V. G. Marques¹, A. O. M. Nogueira¹, R. S. Sousa¹, R. M. Clementin¹, V. R. Lima¹

¹ Universidade Federal do Rio Grande – FURG, Rio Grande, RS, Brazil.

Conjugated linoleic acid (CLA) consists of octadecadienoic acid isomers (18:2) with conjugated double bond systems.¹ CLA has demonstrated important suppression effect on tumor cell growth². This effect can be improved by the CLA incorporation into liposomes, which can be used as nanocarriers for drug delivery.³ Therefore, it is important to understand molecular interactions between CLA and liposomes. In this study, the effect of (9Z,11E)-CLA (Figure 1a) on the physico-chemical properties of soybean asolecitin (ASO) liposomes was monitored by using Fourier Transform Infrared Spectroscopy (FTIR). ASO liposomes, containing 25% phosphatidylcholine (Figure 1a), were prepared without and with CLA (5% m/m) by the method of vesicle hydration⁴. Horizontal Attenuated Total Reflectance (HATR)-FTIR interferograms were averaged for 50 scans in a resolution of 2 cm⁻¹, in the wavenumber range from 400 to 4000 cm⁻¹ at room temperature. CLA-induced shifts were observed to the C=O and CH₃ lipid group wavenumbers (Table 1). This result indicates CLA preferential location in the ASO chain. The wavenumber decrease in C=O can result from hydrogen bonding to the ester carbonyls induced by CLA⁵. The shifts in the lipid CH₃ wavenumber suggest an increase in gauche conformers in the system, reducing the order of the liposome bilayers⁵.

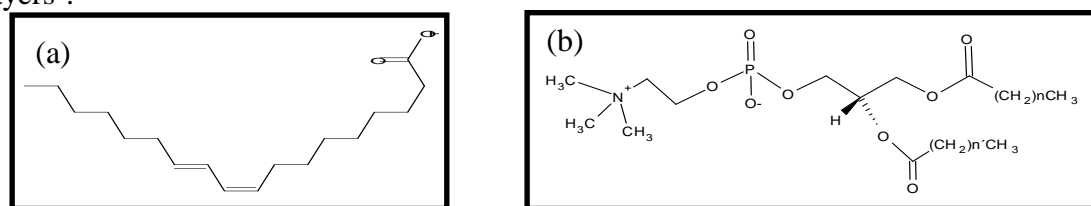


Figure 1: Structure of (9Z,11E)-CLA (a) and phosphatidylcholine (b).

Table 1 - CLA-induced shifts (cm⁻¹) in ASO group wavenumbers.

GROUPS	ASO	ASO+CLA	Δv
$v_{as} PO_2^-$	1219.01	1219.01	0
$v C=O$	1737.86	1735.93	1.93 ↓
$v_s CH_2$	2854.65	2854.65	0
$v_s CH_3$	2924.09	2926.01	1.92 ↑

Key words: liposomes, FTIR, CLA.

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vivianemarques@furg.br – LQO1, FURG, CEP 91501-970, Rio Grande, RS, Brazil.