Reunião Anual do INCT-FCx - 2022

De 26 a 29/outubro de 2022,
Hotel Estância Atibainha, Nazaré Paulista/SP

Ticagrelor protects LDL from oxidation

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Abstract: The most common cardiovascular disease, atherosclerosis (AS) or coronary artery disease (CAD) is mainly characterized by agglomeration of lipids in plaques in arteries, followed by activation of inflammatory cells, that leads to development of the lesion in endothelial cells of artery intima [2,4]. The previous literature highlighted that oxidized low-density lipoprotein (ox-LDL) induces the initial step for AS, leading to endothelial dysfunction. Additionally, that disruption contributes to formation of coagulation cascade and platelet aggregation, potentiating the formation of atherothrombosis [3]. Ticagrelor (cyclopentyl-triazolo pyrimidine) is an antiplatelet drug, that act reverting the aggregation of adenosine diphosphate (ADP), binding as antagonist in purino platelet receptor 12 (P2Y12) without be previously activated [1]. In addition, ticagrelor has been reported to decrease the uptake of ox-LDL, leading us to ask if the quality of ox-LDL changes with the drug in the sense of AS treatment [3]. In his work we separate LDL from plasma, with addition of KBr, and ultracentrifugation for 20 hours at 40000 rpm, after that, added ticagrelor (800ng/mL), followed by incubations with $CuSO_4$ (20 μM per mg of protein) from one to five hours at 37°C. Using the Z-Scan technique, we examined nonlinear optical properties of LDL and also, using UV-visible spectroscopy in order to determine the absorbance in wavelength 484 nm (wavelength of carotenoids). We found, based on significant difference between the group with the drug and without, analyzing the amplitude of the thermal lens from Z-scan analysis and the absorbance, that ticagrelor protects LDL against oxidation, showing that ticagrelor not only helps in decrease of uptake, but also, influences the quality of LDL.

Key-words: LDL, ox-LDL, ticagrelor, z-scan, quality.
Support: This work has been supported by INCT-FCx, CNPq and FAPESP

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