

Molecules for Health: cholesterol absorption and transporter proteins expression under the effect of bioactive molecules

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Objectives: to obtain and study molecules with a cholesterol-lowering activity from food, edible algae, from the Portuguese coast.

Methodology: Cardiovascular diseases are among the highest causes of death. High levels of cholesterol in the blood can be considered as one of the main causes of these diseases. Polyphenols have the possibility of reducing the absorption of cholesterol. The adding of macroalgae to the occidental food practice is increasingly growing. This marine resource has good nutrient properties and a source of new polyphenolic compounds. The student will obtain polyphenols from aqueous extracts of brown macroalgae and study them in the cholesterol homeostasis. Identification of these compounds will be carried out by LC-MS and the effect on cholesterol intestinal permeation will be studied by Caco-2 cell either in monolayers or as in co-culturing systems. The effect of these compounds on cell proteome and the cholesterol transporter proteins (present in caco-2 cells) will be evaluated by 2D electrophoresis and western techniques, respectively. The expression of cholesterol transporter protein target of the polyphenol activity will be studied using molecular biology techniques in order to have some insight at which molecular level the polyphenols are active against the target proteins and if interactions with cholesterol reducing drugs are to be expected.

Type of fellowship: National