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Lipoproteins at model cell membranes, and the transport of fats

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The metabolism of fats including lipids and cholesterol involves the production, in the liver, of lipid carrying particles known as lipoproteins. Lipoproteins are nanoemulsion-like particles composed of fats and proteins (named apolipoproteins). The complexity of lipoproteins is great, with different compositions not only in terms of the amounts of the fat and proteic components, but also on the specific protein type and isoform. Specific apolipoproteins are known to mark an increased risk for developing atherosclerosis where fat accumulation to form plaques occurs at the initial stages of this terrible disease. In this talk, I will present the efforts of my group to explore the role of lipid dynamics in their transport throughout the body by lipoproteins. Contrast matching, biodeuteration and neutron scattering are key to highlight the characterise not only the lipoprotein structure but also their ability to remove and deposit fats as a function of the membrane composition: saturated, unsaturated fats and cholesterol. In this way, we provide unprecedented information on the effect that cholesterol have on fat uptake by lipoproteins.

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