

O-20.2 Invited speaker

Lipoprotein structure and its role on dysfunction: from atherosclerosis to covid-19

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Introduction

Fat metabolism involves producing lipid carrying particles known as lipoproteins. Lipoproteins are nanoemulsion-like particles composed of fats and proteins. Misbalance in lipoprotein composition mark an increased risk for developing atherosclerosis as well as several other diseases such as the severity of symptoms in COVID19. Despite an enormous body of work, there remains to be fully understood what in lipoproteins causes dysfunction. We aim to unravel the role of lipoprotein composition on its structure, and how this is related to functionality.

Methods

We use small angle scattering to characterise the nanoparticle structure while mapping their function for instance via traditional biochemical and cell biology methods as well as via mapping the lipid exchange between lipoproteins and model membranes. We have done this in the presence and absence of the SARS CoV-2 spike (S) protein.

Results

We have updated the structural models for the main lipoproteins HDL & LDL. Upon analysis of samples isolated from individuals classified as low or high risk to develop cardiovascular disease, we found that the lipoprotein fractions differ mainly in specific subfractions, suggesting a critical role for these in dysfunction.

Conclusions

Combining structural with functional and compositional have a synergetic effect enabling discerning properties that differ across populations.