



Olive oil's polyphenols can protect against Type 2 Diabetes

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ABSTRACT

The loss of b-cell function and b-cell death is key feature of type 2 diabetes (T2M). Different hypothesis is presented to contribute to this disease including amyloid formation by the human islet amyloid polypeptide (hIAPP). Despite the prevalence of T2M on the world, there are no therapeutic strategies for the treatment or prevention of amylin amyloidosis. Clinical trials and population studies indicate the healthy virtues of the Mediterranean diet especially the extra virgin olive oil enriched in phenolic compounds showed to be effective against several aging and lifestyle diseases including their action in relation of amyloid deposits related diseases. For this, oleuropein (Ole) one of the most abundant polyphenol in EVOOO, which has been reported to be also anti-diabetic, and some of its main derivatives, have attracted our interest due to their multitarget effects including the interference with amyloid aggregation path. However, the structure- function relationship of polyphenols Ole and its metabolites in T2DM are not yet clear.

We report here a broad biophysical approach and cell biology techniques that enabled us to characterize the different molecular mechanisms by which tyrosol (TYR), hydroxytyrol (HT), oleuropein (Ole) and oleuropein aglycone (OleA) modulate the hIAPP fibrillation in vitro and their effect on cell cytotoxicity. The latter formed by enolic acid and hydroxytyrosol moiety was found to be more active than the Ole and HT at low micromolar concentrations. We further demonstrated that OleA inhibits more the cytotoxicity induced by hIAPP aggerates by protecting more the cell membrane from permeabilization and then from death. These finding highlight the benefits to consume olive oils, the great potential of EVOO polyphenols, mainly OleA, and support for the possibility to validate and optimize their possible pharmacological use not only for T2DM prevention and therapy but also for amyloid related diseases.

Biography:

Dr.Ali Chaari, P.h.D in Biochemistry and Biophysics. He is currently a Lecturer in Biochemistry in Weill Cornell medicine-Qatar. Dr.Chaari is experienced in biochemistry, molecular biology, and biophysics. He has co-authored several original

research articles, written two books and has presented his work at several conferences. In addition, he is active as a research mentor to WCM-Q's medical students. Two active research areas are 1) the study of amyloid proteins modulation in neurodegenerative diseases and diabetes and 2) the effect probiotics on health notably on neurodegenerative diseases and diabetes type 2.