

**OXIDATIVE STRESS IN DIET-INDUCED METABOLIC DISORDERS AND ITS MODULATION BY
OMEGA-3 PUFA FROM MARINE ORIGIN**

Manuel Pazos

Consejo Superior de Investigaciones Científicas

Instituto de Investigaciones Marinas de Vigo (IIM-CSIC)

Eduardo Cabello 6, 36298 Spain

The drastic incorporation of what has been termed the Western diet, essentially enriched in saturated fats and simple sugars and depleted in bioactive components such omega-3 polyunsaturated fatty acids from marine origin, explains to some extent the epidemic numbers for obesity, and related diet-induced metabolic disorders such as insulin resistance, hyperglycaemia and dyslipidaemia. The Western diet may induce mitochondrial dysfunction and imbalance between fatty acid uptake and oxidation, leading to dysfunctional adipose tissue and inappropriate accumulation of lipids in the liver and skeletal muscle. This ectopic fat accumulation provokes a lipotoxic environment that blocks correct glucose transport and insulin signalling. Oxidative stress and inflammation have been suggested as important mechanisms linking lipotoxicity and the development of insulin resistance and diabetes in obesity.

The supplementation of diet with omega-3 from marine origin, especially eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), is found among the nutritional strategies used to minimize the increasing prevalence of these disorders. However, particularly controversial is the potential impact that omega-3 fatty acids may have in vivo on oxidative stress and lipid peroxidation. The present investigation will introduce a new series of evidences showing that obesogenic conditions stimulate oxidative damage on targeted proteins, and that the consumption of EPA and DHA may have a protective effect on minimizing such oxidative damage.