

Insulin Resistance and Vascular Function: Modulatory Effects of Dietary Fatty Acids?

C. M. Williams, University of Reading, School of Biosciences, Faculty of Life Sciences,
Reading, United Kingdom

Obesity, overweight and type 2 diabetes are rising in all regions of Europe. By 2010, some 31m people in Europe will require treatment for diabetes and its related complications. The link between obesity and type 2 diabetes is due to adverse effects of excess body fat on systemic responsiveness to insulin, resulting in impaired action of insulin (insulin resistance) at key target tissues. Previous studies of insulin resistance at cellular level have focused on the target tissues such as adipose tissue, skeletal muscle and liver. However the endothelium is now recognised to be an insulin responsive tissue and endothelial dysfunction is a characteristic feature of insulin resistance, due to impaired generation of the vasodilator, nitric oxide (NO), by vascular endothelial cells in response to shear stress. Because of the central role of NO in the maintenance of normal vascular tone and vascular homeostasis, events which lead to impaired production or action of NO are likely to accelerate atherosclerosis, plaque evolution and thrombus formation. Recent development of cell models of endothelial insulin resistance are beginning to shed light on these events and will enable investigation of molecular pathways which may accentuate or attenuate insulin resistance in vascular endothelial cells. This presentation will consider the molecular basis of insulin resistance in endothelial cells and the potential modulatory effects of dietary lipids. The aim is to provide a stronger scientific base for provision of dietary advice, or development of functional foods, which can ameliorate adverse effects of insulin resistance on vascular function.