



Gema Medina-Gomez, PhD

UNIVERSIDAD REY JUAN CARLOS
Facultad de Ciencias de la Salud
Departamento de Bioquímica, Fisiología y
Genética Molecular
Edif. Departamental I.
Avda. de Atenas s/n
28922 ALCORCÓN (Madrid) SPAIN

Tel office: 914 888 632

Fax: 914 888 831

Email: gema.medina@urjc.es

Web: <http://www.cs.urjc.es>

Team: Adriana Izquierdo, Cristina Martínez,
Yurena Vivas

Principal Investigator: Dr. Gema Medina-Gómez

***New molecular mechanisms of
glucolipototoxicity involved in pancreatic beta
cell dysfunction in Type 2 diabetes.***

Type 2 diabetes (T2DM) occurs in obese patients and is a complex syndrome of polygenic nature, which develops when the pancreas does not increase insulin secretion to maintain normoglycemia in the context of insulin resistance. Prolonged and/or an increasing demand for insulin production in insulin resistance states often leads to pancreatic beta cell failure and subsequently hyperglycemia and T2DM. Under conditions of diet-induced obesity and sedentary behaviour, a phenomenon known as lipotoxicity can occur. Lipotoxicity is caused by an excess of reactive lipid species accumulated in tissues other than adipose tissue as the beta cell causing pathological state. Our working hypothesis is that lipotoxicity combined with hyperglycemia, phenomenon known as glucolipototoxicity, may alter beta cell function decreasing, as a primary event, beta cell mass in the pancreas and leading to the development of T2DM.

Financial support:

- *Ministerio de Ciencia e Innovación. BFU2009-10006.*
- *L'Oreal-Unesco "Women for Science", 2009*
- *Community of Madrid: STUDY OF THE MECHANISMS OF INSULIN RESISTANCE: IMPLICATIONS IN OBESITY, DIABETES AND METABOLIC SYNDROME. Comunidad de Madrid CAM (S2010/BMD-2423)*



***Role of glucolipototoxicity in the development of
renal lesion in the Metabolic Syndrome***

Metabolic Syndrome, characterized by the frequent coexistence of obesity, dyslipidemia, hyperinsulinemia, hyperglycaemia and hypertension, has been increased in the last years due to the increase in the prevalence of obesity. This syndrome is a current problem of health due to an increase in the associated cardiovascular risk and the cases of derived morbidity and mortality. Furthermore, the risk to develop chronic diseases of kidney in individuals with MS also is increasing. Our hypothesis is that the lipotoxicity combined with hyperglycaemia, phenomenon known as glucolipototoxicity during the Metabolic Syndrome, can deteriorate the function of the kidney increasing proteinuria, glomerulosclerosis and tubule-interstitial fibrosis leading to the renal failure.

Financial support:

- *Spanish Society of Endocrinology and Nutrition-NOVO NORDISK IN DIABETES, 2010*
- *Program for the creation and consolidation of new research groups in Biosciences of Community of Madrid-URJC. CCG10-URJC/BIO-5609.*