Global $^{13}$C tracking reveals altered metabolic fluxes in retinal pigment epithelium under hyperglycemic and hypoxic conditions

Miriam Navarro 1,3, Jordi Capellades4, Sara Samino2, Maria Vianixa1,3, Marta Garcia-Ramirez3, Cristina Hernandez3, Rafael Simo3, Oscar Yanes1,2

1. Rovira i Virgili University, Spain
2. Spanish Biomedical Research Center in Diabetes and Associated Metabolic Disorders (CIBERDEM), Spain
3. Diabetes and Metabolism Research Unit, Institut de Recerca Hospital Universitari Vall d’Hebron (VHIR), Spain

BACKGROUND
- Diabetic retinopathy (DR) is the commonest sight-threatening lesion in diabetics.
- Current treatments for DR are applicable only at advanced stages of the disease, when the blood vessels proliferate (PDR, Proliferative Diabetic Retinopathy) and they associate with significant adverse effects.
- DR therapy would greatly benefit from early stages disease diagnosis and intervention.

GOALS
- Identify deregulated metabolic pathways behind the hyperglycemic pseudohypoxic state leading to PDR
- Based on ARPE-19, a human retinal pigment epithelial cell line model, we studied metabolic imbalances resulting from hyperglycemia and hypoxia and their interaction.

RESULTS

N5 (control) =5 mM Glucose/Normoxia
H5=5 mM Glucose/Hypoxia
H25= 25 mM Glucose/Hypoxia
N25=25mM Glucose/Normoxia

Increased versus N5
Decreased versus N5

REFERENCES