RAT ADIPOSE TISSUE SECRETOME DIFFERENTIAL ANALYSIS FROM DIFFERENT ANATOMICAL LOCATIONS

A. Roca-Rivada [(1)], J. Alonso [(2)], O. Al-Massadi [(1)], L. López-Senín [(1)], C. Castelao [(1)], J.R. Peinado [(3)], L.M. Seoane [(1)], F.F. Casanueva [(1)], M. Pardo [(1)].

[(1)] SERGAS, Laboratorio de Endocrinología Molecular y Celular, [(2)] SERGAS, Laboratorio de Proteómica, [(3)] Universidad de Córdoba.

Current evidence shows numerous biological and genetic differences between adipose tissues depending on its anatomical location. It is now well known that upper body/visceral fat distribution in obesity is closely linked to metabolic complications in contrast with the accumulation of fat in the lower body. However, the molecular events responsible of this phenomenon are still unknown.

We performed a 2-DE differential analysis comparing the secretome of fat adipose tissue depots from different anatomical locations. From an average of 1425±SD23.7, 1441±SD14.4 and 1529±SD26.17 spots from visceral, subcutaneous and gonadal adipose secretomes respectively, 204 differences were considered statistically significant when comparing visceral vs subcutaneous vs gonadal secretomes with a p-value < 0.05, 124 with a p-value <0.01, and 45 with a $p<0.001$. The most restrictive analysis was chosen for mass spectrometry analysis, thus 45 spots were excised for protein identification. From those, 37 proteins that correspond to 35 ORFs were identified. 74% of the 35 differentially secreted proteins were classified as secreted by non-classical (51%) and classical (23%) pathways.

Interestingly, proteins such as enoyl-CoA hydratase, adenosine kinase carbonic anhydrase 5B, and transgelin were identified exclusively in visceral and gonadal fat secretomes, and an isoform of gelsolin only in visceral adipose tissue. Adipokines or adipose tissue related proteins were found to be secreted at higher levels in visceral than in subcutaneous fat such as thrombospondin-1, angiotensinogen, fatty acid-binding protein, and galectin-1. On the contrary, vitamin D binding protein was found at more elevated levels in subcutaneous adipose tissue secretome.

In conclusion, this study emphasizes the differential role of adipose tissue in accordance to its anatomical localization, and increases the knowledge about the molecular pathogenesis of obesity and its associated diseases.