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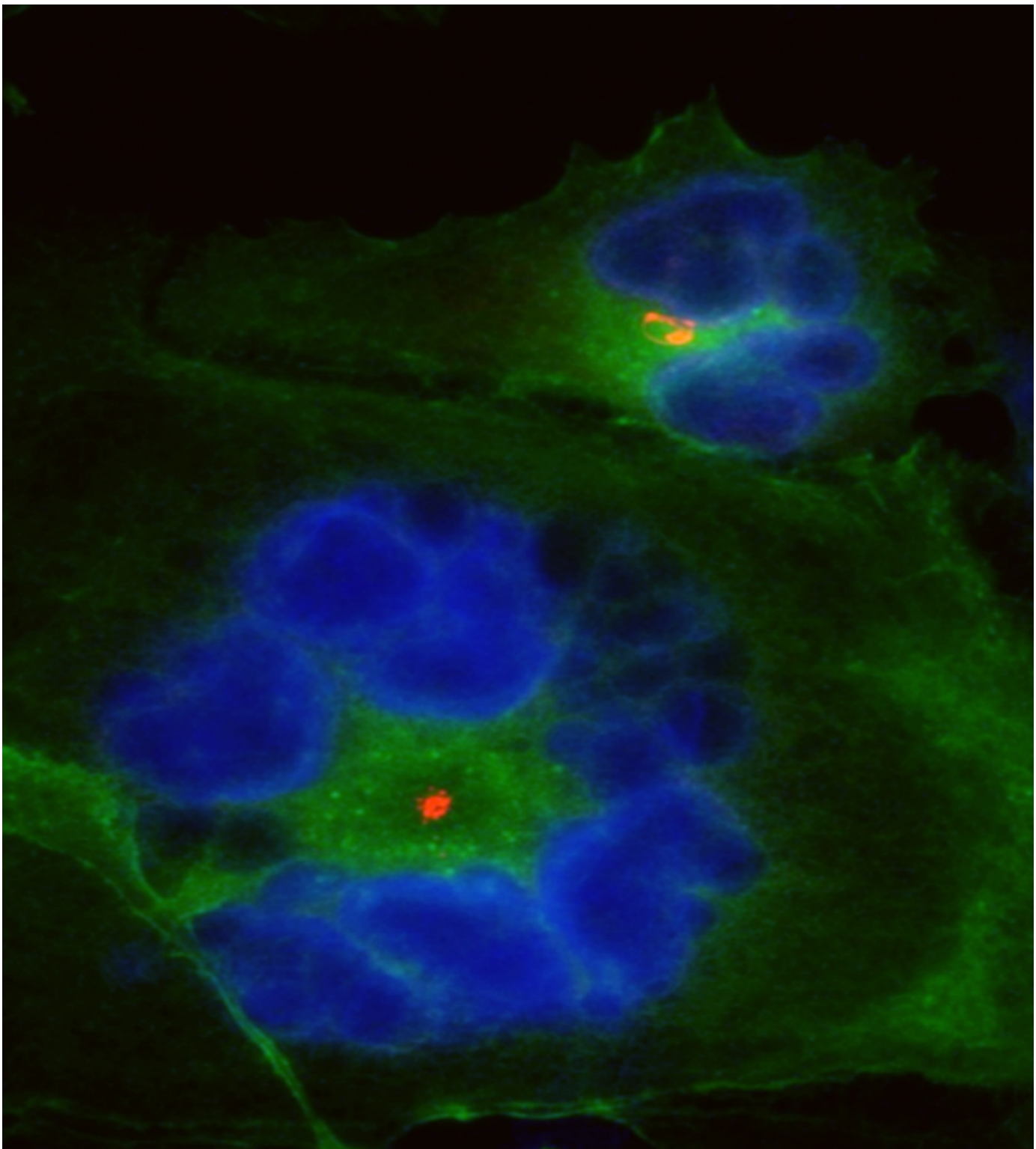

Girotti JR[1], Borús DL[1], Scelsio NS[1], Favale NO[2,3], Ves-Losada A[1,4].
[1]INIBIOLP-CCT-La Plata-CONICET-UNLP, [2]Cat Biol Cel Mol, FFB, UBA, [3]IQUIFIB-CONICET, [4]Dep. Cs Biol. FCE, UNLP, Argentina.
E-mail: avlosada@biol.unlp.edu.ar

The objective of the work was to characterize populations of Lipid Droplets (LD) in *Triatoma infestans* ('vinchuca'). The insect is one the main vector of the parasite *Trypanosoma cruzi*, the causative agent of Chagas disease in Argentina and the Americas. The cuticle (C) is the insect's most external structure, which protects against physical, chemical (dehydration, etc.), and biological (infections, etc.) external factors. Oenocyte cells (OE) are involved in the anabolism of C hydrophobic molecules (hydrocarbons, alcohols, waxes, glycerides, fatty acids, etc). The fat body (FB) is the organ that regulates the entire insect metabolism. The information on the lipid metabolism of the insect will allow the acquisition of new tools to control the vector. Taking into account the scarce information on OE from C in *Triatoma infestans*, the aim of the work was to identify possible populations of LD in these cells as organoids involved in the genesis of C. Previously we demonstrated that in liver, LD populations are dynamic organelle where neutral lipids are stored, mainly located in the cytosol (cLD) and in a small proportion in the nucleus (nLD). For this purpose, protocols were developed to identify and characterize LD populations in FB samples, whole cuticle (C) and scraping of the epidermis (E) of insects fast or feed. Light field microscopy and fluorescence (epifluorescence and confocal) and hematoxylin / Oil Red and DAPY / BODYPY stains were used, respectively. In all the samples studied, populations of LD were observed in the cytosol (cLD). The FB has an important population of cLD characterized by large LD; while, the cuticle (C and E), and in particular, in OE cells, the population of cLD that is large, is made up of LD of a smaller size than those of FB. In OE, the main LD population is located in the cytosol and a small population within the cell nucleus (nLD). These results would confirm the role assigned to OE to actively participate in the anabolism of the cuticle components, moreover, small LDs are metabolically more active than larger LD. In conclusion, *Triatoma infestans* cuticular oenocytes were characterized as cells that have a very varied morphology, depending on the developmental stage of the insect, and are larger than the surrounding epithelial cells. The OEs have two LD populations, a main cytosolic and a nuclear one. These are the first results where nLDs are described in insects.

LI-C03
THE REGULATION OF PROTEINS 14-3-3 AND THE HIPPO VIA AFFECT THE ADIPOGENESIS OF 3T3-L1

Del Veliz S[1,3], Uhart M[1], Lim Gareth E[3], Bustos Diego M[1,2].
IHEM[1] (CONICET-UNCuyo), FECEN[2], UNCuyo, Argentina. CRCHUM[3], Canada. E-mail: delvelizsamanta@gmail.com

Many transcription factors act sequentially to activate adipocyte differentiation. Multiple signal transduction pathways govern the adipocyte physiology. The Hippo kinase pathway is the main regulator of proliferation and differentiation of stem cells and adipocyte precursor cells. The 14-3-3 protein family, comprised of 7 paralogs in mammals, interacts with components of the Hippo kinase pathway regulating the adipogenic differentiation, although the specificity of these proteins in the process remains elusive. Deciphering the subcellular dynamics of 14-3-3 proteins will be instrumental in the discovery of new targets for the manipulation of stem cell fate decisions or treatment of chronic diseases, such as obesity and type 2 diabetes. *In vitro* adipocyte differentiation occurs by the addition of an Adipogenic Differentiation Medium (ADM) including Dulbecco's Modified Eagle Medium, 10% Fetal Bovine Serum, synthetic drugs (dexamethasone, IBMX, rosiglitazone) and peptide hormones (insulin). Since these mentioned chemical drugs are not present in physiological environments, it would be important to achieve a correct activated adipogenic program using fewer drugs and with natural origin. We have decided to evaluate the adipogenic potential of glucagon-like peptide 1 (GLP-1) analogs. In contrast to Native GLP-1 action, which is rapidly degraded by circulating Dipeptidyl Peptidase-4, GLP-1 analogs have shown positive effects on glycemic control and body weight due to their greater stability and longer half-life. In this project, experiments were performed on 3T3-L1 preadipocytes. First, the effect of different combinations of drugs for 7 days in adipogenesis was evaluated. Then, we carried out qPCR experiments to measure the gene expression of 14-3-3 and the most important proteins of the Hippo pathway, on days 3 and 7 of differentiation. We have determined that conditions resulting in greater adipogenic differentiation showed higher levels of Hippo pathway proteins and 14-3-3 gamma and beta isoforms on day 7. These effects were especially evident when IBMX was replaced by GLP-1 in the ADM. These results suggest that different inducers (glucocorticoids, thiazolidinediones, incretins), have different abilities for regulating the expression of 14-3-3 and hippo pathway proteins, thus affecting adipogenic differentiation. We are currently focused on elucidating the mechanisms of action of these drugs to have a greater understanding of the events that are necessary for adipogenesis to occur.

LI-C05
SPHINGOSINE KINASE 2 AS REGULATOR OF LIPID DROPLETS BIOGENESIS

Santacreu BJ, Romero, DJ, Tarallo E, Otero D, Sterin de Speziale NB, Favale NO.
Facultad de Farmacia y Bioquímica, Cátedra de Biología Celular y Molecular, UBA, Argentina. IQUIFIB-CONICET Buenos Aires, Argentina.
Email: bsantacreu@ffyb.uba.ar

Sphingolipids (SLP) participate in several different, even opposite, cellular processes. We have described their participation in the cellular differentiation of renal collecting tubule. We have observed that the levels of sphingosine 1 phosphate (S1P) regulate the levels of the other SLP by inhibition of enzymes involved in *de novo* SLP synthesis. In this way, S1P emerges as a general regulator of the level of sphingolipids, which adapts the SLP levels to the cellular fate. However, less it is known about the interrelation of S1P with phospholipids, triglycerides or other lipids. In this work, we study the importance of S1P in relation to the dynamics of lipid droplets. We found that the activity of sphingosine kinase 2 (SphK2), one isoform of the enzyme that synthetizes S1P, is necessary for the formation of lipid droplet (LD). SphK2 activity modification by pharmacological, siRNA and CRISPR/cas9 strategies produced a decrease in LD size and number. This observation was accompanied by a decrease in triglycerides and was not reversed by S1P receptor antagonists or inhibitors of the *de novo* SLP synthesis. Additionally, by using