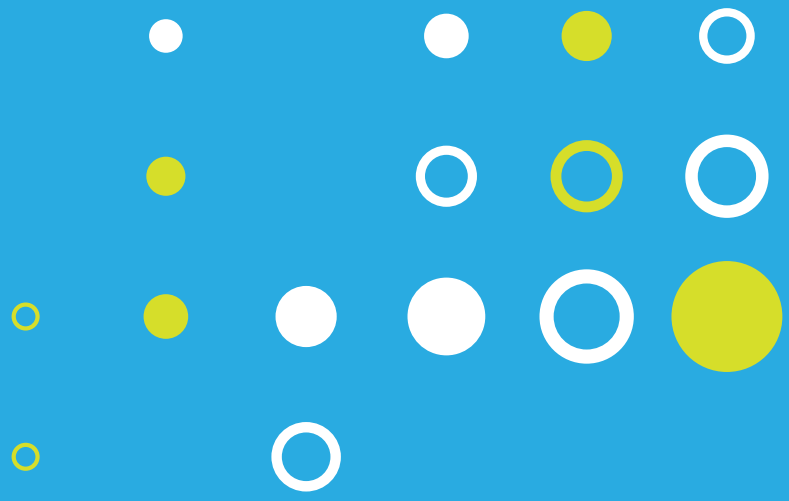
# BIOCELL

nº 47

ISSN: 0327-9545 (print)
ISSN: 1667-5746 (online)

November 2022



SAIB
Sociedad Argentina de
Investigaciones en Bioquímica
y Biología Molecular

BIOCELL, Vol. 47, Suppl. 1, 2023
ISSN 0327- 9545
ISSN 1667-5746 (online version)



# LVIII Annual Meeting of the Argentine Society for Biochemistry and Molecular Biology Research

# (SAIB)

ISSN 0327- 9545
ISSN 1667-5746 (online version)

# MEMBERS OF THE SAIB BOARD

ISSN 0327- 9545
ISSN 1667-5746 (online version)

# DELEGATES OF SCIENTIFIC SECTIONS

*Cell Biology*
Pablo Aguilar
CONICET – Universidad de Buenos Aires

*Lipids*
Martín Oresti
CONICET - Universidad del Sur

*Microbiology*
Hebe Dionisi
CONICET

*Plants*
Elina Welchen
CONICET – Universidad Nacional del Litoral

*Signal Transduction*
Graciela Boccaccio
CONICET

ISSN 0327- 9545
ISSN 1667-5746 (online version)

results also show a modulation on the expression levels of genes coding for AA metabolism and apoptosis-related enzymes that correlate to a diminished apoptotic effect of AA supplementation for those cells expressing higher GPAT2 amount.
Altogether, these results provide new data supporting the consideration of GPAT2 expression as a poor prognostic factor for breast cancer patients.

## LI-12

## ROLE OF ACYL-COA SYNTHETASE 4 IN EPITHELIAL OVARIAN CANCER

*Prada, Jesica G.[1]; Hernández, Andrea[2]; Garrido, Maritza P.[2,3]; Bigi, María M.[1]; Orlando, Ulises D.[1]; Romero Osses, Carmen[2, 3]; Podesta, Ernesto J.[1]; Castillo, Ana F.[1]; Maloberti, Paula M.[1].*
*[1]INBIOMED (UBA-CONICET), Departamento de Bioquímica Humana, Facultad de Medicina, UBA, Argentina. [2]Laboratorio de Endocrinología y Biología de la Reproducción, Hospital Clínico Universidad de Chile, Santiago, Chile. [3]Departamento de Obstetricia y Ginecología, Facultad de Medicina, Universidad de Chile, Santiago, Chile.*

Acyl-CoA synthetase 4 (ACSL4) is an enzyme taking part in the fatty acid metabolism. ACSL4 plays a key role in arachidonic acid metabolism and in steroidogenesis. We and others have described the role of ACSL4 in breast and prostate cancer. Particularly, in triple-negative breast cancer (TNBC) and in castration-resistance prostate cancer (CRPC), increased ACSL4 levels are associated to the promotion of a highly aggressive tumoral phenotype. We developed a specific ACSL4 inhibitor, PRGL493, and characterized its inhibitory effect in TNBC and CRPC in steroidogenesis, chemotherapeutic resistance and tumor growth. Since epithelial ovarian cancer (EOC) is often diagnosed in advanced stages, the available treatments are limited and the prognosis is poor. EOC is the third cause of gynecologic malignancy but the first one of dead. Of the total of the ovarian primary tumors, the 90% corresponds to EOC. Sex-steroid hormones may have a relevant role in the development and progression of EOC. Given the need to develop new effective therapeutic strategies, the aim of this work is to study the role of ACSL4 in EOC. In previous works we have studied the gene expression signature of ACSL4 by RNA-seq, finding that ACSL4 regulates genes associated with an aggressive phenotype such as invasion, migration, proliferation, drug resistance and signal transduction. Therefore, we performed a bioinformatics analysis comparing ACSL4 signature with EOC genetic signature of patient samples obtained from public databases. Cross analysis showed a positive correlation coefficient higher than 0.5 for 38 of 42 the genes, with the correlation coefficient being 0.46 for drug resistance-associated protein genes. Immunohistochemistry was performed on biopsies obtained from patients with EOC. The analysis showed increased levels of ACSL4 in the EOC human tissue samples compared to normal tissue samples. Subsequently, the expression of ACSL4 was compared between EOC cell lines (A2780, OV-90 and SKOV-3) and the non-tumor cell line HOSE. Western blot analysis showed an increased levels of ACSL4 in EOC cell lines relative to HOSE cells. Then, the inhibitory effect of PRGL493 was tested on EOC cell lines by performing MTT and BrdU proliferation assays. Incubation in the presence of PRGL493 produced a significant decrease in cell proliferation in A2780, OV-90 and SKOV-3 cell lines compared with the incubation with vehicle as a control
The IC50 value of PRGL493 was approximately 40 µM for EOC cell lines, being similar to the IC50 value previously obtained for breast and prostate cancer cell lines. These results allow us to conclude that ACSL4 is involved in EOC ovarian tumor biology and also allow us to conclude that ACSL4 could be a therapeutic target in EOC ovarian cancer.

## LI-13

## INHIBITORS OF PHOTOSYSTEM II INCREASE THE EXPRESSION OF CHLOROPLAST DIACYLGLYCEROL ACYLTRANSFERASE-3 AND PROMOTE TRIACYLGLYCEROL ACCUMULATION IN *CHLAMYDOMONAS REINHARDTII*

*Gonorazky, Gabriela[1]; Oresti, Gerardo Martín[2]; Carro, María de las Mercedes[1]; Beligni, María Verónica[1]*
*[1]Instituto de Investigaciones Biológicas (IIB-CONICET-UNMdP), Facultad de Ciencias Exactas y Naturales, Universidad Nacional de Mar del Plata, B7608FBY Mar del Plata, Argentina. [2]Instituto de Investigaciones Bioquímicas de Bahía Blanca (INIBIBB-CONICET-UNS) y Dpto. Biología, Bioquímica y Farmacia, UNS, Bahía Blanca, Argentina.*

Considerable progress has been made towards the understanding of triacylglycerol (TAG) accumulation in algae. A key aspect is finding conditions that trigger TAG production without reducing cell division. We identified a soluble diacylglycerol acyltransferase (DGAT), exclusive to the green lineage and moderately related to plant DGAT3, with heterologous DGAT activity. We demonstrated that DGAT3 localizes to the chloroplast in the model green alga *Chlamydomonas reinhardtii* and that its expression is induced by light in the presence of acetate, consistent with TAG accumulation. The light dependence and the presence

ISSN 0327- 9545
ISSN 1667-5746 (online version)

of an iron-sulfur cluster-binding domain (2Fe-2S) in the sequence of DGAT3 indicates that this protein could accept electrons, directly or indirectly, from the photosynthetic machinery. The aim of this study was to investigate the relationship between DGAT3 expression and photosynthetic electron transport. With that purpose, we incubated *C. reinhardtii* wild type cc-125 cells with two photosystem II (PSII) inhibitors, 3-(3,4-dichlorophenyl)-1,1-dimethylurea (DCMU) and 2,5-dibromo-6-isopropyl-3-methyl-1,4-benzoquinone (DBMIB), and one photosystem I (PSI) inhibitor, N,N′-dimethyl-4 4′-bipyridinium dichloride (paraquat). Both *Dgat3* mRNAs and TAGs increased in DCMU and DBMIB-treated cells as early as 15 minutes after initiating the experiment, whereas no significant variations were observed in paraquat-treated cells in the course of a 3-h incubation period. Our results suggest that DGAT3 expression and TAG biosynthesis increase when PSII is over-reduced in order to avoid photodamage, as TAG is an adequate molecule to store excess electrons. PSII over-reduction occurs naturally in situations in which light absorption is higher than the rate of photosynthesis (e.g. during illumination at high light intensity) or artificially in chemically-altered PSII centers. Currently, this hypothesis is being evaluated in mutants that have deficiencies in the function of PSI, PSII or the cytb6f complex.

## LI-14

## NUCLEAR LIPID DROPLETS IN OENOCYTES CELLS FROM *TRIATOMA INFESTANS* INSECTS ARE A DYNAMIC NUCLEAR ORGANOID

*Girotti, Juan R.[1], Borús Delfina L.[1], Favale Nicolás O.[2,3], Ves-Losada Ana[1,4]*
*[1]INIBIOLP-CCT-La Plata-CONICET-UNLP; [2]Facultad de Farmacia y Bioquímica, UBA; [3]IQUIFIB-CONICET; [4]Dep. Cs. Biol. FCE, UNLP, Argentina.*

The objective of this work was to characterize nuclear populations of Lipid Droplets (nLD) in *Triatoma infestans* (vinchuca) under different development conditions. This hematophage insect is one of the main vectors of the parasite *Trypanosoma cruzi*, the causative agent of Chagas disease in Argentina and the Americas. The cuticle (C) is the insect 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 characterized the LD populations in these cells as organoids involved in the genesis of the cuticle. 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 and optimized to identify and characterize LD populations in the different cells beneath the cuticle. We examined and characterized the LD populations of OE cells from fifth instar nymphs of the insect that were feed or starved for 1 month. Light field microscopy and fluorescence (epifluorescence and confocal) and hematoxylin / Oil Red and DAPI / BODIPY stains were used, respectively. In OE cells the main LD population is located in the cytosol and a small population within the cell nucleus (nLD) in both conditions, feed and starved insects. These results would confirm the role assigned to OE to actively participate in the anabolism of the cuticle components.
In conclusion, *Triatoma infestans* cuticular oenocytes were characterized as cells that have a very varied morphology, depending on the development state of the insect, and are larger than the surrounding epithelial cells. The OEs have two LD populations in both conditions tested, a main cytosolic and a nuclear one. These are the first results where nLDs are described in insects.

## LI-15

## PROGRESSIVE ACCUMULATION OF N-9 PUFAS IN TESTICULAR LIPIDS DURING *EX VIVO* TISSUE MAINTENANCE

*Santiago Valtierra, Florencia Ximena; Luquez, Jessica Mariela; Tajes Ardanaz, Oliverio Julián, Torlaschi, Camila; Oresti, Gerardo Martín.*
*INIBIBB, CONICET-UNS y Dpto. Biología, Bioquímica y Farmacia, UNS, Bahía Blanca, Argentina.*

Spermatogenesis has been achieved in vitro using a gas-liquid interphase culture system. In this setting, it is possible to follow lipid metabolism to know its role during the spermatogenic process, thus gathering potentially useful information for ex vivo spermatogenesis biotechnology. We observed a relationship between the progression of spermatogenesis in both, in vivo and *ex vivo*, at cytological and histological level and the gene expression of enzymes involved in fatty