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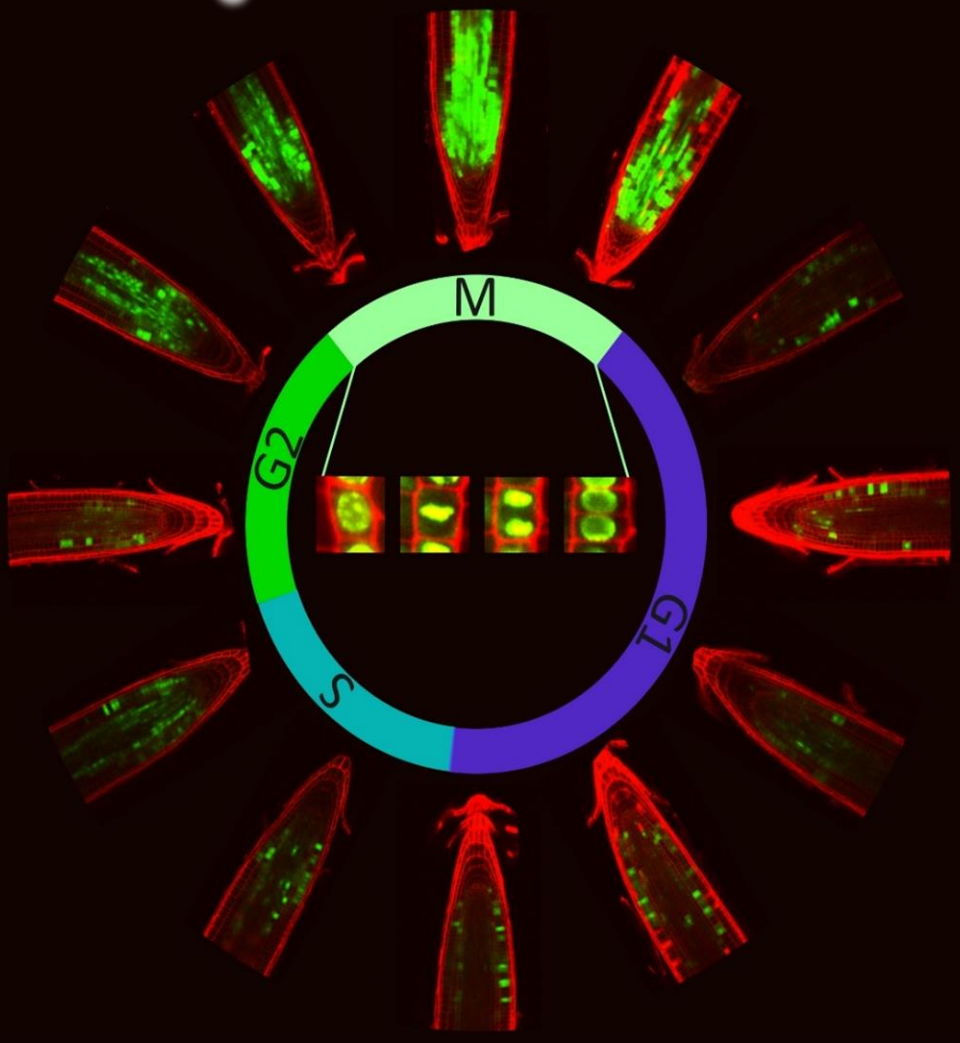

52TH ANNUAL MEETING

ARGENTINE SOCIETY FOR BIOCHEMISTRY AND MOLECULAR BIOLOGY

LII REUNIÓN ANUAL

Sociedad Argentina de Investigación en Bioquímica y Biología Molecular

Pabellón Argentina. Universidad Nacional de Córdoba

November 7-10, 2016

- SAIB -
52th Annual Meeting
Argentine Society for Biochemistry and Molecular Biology

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Córdoba, República Argentina
Pabellón Argentina
Universidad Nacional de Cordoba

Cover Page:

Confocal microscopy images of Arabidopsis thaliana *root are displayed in the cover. The selected roots are expressing a GFP reporter of a mitotic cyclin (CYCB1;1-GFP, green), also they are counterstained with propidium iodide (IP, red) to display the cell structure. In order to follow the progression through the cell cycle phases, the root cells were synchronized in S phase using HU, and after pictures were taken every 2 hours. This type of experiment was also used to generate RNA samples to analyze the dynamics of different gene expression during the cell cycle. Inside the circle, which shows the cell cycle phases, images of cells expressing a histone fused to the fluorescent protein VENUS and stained with IP, are displayed. Those images allow following the steps of mitosis in vivo inside the root (PL-P56: Identification of cell cycle regulators inplants, by Goldy, C; Ercoli, MF; Vena, R; Palatnik, J, Rodriguez, Ramiro E.)*

Diseño de tapa: Natalia Monjes

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its natural substrate amylopectin, but with a different kinetic behavior. To further characterize the enzyme and based in OtDSP homology with *A. thaliana* LSF2 we identified amino acidic residues involved in catalysis and binding to substrate that were mutagenized. Wild type OtDSP and its mutants counterparts were studied by means of native-PAGE, size exclusion chromatography and binding assays to polysaccharides. The results obtained suggest OtDSP as a fully functional enzyme *in vivo*.

EN-C03
ALTERNATIVE CATALYTIC PROPERTIES IN THE GLYCOGEN-SYNTHASE FROM ACTINOBACTERIA

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A new pathway (named GlgE) for prokaryotic glycogen metabolism was described in Actinobacteria. In this pathway, the key enzyme GlgE extends the glucan in two glucose units by means of maltose-1P; whilst in the classical GlgAC pathway glycogen-synthase (GlgA, EC 2.4.1.21) elongates the polymer in one unit, using ADP-glucose as the glucosyl donor. Recently it was reported that the mycobacterial GlgA catalyzes maltose-1P synthesis consuming glucose-1P and ADP-glucose as substrates. Thus, we analyzed this reaction in several GlgAs from different sources so far characterized in our lab. Amongst them, GlgAs from Actinobacteria (Streptomyces and Rhodococcus) were active for maltose-1P synthesis. Moreover, both actinobacterial GlgA showed some degree of promiscuity towards sugar-1Ps but not for NDP-sugars. Particularly, rhodococcal GlgA used glucosamine-1P to the same extent than glucose-1P. Actinobacterial GlgAs also catalyzed the synthetic reaction using ADP-Glc and maltose-1P (~50% lower regarding glucose-1P) as substrates. In addition, the maltose-1P forming activity was detected in crude extracts from *Rhodococcus jostii*, thus suggesting a biological significance for this alternative catalytic property. Results support a critical role of maltose-1P and a multifaceted GlgA function (being involved in the classical as well as in the GlgE pathway) for glycogen metabolism in actinobacteria.

LIPIDS

LI-C01
HIGH-NACL INDUCES SREBP-MEDIATED TRANSCRIPTIONAL REGULATION OF TRIGLYCERIDES

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Hypertonicity regulates phospholipids (PLs) and TAG synthesis. These metabolic pathways can be regulated by transcriptional activation of their biosynthetic enzymes. Several transcription factors may be involved in such regulation but sterol response element binding protein (SREBP) is considered the master regulator of lipogenic genes. We showed that MDCK cells subjected to high NaCl induce changes in mRNA expression and cell distribution of SREBP isoforms. These changes were consistent with the increased levels of PLs and TAG in treated cells and with the decrease in lipid synthesis after fatostatin treatment. However, we did not establish which isoform, SREBP1 (S1) and/or SREBP2 (S2), is responsible for the increased lipogenic activity. The present work was aimed to address this. Before the addition of hypertonic medium, MDCK cells were treated with S1-siRNA, S2-siRNA or both. After NaCl treatment lipid synthesis was studied. PLs and 1,2 DAG synthesis were not affected by any siRNA. In contrast, both 1,3 DAG and TAG synthesis were blocked. S1-siRNA decreased DAG and TAG synthesis by 33 and 46 %. S2-siRNA decreased DAG and TAG by 40 and 37%, respectively. Both siRNAs reduced synthesis by 55 %. So, SREBPs are needed to maintain TAG synthesis and its degradation to DAG but PLs synthesis remains constant indicating that SREBP-mediated transcriptional regulation is not involved

LI-C02
THE ETHER-LINKED LIPIDS OF RAT EPIDIDYMIS ARE AFFECTED BY MILD HYPERTHERMIA

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It is widely known that heat stress temporarily suppresses spermatogenesis in the mammalian testis, but the impact on the epididymis is barely known. The aim of this study was to examine the effects of short, repeated once-a-day episodes of hyperthermia (43ºC) on the ether-linked glycerophospholipids (GPL) and triglycerides (TG) of rat epididymis. One-week post-treatment, the expression (mRNA) of alkylglycerone phosphate synthase (AGPS), a key peroxisomal enzyme in the synthesis of these lipids, significantly fell in caput and corpus epididymis. Coincidentally, levels of the plasmalogen precursor, plasmanyletanolamine, decreased. Concurrently, plasmenylethanolamine and plasmenylcholine accumulated in caput, ascribable to injured and motionless cells and sperm collecting in the lumen. Catabolism of such GPL had started in the epididymal epithelium, as suggested by the build-up of ether-linked TG. Between weeks 2 and 6, spermatogenesis restarted in the testis. Although the epididymis was still sperm-free at week 6, its levels of ether-linked GPL and TG were much higher than those of untreated controls, in agreement with the recovery of AGPS expression. Ether-linked TG were formed by de novo synthesis and during GPL breakdown. The presence of spermatozoa in the epididymal lumen apparently plays a regulatory role in the biosynthesis of ether-linked lipids by the epididymal epithelium