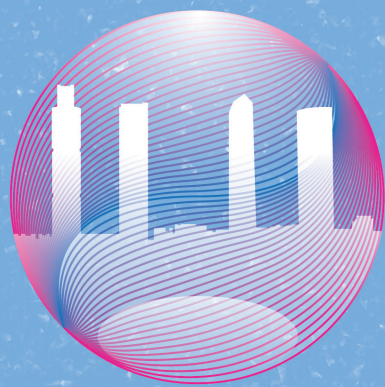




SEBBM19madrid

42nd Congress of the Spanish Society of
Biochemistry and Molecular Biology

16-19th july 2019

Addendum: Modifications to the Programme & Book of Abstracts

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Contents

SEBBM Travel Grants	1
Flash oral communications	2
Modifications to the Book of Abstracts	3
General information	7

SEBBM Travel Grants

Spanish Society of Biochemistry and Molecular Biology has awarded travel grants to facilitate the attendance of its early-career members to the 42nd SEBBM Congress in Madrid on 16-19 July 2019.

Carpintero Fernández, Paula
Etxaniz Iriondo, Asier
Forcada Nadal, Alicia
García Hernández, Violeta
Gaudó Pardo, Paula
Gómez Santos, Beatriz
González Magaña, Amaia
González Ramírez, Emilio José
González Romero, Francisco
Guerra Castellano, Alejandra
Gutiérrez Pelaz, Sara
Hernández Ainsa, Carmen
Huesa, Juan José
Ibeas Martínez, Kevin
Ijurko Valeta, Carla
Jiménez García, Brian
Lagal, Daniel
Lapresa Ruiz de Gauna, Rebeca
Linares Pérez, Azahara
Maestro Lavín, David
Matellán Fernández, Laura
Nemours, Stéphane
Ortega Sanchís, Sheila
Pastor Soler, Sandra
Payá Cuadra, Gloria
Peláez Cristóbal, Rafael
Pesini Martín, Alba
Reche Pérez, Francisco José
Rodríguez Herrero, Verónica
Rodríguez López, Sandra
Romo González, Marta
Sánchez Morán, Irene
Simon Molas, Helga
Solana Manrique, Cristina
Soler Vazquez, M^a del Carmen
Soriano Teruel, Paula María
Varela Eirín, Marta
Vecino Pérez, Rebeca
Zagmutt Caroca, Sebastián
Sanchón Sánchez, Paula

Flash oral communications

Some SEBBM Scientific Groups have selected 3 additional posters as flash oral communications of 5 minutes. Flash oral communications have also presented a poster.

The list of Flash oral communications should have appeared in the Programme as follows:

G02. Molecular Basis of Pathology

17:30-17:45

- **Paula Gaudó** (G02-18-P19 f,m). Universidad de Zaragoza, Zaragoza, ES
“Contribution of the pharmacological treatment to a POLG-related disease progression”
- **Alba Costales-Carrera** (G02-23-P24 f,m). Instituto de Investigaciones Biomédicas “Alberto Sols” (CSIC-UAM), CIBERONC, Madrid, ES
“Patient-derived organoids from normal and tumoral colorectal tissue”
- **Marina Fuertes Agudo** (G02-10-P11). Instituto de Biomedicina de Valencia (CSIC), Valencia, ES
“Role of COX-2 in liver mitochondrial function”

G05. Chemical Biology

17:30-17:45

- **Ane Ruiz de Angulo Dorronsoro** (G05-15-P9). CIC bioGUNE, Bilbao, ES
“Chemical biology studies of improved QS-21-based vaccine adjuvants: novel biochemical tools for mechanistic investigations and molecular vaccines”
- **Paula Carpintero-Fernández** (G05-10-P4 f,m). Blizard Institute, Queen Mary University of London, London, UK
“Uncovering genes implicated in therapy-induced senescence resistance”
- **Sara G. Pelaz** (G05-14-P8 f). INCYL. Universidad de Salamanca, Salamanca, ES
“A c-Src inhibiting peptide based on Connexin43 regulates glucose metabolism in human glioma stem cells”

G09. Protein Structure and Function

17:30-17:45

- **Mónica Balsera** (G09-14-P19). IRNASA, Salamanca, ES
“Thiol-based redox signaling and regulation: diversity of the thioredoxin system”
- **Hugo Muñoz-Hernández** (G09-25-P30 m). Biozentrum, University of Basel, Basel, CH
“Cryo-EM of the R2TP co-chaperone complex reveals a mechanism regulating the AAA-ATPases RUVBL1-RUVBL2”
- **José María Valpuesta** (G09-11-P16). Centro Nacional de Biotecnología (CSIC), Madrid, ES
“The CNB-CIB cryoelectron microscopy facility: a powerful instrument for the acquisition of high-resolution data”

G12. Nitrogen Metabolism

17:30-17:45

- **Antonio López-Lozano** (G12-07-P125). Universidad de Córdoba, Córdoba, ES
“Nitrogen regulation in marine Cyanobacteria: Basis for the study of NtcA, PII and PipX”
- **Sandra Díaz-Troya** (G12-11-P129). Instituto de Bioquímica Vegetal y Fotosíntesis (CSIC-Universidad de Sevilla), Sevilla, ES
“Maintenance of the metabolic carbon flux is required for the response to nitrogen deprivation in Synechocystis sp. PCC 6803”
- **Sandra Pastor-Soler** (G12-20-P138). Universidad de Alicante, Alicante, ES
“Expression analysis of ArsR transcriptional regulator in Haloferax mediterranei”

Modifications to the Book of Abstracts

Please find the following abstracts that require some modifications:

G02-07-P8 f – Some authors and affiliations have to be included in this communication. The abstract should be changed as follows:

G02-07-P8 F

Direct Effects of Cigarette Smoke in Pulmonary Arterial Cells: Implications in Arterial Remodeling and Vascular Tone Maintenance

Sevilla-Montero, Javier¹; Labrousse-Arias, David¹; Fernandez-Perez, Cintia¹; Fernandez-Blanco, Laura¹; Barreira Barba, Bianca^{2,3}; Mondejar-Parreño, Gemma^{2,3}; Alfaro-Arnedo, Elvira⁴; López, Iciar P.⁴; Perez Rial, S^{5,3}; Peces-Barba, G^{5,3}; Pichel, José G.⁴; Peinado, V.I.^{6,3}; Cogolludo Torralba, Angel^{2,3}; **Calzada, María J**³

¹Biomedical Research Institute Hospital La Princesa (IIS-IP), Department of Medicine, School of Medicine, Universidad Autonoma of Madrid, Madrid, Spain, ²Department of Pharmacology and Toxicology, School of Medicine, Universidad Complutense of Madrid, Madrid, Spain, ³Centro de Investigaciones Biomedicas en Red de Enfermedades Respiratorias (CIBERES), Spain, ⁴Lung Cancer and Respiratory Diseases Unit, Centro de Investigación Biomédica de La Rioja, Fundación Rioja Salud, 26006 Logroño, Spain, ⁵Pneumology Unit. IIS-FJD, Madrid, Spain, ⁶Department of Pulmonary Medicine, Hospital Clínic-Institut d'Investigacions Biomèdiques August Pi i Sunyer (IDIBAPS), University of Barcelona, Barcelona, Spain

The effects of cigarette smoke in the progressive deterioration of the airway in COPD patients have been extensively studied. However, the effects on pulmonary vasculature have been neglected, due to the classic conception that vascular damage is a consequence of alveolar hypoxia and loss of capillary bed. In our laboratory we aimed to study the effects of CSE in regulating pulmonary arterial cells phenotypic modulation and in particular the effects in hPAFib and hPASMC. Our results demonstrated that CSE exposure had direct effects on hPAFib and hPASMC, promoting a senescent phenotype that on the other hand contributed through the secretion of inflammatory molecules to increase the proliferative potential of non-exposed cells. In addition, CSE affected cell contractility and dysregulated the expression and activity of voltage-gated K⁺ channels. This ultimately contributed to limit vascular responses impairing vasoconstriction and endothelium-dependent and independent relaxation. These findings greatly enhance knowledge about pulmonary diseases, in particular COPD, and open a new line of study related to the exploitation of these mechanisms as therapeutic targets.

References

- doi: <https://doi.org/10.1101/555953>

G05-15-P9 – Alberto Fernández-Tejada Salas does not attend the Congress. However, we are pleased to announce that Ane Ruiz de Angulo Dorronsoro will present in his place. The abstract should be changed as follows:

G05-15-P9

Chemical biology studies of improved QS-21-based vaccine adjuvants: novel biochemical tools for mechanistic investigations and molecular vaccines

Ruiz de Angulo Dorronsoro, Ane¹

¹CIC bioGUNE/Chemical Immunology Lab

Immunological adjuvants are key ingredients added to vaccines to enhance the immunogenicity of the antigen and potentiate the immune response. The saponin natural product QS-21 is one of the most potent and promising investigational adjuvants and has been co-administered with vaccines against cancers and infectious diseases in many clinical trials. However, its inherent liabilities, including scarcity, heterogeneity, instability, and toxicity have limited its widespread clinical use. In addition, its molecular mechanisms of action are poorly understood. This talk will cover recent and ongoing efforts in my lab at the chemistry-biology interface on the development of improved synthetic saponin adjuvants based on QS-21 [1]. A number of QS-21 variants incorporating stable acyl chain amide linkages, truncated carbohydrate domains, and targeted modifications at the triterpene and central glycosyl ester linkage were designed, chemically synthesized, and immunologically evaluated [2,3]. These multidisciplinary studies have defined key minimal requirements for adjuvant activity, established correlations between saponin structure, conformation, and activity, and provided synthetically accessible saponin adjuvants with improved activity/toxicity profiles [4]. Moreover, leveraging these structure-activity relationships, novel saponin probes with high potency and reduced toxicity were developed and used in *in vivo* biodistribution and fluorescence imaging studies, providing early insights into the enigmatic mechanisms of saponin immunopotential [1].

References

- [1] Acc Chem Res. 2016, 49, 1741-1756
- [2] Chem Sci. 2016, 7, 2371-2380
- [3] Nat Chem. 2014, 6, 635-643
- [4] Pure Appl. Chem. 2017, 89, 1359-1378

G06-08-P90 – The name of an author has to be corrected. In addition, Pilar S. Testillano does not attend the Congress. However, we are pleased to announce that Elena Carneros will present in her place. The abstract should be changed as follows:

G06-08-P90

Small molecule epigenetic modulators to improve somatic embryogenesis yield for regeneration and breeding of cork oak

Testillano, Pilar S.¹; Carneros, Elena¹; Díaz-Luzza, Esteban M.¹; Pérez-Pérez, Yolanda¹; Bárány, Ivett¹; Risueño, María-Carmen¹

¹Biological Research Center, CIB-CSIC/Pollen Biotechnology of Crop Plants group

Somatic embryogenesis is a biotechnological tool for large-scale mass propagation of selected material, genetic transformation and breeding, with many advantages in forest tree improvement. Cell reprogramming, totipotency acquisition and somatic embryogenesis initiation involve change of cell developmental program that affect global genome organization. In herbaceous species, microspore embryogenesis initiation is associated with DNA hypomethylation (Solís et al. 2012, 2015), but little is known in trees (Rodríguez-Sanz et al. 2014, Corredoira et al. 2017).

We analyzed changes in global DNA methylation levels, nuclear distribution and gene expression of DNA methyl transferases during somatic embryogenesis of *Quercus suber* L. (cork oak), by biochemical, molecular and immunocytochemical approaches. Effects of small molecule 5'-azacytidine (AzaC), DNA demethylating agent, on somatic embryogenesis were analyzed. Results showed reduction of global DNA methylation at early stages, in proembryogenic masses, followed by a further increase, during embryo differentiation. *QsMET1* DNA methyl transferase was up-regulated during somatic embryo development, suggesting its involvement in the process. AzaC reduced global DNA methylation of proembryogenic masses and promoted their proliferation, favoring somatic embryogenesis initiation. At advanced stages, AzaC prevented embryo differentiation, an effect that reverted by elimination of the drug, leading to the formation of higher number of embryos compared with control cultures.

These findings provide new insights into the epigenetic regulation of somatic embryogenesis in cork oak, and a promising avenue for pharmacological intervention by using small molecule epigenetic modulators, to improve somatic embryogenesis yields for forestry breeding and propagation programs.

Work supported by project AGL2017-82447-R funded by Spanish MCIU and ERDF/ FEDER.

References

- Corredoira E, Cano V, Bárány I, Solís MT, Rodríguez H, Vieitez AM, Risueño MC, Testillano PS (2017) J Plant Phys. 213: 42-54.
- Rodríguez-Sanz H, Manzanera JA, Solís MT, Gómez-Garay A, Pintos B, Risueño MC, Testillano PS (2014) BMC Plant Biol. 14:224.
- Solís MT, Rodríguez-Serrano M, Meijón M, Cañal MJ, Cifuentes A, Risueño MC, Testillano PS (2012) J Exp Bot. 63: 6431-6444.
- Solís MT, El-Tantawy AA, Cano V, Risueño MC, Testillano PS (2015) Front Plant Sci. 6: 472

G07-17-P101 f,m – Mayela Govea Salas does not attend the Congress. However, we are pleased to announce that Sujey Abigail Niño Herrera will present in her place. The abstract should be changed as follows:

G07-17-P101 F,M

Cytotoxic and proteomic profile analysis of human blood cells treated with gallic acid and resveratrol in vitro

Niño Herrera, Sujey Abigail¹; Govea Salas, Mayela¹; Iliná, Anna¹; Chávez González, Mónica Lizeth¹; Aguilar González, Cristóbal Noé²; Contreras Esquivel, Juan Carlos²

¹Universidad Autónoma de Coahuila/Nanobiociencias, ²Universidad Autónoma de Coahuila/Departamento de Investigación en Alimentos

Introduction: The antioxidant activity of polyphenols is attributed to its ability to reduce the production of free radicals, which can be by inhibiting enzymes involved or by chelation with the transition metals responsible for the generation of free radicals. Therefore flavonoids, due to their low redox potential, can reduce reactive oxygen species [1]. An example of these compounds is gallic acid (GA) and resveratrol (RVT), which are present in foods such as grapes, pomegranates, walnuts, strawberries, cranberries, apple peel, chard and spinach, and in beverages such as coffee, red wine and green tea. They have been attributed biological properties such as antimicrobial, anti-inflammatory, anticancer, antiviral, among others [2]. **Objective:** To know the effect of GA and RVT previously studied in our working group on its anticancer and antiviral activity, but now on blood cells *in vitro*, and thus promote its use as a possible antioxidant therapy. **Methodology:** Several concentrations of GA and RVT (0-1000 ppm) were tested on human peripheral blood cells in cell culture (1x10⁵ cells.) at different times (0, 3, 6, 12 and 24 h) to evaluate the percentage of hemolysis. In addition, leukocytes were extracted from the samples treated with both compounds and an extraction of proteins was performed, they were quantified, and an SDS-PAGE electrophoresis was performed to analyze the proteomic profile. **Results:** A decrease in hemolysis percentage was observed with 250 and 500 ppm. Cell viability was affected from 500 ppm of GA in 40% and with RVT decreased by 30%. In the analysis of the proteomic profile we observed a sub-expression of proteins related to apoptosis processes and DNA damage, as well as an over-expression of proteins related to cell repair processes and oxidative stress. In both treatments, positive and negative cell damage controls were used. **Conclusions:** We observed an effect on the proteomic profile of leukocytes treated with GA and RVT *in vitro*, decreasing the expression of proteins related to cell death and damage processes, as well as increasing the expression of repair proteins and cellular metabolism, without affecting cell viability.

References

- [1] León-González, A.J., Auger, C., Schini-Kerth, V.B. (2015). Pro-oxidant activity of polyphenols and its implication on cancer chemoprevention and chemotherapy. Biochemical Pharmacology.
- [2] Govea, Mayela., Rivas, Ana., Rodríguez, Raúl., Lozano, Sonia., Aguilar, Cristóbal., Zugasti, Alejandro., Salas, Tanya., Morlett, Jesús. (2017). Gallic acid decreases hepatitis C virus expression through its antioxidant capacity. Experimental and Therapeutic Medicine, 11p, 619-624pp.

G13-22-P153 – The title, the name of an author and the affiliations have to be corrected. The abstract should be changed as follows:

G13-22-P153

Effects of the environmental enrichment in *Sparus aurata* on the antioxidant system and monoaminergic synthesis

Tejada, Silvia^{1,2}; Sureda, Antoni^{2,3}; Moranta, David¹; Jiménez, Manuel¹; Caballero, Juan Carlos¹; Esteban, Susana¹; Arechavala, Pablo⁴

¹Laboratory of Neurophysiology, Biology Department, University of the Balearic Islands, E-07122, Palma de Mallorca, Balearic Islands, Spain, ²CIBEROBN (Physiopathology of Obesity and Nutrition), E-07122, Palma de Mallorca, Balearic Islands, Spain, ³Research Group on Community Nutrition and Oxidative Stress, University of the Balearic Islands, E-07122, Palma de Mallorca, Balearic Islands, Spain, ⁴Fish Ecology Group – IMEDEA, Esporles, Spain. Fish Ethology and Welfare Group – CCMAR, Faro, Portugal

Gilthead seabream (*Sparus aurata*) is one of the most important fish species in the Mediterranean aquaculture sector. The largest productions of seabream come from intensive farming; however, intensive farming systems can cause stress, anguish, health problems and even mortality during the production process. The physiological state and behaviour of fish at individual levels can be used as direct indicators of the fish welfare state. Fish experiments were developed at experimental land-based tanks at the facilities of the Laboratory of Marine Research and Aquaculture (LIMIA) of the Balearic Government (Port of Andratx, Mallorca, Spain) to analyze the beneficial effects of the environmental enrichment. One group of *S. aurata* was maintained in standard conditions and a second group was placed in an enriched environment consisting on fibre hemp ropes hanging from the top without reaching the bottom during 60 days. Antioxidant enzyme –catalase, superoxide dismutase, glutathione peroxidase and glutathione reductase– and acetylcholinesterase activities and malondialdehyde (MDA) levels were determined in brain. Monoaminergic neurotransmitters (serotonin, noradrenaline and dopamine) levels were evaluated in telencephalon and cerebellum. The results showed a significant increase ($p < 0.05$) in the activity of catalase, superoxide dismutase, glutathione peroxidase and glutathione reductase in brain of fish from the enriched environment. No significant differences were reported in MDA and acetylcholinesterase between both groups. Moreover, a significant increase of serotonin in cerebellum was observed in the environmental-enriched group ($p < 0.05$). In conclusion, the environmental enrichment caused the activation of the antioxidant defence systems without lipid damage in brain samples of *S. aurata*; in addition, the increase serotonin levels in cerebellum could be related to higher motor activity in an enriched environment.

Acknowledgments: Acción Estratégica en Salud del Ministerio de Ciencia e Innovación (CIBEROBN CB12/03/30038). FEDER Funds. COST Action CA16112.

G13-26-P157 – A new author has to be included. The abstract should be changed as follows:

G13-26-P157

Long-term oral anticoagulation delays Alzheimer's disease pathogenesis in the TgCRND8 mouse model

Cortes-Canteli, Marta¹; Krüyer, Anna²; Fernandez-Nueda, Irene³; Marcos-Diaz, Ana³; Ceron, Carlos³; Richards, Allison T.²; Jno-Charles, Odella C.²; Rodriguez, Ignacio⁴; Callejas, Sergio³; Norris, Erin H.²; Sanchez-Gonzalez, Javier⁵; Ruiz-Cabello, Jesus⁶; Ibanez, Borja⁷; Strickland, Sidney²; Fuster, Valentin⁸

¹CNIC/The Rockefeller University/Corresponding author, ²The Rockefeller University, ³CNIC, ⁴CNIC/UCM, ⁵Philips Healthcare Iberia, ⁶CNIC/UCM/CIC biomaGUNE/CIBERES, ⁷CNIC/IIS-Fundación Jiménez Díaz/CIBERCV, ⁸CNIC/Icahn School of Medicine at Mount Sinai

Background – Alzheimer's disease (AD) is a multifactorial neurodegenerative disorder with important vascular and hemostatic alterations that should be taken into account during diagnosis and treatment.

Objectives – This study evaluates whether long-term anticoagulation with a clinically approved oral direct thrombin inhibitor ameliorates AD pathogenesis in a transgenic mouse model of AD.

Methods – TgCRND8 AD mice and their wild type (WT) littermates were treated for one year with an oral direct thrombin inhibitor or placebo. Cognition was evaluated using the Barnes maze, and cerebral perfusion was examined by arterial spin labeling (ASL). At the molecular level, western blot and histochemical analyses were performed to analyze fibrin content, amyloid burden, neuroinflammatory activity, and blood brain barrier (BBB) integrity.

Results – Long-term oral anticoagulation prevented memory decline, cerebral hypoperfusion, and toxic fibrin deposition in the AD mouse brain. In addition, treatment significantly reduced the extent of amyloid plaques, oligomers, phagocytic microglia, and infiltrated T cells, and also prevented astrocytic depolarization in AD by maintaining the expression of the water channel aquaporin-4 (AQP4) at astrocytic perivascular endfeet of the BBB.

Conclusions – Long-term anticoagulation with an oral direct inhibitor blocked the formation of occlusive thrombi in AD, preserved cognition, cerebral perfusion, and BBB function and ameliorated neuroinflammation and amyloid deposition in AD mice. Our results open a field for future investigation on whether the use of direct oral anticoagulants might be of therapeutic value in AD.

Funding- Robertson Therapeutic Development Fund, NINDS/NIH, FP7-PEOPLE-2013-IIF (GA-2013-624811), MCNU, ProCNIC Foundation, Severo Ochoa Center of Excellence (SEV-2015-0505), Miguel Servet Program (CP16/00174 & MS16/00174), ISCIII, Comunidad de Madrid, FEDER, FSE.

References

- Cortes-Canteli, M* et al. 2019. Long-term oral anticoagulation delays Alzheimer's disease pathogenesis. Under Review. *Corresponding author.
- Cortes Canteli, M.; et al. 2015. Fibrin deposited in the Alzheimer's disease brain promotes neuronal degeneration. *Neurobiol Aging*. 36, 608-617.
- Cortes-Canteli, M.; et al. 2010. Fibrinogen and beta-amyloid association alters thrombosis and fibrinolysis: a possible contributing factor to

Alzheimer's disease. *Neuron*. 66, 695-709.

G14-11-P168 f – Celia López-Gutiérrez does not attend the Congress. Her abstract entitled “*New method for assessment of Trypanothione Synthetase activity to evaluate putative inhibitory molecules*” should not appeared in the Book of abstratscs.

G17-13-P104 f – Montserrat Pinent does not attend the Congress. However, we are pleased to announce that Carme Grau will present in her place. The abstract should be changed as follows:

G17-13-P104 f

Differential expression of bitter taste receptors in animal species used as human models

Pérez, Judit¹; Grau, Carme¹; Miguens, Alba¹; Sierra, Marta¹; González, Carlos¹; Beltran, Raul¹; Terra, Ximena¹; Blay, Mayte¹; Pinent, Montserrat¹; Ardévol, Anna¹

¹URV/Bioquímica i Biotecnologia

Taste 2 receptors (TAS2R) are a family of cell surface receptors that respond to bitter tastants. The finding that they are expressed not only in the tongue, but also in non-gustatory tissues such as the gastrointestinal tract, generated the idea of an additional role not only related to the oral sense of taste. Among their natural ligands TAS2R are selectively recognized by flavanols. In this study, we evaluated the gene expression at different locations of the gastrointestinal tract of two putative targets for flavanols: TAS2R14 and TAS2R39, in rat and pig. We also checked their sensitivity to flavanol treatment. To do so, we assayed their mRNA expression with real time PCR in tongue, duodenum, ileum and colon of Wistar female rats and *Sus scrofa domesticus*. TAS2R39 in pig showed a higher abundance in duodenum followed by colon. In duodenum, a 30 minutes treatment with catechin did not modify its expression. In rat, TAS2R39 was undetectable. Conversely, TAS2R14 in rat was found significantly more expressed in ileum, with an expression there even higher than in tongue. Our observations that the relative abundance of two TAS2R members differs between pig and rat support the need to clarify the different profile of TAS2Rs in different species before extrapolating results from animal models for human use.

This work has been supported by AGL2017-83477-R from the Ministerio de Ciencia, Innovación y Universidades.

G06-04-OS – The order of the authors was not correct. The abstract should be changed as follows:

G06-04-OS

From multi-omics analysis to phenolic metabolism reconstruction in *Quercus ilex*

Infantes-González, Álvaro¹; López-Hidalgo, Cristina²; Jorrín-Novo, Jesús V.¹; Rey, María-Dolores¹

¹University of Córdoba, Córdoba, Spain/Department of Biochemistry and Molecular Biology, ²University Institute of Biotechnology of Asturias (IUBA). University of Oviedo, Asturias, Spain/Plant Physiology, Department of Organisms and Systems Biology

Holm oak (*Quercus ilex* subsp. *ballota* (Desf.) Samp.) is the dominant forest tree in the Mediterranean Basin, with relevance from an environmental and economic point of view. This species is currently facing a series of problems that put its conservation at risk [1]. To solve them, it is particularly interesting the use of modern “omics” techniques and bioinformatics tools in the direction of Systems Biology to identify mechanisms, genes and gene products that underlie phenotypes of interest [2]. The present work focuses on the identification and characterization of enzymes involved in the synthesis of phenolic compounds, which perform a wide variety of physiological functions involved in stresses responses and adaptability of plants [3].

An exhaustive bibliographical research on phenolic compounds detected and identified in *Q. ilex* was performed. Up to 34 phenolic compounds belonging to different families such as cinnamic acids, lignins or coumarins have been reported in the literature or identified in our research group [2]. Through the analysis of the *Q. ilex* transcriptome and proteome databases generated by our group [4], we identified 40 transcripts and 32 proteins of enzymes catalyzing specific reactions in the biosynthetic pathways of these compounds such as the flavonoids or anthocyanins synthesis pathways. Then, a multi-omics integration of available data was carried out based on specific phenolic pathways, as proposed by KEGG database [5]. Moreover, analysis of expression under severe drought conditions revealed overexpression of certain enzymes of the flavonoid biosynthesis pathway at transcript and protein levels. Therefore, this work contributes to extent the current knowledge of phenolic compounds' biosynthesis in *Q. ilex* at the different levels of expression of genetic information.

References

- [1] Jorrín-Novo, J.V. et al. (2014). *Ecosistemas* 23(2): 99-107.
- [2] López-Hidalgo, C. et al. (2018). *Front Plant Sci.* 9:935.
- [3] Buchanan, B. et al. (2015) *Biochemistry and Molecular Biology of Plants* (2nd ed.). American Society of Plant Biologists. Rockville, Maryland, USA. 1178-1205.
- [4] Guerrero-Sanchez V.M. et al. (2019) *PLoS ONE* 14(1): e0210356.
- [5] <https://www.genome.jp/kegg/> (Consulted on 30/4/2019).

G17-06-OS – The name of an author was not correct. In addition, Joan Ribot does not attend the Congress. However, we are pleased to announce that M. Luisa Bonet will present in his place. The abstract should be changed as follows:

G17-06-OS

Neonatal Resveratrol and Nicotinamide Riboside Supplementations Sex-dependently Affect Beige Transcriptional Programming of Preadipocytes in Mouse Adipose Tissue towards Beige Adipogenesis

Rodríguez, Ana M.¹; Asnani-Kishnani, Madhu¹; Serrano, Alba¹; Palou, Andreu¹; **Bonet, M. Luisa¹**; Ribot, Joan¹

¹ *Universitat de les Illes Balears-CIBEROBN-IdISBa, Palma de Mallorca, ES/Grup de Recerca Nutrigenòmica i Obesitat, Laboratori de Biologia Molecular, Nutrició i Biotecnologia (LBNB)*

Nutritional programming of the thermogenic and fuel oxidation capacity of white adipose tissue (WAT) through dietary interventions in early life is a potential strategy to enhance future metabolic health. We previously showed that mild neonatal supplementations with the polyphenol resveratrol (RSV) and the vitamin B3 form nicotinamide riboside (NR) have sex-dependent, long-term effects on the thermogenic/oxidative phenotype of WAT of mice in adulthood, enhancing this phenotype selectively in male animals. Here, we tested the hypothesis that these dietary interventions may impact the commitment of progenitor cells resident in the developing WAT towards brown-like (beige) adipogenesis. NMRI mice received orally from postnatal day 2 to 20 (P2-20) a mild dose of RSV or NR, in independent experiments; control littermates received the vehicle. Sex-separated primary cultures were established at P35 from the stromovascular fraction of inguinal WAT (iWAT) and of brown adipose tissue (BAT). Expression of genes related to thermogenesis and oxidative metabolism was assessed in the differentiated cultures, and in vivo in the iWAT depot of young (P35) animals. Neonatal RSV and NR treatments had little impact on the animals' growth during early postnatal life and the expression of thermogenesis- and oxidative metabolism-related genes in the iWAT depot of young mice. However, the expression of brown/beige adipocyte marker genes was upregulated in the iWAT primary cultures from RSV supplemented and NR supplemented male mice, and downregulated in those from supplemented female mice, as compared to cultures derived from sex-matched control littermates. RSV supplementation had similar sex-dependent effects on the expression of thermogenesis-related genes in the BAT primary cultures. A link between the sex-dependent short-term effects of neonatal RSV and NR supplementations on primary iWAT preadipocyte differentiation observed herein and their previously reported sex-dependent long-term effects on the thermogenic/oxidative capacity of adult iWAT is suggested. The results provide proof-of-concept that the fate of preadipocytes resident in WAT of young animals towards the beige adipogenesis transcriptional program can be modulated by specific food bioactives / micronutrients received in early postnatal life.

Acknowledgements: This work was sponsored by grants from the Spanish Government (AGL2015-67019-P to A.P.; Agencia Estatal de Investigación, MINECO/FEDER, EU) and Fundación Ramón Areces (to M.L.B.). CIBER de Fisiopatología de la Obesidad y Nutrición (CIBEROBN) is an initiative of the ISCIII (Spanish Government).

General information

- For nursing mothers, a room has been reserved for your convenience. Please contact the Organising Committee for further details.

- There was a mistake in the page 8 of the Programme. During the event *El congreso FEBS 1969 de Madrid: semillero y expansión de la bioquímica en España*, Federico Mayor Menéndez did not participate. The correct name is Federico Mayor Zaragoza.