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Group Members

Ana Mª Briones. Ramon y Cajal contract (PhD).
Mercedes Salaices. Professor of Pharmacology (PhD).
Rosa María Aras-López. Juan de la Cierva contract (PhD).
Sonia Martínez Revelles. Contracted researcher (PhD).
Marisol Avendaño. Contracted researcher (PhD).
Andrea Aguado. PhD student (FPI fellow).
Laura García-Redondo. Technician.
María Jesús Alonso. Professor of Physiology (PhD).
Raquel Hernanz. Lecturer (PhD).
Ángela Martín. Lecturer (PhD).
Roberto Palacios. PhD student.
Mª Teresa Barrús. Lecturer (PhD).

We also collaborate very closely with a team of clinicians at La Paz Hospital (Madrid).

Brief overview

Our group is a well-established Research Group that has worked for more than 30 years in the study of the mechanisms involved in the functional, structural and mechanical alterations of the vasculature in different cardiovascular pathologies such as ageing, diabetes and specially, hypertension. It is composed by professors and researchers from the Autonomous University of Madrid (UAM) and the University Rey Juan Carlos (URJC). Our group is involved in Research Collaborations with investigators in different Universities and Research Institutes in Spain and in other countries. Our main objective is to gain more insight into the physiopathological and molecular mechanisms involved in alterations of resistance and conductance arteries in cardiovascular pathologies. We have a particular interest in the role of prostanoids derived from the inducible isoform of cyclooxygenase (COX-2), reactive oxygen species and the interaction among them or with other mediators such as nitric oxide, in inflammatory conditions which resemble those found in cardiovascular pathologies. This is important because of the essential role of these mediators in the control of vascular smooth muscle tone and vascular structure.

Research interests

- Oxidative stress, cyclooxygenase-derived products and vascular function and remodeling. Changes with hypertension and other cardiovascular pathologies.
- Adipose tissue and vascular alterations in cardiovascular pathologies. Role of the renin-angiotensin-aldosterone system.
- Cardiovascular effects of heavy metals

Facilities

Our lab and other facilities of the Faculty of Medicine (UAM) and Faculty of Sciences (Universidad Rey Juan Carlos, Spain) are gifted of most common equipment used in classic and modern pharmacology, physiology and biochemical techniques for biomedical research. Different techniques, such as Western Blot, HPLC, flow-cytometry, confocal microscopy, cell culture and different techniques to measure structure and function of blood vessels, among others, are available.

Expertise

Our group has a wide experience in the study of different aspects of the mechanisms controlling functional, structural and mechanical properties of vessels both in physiological and in pathological cardiovascular conditions. Our group can provide expertise in the following specific aspects: 1)

functional vasoactive studies of conductance or resistance arteries (myography) from different species (rat, mice, human); 2) structural or mechanical studies of conductance and/or resistance arteries and extracellular matrix determination (pressure myography, confocal microscopy, histology); 3) cell culture of vascular cells (smooth muscle, endothelial and fibroblasts) and adipocytes as well as changes in cell phenotype (cell proliferation, migration, size); 4) biochemistry and molecular biology (RT-PCR, Western blot, enzymatic activities and measurements of different oxidative stress parameters and other vasoactive products in plasma or in tissues); 5) *in vivo* physiology techniques (blood pressure). As for animal models we currently hold a line of mPGES-1 *knockout* mice.

Recent publications

1. BRIONES AM, ARAS-LOPEZ R, ALONSO MJ, SALAICES M. Small artery remodeling in obesity and insulin resistance. Current Vascular Pharmacology. In press.
2. MARTÍNEZ-MARTÍNEZ E, JURADO-LÓPEZ R, VALERO MUÑOZ M, BARTOLOMÉ MV, BALLESTEROS S, LUACES M, BRIONES AM, LÓPEZ-ANDRÉS N, MIANA M, CACHOFEIRO V. Leptin induces cardiac fibrosis through galectin-3, Mtor and oxidative stress. Potencial role in obesity. Journal of Hypertension, In press.
3. AVENDAÑO MS, LUCAS E, JURADO-PUEYO M, MARTÍNEZ-REVELLES S, VILA-BEDMAR R, MAYOR F JR, SALAICES M, BRIONES AM+, MURGA C+. Increased Nitric Oxide Bioavailability in Adult GRK2 Hemizygous Mice Protects Against Angiotensin II-Induced Hypertension. Hypertension. 63(2):369-75, 2014. +Corresponding authors
4. HERNANZ R, BRIONES AM, SALAICES M, ALONSO MJ. New roles for old pathways? A circuitous relationship between reactive oxygen species and cyclo-oxygenase in hypertension. Clinical Science (Lond). 126(2):111-21, 2014.
5. ROQUE FR, HERNANZ R, SALAICES M, BRIONES AM. Exercise training and cardiometabolic diseases: focus on the vascular system. Current Hypertension Reports. 15(3):204-14, 2013.
6. AGUADO A, GALÁN M, ZHENYUKH O, WIGGERS GA, ROQUE FR, REDONDO S, PEÇANHA F, MARTÍN A, FORTUÑO A, CACHOFEIRO V, TEJERINA T, SALAICES M, BRIONES AM. Mercury induces proliferation and reduces cell size in vascular smooth muscle cells through MAPK, oxidative stress and cyclooxygenase-2 pathways. Toxicology and Applied Pharmacology. 268(2):188-200, 2013.
7. RIZZETTI DA, TORRES JG, ESCOBAR AG, PEÇANHA FM, SANTOS FW, PUNTEL RL, ALONSO MJ, BRIONES AM, SALAICES M, VASSALLO DV, WIGGERS GA. Apocynin prevents vascular effects caused by chronic exposure to low concentrations of mercury. PLoS One. 8(2):e55806, 2013.
8. BLANCO-RIVERO J, ROQUE FR, SASTRE E, CARACUEL L, COUTO GK, AVENDAÑO MS, PAULA SM, ROSSONI LV, SALAICES M, BALFAGÓN G. Aerobic exercise training increases neuronal nitric oxide release and bioavailability and decreases noradrenaline release in mesenteric artery from spontaneously hypertensive rats. Journal of Hypertension. 31(5):916-26, 2013.
9. ROQUE FR, BRIONES AM, GARCÍA-REDONDO AB, GALÁN M, AVENDAÑO MS, CACHOFEIRO V, FERNANDES T, VASSALLO DV, OLIVEIRA EM, SALAICES M. Aerobic exercise improves vascular remodeling and function in hypertension. Role of oxidative stress. British Journal of Pharmacology. 168(3):686-703, 2013.
10. MARTÍNEZ-REVELLES S, AVENDAÑO MS, GARCIA-REDONDO AB, ALVAREZ Y, AGUADO A, PÉREZ-GIRÓN JV, GARCÍA-REDONDO L, ESTEBAN V, REDONDO JM, ALONSO MJ, BRIONES AM, SALAICES M. Reciprocal relationship between reactive oxygen species and cyclooxygenase-2 and vascular dysfunction in hypertension. Antioxidants and Redox Signalling. 18(1):51-65, 2013.
11. FIORIM J, RIBEIRO JR RF, FERNADES AZEVEDO B, SIMOES MR, PADILHA AS, STEFANON I, ALONSO MJ, SALAICES M, VASSALLO DV. Activation of K+ channels and Na+/K+ ATPase prevents aortic endothelial dysfunction in 7-day lead-treated rats. Toxicology and Applied Pharmacology 262(1):22-31, 2012.
12. BRIONES AM, NGUYEN DINH CAT A, CALLERA GE, YOGI A, BURGER D, HE Y, CORREA JW, GAGNON AM, GOMEZ-SANCHEZ CE, GOMEZ-SANCHEZ EP, SORISKY A, OOI TC, RUZICKA M, BURNS KD,

TOUYZ RM. Adipocytes produce aldosterone through calcineurin-dependent signaling pathways: implications in diabetes mellitus-associated obesity and vascular dysfunction. Hypertension 59(5):1069-78, 2012.

13. HERNANZ R, MARTÍN A, PÉREZ-GIRÓN JV, R PALACIOS, BRIONES AM, MIGUEL M, SALAICES M, ALONSO MJ. Pioglitazone treatment increases COX-2 derived PGI(2) production and reduces oxidative stress in hypertensive rats. Role on vascular function. British Journal of Pharmacology 166(4):1303-19, 2012.
14. MARTÍN A, PÉREZ-GIRÓN JV, HERNANZ R, PALACIOS R, BRIONES AM, FORTUÑO A, ZALBA G, SALAICES M, ALONSO MJ. PPARγ activation reduces COX-2 expression in vascular smooth muscle cells from hypertensive rats by interfering with oxidative stress. Journal of Hypertension 30:315-26, 2012.
15. ESTEBAN V, MÉNDEZ-BARBERO N, JIMÉNEZ-BORREGUERO LJ, ARBONÉS M, ROQUÉ M, NOVENSÁ L, GARCÍA-REDONDO AB, SALAICES M, VILA L, ARBONÉS ML, CAMPANERO MR, REDONDO JM. Regulator of calcineurin 1 mediates pathological vascular wall remodeling. Journal of Experimental Medicine 208:2125-39, 2011.