

# Cardiovascular Biochemistry



## Coordinator

Sánchez Quesada, José Luis IR  
jsanchezq@santpau.cat

## Members

Benítez González, Sonia IR  
Bonet Marques, Rosa FGS  
Freixa Martín, Julia FGS  
García Osuna, Álvaro FGS  
Grau Agramunt, Margarita FGS  
Ordóñez Llanos, Jorge FGS  
Pérez Calleja, Raquel FGS  
Porcel Jabalera, Inmaculada FGS  
Puig Grifol, Núria IR  
Rivas Urbina, Andrea Patricia IR

## Main Lines of Research

### Atherosclerosis mechanisms

- ▶ Mechanisms leading to lipoprotein aggregation in the arterial wall.
- ▶ Use of mimetic peptides derived from apoJ as therapeutic tools.
- ▶ Involvement of LDL(-) on lipid accumulation in cardiomyocytes associated to diabetes and obesity.
- ▶ Association of lipid accumulation in cardiomyocytes with heart failure.
- ▶ Inflammatory mechanisms induced by LDL(-) on monocytes from patients with diabetes.

### Diagnosis and Biomarkers

- ▶ Analysis of apolipoprotein J (apoJ) as a marker of CVR.
- ▶ Diagnosis of chronic or acute cardiovascular diseases.
- ▶ Development of algorithms for ruling-out acute coronary disease.
- ▶ Assessment of new biomarkers of acute cardiovascular disease: cardiac troponins, natriuretic peptides, ST-2.
- ▶ Development of methods for point-of-care biomarker measurement.
- ▶ Vulnerability markers in atheromatous plaque: electronegative LDL, LDL size, HDL function, myeloperoxidase, phospholipase.

## Challenges

- ▶ Determine the intracellular mechanisms involved in the inflammatory response induced by LDL(-) and the components of the particle that entail atherogenicity.
- ▶ Analyse the therapeutic potential of mimetic peptides derived from apoJ to delay the development of atherosclerosis in animal models.
- ▶ Demonstrate that electronegative LDL is a marker of vulnerable atheromatous plaque.
- ▶ Find new markers of cardiovascular risk in diseases such as diabetes, HIV or cardiac failure.

## Active Grants

- ▶ José Luis Sánchez Quesada. Contracte Programa d'Estabilització i Intensificació. CES12/023. Departament de Salut. Duration: 2013-2017. 120,000.00 €.
- ▶ José Luis Sánchez Quesada. Implicación de la apolipoproteína J (clusterina) en la arteriosclerosis. Utilización terapéutica de péptidos miméticos con actividad chaperona. . PI13/00364. Instituto de Salud Carlos III. Duration: 2014-2017. 85,500.00 €.
- ▶ José Luis Sánchez Quesada. Relación de la grasa epicárdica, la función lipoproteica y la inflamación con el desarrollo de arteriosclerosis y miocardiopatía diabética. PI16/00471. Instituto de Salud Carlos III. Duration: 2017-2019. 131,500.00 €.
- ▶ Jorge Ordoñez Llanos. Red Cardiovascular. RD12/0042/0043. Instituto de Salud Carlos III. Duration: 2013-2017. 94,000.00 €.

Note: Total amount granted to PI. It does not include indirect costs.

**Collaborations with other IIB Sant Pau Groups**

- ▶ Metabolic Bases of Cardiovascular Risk (Dr. F. Blanco Vaca).
- ▶ Endocrinology, Diabetes and Nutrition (Dr. A. Pérez).
- ▶ Angiology, Vascular Biology and Inflammation (Dr. M. Camacho).
- ▶ Clinical and Translational Cardiology (Dr. J. Cinca).
- ▶ Lipids and Cardiovascular Pathology (Dr. C. Llorente).
- ▶ Cerebrovascular Diseases (Dr. J. Martí Fàbregas).
- ▶ Clinical Psichiatri (Dra. M.J. Portella).
- ▶ Intensive Care Unit (Dr. A. Betbese).

**External Collaborations****Research into atherosclerosis mechanisms**

- ▶ Dr. Petri Kovanen, Wihuri Research Institute, Helsinki, Finland.
- ▶ Dr. Kati Öörni, Wihuri Research Institute, Helsinki, Finland.
- ▶ Dr. Olga Gursky, Boston University School of Medicine, Boston, USA.
- ▶ Dr. Sandra Villegas Hernández, Biochemistry and Molecular Biology Department, Universitat Autònoma de Barcelona, Spain.
- ▶ Dr. Ferdinando Mannello, Department of Biomolecular Sciences, Section of Clinical Biochemistry and Molecular Genetics, University "Carlo Bo", Urbino, Italy
- ▶ Dr. Mar Hernández-Guillamon, Neurovascular Research Laboratory, Vall d'Hebron Research Institute; Universitat Autònoma de Barcelona, Spain.
- ▶ Dr. Ana Reis, Faculdade de Ciências da Universidade do Porto, Portugal.

**Research into diagnosis**

- ▶ Dr Daniel Podzamczar, HIV Unit, Infectious Disease Service, Bellvitge University Hospital, Barcelona, Spain (PATHER, ATADAR, SPIRAL and BICOMBO clinical trials).
- ▶ Dr. Joan Sabater-Riera, Critical Care Department, Bellvitge University Hospital, Barcelona, Spain.

- ▶ Formation and maintenance of a bank of samples within the Cardiovascular Research Network (RIC), Programme 6 (Clinical and Translational Heart Failure).
- ▶ Cardiovascular Research Network (RIC): Dr Francisco Marín, Cardiology, Hospital Virgen de Arrixaca, Murcia, Spain, 3-month stay by Dr Juan Antonio Vilchez (during a Rio Hortega contract) in our collaborative studies laboratory.
- ▶ Dr. Mariano Valdés, Virgen de Arrixaca University Hospital, Murcia (Spain), 3-week stay by Dr Carmen Puche in our collaborative studies laboratory.
- ▶ Dr. Laura Dos (D. Garcia-Dorado), Integrated Adult Congenital Heart Disease Unit of Vall d'Hebron University Hospital, Barcelona, Spain (Evedes study).
- ▶ Dr. Domingo Pascual-Figal, Cardiology Department, Virgen de la Arrixaca University Hospital, Murcia, Spain.
- ▶ Dr. Rafael Vázquez, Cardiology Service, Puerta del Mar University Hospital, Cádiz, Spain.
- ▶ Dr. Antoni Bayes-Genís, Cardiology Department, Germans Trias i Pujol University Hospital, Barcelona, Spain.
- ▶ IFCC Task Force on Clinical Applications of Cardiac Biomarkers (Dr Jordi Ordóñez-Llanos, member).
- ▶ Dr Fred S. Apple, Department of Laboratory Medicine and Pathology, University of Minnesota, USA.
- ▶ Dr Paul O. Collinson, Cardiovascular and Laboratory Departments, St. George's Hospital, London, UK.
- ▶ Dr Alan S. Jaffe, Mayo Clinic, Cardiovascular Division, Rochester, New York, USA.
- ▶ Dr James L. Januzzi, Cardiology Division, Massachusetts General Hospital, Boston, USA.

**Participation in multicentre studies in the field of heart failure**

- ▶ MUSIC (sudden death in heart failure) Risk Score, Spanish Society of Cardiology.
- ▶ MAGGIC (meta-analysis global group in chronic heart failure), European Society of Cardiology.

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\*TIF: 57.588 \*\*MIF: 4.4298

## Scientific Production

Alquezar A., Santalo M., Rizzi M., Gich I., Grau M., Sionis A., Ordonez-Llanos J., Merce J., Martin A., Munoz M., Povar J., Velilla J., Calmarza P., Tembory F., Ortiz C., Balaguer J., Carratala A., Combined high-sensitivity copeptin and troponin T evaluation for the diagnosis of non-ST elevation acute coronary syndrome in the emergency department (2017) EMERGENCIAS, 29 (4), 237-244.

**IF: 2.363**

Alquezar-Arbe A., Sionis A., Ordonez-Llanos J., Cardiac troponins: 25 years on the stage and still improving their clinical value (2017) CRIT REV CL LAB SCI, 54 (7-8), 551-571.

**IF: 6.442**

Apple F.S., Sandoval Y., Jaffe A.S., Ordonez-Llanos J., Cardiac troponin assays: Guide to understanding analytical characteristics and their impact on clinical care (2017) CLIN CHEM, 63 (1), 73-81.

**IF: 8.138**

Cedo L., Santos D., Roglans N., Julve J., Palares V., Rivas-Urbina A., Llorente-Cortes V., Laguna J.C., Blanco-Vaca F., Escola-Gil J.C., Human hepatic lipase overexpression in mice induces hepatic steatosis and obesity through promoting hepatic lipogenesis and white adipose tissue lipolysis and fatty acid uptake (2017) PLOS ONE, 12 (12).

**IF: 2.600**

Cuartero M., Ballus J., Sabater J., Perez X., Nin N., Ordonez-Llanos J., Betbese A.J., Cell-cycle arrest biomarkers in urine to predict acute kidney injury in septic and non-septic critically ill patients (2017) ANN INTENSIVE CARE, 7 (1).

**IF: 3.653**

Estruch M., Minambres I., Sanchez-Quesada J.L., Soler M., Perez A., Ordonez-Llanos J., Benitez S., Increased inflammatory effect of electronegative LDL and decreased protection by HDL in type 2 diabetic patients (2017) ATHEROSCLEROSIS, 265, 292-298.

**IF: 4.258**

Fernandez-De-Retana S., Cano-Sarabia M., Marazuela P., Sanchez-Quesada J.L., Garcia-Leon A., Montanola A., Montaner J., Maspoch D., Hernandez-Guillamon M., Characterization of ApoJ-reconstituted high-density lipoprotein (rHDL) nanodisc for the potential treatment of cerebral  $\beta$ -amyloidosis (2017) SCI REP-UK, 7 (1).

**IF: 3.745**

Ferrari A., Righetti L., Martinez M.P., Fernandez-Lopez M., Mastrangelo A., Horcajada J.P., Betbese A., Esteban A., Ordonez J., Gea J., Cabello J.R., Pellati F., Lorente J.A., Nin N., Ruperez F.J., Discriminant biomarkers of acute respiratory distress syndrome associated to H1N1 influenza identified by metabolomics HPLC-QTOF-MS/MS platform (2017) ELECTROPHORESIS, 38 (18), 2341-2348.

**IF: 2.081**

Jayaraman S., Sanchez-Quesada J.L., Gursky O., Triglyceride increase in the core of high-density lipoproteins augments apolipoprotein dissociation from the surface: Potential implications for treatment of apolipoprotein deposition diseases (2017) BBA-MOL BASIS DIS, 1863 (1), 200-210.

**IF: 5.4760**

Mccord J., Cabrera R., Lindahl B., Giannitsis E., Evans K., Nowak R., Frisoli T., Body R., Christ M., DeFilippi C.R., Christenson R.H., Jacobsen G., Alquezar A., Panteghini M., Melki D., Plebani M., Verschuren F., French J., Bendig G., Weiser S., Mueller C., Ordóñez-Llanos J., Prognostic utility of a modified HEART score in chest pain patients in the emergency de-

partment (2017) CIRC-CARDIOVASC QUAL, 10 (2).

**IF: 4.753**

Mueller-Hennessen M., Mueller C., Giannitsis E., Biener M., Vafaie M., DeFilippi C.R., Christ M., Ordonez-Llanos J., Panteghini M., Plebani M., Verschuren F., Melki D., French J.K., Christenson R.H., Body R., McCord J., Dinkel C., Katus H.A., Lindahl B., Serial sampling of high-sensitivity cardiac troponin T may not be required for prediction of acute myocardial infarction diagnosis in chest pain patients with highly abnormal concentrations at presentation (2017) CLIN CHEM, 63 (2), 542-551.

**IF: 8.138**

Nowak R., Mueller C., Giannitsis E., Christ M., Ordonez-Llanos J., DeFilippi C., McCord J., Body R., Panteghini M., Jernberg T., Plebani M., Verschuren F., French J.K., Christenson R., Jacobsen G., Dinkel C., Lindahl B., High sensitivity cardiac troponin T in patients not having an acute coronary syndrome: results from the TRAPID-AMI study (2017) BIOMARKERS, 22 (8), 709-714.

**IF: 1.917**

Saenger A.K., Rodriguez-Fraga O., Ler R., Ordonez-Llanos J., Jaffe A.S., Goetze J.P., Apple F.S., Specificity of B-type natriuretic peptide assays: Cross-reactivity with different BNP, NT-proBNP, and proBNP peptides (2017) CLIN CHEM, 63 (1), 351-358.

**IF: 8.138**

Saumoy M., Tiraboschi J.M., Ordonez-Llanos J., Ribera E., Domingo P., Mallolas J., Curto J., Gatell J.M., Podzamczak D., Atherogenic properties of LDL particles after switching from Truvada or Kivexa plus lopinavir/r to lamivudine plus lopinavir/r: OLE-MET study (2017) HIV CLIN TRIALS, 18 (2), 49-53.

**IF: 1.362**

