

Dr. Gloria Alvarez-Llamas

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Current position

Group leader (Associate Researcher)
Translational omics group
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CV SUMMARY

Professional career

- Bachelor Degree in Chemistry with Final Degree Award (1998).
- Bachelor Thesis with Extraordinary Award (1999).
- Pre-doctoral researcher in University of Oviedo with FPU grant (1999-2004).
- Pre-doctoral stays in Technische Universität Wien (Austria, 7 months) and King's College London (UK, 3 months).
- European PhD in University of Oviedo (2004).
- Post-doctoral stay in University Medical Centre Groningen UMCG (The Netherlands, 2005-2007).
- Post-doctoral researcher in Fundación Jiménez Díaz University Hospital with Juan de la Cierva contract (2007-2010).
- Senior researcher (PI) in Fundación Jiménez Díaz University Hospital with Miguel Servet contract from ISCIII (2010-2016).
- Senior researcher (PI) in IIS-Fundación Jiménez Díaz University Hospital with Miguel Servet II contract from ISCIII (2016-2019).

Research areas

- Identification of diagnostic and prognostic molecular markers of cardio-renal disease and cardiovascular risk, mainly related with atherosclerosis development, albuminuria, and chronic kidney disease.
- Study and discovery of novel interaction networks between proteins and metabolites in referred pathologies (systems biology).
- Development of novel analytical strategies for biomarkers quantitation in biological matrices based on mass spectrometry.

Keywords: cardiovascular, albuminuria, hypertension, diabetic nephropathy, chronic kidney disease, metabolism, proteomics, metabolomics, exosomes.

Research and Development, main activities (up to 2019)

- Co-author in 122 publications (WOS)
- 28 financed projects and human resources calls (competitive)
- Participant in EU COST action "Mass Spectrometry Imaging: New Tools for Healthcare Research"
- European projects evaluator.
- Evaluator for the Spanish State Research Agency (ANEP).
- External reviewer for international peer-reviewed journals (1st quartil or decil, WOS).
- Member of the spanish Network of Renal Research REDINRED (ISCIII).
- Member of the Innovation Unit of the IIS-Fundación Jiménez Díaz.
- Vocal of the Management Committee of the Spanish Proteomics Society (2015-2019).
- Awarded with IDCSalud Dr.HernandoAvenidaño Prize.
- Project award for Nephrology Research 2016 (Fundación SEN/SENEFRO).
- Member of the Organizing committee of Scientific Integrity course (IIS-FJD, 2019) and V Jornadas Jóvenes Investigadores en Proteómica (Toledo, 2017).
- Coordinator of the course "Proteomics, fundamentals and applications" for the Antidoping State Agency (2011).

Teaching experience

- 5 Doctoral Thesis supervised and 2 ongoing (Universidad Complutense de Madrid).
- Supervision of Master's Thesis and University Final Grade (Universidad Complutense de Madrid and Universidad de Alcalá de Henares).
- Tutor of formative practices (Universidad Complutense de Madrid, Universidad Carlos III de Madrid, Universidad de Alcalá de Henares).
- Lecturer in University Masters (Universidad Complutense y Universidad San Pablo CEU).
- Member of Doctoral Thesis Tribunal.

Technology transfer

- Co-inventor of 4 patents

REPRESENTATIVE PUBLICATIONS SUMMARY

1: Del Puerto-Nevado L, Santiago-Hernandez A, Solanes-Casado S, Gonzalez N, Ricote M, Corton M, Prieto I, Mas S, Sanz AB, Aguilera O, Gomez-Guerrero C, Ayuso C, Ortiz A, Rojo F, Egido J, Garcia-Foncillas J, Minguez P, Alvarez-Llamas G; DiabetesCancerConnect Consortium. Diabetes-mediated promotion of colon mucosa carcinogenesis is associated with mitochondrial dysfunction. *Mol Oncol.* 2019 Sep;13(9):1887-1897.

2: Martin-Lorenzo M, Martinez PJ, Baldan-Martin M, Lopez JA, Minguez P, Santiago-Hernandez A, Vazquez J, Segura J, Ruiz-Hurtado G, Vivanco F, Barderas MG, Ruilope LM, Alvarez-Llamas G. Urine Haptoglobin and Haptoglobin-Related Protein Predict Response to Spironolactone in Patients With Resistant Hypertension. *Hypertension.* 2019 Apr;73(4):794-802.

3: Martínez PJ, Baldán-Martín M, López JA, Martín-Lorenzo M, Santiago-Hernández A, Agudiez M, Cabrera M, Calvo E, Vázquez J, Ruiz-Hurtado G, Vivanco F, Ruilope LM, Barderas MG, Alvarez-Llamas G. Identification of six cardiovascular risk biomarkers in the young population: A promising tool for early prevention. *Atherosclerosis.* 2019 Mar;282:67-74.

4: Del Puerto-Nevado L, Minguez P, Corton M, Solanes-Casado S, Prieto I, Mas S, Sanz AB, Gonzalez-Alonso P, Villaverde C, Portal-Nuñez S, Aguilera O, Gomez-Guerrero C, Esbrit P, Vivanco F, Gonzalez N, Ayuso C, Ortiz A, Rojo F, Egido J, Alvarez-Llamas G, Garcia-Foncillas J; DiabetesCancerConnect Consortium. Molecular evidence of field cancerization initiated by diabetes in colon cancer patients. *Mol Oncol.* 2019 Apr;13(4):857-872.

- 5: Sanz AB, Ramos AM, Soler MJ, Sanchez-Niño MD, Fernandez-Fernandez B, Perez-Gomez MV, Ortega MR, Alvarez-Llamas G, Ortiz A. Advances in understanding the role of angiotensin-regulated proteins in kidney diseases. *Expert Rev Proteomics*. 2019 Jan;16(1):77-92.
- 6: Martin-Lorenzo M, Gonzalez-Calero L, Ramos-Barron A, Sanchez-Niño MD, Gomez-Alamillo C, García-Segura JM, Ortiz A, Arias M, Vivanco F, Alvarez-Llamas G. Urine metabolomics insight into acute kidney injury point to oxidative stress disruptions in energy generation and H₂S availability. *J Mol Med (Berl)*. 2017 Dec;95(12):1399-1409.
- 7: Martin-Lorenzo M, Martinez PJ, Baldan-Martin M, Ruiz-Hurtado G, Prado JC, Segura J, de la Cuesta F, Barderas MG, Vivanco F, Ruilope LM, Alvarez-Llamas G. Citric Acid Metabolism in Resistant Hypertension: Underlying Mechanisms and Metabolic Prediction of Treatment Response. *Hypertension*. 2017 Nov;70(5):1049-1056.
- 8: Martin-Lorenzo M, Gonzalez-Calero L, Martinez PJ, Baldan-Martin M, Lopez JA, Ruiz-Hurtado G, de la Cuesta F, Segura J, Vazquez J, Vivanco F, Barderas MG, Ruilope LM, Alvarez-Llamas G. Immune system deregulation in hypertensive patients chronically RAS suppressed developing albuminuria. *Sci Rep*. 2017 Aug 21;7(1):8894.
- 9: Gonzalez-Calero L, Martínez PJ, Martin-Lorenzo M, Baldan-Martin M, Ruiz-Hurtado G, de la Cuesta F, Calvo E, Segura J, Lopez JA, Vázquez J, Barderas MG, Ruilope LM, Vivanco F, Alvarez-Llamas G. Urinary exosomes reveal protein signatures in hypertensive patients with albuminuria. *Oncotarget*.
- 10: Gonzalez-Calero L, Martin-Lorenzo M, Martínez PJ, Baldan-Martin M, Ruiz-Hurtado G, Segura J, de la Cuesta F, Barderas MG, Ruilope LM, Vivanco F, Alvarez-Llamas G. Hypertensive patients exhibit an altered metabolism. A specific metabolite signature in urine is able to predict albuminuria progression. *Transl Res*. 2016 Dec;178:25-37.e7.
- 11: Gonzalez-Calero L, Martin-Lorenzo M, Ramos-Barron A, Ruiz-Criado J, Maroto AS, Ortiz A, Gomez-Alamillo C, Arias M, Vivanco F, Alvarez-Llamas G. Urinary Kininogen-1 and Retinol binding protein-4 respond to Acute Kidney Injury: predictors of patient prognosis? *Sci Rep*. 2016 Jan 21;6:19667.
- 12: Martin-Lorenzo M, Gonzalez-Calero L, Maroto AS, Martinez PJ, Zubiri I, de la Cuesta F, Mourino-Alvarez L, Barderas MG, Heredero A, Aldamiz-Echevarría G, Vivanco F, Alvarez-Llamas G. Cytoskeleton deregulation and impairment in amino acids and energy metabolism in early atherosclerosis at aortic tissue with reflection in plasma. *BBA Mol Basis Dis*. 2016 Apr;1862(4):725-732.
- 13: Martin-Lorenzo M, Alvarez-Llamas G, McDonnell LA, Vivanco F. Molecular histology of arteries: mass spectrometry imaging as a novel ex vivo tool to investigate atherosclerosis. *Expert Rev Proteomics*. 2016;13(1):69-81.
- 14: Martin-Lorenzo M, Zubiri I, Maroto AS, Gonzalez-Calero L, Posada-Ayala M, de la Cuesta F, Mourino-Alvarez L, Lopez-Almodovar LF, Calvo-Bonacho E, Ruilope LM, Padial LR, Barderas MG, Vivanco F, Alvarez-Llamas G. KLK1 and ZG16B proteins and arginine-proline metabolism identified as novel targets to monitor atherosclerosis, acute coronary syndrome and recovery. *Metabolomics*. 2015;11(5):1056-1067.
- 15: Martin-Lorenzo M, Balluff B, Maroto AS, Carreira RJ, van Zeijl RJ, Gonzalez-Calero L, de la Cuesta F, Barderas MG, Lopez-Almodovar LF, Padial LR, McDonnell LA, Vivanco F, Alvarez-Llamas G. Lipid and protein maps defining arterial layers in atherosclerotic aorta. *Data Brief*. 2015 Jun 24;4:328-31.

16: Martin-Lorenzo M, Balluff B, Maroto AS, Carreira RJ, van Zeijl RJ, Gonzalez-Calero L, de la Cuesta F, Barderas MG, Lopez-Almodovar LF, Padial LR, McDonnell LA, Vivanco F, Alvarez-Llamas G. Molecular anatomy of ascending aorta in atherosclerosis by MS Imaging: Specific lipid and protein patterns reflect pathology. *J Proteomics*. 2015 Aug 3;126:245-51.

17: Zubiri I, Posada-Ayala M, Benito-Martin A, Maroto AS, Martin-Lorenzo M, Cannata-Ortiz P, de la Cuesta F, Gonzalez-Calero L, Barderas MG, Fernandez-Fernandez B, Ortiz A, Vivanco F, Alvarez-Llamas G. Kidney tissue proteomics reveals regucalcin downregulation in response to diabetic nephropathy with reflection in urinary exosomes. *Transl Res*. 2015 Nov;166(5):474-484.e4.

18: Posada-Ayala M, Alvarez-Llamas G, Maroto AS, Maes X, Muñoz-Garcia E, Villalba M, Rodríguez R, Perez-Gordo M, Vivanco F, Pastor-Vargas C, Cuesta-Herranz J. Novel liquid chromatography-mass spectrometry method for sensitive determination of the mustard allergen Sin a 1 in food. *Food Chem*. 2015 Sep 15;183:58-63.

19: Gonzalez-Calero L, Martin-Lorenzo M, Alvarez-Llamas G. Exosomes: a potential key target in cardio-renal syndrome. *Front Immunol*. 2014 Oct 8;5:465.

20: Martin-Lorenzo M, Balluff B, Sanz-Maroto A, van Zeijl RJ, Vivanco F, Alvarez-Llamas G, McDonnell LA. 30µm spatial resolution protein MALDI MSI: In-depth comparison of five sample preparation protocols applied to human healthy and atherosclerotic arteries. *J Proteomics*. 2014 Aug 28;108:465-8.

21: Martin-Lorenzo M, Gonzalez-Calero L, Zubiri I, Diaz-Payno PJ, Sanz-Maroto A, Posada-Ayala M, Ortiz A, Vivanco F, Alvarez-Llamas G. Urine 2DE proteome análisis in healthy condition and kidney disease. *Electrophoresis*. 2014 Sep;35(18):2634-41.

22: Zubiri I, Posada-Ayala M, Sanz-Maroto A, Calvo E, Martin-Lorenzo M, Gonzalez-Calero L, de la Cuesta F, Lopez JA, Fernandez-Fernandez B, Ortiz A, Vivanco F, Alvarez-Llamas G. Diabetic nephropathy induces changes in the proteome of human urinary exosomes as revealed by label-free comparative analysis. *J Proteomics*. 2014 Jan 16;96:92-102.

23: Posada-Ayala M, Zubiri I, Martin-Lorenzo M, Sanz-Maroto A, Molero D, Gonzalez-Calero L, Fernandez-Fernandez B, de la Cuesta F, Laborde CM, Barderas MG, Ortiz A, Vivanco F, Alvarez-Llamas G. Identification of a urine metabolomic signature in patients with advanced-stage chronic kidney disease. *Kidney Int*. 2014 Jan;85(1):103-11.

24: Alvarez-Llamas G, Martín-Rojas T, de la Cuesta F, Calvo E, Gil-Dones F, Dardé VM, Lopez-Almodovar LF, Padial LR, Lopez JA, Vivanco F, Barderas MG. Modification of the secretion pattern of proteases, inflammatory mediators, and extracellular matrix proteins by human aortic valve is key in severe aortic stenosis. *Mol Cell Proteomics*. 2013 Sep;12(9):2426-39.

25: Zubiri I, Vivanco F, Alvarez-Llamas G. Proteomic analysis of urinary exosomes in cardiovascular and associated kidney diseases by two-dimensional electrophoresis and LC-MS/MS. *Methods Mol Biol*. 2013;1000:209-20.

26: de la Cuesta F, Barderas MG, Calvo E, Zubiri I, Maroto AS, Lopez JA, Vivanco F, Alvarez-Llamas G. Characterization and analysis of human arterial tissue secretome by 2-DE and nLC-MS/MS. *Methods Mol Biol*. 2013;1000:81-90.

27: Alvarez-Llamas G, Zubiri I, Maroto AS, de la Cuesta F, Posada-Ayala M, Martin-Lorenzo M, Barderas MG, Fernandez-Fernandez B, Ramos A, Ortiz A, Vivanco F. A role for the membrane proteome in human chronic kidney disease erythrocytes. *Transl Res*. 2012 Nov;160(5):374-83.

28: de la Cuesta F, Barderas MG, Calvo E, Zubiri I, Maroto AS, Darde VM, Martin-Rojas T, Gil-Dones F, Posada-Ayala M, Tejerina T, Lopez JA, Vivanco F, Alvarez-Llamas G. Secretome analysis of

atherosclerotic and non-atherosclerotic arteries reveals dynamic extracellular remodeling during pathogenesis. *J Proteomics*. 2012 Jun 6;75(10):2960-71

29: Barderas MG, Laborde CM, Posada M, de la Cuesta F, Zubiri I, Vivanco F, Alvarez-Llamas G. Metabolomic profiling for identification of novel potential biomarkers in cardiovascular diseases. *J Biomed Biotechnol*. 2011;2011:790132.

30: Alvarez-Llamas G, de la Cuesta F, Barderas ME, Darde V, Padial LR, Vivanco F. Recent advances in atherosclerosis-based proteomics: new biomarkers and a future perspective. *Expert Rev Proteomics*. 2008 Oct;5(5):679-91.

31: Alvarez-Llamas G, Szalowska E, de Vries MP, Weening D, Landman K, Hoek A, Wolffenbuttel BH, Roelofsen H, Vonk RJ. Characterization of the human visceral adipose tissue secretome. *Mol Cell Proteomics*. 2007 Apr;6(4):589-600.

32: Roelofsen H, Alvarez-Llamas G, Dijkstra M, Breitling R, Havenga K, Bijzet J, Zandbergen W, de Vries MP, Ploeg RJ, Vonk RJ. Analyses of intricate kinetics of the serum proteome during and after colon surgery by protein expression time series. *Proteomics*. 2007 Sep;7(17):3219-28.

33: Esser D, Alvarez-Llamas G, de Vries MP, Weening D, Vonk RJ, Roelofsen H. Sample Stability and Protein Composition of Saliva: Implications for Its Use as a Diagnostic Fluid. *Biomark Insights*. 2008 Feb 1;3:25-27.