MINISTERIO
DE CIENCIA, INNOVACIÓN
Y UNIVERSIDADES

A. Personal Data

Name and Surname	RAFAEL MADUEÑO JIMÉNEZ		
DNI/NIE/passport		Edad	
Identification number of the researcher	WoS Researcher ID *(*)*	M-1483-2014	
	SCOPUS Author ID*(*)*	6507513904	
	Open Researcher and Contributor ID(ORCID)**	0000-0002-2579-4113	

A1. Current Professional Situation

Organism/University	Universidad de Córdoba (UCO)			
Dpt./Center/Faculty	Química Física y Termodinámica Aplicada / Facultad de Ciencias			
Address	Edificio Marie Curie, 2ª planta. Campus de Rabanales. Ctra. Madrid Km. 396. 14071 Córdoba			
Telephone number	957218646	e-mail	rafael.madueno@uco.es	
Academic position	Senior Lecturer		Starting from:	08-06-2012
Keywords	Physical Chemistry. Interfacial Electrochemistry. Nanotechnology. Self-assembly. Surface Functionalization. Metallic Electrodes. Single Crystals. Self-assembled monolayers. Patterned Supramolecular nanostructures. Macromolecules/Polymers. Functionalized nanoparticles. Bioconjugates			

A2. Academic Degrees

Bachelor/Degree/PhD	University	Date
Licenciado en Ciencias Químicas	Facultad de Ciencias de la UCO	12/09/1996
Doctor en Ciencias Químicas	Facultad de Ciencias de la UCO	18/03/2003

A3. Research quality indicators

Research six-year periods: 3 (2000-2005, 2006-2011 y 2012-2017)
Thesis supervised (2015-2019): 1
Total cites: 933
Average citations per year (2011-2020): 54 (Last 5 years: 49)
Publications in Q1: 33
h index: 17

B. CV SUMMARY:

1995/96 Col. Fellow (MEC)
1996 Degree in Chemistry (UCO)
1997 MSc in Chemistry (UCO) with distinction
1999-2002 Predoctoral Fellow (FPI-MEC)
2003 PhD in Chemistry (Summa Cum Laude)
2003-2005 Postdoctoral Fellow (UCO)
2005-2008 Assistant Professor (UPO)
2006-2007 Postdoctoral Fellow (Univ. St. Andrews, UK)
2008-2010 Assistant Professor (UCO)
2010- Associate Professor (UCO)

B1. <u>Research lines/areas</u>

(1997-2003) Predoctoral stage.

I was enrolled as a collaboration student and FPI Fellow in a new research line (MEC and MCyT Projects PB97-0469 and BQU2001-2490) started by the PAIDI group FQM-111 dealing the functionalization of metallic surfaces (2D) with self-assembled monolayers for the direct electrochemistry of biomolecules. A 3-months predoctoral stay at the Lab of the Professor

Hector Abruña (Univesity of Cornell, USA) allowed me getting the know-how for the construction and electrochemical characterization of gold single crystal surfaces. Group publications in this topic were cited by other research groups of reference and included in Q1 level journals of Physical Chemistry, Surface Science and Interfacial Electrochemistry.

(2003-2010) Postdoctoral and Academia stages.
The knowledge acquired in 2D functionalization is then transferred to gold nanomaterials (3D substrates) as an emerging research topic (MEC Projects CTQ2004-00977/BQU y CTQ2007-62723). Relevant contributions about the synthesis, stability and characterization of quantum confined physico-chemical, optical and electrochemical properties of gold nanoparticles and clusters were addressed. Looking for a synergy of this topic with surface nanopatterning for the construction of hybrid materials, a position at the Academia (UPO) was made compatible with a postdoctoral fellow at the St Andrews University (UK) to develop supramolecular host-guest networks down to 1-10 nm (EPSRC UK Proyect EP/D048764/1). The results successfully accomplished some of the core goals of the Comsortium Project also constituted by the Universities of Nottingham, King´s College and Oxford.

(2010-2018) Academia stage.
A logical step forward was the integration of 2D and 3D platforms to obtain nanostructured materials and bioconjugates (MICINN and MINECO Projects, CTQ2010-16137 y CTQ2014-60227-R). The main objective has been to bring together fundamental concepts in the design of biocompatible interfaces with still open questions in health and medicine fields. Thus, the influence of the protein corona in the interfacial properties of bioconjugates was studied, what might be extended to the use of designed polymers, cyclodextrin and calixarene derivatives in prospect of nano-theranostic applications. Properties of gold alloys with jewelry applications were also studied (Excellence Project, JA-P10-FQM-6408), and collaboration with local companies was stablished by signing different contracts.

B2. Results
Projects: National (7) and Autonomic (2). Indexed Publications (32). Book chapters (3). Patents (1.4). Communications (88): National (34) and International (54). Invited/Keynotes (4). CIDETEC National Award (2008). Treasurer/Secretary of the GE-RSEQ Committee (2008-2012). Secretary of NANOUCO Organization and Scientific Committees (2008-2013). FONDECYT Projects Evaluator (2012). Other Scientific Committees (3). Supervisor: Master Projects (7), Degree Projects (16),Company internships (5). Stays: Predoctoral (1999) and Postdoctoral (2006-2007).

C. RELEVANT MERITS
C1. Publications
M. Chávez, G.Sánchez-Obrero, R.Madueño, J. M. Sevilla, M. Blázquez, T. Pineda
Characterization of a self-assembled monolayer of O-(2-Mercaptoethyl)-O'-methyl-hexa(ethylene glycol) (EG7-SAM) on gold electrodes
J. Electroanal. Chem. 880 (2021) 114892
I. F.: 4.464 20/87 (Q1)

R. del Caño, J.M. Gisbert-González, J. González-Rodríguez, G. Sánchez-Obrero, R.Madueño, M. Blázquez, T. Pineda
Effective replacement of cetyltrimethylammonium bromide (CTAB) by mercaptoalkanoic acids on gold nanorod (AuNR) surfaces in aqueous solutions
Nanoscale, 12 (2020) 658-668
I. F.: 7.790 23/160 (Q1)

A.R. Puente Santiago, G. Sánchez-Obrero, T. Pineda, M. Blázquez, R. Madueño
Influence of Patterning in the Acid-Base Interfacial Properties of Homogeneously Mixed CH_3- and COOH-Terminated Self-Assembled Monolayers
J Phys Chem C, 122 (2018) 2854–2865
I. F.: 4.309 60/293 (Q1)

R. del Caño, L. Mateus, G. Sánchez-Obrero, J. M. Sevilla, R. Madueño, M. Blázquez, T. Pineda
Hemoglobin bioconjugates with surface-protected gold nanoparticles in aqueous media: The stability depends on solution pH and protein properties
J. Colloid Interface Sci., 505 (2017) 1165-1171
I. F.: 5.091 33/147 (Q1)

A.R. Puente Santiago, T. Pineda, M. Blázquez, R. Madueño
Formation of 2-D Crystalline Intermixed Domains at the Molecular Level in Binary Self-Assembled Monolayers from a Lyotropic Mixture
J Phys Chem C, 120 (2016) 8595-8606
I. F.: 4.536 43/275 (Q1)

B. Cárdenas, G. Sánchez Obrero, R. Madueño, J.M. Sevilla, M. Blázquez, T. Pineda
Influence of the Global Charge of the Protein on the Stability of Lysozyme-AuNP Bioconjugates
J Phys Chem C, 118 (2014) 22274-22283
I. F.: 4.772 32/260 (Q1)

F. Cañaveras, R. Madueño, J.M. Sevilla, M. Blázquez, T. Pineda
Role of the functionalization of the Gold Nanoparticle Surface on the Formation of Bioconjugates with Human Serum Albumin
J Phys Chem C 116 (2012) 10430-10437
I. F.: 4.814 27/241 (Q1)

García-Raya, R. Madueño, M. Blázquez, T. Pineda
Formation of 1,8-Octanedithiol Mono-and Bi-Layers under Electrochemical Control
J Phys Chem C, 114 (2010) 3568-3574
I. F.: 4.524 22/225 (D1)

C2. <u>Research projects</u>

Hybrid Materials based on gold nanoparticles and brush polymers for Biomedical applications.
Reference: 1265074-R IP: Mª Teresa Pineda Rodríguez
Funding Agency: Junta de Andalucía
Participating Entities: UCO
Duration: 2020-2021
Grant budget: 34271,00 €

Design and Characterization of Nanobioconjugates. Novel Elements for the Construction of Biological Interfaces aimed to the Health Improvement and Public Welfare.
Reference: CTQ2014-60227-R IP: Mª Teresa Pineda Rodríguez
Funding Agency: MINECO
Participating Entities: UCO
Duration: 2014-2018
Grant budget: 81000,00 €

Characterization of nanostructured materials formed on gold alloys with jewelry applications
Reference: P10-FQM-6408 IP: Teresa Pineda Rodríguez
Funding Agency: Junta de Andalucía
Participating Entities: UCO / MAJ Joyeros S.L.
Duration: 2011-2015
Grant budget: 153400,00€

Design 2D and 3D molecular platforms at the nanoscale. Fabrication of surface patterns on gold substrates.
Reference: CTQ2010-16137 Principal investigator: Mª Teresa Pineda Rodríguez
Funding Agency: MICINN
Participating Entities: UCO
Duration: 2010- 2013
Grant budget: 59000,00 €

C3. <u>Contracts</u>
Characterization of nanostructured materials formed on gold alloys with jewelry applications.
Reference: P10 FQM-6408
Company: MAJ Joyeros S.L
Principal investigator: Mª Teresa Pineda Rodríguez
Participating Entities: UCO/ MAJ Joyeros S.L
Duration: 2011- 2014
Amount of funding: 23010 €

Suministro de nanomateriales para su comercialización.
Reference: 12014079
Company: Nanoquimia S.L.
Principal investigator: Mª Teresa Pineda Rodríguez
Duration: 2014- 2015
Amount limit: 12100 €

C4. <u>Patents</u>
Authors/Inventors: Buck M., Madueño R., Silien C., Räisänen M.
Title: Modified Surfaces
(1) Application Nº: PCT/GB2009/001701 Priority countries: United Kingdom
Publication Nº: WO2010/004280 Date: 14/01/2010
(2) Ref./Registry: US 8778454 Application Nº:US 2011-13003213 Date: 15/07/2014
(3) Ref./Registry: US 20140311966 Application Nº:US 2014-14318474 Date: 23/10/2014
(4) Ref./Registry: US 9415328 Application Nº:US 2014-14318474 Date: 16/08/2016
Holder Entity: Univ St Andrews
Patent extension: Europe and United States of America Exploiting companies.

C5. <u>Scientific Awards</u>
CIDETEC National Award for Research in Electrochemistry (2008)