

<b>Part A. PERSONAL INFORMATION</b>		<b>CV date</b>	14.10.19
First and Family name	ALMUDENA ALBILLOS MARTINEZ		
Social Security, Passport, ID number	ID: 07488358H	Age	53
Researcher codes	WoS Researcher ID	AAA-9098-2019	
	Scopus Author ID	7005938478	
	Open Researcher and Contributor ID (ORCID)	0000-0003-3315-9715	

**A.1. Current position**

Name of University/Institution	Universidad Autónoma de Madrid		
Department	Farmacología y Terapéutica		
Address and Country	c/ Arzobispo Morcillo 4, 28029 Madrid, Spain		
Phone number	91 497 5348	E-mail	almudena.albillos@uam.es
Current position	Catedrática de Universidad	From	15.04.2019
Key words	Nicotinic receptor, hippocampus, chromaffin cell, patch-clamp, exocytosis, amperometry, Alzheimer's disease		

**A.2. Education**

	University	Year
Degree in Pharmacy	Universidad Complutense de Madrid	1989
Ph.D. in Pharmacy	Universidad Complutense de Madrid	1994

**A.3. Quality indicators**

JCR articles: 54; chapters in international books: 7 (one indexed in WOS)  
 Six-year research periods: 4 (the last was in 2014)  
 h Index (Scopus): 20  
 Citations Scopus: 2110  
 Thesis supervised: 6 Ph.D Theses

**Part B. CV SUMMARY** (*max. 3500 characters, including spaces*)

My training as a researcher began in 1991 performing my Ph.D. thesis in the laboratory of Prof. Antonio García García at the Autonomous University of Madrid. Prof. García commissioned me as the first challenge to set up a new technique in his laboratory, the "patch-clamp" technique, which only few laboratories in Spain had implemented at that time. To that purpose, I stayed for several months at Prof. Emilio Carbone' laboratory in Turin, Italy, with whom we started a fruitful collaboration, and after that, I set-up this technique in our laboratory in Madrid. Fruit of this period I published 15 papers, of which it is worth noting: Albillos et al., *FEBS Letters*, 1993; Albillos et al., *J. Physiol.*, 1994; Albillos et al., *Eur. J Neurosci.*, 1996; Albillos et al., *J. Physiol.*, 1996; Albillos et al., *Pflügers Archiv*, 1996. I completed my training as an electrophysiologist through a postdoctoral stay in 1996 with Prof. Guillermo Alvarez de Toledo at the University of Seville, who taught me the technique of amperometry using carbon fiber electrodes and the assembly of amperimeters. The next two years, I did my postdoctoral stay in Germany, first with Prof. Manfred Lindau in Heidelberg, where I performed the first experiments with the "patch-amperometry" technique (Albillos et al., *Nature*, 1997). Then I stayed in Goettingen for another year, in the laboratory of Prof. Erwin Neher, Nobel Prize in Medicine in 1991 for the development of the "patch-clamp" technique. There I investigated the coupling of voltage-dependent calcium channels to the exocytotic process in slices of adrenal gland (Albillos et al., *J. Neurosci.*, 2000). I began my career as an independent researcher in 2006. Since then I have continued studying the coupling excitation-secretion, mainly in human chromaffin cells. We have focused our studies on nicotinic receptors in these cells. We have performed molecular

biology and electrophysiology experiments to characterize the transcripts, the functional receptors and their coupling to exocytosis in these human cells (Pérez-Alvarez et al., *J. Neurochem.*, 2007; Pérez-Alvarez et al., *Br. J. Pharmacol.*, 2012; Pérez-Alvarez et al., *FASEB J.*, 2012; Hone et al., *Mol. Pharmacol.*, 2015) or in primate non human chromaffin cells (Hernández-Vivanco et al., *PLOS ONE*, 2014). The final goal of these studies is to translate our knowledge on human native nicotinic receptors to the physiopathology of these receptors in diseases with a cholinergic dysfunction, such as Alzheimer's disease, in order to help development of drugs to treat those diseases. In addition, we have also investigated the effect of drugs currently used to treat tobacco addiction, such as varenicline, on nicotinic receptors of human chromaffin cells (Hone et al., *J. Neurochem.*, 2017). We are also about to submit a manuscript to the *Journal of Clinical Investigation* showing that varenicline indeed increases the release of catecholamines in human chromaffin cells, which might explain some of its reported cardiovascular effects.

## **Part C. RELEVANT MERITS**

### **C.1. Publications (last 10 years)**

- 1.- SANZ-LAZARO, S., JIMENEZ-POMPA, A., CARMONA-HIDALGO, B., UBEDA, M., MUÑOZ, L., CABA-GONZALEZ, J.C., HERNANDEZ-VIVANCO, A., LOPEZ-GARCIA, S., ALBILLOS, A., ALBILLOS, A. (2019) The firing frequency of spontaneous action potentials and their corresponding evoked exocytosis are increased in chromaffin cells of CCl<sub>4</sub>-induced cirrhotic rats with respect to control rats. *J. Neurochem.* 148:359-372. IF: 4.87 Neurosciences 53/267 Q1.
- 2.- HONE, A.J., MCINTOSH, J.M., RUEDA-RUZAFÁ, L., PASSAS, J., DE CASTRO-GUERIN, C., BLAZQUEZ, J., GONZALEZ-ENGUITA, C., ALBILLOS, A. (2017) Therapeutic concentrations of varenicline and nicotine increase action potential firing in human adrenal chromaffin cells. *Journal of Neurochemistry* 140, 37-52. IF: 4.319 Neurosciences 57/261 Q1.
- 3.- HERNANDEZ-VIVANCO, A., SANZ-LAZARO, S., JIMENEZ-POMPA, A., GARCIA-MAGRO, N., CARMONA-HIDALGO, B., PEREZ-ALVAREZ, A., CABA-GONZALEZ, J.C., TABERNERO, A., ALONSO Y GREGORIO, S., PASSAS, J., BLAZQUEZ, J., GONZALEZ-ENGUITA, C., DE CASTRO-GUERIN, C., ALBILLOS, A. (2017) Human native Cav1 channels in chromaffin cells: contribution to exocytosis and firing of spontaneous action potentials. *European Journal of Pharmacology* 796, 115-121. IF: 3.04 Pharmacology & Pharmacy 94/261 Q2.
- 4.- HONE, A.J., MCINTOSH, J.M., AZAM L., LINDSTROM J., LUCERO L., WHITEAKER P., PASSAS J., BLAZQUEZ J., ALBILLOS, A. (2015)  $\alpha$ -Conotoxins identify the  $\alpha 3\beta 4$  subtype as the predominant nicotinic acetylcholine receptor expressed in human adrenal chromaffin cells. *Molecular Pharmacology* 88, 881-93. IF: 3.931 Pharmacology & Pharmacy 46/255 Q1.
- 5.- HERNANDEZ-VIVANCO, A., HONE, A.J., SCADDEN, M., CARMONA-HIDALGO, B., MCINTOSH, J.M., ALBILLOS, A. (2014) Monkey Adrenal Chromaffin Cells Express  $\alpha 6\beta 4^*$  Nicotinic Acetylcholine Receptors. *PLOS One* 9(4):e94142. IF: 3.057 Multidisciplinary Sciences 11/63 Q1.
- 6.- ALBILLOS, A., GIL, A., GONZALEZ-VELEZ, V., PEREZ-ALVAREZ, A., SEGURA, J., HERNANDEZ-VIVANCO, A., CABA-GONZALEZ, J.C. (2013) Exocytotic dynamics in human chromaffin cells: experiments and modeling. *Journal of Computational Neuroscience* 34, 27-37. IF: 2.087 Mathematical & Computational Biology 13/52 Q1
- 7.- HERNANDEZ-VIVANCO, A., PEREZ-ALVAREZ, A., CABA-GONZALEZ, J.C., ALONSO, M. T., MORENO-ORTEGA, M. J., CANO-ABAD, M.F., RUIZ-NUÑO, A., CARMONA-HIDALGO, B., ALBILLOS, A. (2012) Selectivity of action of pregabalin on Ca<sup>2+</sup> channels but

not on fusion pore, exocytotic machinery or mitochondria in chromaffin cells of the adrenal gland. *Journal of Pharmacology and Experimental Therapeutics* 342, 263-72. IF: 3.891 Pharmacology & Pharmacy 43/261 Q1.

**8.-** PEREZ-ALVAREZ, A., HERNANDEZ-VIVANCO, A., MCINTOSH, J.M., ALBILLOS, A. (2012) Native  $\alpha 6\beta 4^*$  nicotinic receptors control exocytosis in human chromaffin cells of the adrenal gland. *FASEB Journal* 26, 346-54. IF: 5.704 Biology 7/83 Q1-D1.

**9.-** PEREZ-ALVAREZ, A., HERNANDEZ-VIVANCO, A., GREGORIO, S.A., TABERNERO A., MCINTOSH, J.M., ALBILLOS, A. (2012) Pharmacological characterization of native  $\alpha 7$  nAChRs and their contribution to depolarization-elicited exocytosis in human chromaffin cells. *British Journal of Pharmacology* 165, 908-21. IF: 5.067 Pharmacology & Pharmacy 21/261 Q1-D1.

**10.-** PEREZ-ALVAREZ, A., HERNANDEZ-VIVANCO, A., JOSE CARLOS CABA-GONZALEZ, ALBILLOS, A. (2011) Different roles attributed to Cav1 channel subtypes in spontaneous action potential firing and fine tuning of exocytosis in mouse chromaffin cells. *Journal of Neurochemistry* 116, 105-21. IF: 4.061 Neurosciences 59/254 Q1.

## **C.2. Research projects and grants (last 10 years)**

1.- **Ref. BFU2015-69092.** "Secreción de colágeno y catecolaminas y su regulación en células hepáticas estrelladas, y secreción de catecolaminas en células cromafines y Kupffer en la cirrosis hepática". Ministerio de Economía y Competitividad. (01/01/2016-31/12/2018). **IP:** Almudena Albillos Martínez. 96.800 €.

2.- **Ref. BFU2012-30997:** "Receptores nicotínicos nativos alfa6\* en la célula cromafín humana de la glándula adrenal: propiedades biofísicas, regulación y control de la secreción de neurotransmisores". Ministerio de Economía y Competitividad. (01/01/2013-31/12/2015). **IP:** Almudena Albillos Martínez. 163.800 €.

3.- **Ref. NRHACC-329956:** "Nicotinic acetylcholine receptors in human adrenal chromaffin cells". European Research Agency, Marie Curie International Fellowship Grant. (28/07/2013-28/07/2015). **IP:** Almudena Albillos Martínez. 166.000 €.

4.- **Ref. BFU2011-27690:** "Microunidades funcionales, calcio mitocondrial y especies reactivas de oxígeno: implicación en la señal de calcio y la exocitosis de vesículas secretoras". Ministerio de Economía y Competitividad. (01/01/2012-31/12/2012). **IP:** Almudena Albillos Martínez. 44.770 €.

5.- **Ref. BFU2008-01382/BFI:** " Microunidades funcionales, calcio mitocondrial y exocitosis de neurotransmisores". Ministerio de Ciencia e Innovación. (31/12/2008-31/12/2011). **IP:** Almudena Albillos Martínez. 205.700 €.

6.- **Ref. BFU2006-27011-E/BFI:** "Equipamiento TIRF". Ministerio de Educación y Ciencia. (01/12/2006-30/09/2007). **IP:** Almudena Albillos Martínez. 130.000 €.

## **C.3. Patents (last 10 years)**

"Method to register variations in membrane capacity generated by variations in cell membrane potential". Inventors: Almudena Albillos Martínez, Alberto Pérez-Alvarez. Patent number: ES2338727B1. Country of priority: Spain. 08/31/2011. Entity holder: Autonomous University of Madrid.

## **C.4. Direction of Ph.D. Theses (last 10 years)**

**1.- “Fisiología de las células cromafines de la glándula adrenal de rata en situación control y en la cirrosis hepática.** Contribución a la cirrosis hepática inducida por Cl<sub>4</sub>C”. Student: Beatriz Carmona Hidalgo. Director: Almudena Albillos Martínez. Autonomous University of Madrid. 15 September 2017.

**2.- “Canales de calcio de tipo Cav1 en la célula cromafín de la glándula adrenal de ratón y humana: propiedades biofísicas y función en la excitabilidad celular y exocitosis”.** Student: Alicia Hernández-Vivanco. Director: Almudena Albillos Martínez. Autonomous University of Madrid. 30 June 2013.

**3.- “Estudio de los elementos implicados en el acoplamiento estímulo-secreción en la célula cromafín humana”.** Student: Alberto Pérez-Alvarez. Director: Almudena Albillos Martínez. Autonomous University of Madrid. 21 June 2010.

**4 and 5 (in progress).**- Students: Amanda Jiménez-Pompa and Sara Sanz Lázaro.

## **C6. Teaching activities**

At the UAM as Full Professor of Pharmacology, and coordinator of Pharmacology and Food Toxicology in the Nutrition degree.

## **C7. Participation in evaluation processes**

· Evaluator of scientific journals: The Journal of Neurochemistry, American Journal of Physiology, The Journal of Neuroscience, Pflügers Archiv European Journal of Physiology, The Journal of Neurochemistry, among others.

· Project Evaluator of the National Plan for the National Agency for Evaluation and Perspective. 2006-present.

· Member of the BFU National Program Selection Commission, BFI Subprogram. April and September 2007.

## **C8. Organization of meetings**

Member of the Organizing Committee of the Symposium "The Spanish Pharmacology of the year 2000", UAM, May 11 and 12, 2000; Organization of the "XXIV Minicongreso de Farmacología y Terapéutica", academic year 2000-2001.

## **C9. Received awards**

Young Researchers Award for Best Scientific Communication at the 9th International Symposium on Chromaffin Cell Biology, Sapporo, Japan, 1997

Young Researchers Award from the Spanish Society of Pharmacology. September 2002

Young Researchers Award from the ISN (International Society for Neurochemistry) and the ASN (American Society for Neurochemistry). August 2007

## **C10. Submitted manuscripts**

1. Hone, A., Rueda-Ruzafa, L., Gordon, T., Gajewiak, J., Christensen, S., Dyhring, T., Albillos, A., McIntosh, J.M. Expression of  $\alpha 3\beta 2\beta 4$  nicotinic acetylcholine receptors by rat adrenal chromaffin cells determined using novel conopeptide antagonists (*second revision*, *FASEB J.*)