MINISTERIO DE CIENCIA E INNOVACIÓN

CURRICULUM VITAE (maximum 4 pages)

AGENCIA ESTATAL DE INVESTIGACIÓN

Part A. PERSONAL INFORMATION

CV date	01/12/2021

First and Family name	ANTONIO AYALA GOMEZ		
Researcher codes	ORCID	0000-0001-9711-3711	
	SCOPUS Author ID	7202837824	
	WoS Researcher ID	N-7591-2019	

A.1. Current position

University/Institution	University of Sevilla		
Department	Biochemistry and Molecular Biology. Faculty of Pharmacy		
Address and Country	Dpto de Bioquímica y Biología Molecular. Facultad de Farmacia. Universidad de Sevilla, Calle Tramontana s/n, 41012, Sevilla		
		E-mail	aayala@us.es
Current position	Professor (Catedrático Universidad)	From	2009
Key words	Aging, oxidative stress, antioxidants, oxidative stress markers, stem cells, neurodegeneration.		

A.2. Education

PhD, Licensed, Graduate	University	Year
Licenciado en Farmacia	University of Sevilla	1982
Doctor en Farmacia	University of Sevilla	1986
Master in Business Administration (MBA)	Instituto Internacional San Telmo-IESE	1994
Master in Foresight and Management of Technology.	European Commission	1998
Master in Nutrition and Dietherapy	University of Navarra	1999

A.3. General indicators of quality of scientific production:

- Periods of outside assessment of research activity (CNEAI): 6 (1985-1990; 1991-1996; 1997-2002; 2003-2008; 2009-2014; 2015-2020). - Total number of doctoral theses supervised in the last 10 years: 5. - Data collected from Web of Science: Publications: 98; Total number of citations: 2912.
- h-index: 24 (SCR), 23 (JCR), 27 (Google académico)

Part B. CV SUMMARY

My professional (teaching and research) activities began in 1984, which means 36 years of experience. During this time I have been recognized for 6 “six-year research periods” by the CNEAI and 6 teaching five-year periods by the University of Seville (without leaving any year without computing). My academic training has been complemented by two long-term Masters: one in Economics and Business Management (Instituto Internacional San Telmo) and another on Management and Foresight of Technology (European Commission). I have made two long-term stays in the US: one for more than two years at the Gerontology Research Center (NIH) and another for almost a year at the american company Genox Co. Among the scholarships I highlight: NATO Postdoctoral Fellow and US NIH Fellow. In relation to research, my activities have focused on the biochemical bases of aging and its control. All papers are centered around these topics. Among the publications, I would highlight the first ones in the J. Biol. Chem Journal, in which we were the first to describe the biological effect of oxidations "in vivo" and those carried out on human samples in collaboration with research groups from hospitals in Cádiz, Granada, and Seville. Of the latter, I would highlight that of the journal Oxidative Medicine and Cellular Longevity, which has been the most downloaded and cited publication in 2016 of this journal. This article has been included by Web of Science in the 1% of the best articles in its field based on the threshold of highly cited articles since January / February 2018. In relationship with elongation factor-2, the protein that the present project focus on, we have described new regulatory mechanisms responsible of cell survival under oxidative stress conditions. All this knowledge will be used to control those diseases where eEF2 is dysregulated. Lastly, our research have focused on both human and rat

stem cells where we have described those molecular pathways playing a relevant role to ensure a successful therapeutic effect. I have been director/supervisor of several PhD students. Special mention are S. Arguelles and M. Muñoz who after finish their PhD thesis completed a postdoctoral training in USA, China, UK and Portugal with excellent results. Sandro is now preparing his exam to get a permanent position as assistant professor position at University of Seville. Mario has recently got a position at the University of Sevilla as "Profesor Ayudante Doctor" where only a single position was offered and 41 candidates competed for this position. In total, 98 publications registered in the Andalusian Scientific Information System (SICA). Since 2003, I am head of the research group "Biochemistry of Aging" of the Junta de Andalucía. Since the beginning of my career I have participated continuously as a collaborator (from 1985-2002) in projects financed by national public calls and as IP from 2003. I have participated in more than 80 invited lectures at national and international congresses. As other activities of interest, I´m the Vice-President of the Spanish Society of Anti-aging and Longevity Medicine (SEMAL) Also, I was one of the founding partner of this scientific society. I have written several newspaper articles on aging (La Razón, El Mundo, ABC, etc). I have written several popular book chapters on aging, such as "Environment and Aging". I signed an agreement with the Spanish Brewers Association to carry out research work. I have organized the scientific conferences of the Rocío Vazquez Foundation, of which I am vice president. I am the editor-in-chief of the journal "Approaches to Aging Control" I am an evaluator for several national and European agencies. I am a member of the Ibero-American Academy of Pharmacy.

Part C. RELEVANT MERITS

C.1. Selected Publications (since 2010)

- Muñoz MF, Argüelles S, Marotta F, Barbagallo M, Cano M, Ayala A (2020) Effect of Age and Lipoperoxidation in Rat and Human Adipose Tissue-Derived Stem Cells. **Oxid. Med. Cell. Longev.** Aceptado. **Q1** (Catª. Medicine) doi: 10.1155/2020/6473279.

-Gonzalez-Minero FJ, Bravo L, Ayala A (2020) Rosmarinus officinalis L. (Rosemary): An Ancient Plant with Uses in Personal Healthcare and Cosmetics. **Cosmetics** 7(4), 1-17. **Q2** (Catª. Pharmaceutical Science)

- Márquez I, Muñoz M-F. Ayala A, López JC, Vargas JP, Díaz E. (2020) Effects on goal directed behavior and habit in two animal models of Parkinson's disease. **Neurobiol. Learn. Mem**. 169. 107190. **Q1** (Catª. Behavioral Neuroscience)

- Cano M, Guerrero-Castilla A, Nabavi SM, Ayala A, Argüelles S. (2019) Targeting pro-senescence mitogen activated protein kinase (MAPK) enzymes with bioactive natural compounds. **Food Chem. Toxicol.** 131:110544. **Q1** (Catª: Food Science & Technology)

- Yeung YT, Guerrero-Castilla A, Cano M, Muñoz MF, Ayala A, Argüelles S. (2019) Dysregulation of the Hippo pathway signaling in aging and cancer. **Pharmacol. Res**. 143:151-165. **Q1** (Catª. Pharmacology and Pharmacy)

- Argüelles S, Guerrero-Castilla A, Cano M, Muñoz MF, Ayala A. (2019) Advantages and disadvantages of apoptosis in the aging process. **Ann. New York Acad. Sci.** 1443(1):20-33. **Q1** (Catª. Multidisciplinary Sciences)

- Carrascal L, Nuñez-Abades P, Ayala A, Cano M. (2018) Role of melatonin in the inflammatory process and its therapeutic potential. **Curr. Pharm. Des.** 24: 1563-1588. **Q2** (Catª. Drug Discovery)

-Mario F. Muñoz, Argüelles S, Guzman-Chozas M, Guillén-Sanz R, Franco JM, Pintor-Toro JA, Cano M, Ayala A. (2018) Cell tracking, survival and differentiation capacity of adipose-derived stem cells after engraftment in rat tissue. **J. Cell. Physiol.** 233: 6317-6328. **Q1** (Catª. Physiology)

-Muñoz M, Muñoz MF, Ayala A (2017). Immunolocalization of Substance P and NK-1 Receptor in adipose stem cells. **J. Cell. Biochem.** 118: 4686-4696. **Q2** (Catª. Biochemistry and Molecular Biology)

- Cano M, Ayala A, Marotta F, Arguelles S. (2017). Application of Kinase Inhibitors for Anti-aging Intervention. **Curr. Pharm. Des.** 23: 4351-4368. **Q2** (Catª. Drug Discovery)

-Muñoz MF, Argüelles S, Cano M, Marotta F, Ayala A. (2017) Aging and Oxidative Stress Decrease Pineal Elongation Factor 2: In Vivo Protective Effect of Melatonin in Young Rats Treated With Cumene Hydroperoxide. **J. Cell. Biochem.** 118:182-190. **Q2** (Catª. Biochemistry and Molecular Biology)

-Pardillo Díaz, R.; et al. 2016. Time and dose dependent effects of oxidative stress induced by cumene hydroperoxide in neuronal excitability of rat motor cortex neurons. **Neurotoxicol.** 53: 201-215. **Q1** (Catª. Toxicology)

-Sánchez-Hidalgo AC, Muñoz MF, Herrera AJ, Espinosa-Oliva A, Ayala A, Machado A, Venero J, De Pablos R. (2016) Chronic stress alters the expression levels of longevity-related genes in the rat hippocampus. **Neurochem. Int.** 97: 181-92. **Q2** (Catª. Cell Biology)

-Pardillo Díaz, R.; et al. 2015. Oxidative stress induced by cumene hydroperoxide evokes changes in neuronal excitability of rat motor cortex neurons. **Neuroscience**. 289, pp.85-183. ISSN 1873-7544. **Q2** (Catª. Neuroscience)

-Machado, A.; et al. 2014. Chronic stress as a risk factor for Alzheimer's Disease. **Rev. Neurosci.** 25: 785-1589. **Q2** (Catª: Neuroscience)

-Argüelles, S.; et al. 2014. Elongation factor 2 diphthamide is critical for translation of two IRES-dependent protein targets, XIAP and FGF2, under oxidative stress conditions. **Free Radic. Biol. Med.** 67: 131-138. **Q1** (Catª. Biochemistry and Molecular Biology)

-Ayala, A.; Muñoz, MF.; Argüelles, S.2014. Lipid peroxidation: production, metabolism, and signaling mechanisms of malondialdehyde and 4-hydroxy-2-nonenal. **Oxid. Med. Cell. Longev.** 2014, pp.360438. **Q1** (Catª. Medicine).

-Argüelles, S.; et al. 2013. Molecular control of the amount, subcellular location, and activity state of translation elongation factor 2 in neurons experiencing stress. **Free Radic. Biol. Med.** 61: 61-71. **Q1** (Catª. Biochemistry and Molecular Biology)

-Argüelles, S.; et al. 2012. In vitro and in vivo protection by melatonin against the decline of elongation factor-2 caused by lipid peroxidation: preservation of protein synthesis. **J. Pineal R.** 53: 1-10. **Q1** (Catª. Endocrinology and Metabolism).

-Argüelles, S.; et al. 2011. Effect of aging and oxidative stress on elongation factor-2 in hypothalamus and hypophysis. **Mech. Ageing Develop.** 132: 55-64. Q1 (Catª. Geriatric and Gerontology)

-Argüelles, S., Cano, M., Machado, A., Ayala, A. (2010) Comparative study of in vitro protective effects of several antioxidants on elongation factor 2 under oxidative stress conditions. **Biosci. Biotechnol. Biochem.** 74, 1373-9. T1 (Catª. Medicine)

-Argüelles, S., Venero, J.L., García-Rodriguez, s., Tomás-Camardiel, M., Ayala, A., Cano, J., Machado, A., (2010) Use of Haptoglobulin and transthyretin as potential biomarkers for the preclinical diagnosis of Parkinson Disease. **Neurochem. Int.** 57, 227-234. Q2 (Catª. Cell Biology)

-Argüelles, S., Machado, A., Ayala, A**.** (2009) Adduct formation of 4-Hydroxynoenal and malondialdehyde with Elongation Factor-2 in vitro and in vivo. **Free Radic. Biol. Med.** 47, 324-330. Q1 (Catª. Biochemistry and Molecular Biology)

C.2. Research projects

- **VI Plan Propio de Investigación y Transferencia US 2017**. Ayuda a proyectos de investigación precompetitivos. Peroxidación lipídica y neurodegeneración en la corteza motora. IP: ANTONIO AYALA GOMEZ. 2017. 5.000 €.

-BFU2010-20882. Significado biológico de la integración de los distintos mecanismos de regulación del factor de elongacion-2 en condiciones de estrés celular y envejecimiento. PROGRAMAS DEL PLAN NACIONAL I+D, MINISTERIO DE CIENCIA Y TECNOLOGÍA. IP: ANTONIO AYALA GOMEZ. Desde 01/01/2011 -2013. 95.000 €.

-BFU2009-12307. Implicación de las interacciones de las rutas que aumentan la vida media y la supervivencia celular con el factor de elongación 2 en el mantenimiento de la síntesis de proteínas durante el envejecimiento. PROGRAMAS DEL PLAN NACIONAL I+D, MINISTERIO DE CIENCIA Y TECNOLOGÍA. IP: ANTONIO AYALA. GOMEZ. Desde 01/01/2009 a 2010. 24.000 €.

-BFU2006-06517. Influencia del mantenimiento de la síntesis de proteínas durante el envejecimiento en el aumento del plazo de vida causado por la restricción calórica: importancia del factor de elongación 2. PROGRAMAS DEL PLAN NACIONAL I+D, MINISTERIO DE CIENCIA Y TECNOLOGÍA. ANTONIO AYALA GOMEZ. Desde 01/10/2006 a 2009. 141.207 €.

-FIS PI031233. Estudio del mecanismo de inhibición de la síntesis de proteínas por el envejecimiento y el estrés oxidativo y prevención de esta inhibición mediante el uso de compuestos antioxidantes y protectores. MINISTERIO DE SANIDAD Y CONSUMO (INSTITUTO DE SALUD CARLOS III). IP: ANTONIO AYALA GÓMEZ. Desde 01/01/2004-31/03/2007. €59.340,00.

-P10-CTS-6494. Estudio de los mecanismos moleculares que regulan la inflamación cerebral y la longevidad. IP: José Luis Venero Recio. 15/03/2011-30/04/2016. 250.000 €. Junta de Andalucía.
-**EXC/2005/CTS-1014.** La enfermedad de Parkinson: Diagnóstico en estado subclínico. IP: Alberto Machado. Junta de Andalucía. 01/03/2006-28/02/2009. 180.000 €.
-P09-CTS-5244. 2010, Estudio de los cambios que experimentan con el envejecimiento las rutas que promueven la supervivencia celular y la inflamación cerebral. JUNTA ANDALUCÍA. IP: ALBERTO MACHADO DE LA QUINTANA. Desde 03/03/2011-2015.
-**Ayudas anuales a Grupos PAIDI Junta de Andalucía.** BIO-158 "Bioquímica del Envejecimiento". Responsable del grupo: Antonio Ayala. Desde 2003.

C.3. Patents

-P201500766. 2. "Kit and method for quantifying toxicity in neurons of the cerebral cortex for the detection of neurodegenerative diseases " España. 01/10/2015. Universidad de Sevilla. Antonio Ayala and 5 investigators.
-ES1650.43. Composition of folic acid + melatonin for the treatment of chronic alcoholism España. 2014. Universidad de Sevilla. Antonio Ayala and 5 investigators.

C.4. Supervision of doctoral theses

The last three supervised theses (all of them Outstanding "cum laude") have been presented in 2014, 2015 and 2016: 1.- Title: Effect of treatment with metformin on the nigrostriatal dopaminergic system. Possible involvement in Parkinson's disease. Doctor: Afrah Ismaiel. University: Seville. Faculty: Pharmacy. Year: 2014. 2.- Title: Therapeutic interventions of the comparative analysis between different obsessive compulsive disorder: paradigmatic cognitive-behavioral treatments versus psychopharmacological and / or combined. Doctor: Angel Valaer. University: Seville. Faculty: Pharmacy. Year: 2015. 3.- Title: Study of the viability and differentiation of adipose tissue mesenchymal stem cells under conditions of oxidative stress and aging. Possibility of its therapeutic use and influence of the elongation factor 2. Doctor: Mario Muñoz. University: Seville. Faculty: Pharmacy. Year: 2016.

C.5. Direction/participation in Masters

In addition to teaching activities in Undergraduate and Doctorate programs, I am the Director of an Expert Course in Anti-aging Medicine at the US (http://www.cfp.us.es/cursos/eu/medicina-antienvejecimiento/5314/) and co-coordinator of a Course on Anti-aging and Genomic Medicine at CEU (http://www.cfp.us.es/cursos/eu/medicina-antienvejecimiento/5314/). In addition, I am a professor of different Masters of Anti-Aging Medicine in different countries (USA, Brazil, Colombia, Ecuador, Mexico, Dubai, and Thailand)

C.6. Participation in evaluation tasks

I participate as an evaluator in: 1) Projects of the European Union. 2) Marie Skłodowska-Curie fellowships. 3) National Agency for Evaluation and Foresight (ANEP). 4) National Agency for Quality Assessment and Accreditation (ANECA). 4) Agency of University Qualitat de les Illes Balears. 5) Andalusian Knowledge Agency.

C.7. Awards

Premio extraordinario Fin de Carrera.

C.8. Editorial boards

I am the director of the journal "Approaches to Aging Control", which is edited by the Spanish Society of Anti-aging and Longevity Medicine (SEMAL), of which I am vice president. In addition, I am an associate editor of the journals "Oxidative Medicine and Cellular Longevity" and "Research Journal of Aging."

C.9. Manegement positions

2007-2017: Director of the Animal Facility lab at the Faculty of Pharmacy.

C.10. Congress organization

Since 2003 I have participated in the organization of the annual congresses of the Spanish Society of Anti-Aging and Longevity Medicine.

C.11. Science dissemination activities

Within the Rocío Vazquez Foundation, of which I am Vice President, I organize the biannual Scientific Sessions. I have been interviewed several times in Canal Sur's "Salud al Día" Program (https://www.youtube.com/watch?v=BH0VI2s9Z40) and in various media to talk about Anti-Aging Medicine.