ABBREVIATED CURRICULUM VITAE (with emphasis on the last 10 years)

CV date	21-Jan-2021

Part A. PERSONAL INFORMATION

First name	Angel T.		
Family name	Martinez		
Gender (*)	male	Birth date	29/12/1951
ID No (DNI)	17844654N		
e-mail	ATMartinez@cib.csic.es (AngelT.Martinez@gmail.com)	URL www.cib.csic.es/research/microbial-plant-biotechnology	
Open Researcher & Contributor ID (orcid)*		https://orcid.org/0000-0002-1584-2863	

Scopus ID: 55622506400	Researcher ID: G-7284-2017
H index: **79** (Scopus), **76** (WOS), **93** Google Scholar (4-Dec-21)	
Total citations: **20676** (of 337 papers in Scopus),**18814** (of 295 papers in WOS) (4-Dec-21)	
Sexenios (outstanding 6-year recognized research periods, up to a max of 6): **6**	

A.1. Current position

Position	"ad honorem" Research Professor at the Spanish Research Council (CSIC)		
Initial date	29-May-2003		
Institution	CSIC		
Dept./Center	Dept. Microbial and Plant Biotechnology		CIB, CSIC
Country	Spain	Phone number	+34 918373112
Key words	Biotechnology for plant biorefineries, Enzyme structure-function, Epoxidation, Flavo-oxidases, Genomic analyses, Green chemistry, Heme-peroxidases, Lignin biodegradation, Lignin chemistry, Microbial ecology, Microbial enzymes, Plant biomass, Plant lipids, Protein engineering, Wood		

A.2. Previous positions

1990-2003	Investigador Científico/CSIC
1981-1990	Colaborador Científico/CSIC
1978-1979	Dutch Contract at Centraalbureau voor Schimmelcultures, Baarn and Delft
1977-1978	French Contract at Centre de Pédologie Biologique, CNRS, Vandoeuvre
1973-1975	Full-time Assistant Professor of Microbiology, Universidad de Navarra, Spain

A.3. Education

Licenciado in Biological Sciences	Universidad de Navarra/Spain	1973
Doctor in Biological Sciences ("cum laude")	Universidad de Navarra/Spain	1976

Part B. CV SUMMARY (<5000 words following **DORA** principles)

His main research area is design of redox enzymes and their utilization in reactions of industrial interest, as those explored in years 2012-21 in the PeroxiCats, IndOx, EnzOx2 and SusBind projects mentioned below. These four projects, the first three coordinated by AT Martinez, obtained a total EU funding over 18 million euro (from 2010). His contribution focuses on proteins of the **(i)** heme-peroxidase, and **(ii)** flavo-oxidase types, as Green Chemistry catalysts for oxidation and oxyfunctionalization reactions of industrial interest. The SusBind project, still in course, directly focuses on the use of a new family of enzymes with mono(per)oxygenase activity to obtain fully biob-ased chemicals and materials from vegetable oil byproducts in the frame of industrial green transition.

Computationally-aided rational design of enzymes is aimed to develop intelligent manufacturing processes. The above includes: **i)** Simulations of protein-ligand interactions (computational biophysics) and quantum mechanics/molecular mechanics to predict the electron transfer (computational biochemistry), in a well-established collaboration with BSC (www.bsc.es; Prof V. Guallar); **ii)** Use of instrumental facilities (NMR, GC/MS, etc) at CIB

and IRNAS in Seville (www.irnas.csic.es; Prof A. Gutiérrez); and **iii)** Genomic information on fungi involved in biomass decay including JGI (http://jgi.doe.gov) CSP-2015-1609 project coordinated by F.J. Ruiz-Dueñas (CIB) for analyzing large sets of newly sequenced fungal genomes (see publications below).

The group of Biotechnology for Lignocellulosic Biomass at the Department of Microbial and Plant Biotechnology (www.cib.csic.es/research/microbial-plant-biotechnology) is one of the largest groups at CIB -currently including 6 staff scientists (with differentiated research lines), 2 technicians, 4 postdocs, 12 PhD students, and several visitors- has a record of internal and external (with CIB and other groups) collaborations. Those inside CIB resulted in publications with A. Romero (x-ray diffraction), F.J. Cañada (NMR), J.I. Casal (proteomics) and M.J. Martínez (fungi and enzymes), among others. Outside CIB, collaborations with Novozymes (Denmark; www.novozymes.com), the world leader in industrial enzymes, and the above BSC (Barcelona) and JGI (California) are among the most relevant ones. Outside the biotechnological sector, are relevant the collaborations with Cargill (Belgium; www.cargill.com), IKEA (Sweden; https://about.ikea.com) and other large companies in EU projects (below) for application of biocatalysts in the green transition to bio-based products.

A.T. Martinez has a record of 8 EU projects coordinated from FP3 to H2020 (and participation in several additional EU projects) together with 14 Spanish-Biotechnology projects, 1 FEDER project, and the recent FurEnPol of the Strategic Lines call. The above resulted in an outstanding scientific activity, with a total of over 349 publications in SCI journals (131 of them from 2012), reporting for the first time several key enzymes involved in lignin degradation, as a central aspect of carbon recycling in land ecosystems and the key step for the use of lignocellulose as industrial raw material. He also contributed to the advance of science as a frequent evaluator of EU and National projects, and reviewer of many scientific journals of biocatalysis and other areas (such as *ACS Catal., Biotechnol. Biofuels, ACS Sust. Chem. Eng., Biotechnol. Adv., Appl. Environ. Microbiol.,* and many others). He has been also a member of the Management Committees of several COST Actions and of the Advisory Board of the ERANET of Industrial Biotechnology. He is specially active organizing (as a member of a total of 48 organizing/scientific committees, 18 of them from 2012) and participating (with over 500 communications) in scientific conferences to promote the potential of biotechnology in biomass biorefineries, and related topics.

He has supervised 18 PhD theses (six of them from 2012) plus a number of other thesis (in Spain, Germany and Portugal) maintaining contacts with many of these persons at CSIC and companies. Finally, he is strongly involved in activities of scientific societies, being: **i)** member of the Spanish Microbiology (www.semicrobiologia.org), Biotechnology (https://sebiot.org), and Mycology (https://aemicol.com) societies (in the last two cases from their constitution); **ii)** member of the American Chemical Society (www.acs.org) and its Biotechnology and Cellulose divisions (from 2001), the USA Technical Association of Pulp and Paper Industries (www.tappi.org; from 2000) and the American Society of Microbiology (https://asm.org; from 2002); and **iii)** elected member of the International Academy of Wood Sciences (www.iaws-web.org; from 2000), which brings together the most recognized specialists in different areas of wood science (biotechnology included) and its societal and technological domains.

Part C. RELEVANT MERITS

C.1. Publications:

- During his scientific career he published **29** book chapters, **2** monographs and **349 articles** including the **best journals** of the specialty, according to **D1/Q1 ranking** and **IFs** (WOS 2020):

6 ACS Catal (IF 13.1, D1)
3 ACS Sust Chem Eng (IF 8.2, D1)
2 Acta Cryst D (IF 2.7, Q1)
1 Adv Synth Catal (IF 5.8, D1)
1 Anal Chim Acta (IF 6.6, D1)
1 Angew Chem (**IF 15.3**, **D1**)
2 Antioxidants (IF 6.3, D1)
1 Appl Ener (IF 9.7, D1)
25 Appl Environ Microbiol (IF 4.8, Q1)
2 Biofpr (IF 4.1, Q1)
1 Biomacromolecules (IF 7.0, D1)
2 Biomass Bioenergy (IF 5.1, Q1)
13 Bioresource Technol (IF 9,6, D1)
2 Biotechnol Adv (IF 14.2, D1)
10 Biotechnol Biofuels (IF 6.0, Q1)
10 Catal Sci Technol (IF 6.1, Q1)
1 Curr Opin Biotechnol (IF 9.7, D1)
2 Environ Microbiol (IF 5.5, Q1)

5 Environ Sci Technol (IF 9.0, D1)
1 FEMS Microbiol Rev (IF 16.4, D1)
1 Front Bioeng Biotech (IF 5.9, Q1)
1 Front Plant Sci (IF 5.8, D1)
2 Green Chem (IF 10.2, D1)
11 Holzforschung (IF 2.4, Q1)
2 Ind Crops Products (IF 5.6, D1)
1 Int J Biol Macromol (IF 7.0, D1)
1 Int J Mol Sci (IF 5.9, Q1)
12 J Agric Food Chem (IF 5.3, D1)
10 J Anal Appl Pyrolysis (IF 5.5, Q1)
12 J Biol Chem (IF 5.2, Q2)
1 J Chem Theory Comp (IF 6.0, Q1)
1 J Clean Prod (IF 9.3 , D1)
1 J Chromatogr A (IF 4.8, Q1)
1 J Ecol (IF 6.3, D1)
2 J Electroanal Chem (IF 4.5, Q1)
1 J Exp Bot (IF 7.0, D1)
1 J Fungi (IF 5.8, Q1)
1 J Phys Chem Lett (IF 6.5, D1)
1 Microb Biotechnol (IF 5.8, Q1)
2 Microb Cell Fact (IF 5.3, Q1)
1 Mol Biol Evol (IF 16.2, D1)
6 Mycol Res (IF 2.8, Q1)
1 Persoonia (IF 11.1, D1)
2 Phys Chem Chem Phys (IF 3.7, Q1)
1 Phytochemistry (IF 4.1, Q1)
1 Plant Physiol (IF 8.3, D1)
2 Planta (IF 4.1, Q1)
1 PLOS Genet (IF 5.9, Q1)
4 PNAS (IF 11.2, Q1)
4 Sci Rep (IF 4.4, Q1)
1 Sci Total Environ (IF 8.0, D1)
2 Science (IF 47.7, D1)
6 Soil Biol Biochem (IF 7.6, D1)
1 Solid State NMR (IF 4.0, Q1)
3 Stud Mycol (IF 16.1, D1)
1 Trends Biotechnol (IF 19.5, D1)
2 Wood Sci Technol (IF 2.5, D1)

- From 2012, he published **131 articles**, including the following very recent ones:

1. Aranda C, Carro J, González-Benjumea A, Babot ED, Olmedo A, Linde D, **Martínez AT**, Gutiérrez A. **2021**. Advances in enzymatic oxyfunctionalization of aliphatic compounds. **Biotechnol Adv** 51, 107703
2. González-Benjumea, A., D. Linde, J. Carro, R. Ullrich, M. Hofrichter, **A. T. Martínez**, A. Gutiérrez. **2021**. Regioselective and stereoselective epoxidation of n-3 and n-6 fatty acids by fungal peroxygenases. **Antioxidants** 10, 1888; https://doi.org/10.3390/antiox10121888
3. Rencoret, J., A. Gutiérrez, G. Marques, J. C. del Río, Y. Tobimatsu, P. Y. Lam, M. Pérez-Boada, F. J. Ruiz-Dueñas, J. M. Barrasa, **A. T. Martínez. 2021**. New insights on lignins in ancestral plants. **Front. Plant Sci.** 12:740923
4. González-Benjumea A, Carro J, Renau C, Linde D, Fernández-Fueyo E, Gutiérrez A, **Martínez AT**. 2020. Fatty acid epoxidation by the new *Collariella virescens* peroxygenase and heme-channel variants. **Catal Sci Technol** 10:717-725
5. Linde D, Olmedo A, González-Benjumea A, Renau C, Estévez M, Carro J, Fernández-Fueyo E, Gutiérrez A, **Martínez AT**. **2020**. Two new unspecific peroxygenases from heterologous expression of fungal genes in *Escherichia coli.* **Appl Environ Microbiol** 86 doi:10.1128/AEM.02899-19
6. Municoy M, González-Benjumea A, Carro J, Aranda C, Linde D, Renau-Mínguez C, Ullrich R, Hofrichter M, Guallar V, Gutiérrez A, **Martínez AT**. **2020**. Fatty-acid oxygenation by fungal peroxygenases: From computational simulations to preparative regio- and stereo-selective epoxidation. **ACS Catal** 10:13584-13595
7. Ruiz-Dueñas FJ, Barrasa JM, Sánchez-García M, Camarero S, Miyauchi S, Serrano A, Linde D, Babiker R, Drula E, Ayuso-Fernández I, Pacheco R, Padilla G, Ferreira P, Barriuso J, Kellner H, Castanera R, Alfaro M, Ramírez L, Pisabarro AG, Riley R, Kuo A, Amdreopoulos W, LaButti K, Pangilinan J, Tritt A, Lipzen A, He G, Yan M, Ng V, Grigoriev IV, Cullen D, Martin F, Rosso M-N, Henrissat B, Hibbett D, **Martínez AT**. **2020**. Genomic analysis enlightens Agaricales lifestyle evolution and increasing peroxidase diversity. **Mol Biol Evol** doi:10.1093/molbev/msaa301
8. Ayuso-Fernández I, Rencoret J, Gutiérrez A, Ruiz-Dueñas FJ, **Martínez AT**. **2019**. Peroxidase evolution in white-rot fungi follows wood lignin evolution in plants. **Proc Natl Acad Sci USA** 116:17900-17905
9. Carro J, González-Benjumea A, Fernández-Fueyo E, Aranda C, Guallar V, Gutiérrez A, **Martínez AT**. **2019**. Modulating fatty acid epoxidation vs hydroxylation in a fungal peroxygenase. **ACS Catal** 9:6234-6242
10. Serrano A, Sancho F, Viña-González J, Carro J, Alcalde M, Guallar V, **Martínez AT**. **2019**. Switching the substrate preference of fungal aryl-alcohol oxidase: towards stereoselective oxidation of secondary benzyl alcohols. **Catal Sci Technol** 9:833-841

C.2. Congresses

Up to **505 congress** presentations, including numerous invited and Keynote lectures among **362** presentations in **international** congresses.

C.3. Research projects

- **National** projects:
  - **i) PI** of **16** past **Biotechnology** projects
  - **ii) Team** member of **GenoBioRef** project in course (on "Basidiomycete genomes for lignocellulose biorefineries"), PIs F.J. Ruiz-Dueñas/S. Camarero, Spanish MINECO (BIO2017-86559-R), Funding **302 500** euro (**2018-22**)
  - **iii) Coordinator** of the recent **FurEnPol** project ("Enzymatic synthesis and recycling of biobased furanic polymers"; PLEC2021-007690) of Spanish **Strategic Lines**, CIB co-PI F.J. Ruiz-Dueñas, Total funding **1 038 039** euros and CIB funding **310 406** euro (**2022-24**)
- **Coordinator** of **8 FP3-H2020** projects, and participant in additional EU projects, including:

1. H2020-BBI-JTI-2017-792063, Title: "Development and pilot production of sustainable bio binder systems for wood based panels" (**SusBind**, www.susbind.eu); Funded by: **H2020 BBI-JU** (www.bbi-europe.eu), PI-CIB: AT Martínez (12 partners, including 6 companies); Dates: **2018-22**; Funding: 4 414 418 € including 756 170 € for CIB
2. H2020-BBI-PPP-2015-2-720297; Title: "New enzymatic oxidation/oxyfunctionalization technologies for added value bio-based products" (**EnzOx2,** www.enzox2.eu); Funded by: **H2020 BBI-PPP**; Coordinator: AT Martínez (12 partners, including 6 companies); Dates: **2016-19**; Funding: **3 000 000** €, including **606 000** € for CIB
3. KBBE-2013-7-613549; Title: "Optimized oxidoreductases for medium and large scale industrial biotransformations" (**INDOX**, www.indoxproject.eu); Funded by: **FP7**; Coordinator: AT Martínez (15 partners including 8 companies); Dates: **2013-16**; Funding: **7 825 824** €, including **892 540** € for CIB
4. KBBE-2010-4-265397; Title: "Novel and more robust fungal peroxidases as industrial biocatalysts" (**PeroxiCats,** www.peroxicats.org); Funded by: **FP7**; Coordinator: AT Martínez (4 partners, 2 companies); Dates: **2010-13**; Funding: **2 999 350** €, including **732 114** € for CIB
5. NMP2-CT-2006-026456-2; Title: "White biotechnology for added value products from renewable plant polymers: Design of tailor-made biocatalysts and new industrial bioprocesses" (**BioRenew**, www.biorenew.org); Funded by: **FP6**; Coordinator: AT Martínez (26 partners including 13 companies); Dates: **2006-10**; Funding: **9 500 000** €, including **1 895 239** € for CSIC (CIB+IRNAS)

C.4. Contracts, technological or transfer merits

Contracts with Abengoa, Grencell SA and Agrenvec, in addition to contracts in 10 EU-projects (see above for the most recent ones). He also submitted the following more recent **patents**:

1. Carro, J., A. González-Benjumea, C. Aranda, A. Gutiérrez, and **A. T. Martínez**. Unspecific peroxygenase enzyme variants for selective fatty acid epoxidation or hydroxylation. **EP19382479** (**2019**), **US1641.1465** (**2021**)
2. Aranda C, del Río JC, Gutiérrez A, **Martínez AT**. **2018**. Process for selective synthesis of 4-hydroxyisophorone and 4-ketoisophorone by fungal peroxygenases. **EP1641.1440**.
3. Carro J, Fernández-Fueyo E, Alcalde M, **Martínez AT**, Ferreira P, Ullrich R, Hofrichter M. **2018**. Enzymatic composition and enzymatic process for the production of 2,5-furandicarboxylic acid from 5-methoxymethylfurfural using said enzymatic composition. PCT/ES2018/070428.
4. Fernández-Fueyo, E., C. Aranda, A. Gutiérrez, and A. T. **Martínez**. **2018**. Method of heterologous expression of active fungal unspecific peroxygenase in bacterial host cells for fatty-acid epoxidation and other oxygenation reactions. **EP18382514.0**.
5. Gutiérrez A, Olmedo A, del Río JC, **Martínez AT**. **2017**. Process for shortening the hydrocarbon chain of a carboxylic acid by a peroxygenase. **EP17382211.5**.
6. Lund H, Brask J, Kalum L, Gutiérrez A, Babot ED, Ullrich R, Hofrichter M, **Martínez AT**, del Río JC. **2011** Enzymatic preparation of diols. **WO2013/004639A2**, **12249-EP-EPA**, **US20140234917** (exploitation by Novozymes, Bagsvaerd, Denmark).