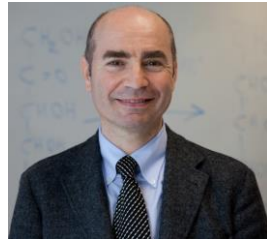


BIOGRAPHICAL SKETCH

NAME: **Mauro MACCARRONE**



POSITION TITLE

Dr. Enzymology and Bio-Organic Chemistry, Professor and Chair of Biochemistry at the Department of Applied Clinical and Biotechnological Sciences, University of L'Aquila, Via Vetoio, 67100 L'Aquila, Italy (contacts: phone +39 0862 433547; e-mail mauro.maccarrone@univaq.it).

Head of the Laboratory of Lipid Neurochemistry at the European Center for Brain Research (CERC)/IRCCS Santa Lucia Foundation, 00179 Rome, Italy.

EDUCATION/TRAINING (*Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.*)

INSTITUTION AND LOCATION	DEGREE	YEAR	FIELD OF STUDY
University of L'Aquila (I)	M.S.	1986	Biological Sciences (Biochemistry)
Universities of L'Aquila (I), of Chieti (I) and of Rome Tor Vergata (I)	Ph.D.	1992	Enzymology Applied to Medical Sciences
University of Utrecht (NL)	Ph.D.	1992	Bio-Organic Chemistry

A. Personal Statement

Dr. Maccarrone's group is made of four units (highly integrated and in collaboration for more than 20 years), located at Tor Vergata University of Rome, University of Teramo, Santa Lucia Foundation, Campus Bio-Medico University of Rome and University of L'Aquila. The group has 15 permanent positions, which are currently taken by 1 Professor, 5 Associate Professors and 9 Assistant Professors (Ricercatori), as well as 5 Post-docs and 5 Ph.D students. The group leaders at the different institutions (Dr. Filomena Fezza at Tor Vergata, Dr. Enrico Dainese at Teramo, Dr. Sergio Oddi at Santa Lucia Foundation, and Dr. Alessandro Leuti at Campus Bio-Medico) have complementary expertises, that altogether span from chemistry, protein science and molecular biology to animal models of disease. Stipend holders and visiting scientists from abroad are frequently visiting the group for training purposes. In the last 5 years, Prof. M. Maccarrone has been the tutor of 10 PhD students and 5 Post-doc fellows, who were all supported by national and international institutions and companies, like Ministero dell'Istruzione, dell'Università e della Ricerca, Ministero della Salute, Agenzia Spaziale Italiana, Fondazione Italiana per la Sclerosi Multipla, HighQ Foundation, Medical Research Council, European Space Agency, Sigma-Tau Industries, L'Oreal Paris, GW Pharmaceuticals, F. Hoffmann-La Roche, Angelini, Kayser Italia, Phytects e InMed Pharmaceuticals.

B. Positions and Honors. List in chronological order previous positions, concluding with your present position. List any honors. Include present membership on any Federal Government public advisory committee.

Previous positions held:

Dates	Position	University/Institution
2020-present	Professor of Biochemistry	University of L'Aquila
2012-2020	Professor of Biochemistry	Campus Bio-Medico University of Rome
2002-2012	Professor of Biochemistry	University of Teramo
1996-2002	Assistant Professor of Biochemistry	Tor Vergata University of Rome
1992-1996	Consultant of Biochemistry	IRCCS Istituto Dermopatico dell'Immacolata, Rome
1992-1994	Researcher of Bio-Organic Chemistry	Utrecht University
1990-1992	Young Researcher (AIO) of Bio-Organic Chemistry	Utrecht University

Honors:

1. *Chief* of the Laboratory of Neuropharmacology (2004-2005) and then of the Laboratory of Neurochemistry (2005-2006) of the IRCCS C. Mondino, Mondino-Tor Vergata Center for Experimental Neuropharmacology, Rome (Italy). *Coordinator* of the Bachelor's Degree in "Biotechnology" of the Faculty of Agriculture and the School of Veterinary Medicine of the University of Teramo (2004-2012). *Director* of the Department of Biomedical Sciences of the University of Teramo (2007-2012). *Director* of the Laboratory of Neurochemistry of Lipids of the European Center for Brain Research (CERC)/IRCCS Santa Lucia Foundation, Rome, Italy (2006-present). *Coordinator* of the Bachelor's Degree in "Food Science and Human Nutrition" at the School of Medicine, Campus Bio-Medico University of Rome (2013-2019).

2. *Member* of the Editorial Board of the journals *Lipids in Health and Disease* (since 2002), *Anti-Allergy and Anti-Inflammatory Agents in Medicinal Chemistry* (since 2005), *Current Neurovascular Research* (since 2006), *The Open Journal of Neuroscience* (since 2006), *Current Medicinal Chemistry* (since 2008), *Cardiovascular Psychiatry and Neurology* (since 2009), *Cannabinoids* (since 2009), *Frontiers in Molecular Neuroscience* (since 2010), *BioFactors* (2016-2020), *Molecules* (since 2019), *Frontiers in Neuroscience* and *Frontiers in Endocrinology* (since 2020). *Member* of the Biochemistry Editorial Advisory

Board (since 2010), and then *Editor* of *Biochemistry* (since 2017), for the *Encyclopedia of Life Sciences (ELS)*, published by Wiley-Blackwell. *Associate Editor* of *Frontiers in Membrane Physiology and Biophysics* (since 2010), of the *Journal of Alzheimer's Disease* (2013-2015), of *Cannabis and Cannabinoid Research* (since 2015), and of *Frontiers in Molecular Neuroscience* (since 2016).

3. Awarded the "Onore al Merito Prize for Scientific Research Performed Abroad" (1994) by the Ministry of Foreign Affairs and Regione Abruzzo; the "4th Royan International Research Award for Reproductive Biomedicine" (2003) by the Royan Institute of Tehran (Iran), under the patronage of the ESHRE (European Society of Human Reproduction and Embryology); the "2007 IACM Award for Basic Research" by the International Association for Cannabis as Medicine; the "BIO#4 Mission Team Achievement Award" by the European Space Agency, for the ROALD experiment flown on the International Space Station (2008); the "2016 Mechoulam Award" by the International Cannabis Research Society; and the "2020 Tu Youyou Award" by the journal *Molecules*. Moreover, in 2004 was awarded the "Gold Medal for International Cooperation" by Mansura University (Egypt); in 2009 was elected "Person of the Year in Science" by "La Città" (main newspaper of Teramo, Italy), and in 2018 was awarded the "Premio L'Aquila – Zirè d'Oro as Person of the Year", by the Istituto di Abbruzzesistica e Dialectologia di L'Aquila (Italy).

4. *Guest Editor* of the following theme-issues: "Current Drug Targets – CNS & Neurological Disorders" on "The endocannabinoid system in the brain: From biology to therapy" (Vol. 4, 2005); "Current Pharmaceutical Design" on "The endocannabinoid system in neuroinflammatory diseases" (Vol. 14, 2008); "Current Medicinal Chemistry" on "Endocannabinoid-binding receptors: Old friends and new comers" (Vol. 17, 2010); "Experimental Neurology" on "Endocannabinoid signaling in healthy and diseased brain" (Vol. 224, 2010); "Current Medicinal Chemistry" on "Regulation of GPCRs by the membrane environment" (Vol. 20, 2013); "FEBS Journal" on "Recent advances on the endocannabinoid system and its relevance for human health" (Vol. 280, 2013); "BioFactors" on "Endocannabinoids and nutrition" (Vol. 40, 2014); in 2014 he has prepared with Dr. T. Harkany a virtual theme-issue of "Nature Reviews Neuroscience" on "Endocannabinoids", including 7 articles published in volumes 15 and 16; "Methods in Molecular Biology" on "Endocannabinoid signaling: Methods and protocols" (Vol. 1412, 2016); "Biotechnology and Applied Biochemistry" on "Biochemistry of Protein-Protein and Protein-Lipid Interactions: Applications to Biotechnology" (Vol. 65, 2018); "Frontiers in Neuroscience" on "Molecular clues to food addiction-like behavior" (Vol. 271, 2018); "Antioxidants & Redox Signaling" on "Neurodegenerative Disorders" (Vol. 29, 2018); "Molecules" on "Emerging topics in (endo)cannabinoid signalling" (Vol. 24, 2019); "Cancers" on "Cannabinoids and Cancer" (Vol. 12, 2020, and Vol. 13, 2021); "Drug Discovery" (Royal Society of Chemistry) on "New Tools to Interrogate Endocannabinoid Signalling" (Vol. 76, 2021).

5. *Founding member* of the "European Cannabinoid Research Alliance (ECRA)", a leading network of (endo)cannabinoid researchers in Europe (2008).

6. *Founder* of two Biotechnology companies: *MediaPharma S.r.l.* in 2009 (a spin-off of "G. D'Annunzio" University of Chieti, Italy; www.mediapharma.it), and *PharmaMab S.r.l.* in 2010 (www.pharmamab.it).

7. *Consultant* for different pharmaceutical companies, at the national (Dompè, Sigma-Tau, Vetagro, Angelini) and international level (Takeda Pharmaceutical Company, Reddy U.S. Therapeutics, GW Pharmaceuticals, Hoffmann-La Roche, Almirall, Phytects, InMed Pharmaceuticals).

8. *President* (2010-2011) of the "International Cannabinoid Research Society (ICRS)".

9. Elected *Vice Chair* of the 2013 Gordon Research Conference on "Cannabinoid Function in the CNS" (4-9 August, Waterville Valley, NH, USA), and *Chair* of the 2015 edition of the same congress (24-29 May, Lucca (Barga), Italy).

10. Appointed *member* of the "Group of Expert Referees (GEV)" by the Italian Agenzia Nazionale di Valutazione del sistema Universitario e della Ricerca (ANVUR) in 2011.

11. *Member* of the following professional associations:

World Federation of Scientists (1986-); Ordine Nazionale dei Biologi (1987-2005); European Low Gravity Research Association (ELGRA, 1989-2002); Italian Society of Biochemistry and Molecular Biology (SIB, 1991-); Royal Netherlands Chemical Society (KNCV) and the Netherlands Society for Biochemistry and Molecular Biology (1992-1995); New York Academy of Sciences (NYAS, 1994-1995); International Cannabinoid Research Society (ICRS, 1999-); American Society for Biochemistry and Molecular Biology (2003-); American Association for the Advancement of Science (2004-); American Chemical Society (2007-); Society for Neuroscience (2009); European Society of Human Reproduction and Embryology (2014); Epigenetics Society (2016-); American Society for Gravitational and Space Research (2016-); International Society for Gravitational Physiology (2018-).

12. *Invited speaker* at more than 95 international congresses, including: five Gordon Research Conferences on "Cannabinoid function in the CNS" (30 September – 5 October 2007, Les Diablerets, Switzerland; 2-7 August 2009, New England, USA, as Discussion Leader; 22-27 May 2011, Les Diablerets, Switzerland; 20-25 August 2017, Waterville Valley, USA, as Discussion Leader; 21-26 July 2019, Castelldefels, Spain, as Discussion Leader); Banff Conference on "CB2 cannabinoid receptors: new vistas" (May 31 – June 3 2007, Banff, Canada); ELSO-EMBO Meeting 2008 on "Frontiers of cellular, developmental and molecular biology" (30 August – 2 September 2008, Nice, France); Canadian College for Neuropharmacology-Canadian Association for Neuroscience (14-17 May 2010, Ottawa, Canada); 4th ISN Special Neurochemistry Conference on "Membrane domains in CNS physiology and pathology" (22-26 May 2010, Erice, Italy); 36th FEBS Congress on "Biochemistry for Tomorrow's Medicine" (25-30 June 2011, Torino, Italy); First Joint Spanish-Italian Meeting on Cannabinoid Research (November 29th- December 1st 2012, Madrid, Spain), as Plenary Lecturer; Gordon Research Seminar on "Cannabinoid Function in the CNS" (23-24 May 2015, Lucca (Barga), Italy), as Discussion Leader; 12th World Congress of Biological Psychiatry (14-18 June 2015, Athens, Greece); 2nd Swiss Endocannabinoid Pharmacology Meeting (29-30 October 2015, Bern, Switzerland), as Plenary Lecturer; Annual European Congress of Rheumatology (EULAR) 2016 (8-11 June 2016, London, U.K.); Joint Annual Meeting of Hungarian Pharmacological and Physiological Societies - EFM (13-16 June 2017, Debrecen, Hungary), as Plenary Lecturer; 1st International Conference on Medical Grade Cannabis - CANNAAN (23-26 April 2018, Tel Aviv, Israel), as Keynote Speaker; 23rd European Society of Neurochemistry Biennial Meeting (1-4 September 2019, Milan, Italy); 11th Congress of the European Pain Federation EFIC (4-7 September 2019, Valencia, Spain); Canadian Fertility and Andrology Society (CFAS) 65th Annual Meeting (19-21 September 2019, Ottawa, Canada); "Cannabis and Cannabinoids" - Accademia Nazionale dei Lincei (20 December 2019, Rome, Italy); 10th World Congress on Chemistry & Medicinal Chemistry (28-29 February 2020, Rome, Italy), as Keynote Speaker. Has been session chairman at 15 international congresses.

13. *Referee* for several journals of science, including *Science*, *Nature Medicine*, *Nature Reviews Neuroscience*, *Nature Reviews Urology*, *JAMA*, *PNAS*, *Blood*, *Brain*, *Journal of Neuroscience*, *Journal of Biological Chemistry*, *FASEB Journal*, *Biological Psychiatry*, and *Cell Death and Differentiation*.

Referee for The Israel Science Foundation, The Science Foundation Ireland, the German Research Foundation (DFG), the Austrian Science Fund (FWF), the Swiss National Science Foundation (SNSF), The Wellcome Trust, the Medical Research Council, the Gordon Research Conferences, the Fondazione Italiana Sclerosi Multipla (AISM-FISM), and the NASA Postdoctoral Program (NPP).

14. *Holder* of the following granted patents: 1) Enol carbamate derivatives as modulators of fatty acid amide hydrolase (TW200948805, AR072346). 2) Oxime carbamoyl derivatives as modulators of fatty acid amide hydrolase (WO2009138416 AR071800). 3) Compounds of 2,3-dihydro-4H-1,3-benzoxazine-4-one, method for preparing them and pharmaceutical form comprising them (WO20131B61106, ITMI20122221). 4) Use of cannabinoid compounds for stimulating melanogenesis (FR2978659, 2014). 5) Use of a cb1 receptor antagonist as a whitening and/or anti-browning agent for keratin material (FR2978660, 2013). 6) Design and synthesis of biotinylated probes for *n*-acyl-ethanolamines (US7955816, 2011). 7) Method and kit for the early diagnosis of miscarriage in human beings (EP1272659, 2007). 8) Metodo per la diagnosi della malattia di Huntington (IT0001378173).

15. *Organizer* of the German-Italian Villa Vigoni Conferences (Loven di Menaggio, Como) on “*Redox Regulation in Disease and Ageing*” (24-27 March 2004), “*Redox-regulation by ischemia/reperfusion*” (29 March-1 April 2006), “*Redox regulation in acute and chronic inflammation*” (11-14 March 2009), and “*Redox regulation and the metabolic syndrome*” (23-26 March 2011). *Member* of the Organizing Committee of the 56th National Meeting of the Italian Society of Biochemistry and Molecular Biology (26-29 September 2012, Chieti). *Organizer* of the Session “Developing novel tools for endocannabinoid research” at the 6th Mediterranean Neuroscience Society Conference 2017 (12-15 June 2017, Malta), and *co-organizer* of the Redox Webinar Series “Oxidative Stress: Biochemical and Pharmacological Aspects” (12 events [3 hours each] in 2021).

16. *Faculty member* of the 2011 Neuroscience School of Advanced Studies (NSAS) on “Endocannabinoids” (16-21 May 2011, San Quirico d'Orcia, Siena), and of the 2015 IBRO-Kemali School in Neuroscience on “Cannabinoid function in synapses, circuits and brain: from molecules to disease mechanisms” (28 September - 3 October 2015, Pozzuoli). *Plenary lecturer* at Master degree courses (I and II levels), PhD schools and CME courses of several Italian Universities (e.g., Catania, Genova, Humanitas, Messina, Milano, Padova, Pavia, Roma Sapienza, Roma Tor Vergata, Roma Campus Bio-Medico, Scuola Superiore Sant'Anna di Pisa, Siena, Teramo). *Scientific director* of the educational programme for medical doctors PERSEO on “Cannabinoids in Multiple Sclerosis” (2017-2018, Milan). *Member* of the “Group of Experts” of the Italian Ministero dell'Istruzione, dell'Università e della Ricerca (MIUR) in 2012. *Member* of the Honorary Academic Committee of the international Diploma of Advanced Studies in Endocannabinology, Cannabis and Cannabinoids (2021-2022, National University of Rosario, Argentina).

17. *PI* of the LAM project flown on the 28th Parabolic Flight campaign of ESA (in 2000), and of three projects flown on the International Space Station (ISS) after selection by the Italian (ASI), European (ESA) and American (NASA) Space agencies: ROALD (in 2008), ROALD-2/RESLEM (co-PI, in 2012) and SERISM (in 2017).

18. *Lead PI* of the BioStruct-X BAG proposal 3060 “Protein-protein and protein-lipid interactions: structural triggering of cellular functions”, selected by the European Union under the FP7 programme 2012 (BioStruct-X proposal 3060); and of the BioStruct-X BAG proposal 9643 “A new player in the modulation of protein function: the biological membrane”, selected by the European Union under the FP7 programme 2007-2013.

19. *Registered Investigator* of the Italian Ministry of Health (ID: 018570), EU Expert (ID: EX2006C196475), COST Expert, and *registered member* of the “Elenco Nazionale degli Organismi Indipendenti di Valutazione (OIV)” (ID: 3441).

20. *Member* of the Scientific Advisory Board of Phytects, Inc. (2016-2020), and of InMed Pharmaceuticals (since 2017).

21. *Visiting Professor* at Leiden University (Leiden Institute of Chemistry, The Netherlands) with a competitive Erasmus+ mobility grant (April 2017). *Member* of the Scientific Committee of the “Accademia dei Meccanismi Molecolari” (Consiglio Nazionale delle Ricerche, Bologna, Italy), since 2018. *Faculty member* of The Lambert Center for the Study of Medicinal Cannabis and Hemp at Thomas Jefferson University in Philadelphia, since 2019. *Visiting Professor* at Cambridge University (Department of Psychology, U.K.), where he gave a *Zangwill Lecture*, with a competitive intramural mobility grant (October 2019).

22. *Member* of the Advanced Course Committee of the Federation of the European Biochemical Societies (FEBS), since 2020.

23. *Member* of the *Professional Council* of the International Association for Cannabinoid Medicines (IACM), since 2020.

24. *Member* of the Advisory Board on Integrated Physiology (Life Sciences) of the Italian Space Agency (ASI), since 2020.

25. *Member* of the Governing Council of the Italian Society of Biochemistry and Molecular Biology (SIB), since 2021.

His research activities have been often broadcasted for lay people by major international (e.g., The Scientist, El Pais, BBC-Earth, Scientific American, Kazakh national television K24), and national media (e.g., RAI 1-Tempo e Denaro, TG1-Uno Mattina, TG2-Mizar, TG2-Costume e Società, TG2-Insieme, TG2-Medicina 33, Geo-RAI3, TGR-Leonardo, RAI Utile-Ambiente, ANSA, Il Sole 24 Ore, Sanità 24-Il Sole 24 Ore, Il Corriere della Sera, Panorama, Il Centro, Il Messaggero, Adn Kronos, Isoradio, RDS), as well as by several local (regional) TVs, radios and newspapers.

C. Selected peer-reviewed publications, in chronological order (Does not include publications submitted or in preparation).

Published more than **510 full papers**, of which **60** with I.F. ≥ 9 , **12** with I.F. ≥ 15 , **45** with ≥ 100 citations (total I.F. > 2600; citations >18000, *h*-index = 70 according to Scopus), including more than **45 review articles** and more than **60 invited papers** in international refereed journals, besides more than **100** mini-papers and more than **330 Congress communications**. Among others, he published 14 papers in *J. Biol. Chem.*, 10 in *J. Neurosci.*, 9 in *Cell. Mol. Life Sci.*, 8 in *Cell Death Differ.*, 6 in *Trends Pharmacol. Sci.*, 4 in *Blood*, *Neuropsychopharmacol.* and *FASEB J.*, 3 in *Prog. Lipid Res.*, *Biol. Psych.* and *J. Immunol.*, 2 in *Prog. Neurobiol.*, *Nature Commun.*, *PNAS*, *Ann. Neurol. and Brain*, 1 in *NEJM*, *Nature Rev. Neurosci.*, *Science*, *Science Trans. Med.*, *Lancet*, *Lancet Neurol.*, *JAMA*, *Endocr. Rev.*, *Nature Neurosci.*, *Trends Biochem. Sci.*, *Annu. Rev. Nutr.*, and *Gastroenterology*. Due to his scientific activity, is listed among the “*Top Italian Scientists*”.

Selected publications (30) in the last few years.

Maccarrone, M., Rapino, C., Francavilla, F. and Barbonetti, A. “Cannabinoid signalling and effects of cannabis on the male reproductive system”. *Nature Rev. Urol.* **18** (2021) 19–32.

- Maccarrone, M.** "Missing pieces to the endocannabinoid puzzle". *Trends Mol. Med.* **26** (2020) 263-272.
- Friedman, D., French, J.A. and **Maccarrone, M.** "Safety, efficacy, and mechanisms of action of cannabinoids in neurological disorders". *Lancet Neurol.* **18** (2019) 504-512.
- Chiurchiù, V., Leuti, A., Saracini, S., Fontana, D., Finamore, P., Giua, R., Padovini, L., Antonelli Incalzi, R. and Maccarrone, M. "Resolution of inflammation is altered in chronic heart failure and entails a dysfunctional responsiveness of T lymphocytes". *FASEB J.* **33** (2019) 909-916.
- Chiurchiù, V., van der Stelt, M., Centonze, D. and **Maccarrone, M.** "The endocannabinoid system and its therapeutic exploitation in multiple sclerosis: Clues for other neuroinflammatory diseases". *Prog. Neurobiol.* **160** (2018) 82-100.
- Van Esbroeck, A.C.M., Janssen, A.P.A., Cognetta III, A.B., Ogasawara, D., Shpak, G., van der Kroeg, M., Kantae, V., Baggelaar, M.P., de Vrij, F.M.S., Deng, H., Al-larà, M., Fezza, F., Lin, Z., van der Wel, T., Soethoudt, M., Mock, E.D., den Dulk, H., Baak, I.L., Florea, B.I., Hendriks, G., De Petrocellis, L., Overkleeft, H.S., Hankemeier, T., De Zeeuw, C.I., Di Marzo, V., **Maccarrone, M.**, Cravatt, B.F., Kushner, S.A. and Van der Stelt, M. "Activity-based protein profiling reveals off-target proteins of the Fatty Acid Amide Hydrolase inhibitor BIA 10-2474". *Science* **356** (2017) 1084-1087.
- Soethoudt, M., Grether, U., Fingerle, J., Grim, T.W., Fezza, F., de Petrocellis, L., Ullmer, C., Rothenhäusler, B., Perret, C., van Gils, N., Finlay, D., MacDonald, C., Chicca, A., Dalghi Gens, M., Stuart, J., de Vries, H., Mastrangelo, N., Xia, L., Alachouzos, G., Baggelaar, M.P., Martella, A., Mock, E.D., Deng, H., Heitman, L.H.*, Connor, M.*, Di Marzo, V.*, Gertsch, J.*, Lichtman, A.H.*, **Maccarrone, M.***, Pacher, P.*, Glass, M.* and van der Stelt, M.* "Cannabinoid CB₂ receptor ligand profiling reveals biased signaling and off-target activity: Implications for drug discovery". *Nature Commun.* **8** (2017) 13958. *Equally senior authors
- Chiurchiù, V., Leuti, A., Dalli, J., Jacobsson, A., Battistini, L., **Maccarrone, M.*** and Serhan, C.N.* "Pro-resolving lipid mediators Resolvin D1, Resolvin D2 and Maresin 1 are critical in modulating T cell responses". *Science Trans. Med.* **8** (2016) 353ra111. *Equally senior authors
- Maccarrone, M.**, Bab, I., Bíró, T., Cabral, G.A., Dey, S.K., Di Marzo, V., Konje, J.C., Kunos, G., Mechoulam, R., Pacher, P., Sharkey, K.A. and Zimmer, A. "Endocannabinoid signaling at the periphery: 50 years after THC". *Trends Pharmacol. Sci.* **36** (2015) 277-296.
- Maccarrone, M.**, Guzman, M., Mackie, K., Doherty, P. and Harkany, T. "Programming and reprogramming neural cells by (endo-)cannabinoids: from physiological roles to emerging therapies". *Nature Rev. Neurosci.* **15** (2014) 786-801.
- Galve-Roperh, I., Chiurchiù, V., Díaz-Alonso, J., Bari, M., Guzman, M. and **Maccarrone, M.** "Cannabinoid receptor signaling in progenitor/stem cell proliferation and differentiation". *Prog. Lipid Res.* **52** (2013) 633-650.
- Maccarrone, M.** "Endocannabinoid signaling in cancer: a rather complex puzzle". *Trends Pharmacol. Sci.* **34** (2013) 426-427.
- Chiurchiù, V., Cencioni, M.T., Bisicchia, E., De Bardi, M., Gasperini, C., Borsellino, G., Centonze, D., Battistini, L. and **Maccarrone, M.** "Distinct modulation of human myeloid and plasmacytoid dendritic cells by anandamide in multiple sclerosis". *Ann. Neurol.* **73** (2013) 626-636.
- D'Addario, C., Dell'Osso, B., Galimberti, D., Palazzo, M.C., Benatti, B., Di Francesco, A., Scarpini, E., Altamura, A.C. and **Maccarrone, M.** "Epigenetic modulation of BDNF gene in patients with major depressive disorder". *Biol. Psychiat.* **73** (2013) 6-7.
- Pucci, M., Pasquariello, N., Battista, N., Di Tommaso, M., Rapino, C., Fezza, F., Zuccolo, M., Jourdain, R., Finazzi Agrò, A., Breton, L. and **Maccarrone, M.** "Endocannabinoids stimulate human melanogenesis via type-1 cannabinoid receptor". *J. Biol. Chem.* **287**(2012) 15466-15478.
- Den Boon, F.S., Chameau, P., Schaafsma-Zhao, Q., Van Aken, W., Bari, M., Oddi, S., Kruse, C.G., **Maccarrone, M.#**, Wadman, W.J.# and Werkman, T.R.# "Excitability of prefrontal cortical pyramidal neurons is modulated by activation of intracellularly located type-2 cannabinoid receptors". *Proc. Natl. Acad. Sci. USA* **109** (2012) 3534-3539. #Equally senior authors
- Chiurchiù, V. and **Maccarrone, M.** "Chronic inflammatory disorders and their redox control: From molecular mechanisms to therapeutic opportunities". *Antioxid. Redox Signal.* **15** (2011) 2605-2641.
- Maccarrone, M.**, Dainese, E. and Oddi, S. "Intracellular trafficking of AEA: new concepts for signaling". *Trends Biochem. Sci.* **35** (2010) 601-608.
- Dainese, E., Angelucci, C.B., Sabatucci, A., De Filippis, V., Mei, G. and **Maccarrone, M.** "A novel role for iron in modulating the activity and membrane binding ability of a trimmed soybean lipoxygenase-1". *FASEB J.* **24** (2010) 1725-1736.
- Maccarrone, M.**, Gasperi, V., Catani, M.V., Diep, T.A., Dainese, E., Hansen, H.S. and Avigliano, L. "The endocannabinoid system and its relevance for nutrition". *Annu. Rev. Nutr.* **30** (2010) 423-440.
- Oddi, S., Fezza, F., Pasquariello, N., D'Agostino, A., Catanzaro, G., De Simone, C., Rapino, C., Finazzi Agrò, A. and **Maccarrone, M.** "Molecular identification of albumin and Hsp70 as cytosolic anandamide-binding proteins". *Chem. Biol.* **16** (2009) 624-632.
- Viscomi, M.T., Oddi, S., Latini, L., Pasquariello, N., Florenzano, F., Bernardi, G., Molinari, M.* and **Maccarrone, M.*** "Selective CB2 receptor agonism protects central neurons from remote axotomy-induced apoptosis through the PI3K/Akt pathway". *J. Neurosci.* **29** (2009) 4564-4570. *Equally senior authors
- Maccarrone, M.** "Anandamide as a marker of human disease". *JAMA* **300** (2008) 281-282.
- Pasquariello, N., Paradisi, A., Barcaroli, D. and **Maccarrone, M.** "Anandamide regulates keratinocyte differentiation by inducing DNA methylation in a CB1 receptor-dependent manner". *J. Biol. Chem.* **283** (2008) 6005-6012.
- Maccarrone, M.**, Rossi, S., Bari, M., De Chiara, V., Fezza, F., Musella, A., Gasperi, V., Prosperetti, C., Bernardi, G., Finazzi Agrò, A., Cravatt, B.F. and Centonze, D. "Anandamide inhibits metabolism and physiological actions of 2-arachidonoylglycerol in the striatum". *Nature Neurosci.* **11** (2008) 152-159.
- Taccone-Gallucci, M., Manca di Villahermosa, S. and **Maccarrone, M.** "Leukotrienes". *N. Engl. J. Med.* **358** (2008) 746.
- Centonze, D., Finazzi Agrò, A., Bernardi, G. and **Maccarrone, M.** "The endocannabinoid system in targeting inflammatory neurodegenerative diseases". *Trends Pharmacol. Sci.* **28** (2007) 180-187.
- Wang, H., Dey, S.K. and **Maccarrone, M.** "Jekyll and Hyde: Two faces of cannabinoid signaling in male and female fertility". *Endocr. Rev.* **27** (2006) 427-448.
- Maccarrone, M.**, Barboni, B., Paradisi, A., Bernabò, N., Gasperi, V., Pistilli, M.G., Fezza, F., Lucidi, P. and Mattioli, M. "Characterization of the endocannabinoid system in boar spermatozoa and implications for sperm capacitation and acrosome reaction". *J. Cell Sci.* **118** (2005) 4393-440.
- Pisani, A., Fezza, F., Galati, S., Battista, N., Napolitano, S., Finazzi Agrò, A., Brusa, L., Pierantozzi, M., Bernardi, G., Stanzione, P. and **Maccarrone, M.** "High endogenous cannabinoid levels in the cerebrospinal fluid of untreated Parkinson's disease patients". *Ann. Neurol.* **57** (2005) 777-779.

D. Research Support. List selected ongoing or completed (during the last ten years) research projects and indicate your role (e.g., PI, Co-Investigator, Consultant) in the research project.

- MoMa Project of the Italian Space Agency (ASI-ESA-NASA) 2006 – The endocannabinoid system in the induction of T cell apoptosis under microgravity conditions. Local PI. DCMC Project of the Italian Space Agency (ASI-ESA-NASA) 2006 – The endocannabinoid system in the control of neuronal cell death under microgravity conditions. Local PI.
- Research Project HIGH Q FOUNDATION Inc. (New Jersey, U.S.A.) 2007 – Endocannabinoid system as potential biomarker and therapeutic target in HD. PI.
- Research Project NATIONAL INSTITUTES OF HEALTH (NIH) 2007 – Characterization of anandamide transport in brain (subaward No. 2007-1917 under NIH prime award No. DA012413). Local PI.
- Research Project of National Interest (PRIN) 2008 - Interaction of anandamide hydrolase (FAAH) with membranes: how to get hydrophobic substrates and release hydrophilic products. PI.

- e. Medical Research Council (MRC)-funded research 2009-2011 –The endocannabinoid, anandamide as a biomarker of outcome in pregnancies complicated by threatened miscarriage. Local PI.
- f. L'Oreal (Paris) 2009-2012 - Endocannabinoid system in melanocytes: A target for novel cosmetic drugs. PI.
- g. SIGMA TAU Industries (Rome) 2009-2010 – Study of potential reversible inhibitors of FAAH. PI.
- h. GW Pharmaceuticals PLC (London) 2010-2011 - Regulation of gene expression through DNA methylation by cannabidiol and other phytocannabinoids. PI.
- i. Fondazione Italiana Sclerosi Multipla 2010-2011 - Role of the endocannabinoid system in the neurodegenerative process of experimental Multiple Sclerosis. PI.
- j. Research Project of National Interest (PRIN) 2010-11 - Emerging role of the endocannabinoid signalling in neuropsychiatric disorders. Local PI.
- k. GW Pharmaceuticals PLC (London) 2013-2014 - Impact of phytocannabinoids on the epigenetic regulation of diabetes. PI.
- l. F. Hoffmann-La Roche Ltd (Basel) 2014-2018 - Biochemical profiling of new chemical entities. PI.
- m. Human Frontier Science Program 2014-2017 - Oxidized lipidome: the unspoken language of non-apoptotic cell death. Team member.
- n. FP7 (2007-2013) Programme of the European Union 2015-2017 - BioStruct-X BAG proposal 9643 “A new player in the modulation of protein function: the biological membrane“. Lead PI.
- o. Angelini S.p.A. (Rome) 2016-2017 – *In vitro* characterization of compounds for therapeutic intervention against diseases of the nervous system and pain/inflammation. Co-PI.
- p. Agenzia Spaziale Italiana 2016-2018 - Role of the endocannabinoid system in reprogramming human pluripotent stem cells under microgravity. PI.
- q. Research Project of National Interest (PRIN) 2015 - Endocannabinoid signaling in Alzheimer's disease: A novel target for mechanistic understanding and potential therapeutics. PI.
- r. Phytecs, Inc. (Delaware) 2016-2017 – Evaluation of the *in vitro* effects of certain target compounds on an experimental model of epilepsy. PI.
- s. GW Pharmaceuticals PLC (London) 2017-2018 - Epigenetic regulation of target genes in peripheral blood mononuclear cells of frontotemporal dementia subjects by selected phytocannabinoids. PI.
- t. Dompé Farmaceutici S.p.A. 2017-2018 - Interleukin-8 and programmed cell death protein 1 checkpoint in the tumor microenvironment. PI.
- u. EU-LAC HEALTH 2018-2020 - Mechanistic insights into Alzheimer's disease: Epigenetic and immunomodulatory remodelling of endocannabinoid signalling. PI.
- v. Università Campus Bio-Medico di Roma - Competitive Intramural Project 2019-2021 - OXidative post-translational modifications of Insulin as biomarkers of type 1 DIAbetes prediction, progression and complications (OXIDIA). Key-person and Unit PI.
- w. InMed Pharmaceuticals Inc. (Vancouver) 2019-2021 – Impact of InMed compounds on the endocannabinoid system of human keratinocytes. PI.
- x. Research Project of National Interest (PRIN) 2017 - Addressing microglial dysfunction in Alzheimer's disease: a role for endocannabinoid signaling in immunosenescence. PI.
- y. Ricerca Finalizzata, Ministry of Health 2019-2021 - Effects of long-term oral administration of palmitoylethanolamide on subjects with mild cognitive impairment. PI.
- z. Bando MIUR-Dottorati innovativi a caratterizzazione industriale XXXIV ciclo (2019-2021) – Molecular mechanisms of neuroinflammation: Interactions between endocannabinoids and other bioactive lipids. PI.

L'Aquila, 01 March 2021

