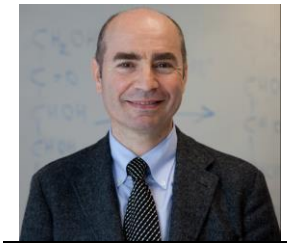
BIOGRAPHICAL SKETCH

Provide the following information for the key personnel and other significant contributors in the order listed on Form Page 2.
Follow this format for each person. **DO NOT EXCEED FOUR PAGES.**

NAME: **Mauro MACCARRONE**



POSITION TITLE

Professor and Chair of Biochemistry and Molecular Biology, and *Coordinator* of the Bachelor's Degree in "Food Science and Human Nutrition" at the School of Medicine, Campus Bio-Medico University of Rome, Via Alvaro del Portillo 21, 00128 Rome, Italy (contacts: phone +39 06 2254 19169; fax +39 06 2254 1456; m.maccarrone@unicampus.it).
Director 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 *(if applicable)*	YEAR(s)	FIELD OF STUDY
University of L'Aquila (I)	M.S.	1986	Biochemistry
University of L'Aquila (I) and Tor Vergata University of Rome (I)	Ph.D.	1992	Enzymology Applied to Medical Sciences
University of Utrecht (NL)	Ph.D.	1992	Bio-Organic Chemistry

Please refer to the application instructions in order to complete sections A, B, and C of the Biographical Sketch.

A. Personal Statement

M. Maccarrone is Professor and Chair of Biochemistry and Molecular Biology, and Director of the Laboratory of Lipid Neurochemistry of the European Center for Brain Research-Santa Lucia Foundation in Rome. His group is made of four units (highly integrated and in collaboration for more than 15 years), located at Tor Vergata Univesity of Rome, University of Teramo, Santa Lucia Foundation, and Campus Bio-Medico University of Rome. The group has 10 permanent positions, which are currently taken by 2 Associate professors and 8 Assistant professors (Ricercatori), as well as 5 Post-docs and 5 Ph.D students. The group leaders (Dr. Monica Bari at Tor Vergata, Dr. Enrico Dainese at Teramo, Dr. Sergio Oddi at Santa Lucia Foundation, and Dr. Tiziana Bisogno 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 6 PhD students and 4 Post-doc fellows at the University of Teramo, and 2 PhD students and 2 Post-doc fellows at Campus Bio-Medico University of Rome. These young researchers 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 e Phytecs..

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
2012-present	Professor of Biochemistry	Campus Bio-Medico University of Rome
2002-2012	Professor of Biochemistry	University of Teramo
1996-2002	Researcher 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). *Director* of the Laboratory of Neurochemistry of Lipids (2006-) of the European Center for Brain Research(CERC)/IRCCS Santa Lucia Foundation, Rome, Italy.

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) and *BioFactors* (since 2016). *Member* of the Biochemistry Editorial Advisory Board for the *Encyclopedia of Life Sciences (ELS)*, published by Wiley-Blackwell (since 2010). *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 "*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); and the *"2016 Mechoulam Award"* by the International Cannabis Research Society.

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); "*Methods in Molecular Biology*" on "Endocannabinoid signaling: Methods and protocols" (2016). 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.

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: *MediaPharmaS.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, Phytecs).

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

9. Elected *Vice Chair* (with Dr.Tibor Harkany) 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 (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-).

12. *Invited speaker* at more than 80 international congresses, including: three 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); 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), 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.). Has been session chairman at 15 international congresses.

13. *Referee* for several journals of science, including Science, Nature Medicine, 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 (WO2013IB61106, 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 (Loveno 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).

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).

17. *Plenary lecturer* at Master degree courses (I and II levels), PhD schools and CME courses of several Italian Universities (*e.g.*, Catania, Genova, Messina, Milano, Padova, Pavia, Roma Sapienza, Roma Tor Vergata, Roma Campus Bio-Medico, Siena, Teramo).

18. *Member* of the "Group of Experts" of the Italian Ministero dell'Istruzione, dell'Università e della Ricerca (MIUR) in 2012.

19. *PI* of two experiments flown on the International Space Station (ISS) in 2008 (ROALD) and 2017 (SERiSM), and co-PI of a third experiment flown on the ISS in 2012 (ROALD-2/RESLEM), selected by the Italian (ASI), European (ESA) and American (NASA) space agencies.

20. *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.

21. *Registered Investigator* of the Italian Ministry of Health (ID: 018570), EU Expert (ID: EX2006C196475), and COST Expert.

22. *Member* of the Scientific Advisory Board of Phytecs, Inc. (since 2016).

His research activities have been often broadcasted for lay people by major international (*e.g.*, 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, 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). Do not include publications submitted or in preparation.
Published more than **450** *full papers* (total I.F. > 2200, citations >14900, *h*-index = 66; *i10h*-index = 284), including more than **45** *review articles* and more than **60** *invited papers* in international refereed journals, besides more than **90** mini-papers and more than **285** *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 and Neuropsychopharmacol., 3 in J. Immunol., 2 in Prog. Lipid Res., PNAS, Ann. Neurol., Brain and FASEB J., and 1 in NEJM, Nature Rev. Neurosci., Science (comment), Science Trans. Med., Lancet, JAMA, Endocr. Rev., Nature Neurosci., Nature Commun., Trends Biochem. Sci., Annu. Rev. Nutr., Prog. Neurobiol. and Gastroenterology. Due to his scientific activity, is listed among the “*Top Italian Scientists*”.

Selected publications (30) in the last few years.

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 rules to emerging therapies”. *Nature Rev. Neurosci*. **15** (2014) 786-801.

Rapino, C., Battista, N., Bari, M. and **Maccarrone, M**. “Endocannabinoids as biomarkers of human reproduction”. *Hum. Reprod. Update* **20** (2014) 501-516.

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.

Battista, N., Meloni, M.A., Bari, M., Mastrangelo, N., Galleri, G., Rapino, C., Dainese, E., FinazziAgrò, A., Pippia, P. and **Maccarrone, M.** “5-Lipoxygenase-dependent apoptosis of human lymphocytes in the International Space Station: data from the “ROALD” experiment”. *FASEB J*. **26** (2012) 1791-1798.

Den Boon, F.S., Chameau, P., Schaafsma-Zhao, Q., Van Aken, W., Bari, M., Oddi, S., Kruse, C.G., Wadman, W.J.*, Werkman, T.R.* and **Maccarrone, M.*** “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.

Maccarrone, M. “Endocannabinoids: Friends and foes of reproduction”. *Prog. Lipid Res*. **48** (2009) 344-354.

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.

Di Marzo, V. and **Maccarrone, M**. “FAAH and anandamide: is 2-AG really the odd one out?” *Trends Pharmacol. Sci*. **29** (2008) 229-233.

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., FinazziAgrò, 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.

Mei, G., Di Venere, A., Gasperi, V., Nicolai, E., Masuda, K.R., FinazziAgrò, A., Cravatt, B.F. and **Maccarrone, M**. “Closing the gate to the active site: Effect of the inhibitor MAFP on the conformation and membrane binding of fatty acid amide hydrolase”. *J. Biol. Chem*. **282** (2007) 3829-3836.

Maccarrone, M., Battista, N. and Centonze, D. “The endocannabinoid pathway in Huntington’s disease: a comparison with other neurodegenerative diseases”. *Prog. Neurobiol*. **81** (2007) 349-379.

Bari, M., Spagnuolo, P., Fezza, F., Oddi, S., Pasquariello, N., Finazzi Agrò, A. and **Maccarrone, M**. “Effect of lipid rafts on CB2 receptor signaling and 2-arachidonoylglycerol metabolism in human immune cells”. *J. Immunol*. **177** (2006) 4971-4980.

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". A*nn. Neurol*. **57** (2005) 777-779.

Bari, M., Battista, N., Fezza, F., Finazzi Agrò, A. and **Maccarrone, M**. "Lipid rafts control signaling of type-1 cannabinoid receptors in neuronal cells.Implications for anandamide-induced apoptosis". *J. Biol. Chem*. **280** (2005) 12212-12220.

D. ResearchSupport. List selected ongoing or completed (during the last ten years) research projects (federal and non-federal support). Begin with the projects that are most relevant to the research proposed in this application. Briefly indicate the overall goals of the projects and your role (e.g. PI, Co-Investigator, Consultant) in the research project. Do not list award amounts or percent effort in projects.

a. Intramural Scientific Research (ex 60%) 2005 – Role of the arachidonate cascade in different pathways of neurotoxicity. PI.
b. Research Project HIGH Q FOUNDATION Inc. (New Jersey, U.S.A.) 2005 – Identification of peripheral biological markers in patients with Huntington's disease: Analysis of A2A receptor, BDNF, endocannabinoids and cholesterol. PI.
c. Research Project Fondazione TERCAS (Teramo) (2005-2008) – The endocannabinoid system in metastatic tumor spreading. PI.
d. 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.
e. 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.
f. Research Project of National Interest (PRIN) 2006 – The endocannabinoid system in the acquisition of fertilizing power of sperm. Local PI.
g. Intramural Scientific Research (ex 60%) 2007 – Role of the arachidonate cascade in different pathways of neurotoxicity. PI.
h. Research Project HIGH Q FOUNDATION Inc. (New Jersey, U.S.A.) 2007 – Endocannabinoid system as potential biomarker and therapeutic target in HD. PI.
i. 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.
j. Research Project of National Interest (PRIN) 2008 - Interaction of anandamide hydrolase (FAAH) with membranes: how to get hydrophobic substrates and release hydrophilic products. PI.
k. Research Project Fondazione TERCAS (Teramo) 2009-2011 – The endocannabinoid system in neuroinflammatory diseases. PI.
l. Medical Research Council (MRC)-funded research 2009-2011 –The endocannabinoid, anandamide as a biomarker of outcome in pregnancies complicated by threatened miscarriage. Local PI.
m. L'Oreal (Paris) 2009-2012 - Endocannabinoid system in melanocytes: A target for novel cosmetic drugs. PI.
n. SIGMA TAU Industries (Rome) 2009-2010 – Study of potential reversible inhibitors of FAAH. PI.
o. GW Pharmaceuticals PLC (London) 2010-2011 - Regulation of gene expression through DNA methylation by cannabidiol and other phytocannabinoids. PI.
p. Fondazione Italiana Sclerosi Multipla 2010-2011 - Role of the endocannabinoid system in the neurodegenerative process of experimental Multiple Sclerosis. PI.
q. Research Project of National Interest (PRIN) 2010-11 - Emerging role of the endocannabinoid signalling in neuropsychiatric disorders. Local PI.
r. Research Project of National Interest (PRIN) 2012 - Cells-on-chip technologies for the study of the endocannabinoid system in an *in vitro* model of tumor/immune system interaction. Consultant.
s. GW Pharmaceuticals PLC (London) 2013-2014 - Impact of phytocannabinoids on the epigenetic regulation of diabetes. PI.
t. F. Hoffmann-La Roche Ltd (Basel) 2014-2016 - Biochemical profiling of new chemical entities. PI.
u. Human Frontier Science Program 2014-2017 - Oxidized lipidome: the unspoken language of non-apoptotic cell death. Team member.
v. 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.
w. 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.
x. Agenzia Spaziale Italiana 2016-2018 - Role of the endocannabinoid system in reprogramming human pluripotent stem cells under microgravity. PI.
y. Research Project of National Interest (PRIN) 2015 - Endocannabinoid signaling in Alzheimer's disease: A novel target for mechanistic understanding and potential therapeutics. PI.
z. Phytecs, Inc. (Delaware) 2016-2017 – Evaluation of the *in vitro* effects of certain target compounds on an experimental model of epilepsy. PI.