

CV Date	18/01/2023
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Part A. PERSONAL INFORMATION

First Name	Mattia		
Family Name	Bramini		
Sex	Male	Date of Birth	
ID number Social Security, Passport			
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Email Address	mbramini@ugr.es		
Open Researcher and Contributor ID (ORCID)	0000-0002-0381-9391		

A.1. Current position

Job Title	Ramon y Cajal Senior Researcher		
Starting date	2021		
Institution	Universidad de Granada		
Department / Centre	Cell Biology / Facultad de Ciencias		
Country	Italy	Phone Number	
Keywords	Biomedicine		

A.2. Previous positions (Research Career breaks included)

Period	Job Title / Name of Employer / Country
2019 - 2021	MSCA COFUND Athenea3i Senior Researcher / Universidad de Granada
2018 - 2019	Investigador / Fondazione Istituto Italiano di Tecnologia
2016 - 2018	Investigador / Fondazione Istituto Italiano di Tecnologia
2014 - 2016	Investigador / Fondazione Istituto Italiano di Tecnologia

A.3. Education

Degree/Master/PhD	University / Country	Year
Phd in Bionanointeractions	University College Dublin, School of Chemistry and Chemical Biology / Ireland	2014
Master Degree in Medical and Pharmaceutical Biotechnology	Università degli Studi di Modena e Reggio Emilia / Italy	2009
Bachelor Degree in Biotechnology	Università degli Studi di Modena e Reggio Emilia / Italy	2007

Part B. CV SUMMARY

I got a PhD in Bionano-interactions (2014) from the Centre for BioNano Interactions (CBNI), School of Chemistry and Chemical Biology, University College Dublin (Ireland) under the supervision of Prof. Kenneth A. Dawson. In my Phd Thesis, I have been focused in understanding the behaviour of nanoparticles in biological conditions (in particular the translocation through a human in vitro model of blood-brain barrier), by applying advanced light and fluorescence microscopy, cellular and molecular biology approaches. Moreover, I had the chance to learn many nanomaterial characterisation techniques. As a PhD student, I have published 6 papers in international peer-reviewed journal and I had the chance to attend few conferences as speaker and my communication skills were awarded in 3 occasions with best oral presentation awards.

In 2014 I joined the Italian Institute of Technology (IIT) in the group of Prof. Fabio Benfenati as a post-doc within the European Graphene Flagship project. Here, I had the chance to become more and more familiar with the physiology of neuroscience. I moved from being involved in the graphene interaction with the brain, to be active member of many other neuro-nano and smart

material related projects. The output of my stay in IIT can be seen in several papers published and 2 book chapters, all related to neuro-nanotechnology for biomedical applications. At IIT, I supervised 1 PhD, 1 Bachelor and 2 Master students. I also gave a yearly PhD-course of 2 CFU titled: Neuronal-nanotechnology: a systematic review of the bionano interactions in the central nervous system. Scientifically, I have been the link between the neuroscience group and material scientist in IIT, leading to new collaborations and grant proposal writing.

In November 2019, I joined the Department of Applied Physics of the University of Granada as a Marie Curie-MSCA COFUND Athenea3i researcher.

Since May 2021, I am a Ramon y Cajal Researcher at the Department of Cell Biology (University of Granada), leading a research line named Biomaterials for Neurobiology Applications.

Part C. RELEVANT ACCOMPLISHMENTS

C.1. Most important publications in national or international peer-reviewed journals, books and conferences

AC: corresponding author. (n° x / n° y): position / total authors. If applicable, indicate the number of citations

- 1 **Scientific paper**. Matteo Moschetta; Martina Chiacchiaretta; Fabrizia Cesca; Ipsita Roy; Athanassia Athanassiou; Fabio Benfenati; Evie L. Papadopoulou; (AC). (8/8). 2021. Graphene Nanoplatelets Render Poly(3-Hydroxybutyrate) a Suitable Scaffold to Promote Neuronal Network Development *Frontiers in Neuroscience*. Frontiers. 15-731198.
- 2 **Scientific paper**. Matteo Moschetta; João Rodrigues; Jong-Young Lee; et al; Mattia Bramini (AC);. (11/12). 2021. Hydrogenated Graphene Improves Neuronal Network Maturation and Excitatory Transmission *Advanced Biology*. Wiley-VCH GmbH.
- 3 **Scientific paper**. Nara Liessi; Luca Maragliano; Valentina Castagnola; Mattia Bramini; Fabio Benfenati; Andrea Armirotti. (4/6). 2020. Isobaric Labeling Proteomics Allows a High-Throughput Investigation of Protein Corona Orientation *Analytical Chemistry*. ACS Publications. 93-2, pp.784-791.
- 4 **Scientific paper**. Andrea Capasso; João Rodrigues; Matteo Moschetta; et al; Mattia Bramini;. (11/13). 2020. Interactions between Primary Neurons and Graphene Films with Different Structure and Electrical Conductivity *Advanced Functional Materials*. Wiley-VCH GmbH.
- 5 **Scientific paper**. Jose Fernando Maya Vetencourt; Giovanni Manfredi; Maurizio Mete; et al; Mattia Bramini;. (5/25). 2020. Subretinally injected semiconducting polymer nanoparticles rescue vision in a rat model of retinal dystrophy *Nature Nanotechnology*. Springer Nature. 8, pp.698-708.
- 6 **Scientific paper**. Giuseppe Maria Paternò; Elisabetta Colombo; Vito Vurro; et al; ;. (8/14). 2020. Membrane Environment Enables Ultrafast Isomerization of Amphiphilic Azobenzene *Advanced Science*. Wiley - VCH. 7-8.
- 7 **Scientific paper**. Fabio Candotto Carniel; Lorenzo Fortuna; Massimo Nepi; et al; ;. (7/13). 2020. Beyond graphene oxide acidity: Novel insights into graphene related materials effects on the sexual reproduction of seed plants *Journal of Hazardous Materials*. Elsevier. 393.
- 8 **Scientific paper**. Miriam Marquitan; Adrian Ruff; Mattia Bramini; Stefan Herlitze; Melanie Mark; Wolfgang Schuhmann. (3/6). 2020. Polymer/enzyme-modified HF-etched carbon nanoelectrodes for single-cell analysis *Bioelectrochemistry*. Elsevier. 133.
- 9 **Scientific paper**. Mattia Lorenzo DiFrancesco; Francesco Lodola; Elisabetta Colombo; et al; ;. (5/23). 2020. Neuronal firing modulation by a membrane-targeted photoswitch *Nature Nanotechnology*. Springer Nature. <https://doi.org/10.1038/s41565-019-0632-6>
- 10 **Scientific paper**. Elisa Banchi; Fabio Candotto Carniel; Alice Montagner; et al; ;. (5/12). 2019. Graphene-based materials do not impair physiology, gene expression and growth dynamics of the aeroterrestrial microalga *Trebouxia gelatinosa*. *Nanotoxicology*. Taylor & Francis. 13-4, pp.492-509.

- 11 **Scientific paper.** (AC); Martina Chiacchiaretta; Andrea Armirotti; et al;. (1/11). 2019. An Increase in Membrane Cholesterol by Graphene Oxide Disrupts Calcium Homeostasis in Primary Astrocytes. *Small*. Wiley-VCH. 13-4, pp.492-509.
- 12 **Scientific paper.** Gambardella, Chiara; Morgana, Silvia; Bramini, Mattia; et al; Faimali, Marco. 2018. Ecotoxicological effects of polystyrene microbeads in a battery of marine organisms belonging to different trophic levels. *Marine environmental research*. 141, pp.313-321.
- 13 **Scientific paper.** Chiacchiaretta, Martina; Bramini, Mattia (AC); Rocchi, Anna; et al; Benfenati, Fabio. (2/10). 2018. Graphene Oxide Upregulates the Homeostatic Functions of Primary Astrocytes and Modulates Astrocyte-to-Neuron Communication. *Nano Letters*. 18-9, pp.5827-5838. ISSN 1530-6992.
- 14 **Scientific paper.** Bramini, Mattia (AC); Alberini, Giulio; Colombo, Elisabetta; et al; Cesca, Fabrizia. (1/9). 2018. Interfacing Graphene-Based Materials With Neural Cells. *Frontiers in Systems Neuroscience*. 12-12, pp.1-22. ISSN 1662-5137.
- 15 **Scientific paper.** Piccini, Alessandra; Castroflorio, Enrico; Valente, Pierluigi; et al; Bramini, Mattia; Giovedì, Silvia. (7/18). 2017. APACHE Is an AP2-Interacting Protein Involved in Synaptic Vesicle Trafficking and Neuronal Development. *Cell Reports*. 12-12, pp.3596-3611. ISSN 2211-1247.
- 16 **Scientific paper.** Gambardella, Chiara; Morgana, Silvia; Ferrando, Sara; Bramini, Mattia; Piazza, Veronica; Costa, Elisa; Garaventa, Francesca; Faimali, Marco. 2017. Effects of polystyrene microbeads in marine planktonic crustaceans. *Ecotoxicology and Environmental Safety*. 145, pp.250-257.
- 17 **Scientific paper.** Ye, Dong; Bramini, Mattia; Hristov, Delyan R.; Wan, Sha; Salvati, Anna; Aberg, Christoffer; Dawson, Kenneth A. 2017. Low uptake of silica nanoparticles in Caco-2 intestinal epithelial barriers. *Beilstein Journal of Nanotechnology*. 8, pp.1396-1406.
- 18 **Scientific paper.** Chiacchiaretta, Martina; Latifi, Shahrzad; Bramini, Mattia; Fadda, Manuela; Fassio, Anna; Benfenati, Fabio; Cesca, Fabrizia. (3/7). 2017. Neuronal hyperactivity causes Na⁺/H⁺ exchanger-induced extracellular acidification at active synapses. *Journal of Cell Science*. 130, pp.1435-1449. ISSN 1477-9137.
- 19 **Scientific paper.** Antognazza, Maria Rosa; Di Paolo, Mattia; Ghezzi, Diego; et al; Benfenati, Fabio. 2016. Characterization of a Polymer-Based, Fully Organic Prosthesis for Implantation into the Subretinal Space of the Rat. *Advanced Healthcare Materials*. 5-17, pp.2271-2282.
- 20 **Scientific paper.** Bramini, Mattia; Sacchetti, Silvio; Armirotti, Andrea; et al; Benfenati, Fabio. (1/9). 2016. Graphene Oxide Nanosheets Disrupt Lipid Composition, Ca²⁺ Homeostasis, and Synaptic Transmission in Primary Cortical Neurons. *ACS Nano*. 10-7, pp.7154-7171. ISSN 1936- 0851.
- 21 **Scientific paper.** Gambardella, Chiara; Ferrando, Sara; Morgana, Silvia; et al; Falugi, Carla. 2015. Exposure of *Paracentrotus lividus* male gametes to engineered nanoparticles affects skeletal bio-mineralization processes and larval plasticity. *Aquatic Toxicology*. 158, pp.181-191.
- 22 **Scientific paper.** Gambardella, Chiara; Morgana, Silvia; Di Bari, Gaetano; Ramoino, Paola; Bramini, Mattia; Diaspro, Alberto; Falugi, Carla; Faimali, Marco. 2015. Multidisciplinary screening of toxicity induced by silica nanoparticles during sea urchin development. *Chemosphere*. 139, pp.486-495.
- 23 **Scientific paper.** Zarschler, Kristof; Prapainop, Kanlaya; Mahon, Eugene; Rocks, Louise; Bramini, Mattia; Kelly, Philip M.; Stephan, Holger; Dawson, Kenneth A. 2014. Diagnostic nanoparticle targeting of the EGF-receptor in complex biological conditions using single-domain antibodies. *Nanoscale*. 6-11, pp.6046-6056.
- 24 **Scientific paper.** Bramini, Mattia; Ye, Dong; Hallerbach, Anna; Nic Raghnaill, Michelle; Salvati, Anna; Aberg, Christoffer; Dawson, Kenneth A. 2014. Imaging approach to mechanistic study of nanoparticle interactions with the blood-brain barrier. *ACS Nano*. 8-8, pp.4304-4312.
- 25 **Scientific paper.** Nic Raghnaill, Michelle; Bramini, Mattia; Ye, Dong; et al; Dawson, Kenneth A. 2014. Paracrine signalling of inflammatory cytokines from an in vitro blood brain barrier model upon exposure to polymeric nanoparticles. *The Analyst*. 139, pp.923-930.

- 26 **Scientific paper.** Ye, Dong; Nic Raghnaill, Michelle; Bramini, Mattia; Mahon, Eugene; Aberg, Christoffer; Salvati, Anna; Dawson, Kenneth A.2013. Nanoparticle accumulation and transcytosis in brain endothelial cell layers.Nanoscale. 13, pp.11153-11165.
- 27 **Scientific paper.** Sterrenburg, Linda; Gaszner, Balazs; Boerrigter, Jeroen; et al; Kozicz, Tamas. 2011. Chronic stress induces sex-specific alterations in methylation and expression of corticotropin-releasing factor gene in the rat.PloS One. 6-11, pp.e28128.
- 28 **Scientific paper.** Nic Raghnaill, Michelle; Brown, Meredith; Ye, Dong; Bramini, Mattia; Callanan, Sean; Lynch, Iseult; Dawson, Kenneth A.2011. Internal benchmarking of a human blood-brain barrier cell model for screening of nanoparticle uptake and transcytosis.European Journal of Pharmaceutics and Biopharmaceutics. 77-3, pp.360-367.
- 29 **Scientific paper.** Sterrenburg, Linda; Gaszner, Balazs; Boerrigter, Jeroen; Santbergen, Lennart; Bramini, Mattia; Roubos, Eric W.; Peeters, Bernard W. M. M.; Kozicz, Tamas. 2011. Sex-dependent and differential responses to acute restraint stress of corticotropin-releasing factor-producing neurons in the rat paraventricular nucleus, central amygdala, and bed nucleus of the stria terminalis.Journal of Neuroscience Research. 90-1, pp.179-192.
- 30 **Book chapter.** Mattia Bramini; Anna Rocchi; Fabio Benfenati; Fabrizia Cesca. 2019. Neuronal Cultures and Nanomaterials In vitro neuronal networks. From culturing methods to neuro-technological applications. Springer. 22.
- 31 **Book chapter.** Bramini, Mattia; Alberini, Giulio; Benfenati, Fabio; Maragliano, Luca; Cesca, Fabrizia. 2018. Interactions Between 2D Graphene-Based Materials and the Nervous tissue 2D Materials: Characterization, Production and Applications. pp.62-86.
- 32 **Review.** Raluca-Elena Munteanu; Paola Sanchez Moreno; Mattia Bramini; Szilveszter Gáspár. (3/4). 2020. 2D materials in electrochemical sensors for in vitro or in vivo use Analytical and Bioanalytical Chemistry. Springer. 413-3, pp.701-725.
- 33 **Scientific-technical report.** Michelle Nic Raghnaill; Meredith Brown; Dong Ye; Mattia Bramini; Kenneth Dawson; Iseult Lynch. (4/6). 2011. Nanotechnology: Environmental and Human Health Impacts Science, Technology, Research & Innovation for the Environment - STRIVE. Environmental Protection Agency (EPA). 79.

C.3. Research projects and contracts

- 1 **Project.** NANOPARTICULAS CAMUFLADAS CON MEMBRANAS CELULARES PARA TERAPIA DIRIGIDA DE GLIOBLASTOMA / Cell membrane camouflaged nanoparticles for targeted glioblastoma therapy. Agencia Estatal de Investigación; Ministerio de Ciencia y Innovación. Mattia Bramini. (Universidad de Granada). 01/09/2022-31/08/2026. 157.058 €.
- 2 **Project.** PROGRAMA DE AYUDAS RAMÓN Y CAJAL, 01/05/2021, MINISTERIO DE CIENCIA E INNOVACIÓN. AGENCIA ESTADAL DE INVESTIGACIÓN; FONDO SOCIAL EUROPEO. (Universidad de Granada). 01/05/2021-30/04/2026. 314.388 €.
- 3 **Project.** Soportes Magnéticos 3d Conductivos e Inyectables Para la Reconexión Neuronal - Mag-Net. Dirección General de Fondos Europeos de la Junta de Andalucía. Consejería de Hacienda y Financiación Europea. Mattia Bramini. (Universidad de Granada). 01/07/2021-30/06/2023. 40.000 €.
- 4 **Project.** NANOPARTÍCULAS CAMUFLADAS CON MEMBRANAS CELULARES COMO POTENCIAL TRATAMIENTO DEL GLIOBLASTOMA. Universidad de Granada. Paola Sanchez Moreno. (Universidad de Granada). 01/01/2022-31/12/2022. 1.000 €.
- 5 **Project.** MAG-NEUROREG: Magnetic ferrofluid nanosystems as innovative neuro-interfaces to foster regeneration and restore network connectivity in neurodegenerative disorders. (Universidad de Granada). 01/11/2019-30/09/2022. 18.000 €.
- 6 **Project.** Governing neuronal signalling: graphene-based interfaces to foster neuronal regeneration and restore network excitability in neurodegenerative disorders. Fabio Benfenati. (Istituto Italiano di Tecnologia). 01/01/2019-31/12/2021. 188.886 €.
- 7 **Project.** Mapping the detailed composition (epitope exposure) of surfaceadsorbed protein layers on biomaterials and nanoparticles - an alternative approach to biocompatibility and nanotoxicity (EpitopeMap). European Science Foundation (ESF). Kenneth Dawson. (University College Dublin). 01/01/2010-31/05/2010.