

Arben Merkoçi – Curriculum Vitae

• EDUCATION

1991 PhD in Chemistry at University of Tirana (16.09.1991), Spanish Equivalency received by Ministerio de Educación Cultura y Deporte of Spain (Delivered in Madrid on 16.11.2000)

• CURRENT POSITION

2008 – ICREA Research Professor and Group Leader at Nanobioelectronics and Biosensors Group / Catalan Institute of Nanoscience and Nanotechnology/ Spain

• PREVIOUS POSITIONS

2006 – 2008 Research Professor and Group Leader at Nanobioelectronics and Biosensors Group / Catalan Institute of Nanoscience and Nanotechnology / Spain

2003 – 2006 Ramon y Cajal Senior Scientist at Chemistry Department / Autonomous University of Barcelona (UAB) / Spain

2002 – 2002 Research scientist & laboratory manager at New México State University / USA

1997 – 2002 Invited Researcher at Chemistry Department / UAB / Spain

1996 – 1996 Lecturer and Scientific Researcher at University of Tirana / Albania

1995 – 1996 Postdoctoral researcher at Universitat Politècnica de Catalunya / Spain

1993 – 1994 Postdoctoral researcher at Università degli Studi di Padova / Italy

1986 – 1993 Lecturer and scientific researcher at University of Tirana / Albania

• FELLOWSHIPS AND AWARDS

2016 Rudolf Zahradník Award Lecture from the Regional Centre of Advanced Technologies and Materials (RCPTM), Palacký University, Czech Republic.

2013 The IAAM Nano Award

2011 IAAM Medal (Intern. Assoc. Advanced Materials)

2008 Member of the Academy of Science of Albania

2005 Electrochemistry Communications Award

2003 – 2006 Ramon y Cajal Fellowship, Chemistry Department / UAB / Spain

• SUPERVISION OF GRADUATE STUDENTS AND POSTDOCTORAL FELLOWS

2006 – 2023 Number of Postdocs: 39/ PhD: 37/ Master Students: 29 / Nanobioelectronics and Biosensors Group / Catalan Institute of Nanoscience and Nanotechnology/ Spain

2003– 2006 Number of Postdocs: 4/ PhD: 5/ Master Students: 5 / Chemistry Department/ Autonomous University of Barcelona / Spain

• TEACHING ACTIVITIES

2016- Member of BIST ACADEMY Commission

2015 – 2021 Coordinator of Module: Nanodiagnosics within Master in Nanoscience & Nanotechnology, / UAB / Spain

2006 – 2015 Professor at Master in Nanotechnology and Materials Science, Module: Nanochemistry/ UAB / Spain

2008 – Member of the commission, nominated by UAB rector, for the creation of Nanoscience and Nanotechnology bachelor studies at UAB / Spain

• ORGANISATION OF SCIENTIFIC MEETINGS

2023 Co-Chair of World Congress of Biosensors 2023, Busan, South Korea.

2022 Member of the organizing committee of the NANOBIOMED Conference, Barcelona / Spain

2022 Co-Chair of 22d edition of Trends in Nanotechnology International Conference (TNT2022 NanoBalkan), Tirana / Albania and Co-organizer of “3rd Workshop Nanotechnologies for 21st Century, Cooperation event between Albania, Japan and Spain” and of “TNT2022 School of Nanobiosensors”, in the framework of TNT2022 NanoBalkan.

2021 Co-chair of 21st edition of Trends in Nanotechnology International Conference (TNT2021) and co-organizer of "Workshop on Nanotechnologies for 21st century: Cooperation event between Albania, Czech Republic and Spain" and of “2nd Workshop Nanotechnologies for 21st Century, Cooperation event between Albania, Japan and Spain” and of “TNT2021 School of Nanobiosensors” in the framework of TNT2021, Tirana / Albania

2021 Scientific Chairperson/Organizer of “Biosensors for Pandemics 2021: Reliable and efficient nanotech-based diagnostics in emergency situations” Online conference

2020 Scientific Chairperson/Organizer of “Biosensors for Pandemics: Reliable and efficient nanotech-based diagnostics in emergency situations” Online conference.

2020 Co-Coordinator of the Workshop, “1st workshop Nanotechnologies for 21st century. Cooperation event between Albania, Japan and Spain”, Tokyo / Japan

2018 Coordinator/Director (with Prof. Paul Yager, Univ. of Washington, USA) of the Pre-Congress School on Paper-based (Bio)Sensors, Miami, Florida / USA

- 2017 Coordinator/Director: VIII International Congress on Analytical Nanoscience and Nanotechnology (NyNA 2017) / Spain
- 2016 Coordinator of ALBNANO 2016, Workshop on Nanotechnology and Biosensors Impact in health, environment, safety and security of Albania, A collaboration event between Albania and Spain, in Tirana / Albania
- 2015 Coordinator/Director: ICREA Workshop on Graphene Nanobiosensors / Spain

• **INSTITUTIONAL RESPONSIBILITIES**

- 2016 - Member of Academic Working group at BIST (Barcelona Institute of Science and Technology)/ Spain
- 2015 - Member of Ethics Committee at Catalan Institute of Nanoscience and Nanotechnology
- 2008 - Member of the commission, nominated by UAB rector, for the creation of Nanoscience and Nanotechnology bachelor studies at Autonomous University of Barcelona/ Spain

• **REVIEWING ACTIVITIES**

- 2023 Member of the Evaluation Panel for the Nanomaterials research domain of IIT (Istituto Italiano di Tecnologia).
- 2017-2019 Reviewer / Expert for monitoring of H2020 EU Projects (two projects already monitored and other two invited for 2019)
- 2004-2019 Member of the panel of experts to evaluate scientific projects for proposals under several calls of the European Commission (FP6, FP7, H2020) and other (ANR France, Member of Materials Science and Engineering and Nanotechnology panel of FCT, Portugal.
- 2019 Member Scientific Advisory Board (SAB), of Leibniz-Institute for Solid State and Materials Research Dresden (IFW), Dresden, Germany.
- 2019,2022 Member of ERC Starting Grant Panel
- 2018- Member of Scientific Board of Regional Centre of Advanced Technologies and Materials (RCPTM), Olomouc, Check Republic
- 2018-2023 Member of Photonics21 Board (Board of Stakeholders of European Technology Platform)
- 2011 Evaluator for “Italian Association for Cancer Research (AIRC) Special Program 2011”

• **MEMBERSHIPS OF SCIENTIFIC SOCIETIES**

- 2012 - Member, NANOMED Spain (Plataforma Española de Nanomedicina)/ Spain
- 2011- Member, ONCOCAT (Catalan Oncology Network) and BioNanoMed/ Catalonia/ Spain
- 2009- Member, NanoSpain (Spanish Nanotechnology Network)/ Spain

• **MAJOR COLLABORATIONS**

- Armand Sánchez, Olga Francino, Laura Altet, Topic: development of DNA detection platforms for Leishmania detection in domestic animals, VETGENOMICS Company / Spain
- Carlos Rodriguez, Topic: cancer biomarkers detection using electrochemical platforms / Hospital Sant Joan de Déu, Barcelona / Spain
- Anna Bosch, Joan Claria, Vicente Arroyo, Nanobiosensors application in microbiome: / European Foundation for the study of chronic liver failure (EF-CLIF) / Spain
- Evind Strøm, Topic: development of a smartphone based lateral flow reader that allows reading the fluorescent signal of the lateral flow strips, Skannex company / Norway
- Jean-Jacques Toulmé, Aptamers synthesis and functionalisation, ARNA laboratory / University of Bordeaux, inserm / France
- Jonel Trebicka, Microbiome related nanobiosensors, University Clinic Frankfurt, Germany
- Christophe Junot, Immunoanalysis with interest in clinics, CEA-INRA-Université Paris Saclay, France.
- Elvira Fortunato and Rodrigo Martins, laser induced electrodes on nitrocellulose substrates, UNINOVA Lisbon, Portugal

10 selected publications (2013-2023)

- Rubio-Monterde, A.; Quesada-González, D.; Merkoçi, A. Toward Integrated Molecular Lateral Flow Diagnostic Tests Using Advanced Micro- and Nanotechnology. *Anal. Chem.* **2023**, *95*, 1, 468–489. <https://doi.org/10.1021/acs.analchem.2c04529>.
 - I led the team that reviewed the latest achievements in the field of molecular LF and discussed the future perspectives in the field.
- Sena-Torralba, A.; Álvarez-Diduk, R.; Parolo, C.; Piper, A.; Merkoçi, A. Toward Next Generation Lateral Flow Assays: Integration of Nanomaterials. *Chem. Rev.* **2022**, *122*, 18, 14881–14910. <https://doi.org/10.1021/acs.chemrev.1c01012>.
 - I led the team who reviewed the role of nanomaterials in LF and the recent trends and perspectives for improvements in this area.

3. Sena-Torralba, A.; Álvarez-Diduk, R.; Claudio, P.; Helena, T.-M.; Müller, A.; Merkoçi, A. Paper-Based Electrophoretic Bioassay: Biosensing in Whole Blood Operating via Smartphone. *Anal. Chem.* **2021**, *93*, 6, 3112–3121. <https://doi.org/10.1021/acs.analchem.0c04330>.
 - *I led the team that designed and developed the first smartphone electrophoretic operated LF bioassay.*
4. Parolo, C.; Sena-Torralba, A.; Bergua, J. F.; Calucho, E.; Fuentes-Chust, C.; Hu, L.; Rivas, L.; Álvarez-Diduk, R.; Nguyen, E. P.; Cinti, S.; Quesada-González, D.; Merkoçi, A. Tutorial: Design and Fabrication of Nanoparticle-Based Lateral-Flow Immunoassays. *Nat. Protoc.* **2020**, *15*, 3788–3816. <https://doi.org/10.1038/s41596-020-0357-x>.
 - *I led the team that analysed, discussed and proposed in a tutorial mode the most important issues related to nanoparticle-based LF.*
5. Quesada-González, D.; Stefani, C.; González, I.; de la Escosura-Muñiz, A.; Domingo, N.; Mutjé, P.; Merkoçi, A. Signal enhancement on gold nanoparticle-based lateral flow tests using cellulose nanofibers. *Biosens. Bioelectron.* **2019**, *141*, 111407. <https://doi.org/10.1016/j.bios.2019.111407>.
 - *I led the team that introduced for the first time the use of nanofibers as as signal enhancer in LF tests.*
6. Morales-Narváez, E.; Naghdi, T.; Zor, E.; Merkoçi, A. Photoluminescent Lateral-Flow Immunoassay Revealed by Graphene Oxide: Highly Sensitive Paper-Based Pathogen Detection. *Anal. Chem.* **2015**, *87*, 16, 8573–8577. <https://doi.org/10.1021/acs.analchem.5b02383>.
 - *I led the team that developed and demonstrated the first LF operating in synergy with graphene oxide quantum dots induced light quenching.*
7. Morales-Narváez, E.; Golmohammadi, H.; Naghdi, T.; Yousefi, H.; Kostiv, U.; Horák, D.; Pourreza, N.; Merkoçi, A. Nanopaper as an Optical Sensing Platform. *ACS Nano* **2015**, *9*, 7, 7296–7305. <https://doi.org/10.1021/acs.nano.5b03097>.
 - *I led the team that developed and demonstrated the first nanopaper platform for sensing.*
8. Rivas, L.; Medina-Sánchez, M.; De La Escosura-Muñiz, A.; Merkoçi, A. Improving sensitivity of gold nanoparticle-based lateral flow assays by using wax-printed pillars as delay barriers of microfluidics. *Lab Chip* **2014**, *14*, 4406–4414. <https://doi.org/10.1039/C4LC00972J>.
 - *I led the team that proposed a strategy to modulate the analytical performance of LF based on wax pillars designed by microfluidics simulations.*
9. Parolo, C.; Medina-Sánchez, M.; De La Escosura-Muñiz, A.; Merkoçi, A. Simple Paper Architecture Modifications Lead to Enhanced Sensitivity in Nanoparticle Based Lateral Flow Immunoassays. *Lab Chip* **2013**, *13* (3), 386–390. <https://doi.org/10.1039/C2LC41144J>.
 - *I led the team that proposed based on LF architecture simulations the tuning of analytical performance.*
10. López-Marzo, A. M.; Pons, J.; Blake, D. A.; Merkoçi, A. All-Integrated and Highly Sensitive Paper Based Device with Sample Treatment Platform for Cd²⁺ Immunodetection in Drinking/Tap Waters. *Anal. Chem.* **2013**, *85* (7), 3532–3538. <https://doi.org/10.1021/ac3034536>.
 - *I led the team that designed the first LF for highly sensitive detection of cadmium.*

Active Patents

- “Method of forming an electronic device on a flexible substrate”, Licensed to Graphenicalab. PCT publication number: WO2015/193486 A1, EuroPCT grant number: EP3158397B1. Active patent licensed to our spin-off Graphenicalab. Active in Europe, Canada, South Korea, Israel and China.
- “Methods for detecting target DNA sequences”, PCT publication number: WO 2016/005517. Active patent. Owner: VETGENOMICS. Arben Merkoçi as inventor.

See Full CV at: https://www.icrea.cat/security/files/researchers/files-maintenance/cv_arben.pdf