

Tianji MA

Ph.D. in Physical-Chemistry

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PROFESSIONAL EXPERIENCES

- Ph.D Physical-Chemistry** 01.12.2016 – 14.11.2019
Université de Montpellier, Institut Européen des Membranes, Montpellier, France.
Functionalization of solide-state nanopore by polyelectrolytes for stimuli-responsive ionic channel, biosensing and energy.
Advisors: Dr. Sébastien Balme, Dr. Jean-Marc Janot
- Internship, M2** 01.02.2016 – 30.06.2016
Université de Montpellier, Institut Européen des Membranes, Montpellier, France.
PECVD deposition of oxygen barrier SiC_xN_y thin film on micro nuclear fusion reactor of MegaJoule.
Advisor: Dr. Vincent Rouessac
- Internship, M1** 01.05.2015 – 30.06.2015
Université de Montpellier, Institut Charles Gerhardt, Montpellier, France.
Synthesis of mono glycerol ether with acidic catalyser.
Advisor: Dr. Nathalie Tanchoux

EDUCATION

- Ph.D Physical-chemistry** 2019
Université de Montpellier, Montpellier, France
- MSc Material Chemistry** 2016
Université de Montpellier, Montpellier, France
- BSc Chemical Engineering** 2014
East China University of Science and Technology, Shanghai, China
- BSc Chemistry** 2014
Université Claud Bernard Lyon 1, Lyon, France

MENTORING

- Raphael Chabas:** (Master 2) 2019
Track-etched nanopore for virus detection

PROFESSIONAL SKILLS

- Research interests:** solid-state nanopores, nanopore functionalization, nanoscale biophysics
- Nano-electrochemistry and resistive pulse:** Amplifier HEKA
- Single nanopore production:** track-etched method
- Surface chemistry:** CVD, PVD, bio-conjugate chemistry, self-assembly chemistry
- Characterization:** contact angle, SEM(EDX), FTIR, UV-Vis, GC-MS, XRD, Ellipsometry
- Computer software:** Origin, Chemskech, ImageJ, Fitmaster (HEKA), Patchmaster (HEKA)

LANGUAGE

Chinese: Native
English: Fluent
French: Bilingual

SCIENTIFIC PRODUCTION

9 Articles
8 Oral communications
2 Posters

REFERENCES

- Dr. Sébastien Balme # +(33) (0)4 67 14 91 18, mail: sebastien.balme@umontpellier.fr
Advisor of my PhD, Université Montpellier , Institut Européen des Membranes, Montpellier, France
- Dr. Jean-Marc Janot # +(33) (0)4 67 14 91 26, mail: jean-marc.janot@umontpellier.fr
Co-advisor of my PhD, Université Montpellier , Institut Européen des Membranes, Montpellier, France
- Dr. Vincent Rouessac # +33 (0)4 67 14 91 45, mail: vincent.rouessac@umontpellier.fr
Advisor of my MSc thesis, Université Montpellier , Institut Européen des Membranes, Montpellier, France

RESEARCH

Papers

1. **T. Ma**, E. Balanzat, J-M. Janot, S. Balme,
Dynamics of Long Hyaluronic Acid Chains through Conical Nanopore for Characterizing Enzyme Reactions in Confined Space.
Submitted.
2. C-Y. Lin*, **T. Ma***, Z. Siwy, S. Balme, J-P. Hsu,
Tunable Current Rectification and Selectivity Demonstrated in Nanofluidic Diodes through Kinetic Functionalization.
[J. Phys. Chem. Lett.](#), accepted.
3. **T. Ma**, E. Balanzat, J-M. Janot, S. Balme,
Conical track-etched Nanopore for a free-label detection of OSCS contaminants in heparin.
[Biosens. Bioelectron.](#), 2019, 137, 207-212.
4. **T. Ma**, E. Balanzat, J-M. Janot, S. Balme,
Nanopore Functionalized By Highly Charged Hydrogels For Osmotic Energy Harvesting.
[ACS Appl. Mater. Interfaces](#), 2019, 11, 13, 12578-12585.
5. N. Giambianco, D. Coglitore, A. Gubbiotti, **T. Ma**, E. Balanzat, J-M. Janot, M. Chinappi, S. Balme,
Amyloid Growth, Inhibition, and Real-Time Enzymatic Degradation Revealed with Single Conical Nanopore.
[Anal. Chem.](#), 2018, 90 (21), pp 12900–12908.
6. **T. Ma**, P. Gaigalas, M. Lepoitevin, I. Plikusiene, M. Bechelany, J-M. Janot, E. Balanzat, S. Balme,
Impact of Polyelectrolyte Multilayers on the Ionic Current Rectification of Conical Nanopores.
[Langmuir](#), 2018, 34 (11), pp 3405–3412.

7. I. Ma, M. Walko, M. Lepoitevin, E. Balanzat, J-M. Janot, A. Kocer, S. Balme, *Combining Light - Gated and pH - Responsive Nanopore Based on PEG - Spiropyran Functionalization*. [*Adv. Mater. Interfaces*](#), 2017, 5, 1701051.
8. M. Lepoitevin, I. Ma, M. Bechelany, J-M. Janot and S. Balme, *Functionalization of single solid state nanopores to mimic biological ion channels: A review*. [*Adv. Colloid Interface Sci.*](#), 2017, 250, 195– 213.
9. S. Balme, I. Ma, E. Balanzat, J-M. Janot, *Large osmotic energy harvesting from functionalized conical nanopore suitable for membrane applications*. [*J. Membr. Sci.*](#), 2017, 544, 18.

Oral communications (speaker underlined)

1. I. Ma, E. Balanzat, J-M. Janot, S. Balme, *Polyelectrolytes functionalization in track etched nanopore for osmotic energy harvesting*. [French-Italian workshop on Single Nanopore for Sensing and Energy](#), 10-11 July 2019, Montpellier, France.
2. I. Ma, E. Balanzat, J-M. Janot, S. Balme, *Conical track-etched Nanopore for a free-label detection of OSCS contaminants in heparin*. [Biophysics@Rome 2019, Biophysics across scales: from nano to macro](#), 15-16 May 2019, Rome, Italy.
3. I. Ma, E. Balanzat, J-M. Janot, S. Balme, *Track-etched nanopores functionalized with Polyelectrolytes for osmotic energy conversion*. [Department conference of Interface, physicochemistry and polymers](#), 21 May 2019, Montpellier, France.
4. I. Ma, E. Balanzat, J-M. Janot, S. Balme, *Reverse electro-dialysis energy harvesting from hydrogels functionalized conical nanopores*. [Journées de la Matière Condensée](#), 27-31 August 2018, Grenoble, France.
5. I. Ma, M. Walko, E. Balanzat, J-M. Janot, A. Kocer, S. Balme, *Combining Light-Gated and pH-responsive nanopore based on PEG-spiropyran functionalization*. [International School of Nanomedicine](#), 5-11 April 2018, Erice, Italy.
6. I. Ma, M. Walko, E. Balanzat, J-M. Janot, A. Kocer, S. Balme, *Combining Light-Gated and pH-responsive nanopore based on PEG-spiropyran functionalization*. [Balard Conference](#), 18-21 June, Montpellier, France.
7. I. Ma, M. Walko, E. Balanzat, J-M. Janot, A. Kocer, S. Balme, *Combining Light-Gated and pH-responsive nanopore based on PEG-spiropyran functionalization*. [Journée scientifique de l'école doctorale SCB](#), December 2017, Montpellier, France.
8. I. Ma, E. Balanzat, J-M. Janot, S. Balme, *Combining Light-Gated and pH-responsive nanopore based on PEG-spiropyran functionalization*. [Department conference of Interface, physicochemistry and polymers](#), May 2017, Montpellier, France.

Posters (speaker underlined)

1. I. Ma, E. Balanzat, J-M. Janot, S. Balme, *Dynamics of Long Hyaluronic Acid Chains through Conical Nanochannel for Characterizing Enzyme Reactions in Confined Space*. [French-Italian workshop on Single Nanopore for Sensing and Energy](#), 10-11 July 2019, Montpellier, France.

2. T. Ma, E. Balanzat, J-M. Janot, S. Balme. *Reverse electro-dialysis energy harvesting from hydrogels functionalized conical nanopores*. *Nanofluidics in physics and biology*, 9-12 July 2018, Lyon, France.