

Mateo I. Sanchez Lopez. misanche@ic.ac.uk
University of Cambridge
Department of Chemistry
Lensfield Road, Cambridge CB2 1EW, UK. Cell +44-750-3931-336
WoS Researcher ID **AAB-2434-2020**.
Open Researcher and Contributor ID (ORCID) **0000-0003-1359-6969**

Education and Research Experience.

5/2023-	Cambridge University, Chemistry Department Wellcome Trust Career Development Award Chemical biology and protein engineering for cell biology and neuroscience	 UNIVERSITY OF CAMBRIDGE
1/2021-4/2023	Imperial College, Bioengineering Department MSCA Fellowship. Advisor: Professor Tom Ellis <i>Synthetic genomics.</i>	 Imperial College London
4/2019 – 12/2020	Chan-Zuckerberg Foundation (Facebook) Stanford University, Genetics Department Junior Scientist. Advisor: Professor Alice Y. Ting <i>Development of molecular tools to label active neurons and to discover neural circuits.</i>	 CHAN ZUCKERBERG BIOHUB  Stanford University
7/2016 – 12/2020	Stanford University, Genetics Department	
4/2015 – 7/2016	Massachusetts Institute of Technology (MIT), Chemistry Department EMBO Long-Term Fellowship. Advisor: Professor Alice Y. Ting <i>Directed evolution of optogenetic technologies for cell biology and neuroscience.</i>	 Stanford University  MIT Massachusetts Institute of Technology
9/2008 – 4/2015	University of Santiago de Compostela, Spain Ph.D. in Chemistry. Advisor: Professor Jose Luis Mascareñas. <i>Thesis: DNA recognition by designed fluorescent binders.</i>	 USC UNIVERSIDAD DE SANTIAGO DE COMPOSTELA
9/2012 – 12/2012	Massachusetts Institute of Technology (MIT), Chemistry Department Internship with Professor Alice Y. Ting <i>Site-specific protein labeling using PRIME and chelation-assisted click chemistry.</i>	 MIT Massachusetts Institute of Technology
9/2011 – 12/2011	Stanford University, Pathology Department Internship with Professor Matthew Bogoy <i>Chemical synthesis of activity-based probes and inhibitors to study human pathogens.</i>	 Stanford University
10/2003 – 9/2008	University of Santiago de Compostela (USC), Spain A.B. in Chemistry (graduated first in class, 2008) <i>Synthesis of fluorogenic bisbenzamidines.</i>	 USC UNIVERSIDAD DE SANTIAGO DE COMPOSTELA

Publications.

• Total publications with IF* **31** (Considering Impact Factor (IF) as JCR from Thompson Reuters). Journals where I have published as first or co-first author are in bold.

Cell	1	Nat. Biotechnol.	1	Nat. Methods	1	Nat. Protoc.	1
eLife	2	Angew. Chem. Int. Ed.	2	Chem. Sci.	3	J. Am. Chem. Soc.	1
Org. Lett.	1	ACS. Chem. Biol.	2	Chem. Commun.	5	PLOS One	2
ChemBioChem.	1	Chem. Eur. J.	2	Sci. Rep.	1	J. Org. Chem.	1
PLOS Pathog..	1	FEBS. J.	1	Proc. Natl. Acad. Sci. U.S.A			1

Publications as first or co-first author	16	Q1 publications: (78 % indexed publications)	24
Publications without PhD Supervisor	13	Publications without PhD or Postdoc Supervisor	6

Google Scholar Citation 989, H-Index 18, I10 Index 20

WoS Citation 661, H-Index 16

Publication list. (* denotes co-authorship)

- [31] R. Coukos R, D. Yao D, **Sanchez MI**, Strand ET, Weissman JS, Bassik MC, and Ting AY. An engineered transcriptional reporter of protein localization identifies regulators of mitochondrial and ER membrane protein trafficking in high-throughput screens.
Elife 2021 *Accepted*.
- [30] Kim CC*, **Sanchez MI***, Hoerbelt P, Malenka RC, Deisseroth K, and Ting AY. A molecular calcium recorder reveals unique cell type in brain striatum underlying aversion.
Cell 2020, 183, 2003.
- [29] **Sanchez MI**, Wang W, Nguyen Q.-A, Soltesz I, and Ting AY. Transcriptional readout of neuronal activity via an engineered Ca²⁺-activated protease.
Proceedings of the National Academy of Sciences 2020, 117, 33186.
- [28] **Sanchez MI** and Ting AY. Directed evolution improves the catalytic efficiency of TEV protease.
Nature Methods 2020, 17, 167.
- [27] **Sanchez MI**, Yolanda Vida, Ezequiel Perez-Inestrosa, José L. Mascareñas, M. Eugenio Vazquez, Ayumu Sugiura, and Jose Martinez-Costas. MitoBlue as a tool to analyze the mitochondria-lysosome communication.
Sci. Rep. 2020, 10, 3528.
- [26] Tan MSY, Davison D, Sanchez MI, Anderson BM, Howell S, Snijders A, Edgington-Mitchell LE, Deu E. Novel broad-spectrum activity-based probes to profile malarial cysteine proteases
PLoS One 2020, 15, e0231231.
- [25] **Sanchez MI**, de Vries LE, Lehmann C, Lee JT, Ang KK, Wilson C, Chen S, Arkin MR, Bogyo M, Deu E Identification of Plasmodium dipeptidyl aminopeptidase allosteric inhibitors by high throughput screening.
PLoS One 2019, 14, e0226270.
- [24] **Sanchez MI**, Rama G, Calo R, Calo, Kübra Ucar, Per Lincoln, Vázquez López M, Manuel Melle-Franco, Mascareñas JL, Vázquez ME. Canonical DNA minor groove insertion of bisbenzamidine-Ru(II) complexes with chiral selectivity.
Chem. Sci. 2019, 10, 8681-8674.
- [23] de Vries LE, **Sanchez MI***, Groborz K, Kuppens L, Poreba M, Lehmann C, Nevins N, Withers-Martinez C, Hirst DJ, Yuan F, Arastu-Kapur S, Horn M, Mares M, Bogyo M, Drag M, Deu E. Characterization of *P. falciparum* dipeptidyl aminopeptidase 3 specificity identifies differences in amino acid preferences between peptide-based substrates and covalent inhibitors.
FEBS J. 2019 febs.14953
- [22] Lehmann C, Tan MSY, de Vries LE, Russo I, **Sanchez MI**, Goldberg DE, Deu E. Plasmodium falciparum dipeptidyl aminopeptidase 3 activity is important for efficient erythrocyte invasion by the malaria parasite.
PLoS Pathog. 2018 14, e1007031.
- [21] Kim MW, Wang W, **Sanchez MI**, Coukos R, von Zastrow M, Ting AY. Time-gated detection of protein-protein interactions with transcriptional readout.
Elife. 2017, 6. e30233.
- [20] W. Wang, C. P. Wildes, T. Pattarabanjird, **Sanchez MI**, G. F. Glober, G. A. Matthews, K. M. Tye, Y. Ting A light- and calcium-gated transcription factor for imaging and manipulating activated neurons.
Nature Biotechnology, 2017, 35, 864-871.
- [19] Penas C, **Sánchez MI**, Guerra-Varela J, Sanchez L, Vázquez ME, Mascareñas JL. Light-Controlled Cellular Internalization and Cytotoxicity of Nucleic Acid-Binding Agents: Studies in Vitro and in Zebrafish Embryos.
Chembiochem. 2016, 1, 37.
- [18] Mosquera J, **Sánchez MI**, M. E. Vazquez, J. L. Mascareñas. Sequence-Selective DNA Binding with Cell-Permeable Oligoguanidinium-Peptide Conjugates.
Chem. Commun. 2015, 51, 4841-4.
- [17] Mosquera J*, **Sánchez MI***, M. E. Vazquez, J. L. Mascareñas. Synthetic peptides caged on histidine residues with a bisbipyridyl ruthenium(ii) complex that can be photolyzed by visible light.
Chem. Commun. 2015, 51, 5501.

- [16] Oresic Bender K, Ofori L, van der Linden WA, Mock ED, Datta GK, Chowdhury S, Li H, Segal E, **Sanchez Lopez M**, Ellman JA, Figdor CG, Bogoy M, Verdoes M. Design of a highly selective quenched activity-based probe and its application in dual color imaging studies of cathepsin S activity localization.
J. Am. Chem. Soc. 2015, 137, 4771.
- [15] Bordello J, **Sánchez MI**, Vázquez ME, Mascareñas JL, Al-Soufi W, Novo M. Fluorescence-Labeled Bisbenzamidines as Fluorogenic DNA Minor-Groove Binders: Photophysics and Binding Dynamics.
Chem. Eur. J. 2015, 21, 1609.
- [14] **Sánchez MI**, Martínez-Costas J, González F, Bermúdez MA, Vázquez ME, Mascareñas JL. MitoBlue: A Nontoxic and Photostable Blue-Emitting Dye That Selectively Labels Functional Mitochondria.
ACS Chem Biol. 2014, 9, 2742.
- [13] **Sánchez MI***, Mosquera J*, M. E. Vazquez, J. L. Mascareñas. Reversible Supramolecular Assembly at Specific DNA Sites: Nickel-Promoted Bivalent DNA Binding with Designed Peptide and Bipyridyl–Bis(benzamidine) Component.
Angew. Chem. Int. Ed. Engl. 2014, 53, 9917.
- [12] Mosquera J*, **Sánchez MI***, M. E. Vazquez, J. L. Mascareñas. Ruthenium bipyridyl complexes as photocleavable dimerizers: deactivation of DNA-binding peptides using visible light.
Chem. Commun. 2014, 50, 10975.
- [11] **Sánchez MI**, C. Penas, M. E. Vazquez, J. L. Mascareñas. Metal-catalyzed uncaging of DNA-binding agents in living cells.
Chem. Sci. 2014, 5, 1901.
- [10] Gamba I, Salvadó I, Rama G, Bertazzon M, **Sánchez MI**, Sánchez-Pedregal VM, Martínez-Costas J, Brissos RF, Gamez P, Mascareñas JL, Vázquez López M, Vázquez ME. Custom-Fit Ruthenium(II) Metallopeptides: A New Twist to DNA Binding With Coordination Compounds.
Chem. Eur. J. 2013, 19, 13369.
- [9] Uttamapinant C, **Sánchez MI**, Liu DS, Yao JZ, Ting AY. Site-specific protein labeling using PRIME and chelation-assisted click chemistry.
Nat. Protoc. 2013, 8, 1620.
- [8] **Sánchez MI**, Vázquez O, Vázquez ME, Mascareñas JL. Sequence-Selective DNA Recognition with Peptide–Bisbenzamidine Conjugates.
Chem. Eur. J. 2013, 19, 9923.
- [7] Bordello J, **Sánchez MI**, Vázquez ME, Mascareñas JL, Al-Soufi W, Novo M. Single-Molecule Approach to DNA Minor-Groove Association Dynamics.
Angew. Chem. Int. Ed. Engl. 2012, 51, 7541.
- [6] **Sánchez MI**, Vázquez O, Martínez-Costas J, Vázquez ME, Mascareñas JL. Straightforward access to bisbenzamidine DNA binders and their use as versatile adaptors for DNA-promoted processes.
Chem. Sci. 2012, 3, 2383-2387.
- [5] **Sánchez MI**, Martínez-Costas J, Gonzalez F, Bermudez MA, Vázquez ME, Mascareñas JL. In Vivo Light-Driven DNA Binding and Cellular Uptake of Nucleic Acid Stains.
ACS Chem Biol. 2012, 7, 1276.
- [4] **Sánchez MI**, Vázquez O, Vázquez ME, Mascareñas JL. Light-controlled DNA binding of bisbenzamidines.
Chem. Commun. 2011, 47, 11107.
- [3] Vázquez O, **Sánchez MI**, Mascareñas JL, Vázquez ME. dsDNA-triggered energy transfer and lanthanide sensitization processes. Luminescent probing of specific A/T sequences.
Chem. Commun. 2010, 46, 5518.
- [2] Vázquez O, **Sánchez MI**, Martínez-Costas J, Vázquez ME, Mascareñas JL. Bis-4-aminobenzamidines: Versatile, Fluorogenic A/T-Selective dsDNA Binders.
Org. Lett. 2010, 12, 216.
- [1] Fernández de la Pradilla R, Castellanos A, Osante I, Colomer I, **Sánchez MI**. Highly Diastereoselective Katsuki–Jacobsen Oxidation–Epoxidation of α -Silyloxy Sulfinyl Dienes: Synthetic Applications.
J. Org. Chem. 2009, 74, 170.

Teaching.

- 2022 Teaching assistant Foundations of Synthetic Biology, Imperial College, United Kingdom. (40h, 60 students, conventional lectures. Role: Participant teacher)
- 2021 Teaching assistant Foundations of Synthetic Biology, Imperial College, United Kingdom. (40h, 60 students, conventional lectures. Role: Participant teacher)
- 2012 – 2013 Teaching assistant in Organic Chemistry, Faculty of Chemistry, USC, Spain. (60h, 40 students, conventional lectures. Role: Participant teacher)

Technology Transfer

Patents.

- Improved variants of TEV protease for biotechnological applications. **Mateo Isidro Sanchez Lopez**, Alice Y. Ting U.S. **Provisional Application No. 62/906,373**.
- Fluorescent Compounds. **M. I. Sánchez**, J. Martínez Costas, E. Vázquez Sentís, J. L. Mascareñas. Publication number **WO2014/202814A1**.
- Cell uptake and photoactivation of small molecule DNA binders. **Mateo I. Sánchez**, Olalla Vázquez, Eugenio Vázquez Sentís, José L. Mascareñas. Publication number: **WO2013/026947A1**.
- Bis-benzamidine derivatives as fluorogenic probes to recognize specific sequences of double-stranded DNA. **Mateo I. Sánchez**, M. Eugenio Vázquez, José L. Mascareñas. Olalla Vázquez. Publication number: **WO2011/007038A3**.

Collaboration with Companies.

- Advisory Board on AIMEN for the development of PhoBiC (Biophotonics Methods and Devices as research tools to understand the origin of diseases).
- Mitoblue® (Mateo et al. *ACS. Chem. Biol.* 2014, 9, 12, 2742. Mateo et al. *Sci. Rep.* 2020, 10, 3528. is being commercialize by several companies: *SigmaAldrich*- SCT135, *Promocell*- PK-CA707-70052, *Abcam*- ab219940 among others.

Grants and funding.

- | | |
|--|---------|
| - Wellcome Trust Career Development Award (Number 225914/Z/22/Z,). <u>Role PI</u> . | 2023-29 |
| - Marie Skłodowska-Curie Actions (Number 101024747, Score 96/100). <u>Role PI</u> . | 2022-23 |
| - EMBO Long-Term Fellowship (ALTF 1022-2015, Success rate 16%). <u>Role PI</u> . | 2015-16 |
| - Formacion Personal Universitario (FPU) Fellowship (Most prestigious PhD fellowship in Spain). <u>Role PI</u> | 2019-21 |

Prizes and awards.

- | | |
|--|------|
| - XII Angeles Alvariño award for the scientific trajectory. Spain (€1000) | 2021 |
| - XIII SusChem award for the best national publication in chemistry. Spain (€3000) | 2021 |
| - Best thesis award at University of Santiago de Compostela, Spain | 2015 |
| - Eli Lilly Award for the best national PhD Thesis in organic chemistry, Spain (€1000) | 2014 |

Recent Invited speaker at international conferences.

- Centre for Discovery Brain Sciences, University of Edinburgh 02/02/2023
- Spanish National Centre for Cardiovascular Research (CNIC), Madrid 28/06/2022
- Spanish National Centre for Biotechnology (CNIC), Madrid 27/06/2022
- The Imperial College Centre for Synthetic Biology- Seminar Series (ICL), London 17/02/2022
- Current themes in chemical biology, Cambridge University 09/12/2021
- Designer Biology'21 08/09/2021.
- onLine Seminar Leibniz Institute for Neurobiology (LIN) 11/06/2021 London.
- Annual Advanced Imaging Methods Workshop 29/01/2020 Berkeley.
- Extraordinary seminar "From organometallic catalysis in living cells to mapping neural circuits" 27/01/2020 IRB, Spain
- Rising Stars Symposium in Chemical Biology.19/09/2019 Utah.
- Protein Engineering Workshop 19/05/2019 Janelia Research Campus.