

CURRICULUM VITAE

PERSONAL INFORMATION

Name: Sánchez Ordóñez, Samuel

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Researcher ID: B-6803-2015_

Date of birth: May 15th, 1980/ Terrassa, Spain.

Father of two kids (19 and 14)

web sites:

<http://www.ibecbarcelona.eu/nanodevices>

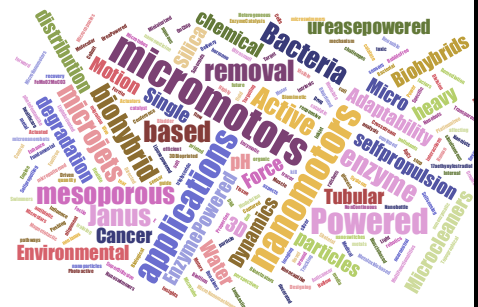
<https://www.icrea.cat/Web/ScientificStaff/samuel-sanchez-ordonez-578>

<https://www.nanobotstx.com/>



SHORT SUMMARY

+190 research papers	23055 Citations	8 patents	Founder of Spin-off
<i>h</i> -index: 83 (Google Scholar)	+ 140 invited talks	+ 12 Mi€ attracted. (Direct funding and personnel)	ERC StG +CoG+4PoC



I hold a joint appointment as full Research Professor at the Institute for Bioengineering of Catalonia (IBEC) and the Catalan Institution for Research and Advanced Studies (ICREA) in Barcelona (Spain). I am leading the “[Smart Nano-Bio-Devices](#)” group, composed by scientists working in the multidisciplinary field of nanosciences with focus on self-powered nano-robots, integrated and flexible biosensors, physics of active matter, smart drug delivery systems and 3D Bio-printed soft robotics. Moreover, I am co-founder and CSO of the spin-off Nanobots Therapeutics S.L.

Previous steps:

After my PhD (Autonomous University of Barcelona, June 2008), I moved as an independent postdoc -tenure-track- at the International Center for Young Scientists at NIMS, Japan (2009-2010). There, I radically changed my research topic from biosensors to catalytic nanomachines, a striking leap from my supervisor’s project. In May 2010, I became Group Leader at the Institute for Integrative Nanosciences (IIN), IFW Dresden (2010-2013). After receiving the ERC StG, I accepted an offer to become Group Leader at the Max Planck for Intelligent Systems where I consolidated my scientific independence and grew as a leader in the field of micro-nanomotors.

EDUCATION

November 2016	Executive Education Focus Program, IESE Business School Developing Leadership Competencies
June 2008	PhD in Chemistry, Autonomous University of Barcelona, Spain
September 2005	Master in Chemistry. Autonomous University of Barcelona, Spain
March 2003	BSc in Chemistry, Autonomous University of Barcelona, Spain

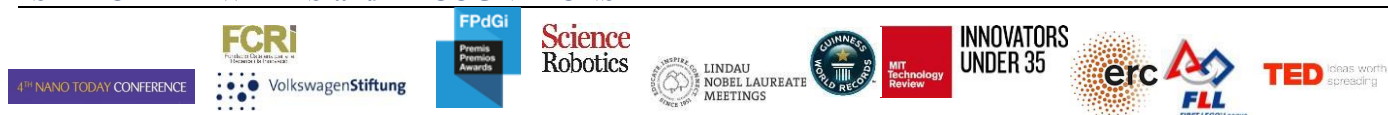
CURRENT POSITIONS

Since 01/2023	Nanobots Therapeutics, CSO and Founder, Board Member, Barcelona Spain
Since 01/2019	Deputy Director for the Internationalization of IBEC
Since 06/2017	Institut Català de Recerca i Estudis Avancats (ICREA), Spain
Since 01/2015	Fundació Institut de Bioenginyeria de Catalunya (IBEC), Barcelona, Spain Senior Group Leader, Smart Nano-bio-devices group

PREVIOUS POSITIONS

01/2022-12/2024	Adjunct Professor, POSTECH, Pohang, South Korea
01/2022-12/2021	Honorary Visiting Professor, Harbin Institute of Technology, Harbin, China
09/2013-12/2017	Max Planck Institute for Intelligent Systems, Independent Research, Mentor: Prof. Dr. Dietrich, Stuttgart, Germany
05/2010-08/2013	Leibniz Institute for Solid State and Materials Research Dresden, Group Leader and ERC group Head. Director: Oliver G. Schmidt , Dresden, Germany
02/2009-04/2010	International Center for Young Scientists, National Institute for Materials Science, Independent Scientist, Tenure.track position, Mentor: Martin Pumera , Tsukuba, Japan
06/2008-02/2009	Universitat Autònoma de Barcelona, Associate Professor, Analytical Dept., Bellaterra, Spain
09/2005-06/2008	Universitat Autònoma de Barcelona, Analytical Chemistry Dept, PhD Student, Assistant Professor, Bellaterra, Spain
07/2007-10/2007	International Center for Young Scientists, National Institute for Materials Science, Guest Scientist (student fellowship), Tsukuba, Japan
09/2003-09/2005	Universitat Autònoma de Barcelona, Assistant Professor, Analytical Chemistry Dept., Bellaterra, Spain
03/2003-09.2003	Universitat Autònoma de Barcelona, Assistant Professor, Organic Chemistry Dept., Bellaterra, Spain
10/2002-03/2003	University of Twente, Guest Scientist, Inorganic Chemistry, Enschede, The Netherlands

SELECTED AWARDS and RECOGNITIONS



11/2025	La Vanguardia de La Ciencia Award (3rd position)
07/2025	Control Realeased Society (Senior Award). CRS Awards & Distinctions (800 USD)
09/2024	Leonardo Grant. BBVA Foundation (40k€ for research).
11/2023	Young Talent Award in Biomedical Research. Constantes y Vitales (100k€ for research)
06/2023	BASF-ICIQ Award Entrepreneur in Chemistry (4.000€ Award)
11/2022	BStart Up Award to biotech spin-off. Banco Sabadell Foundation (100.000€ funding)
06/2022	Banco Sabadell Foundation Award. Engineering and Basic Science (50.000€ Award)
05/2022	Spanish Royal Society of Chemistry “Scientific Excellence Award” (2000€ Award)

06/2020	Selected as “Académico de Número”. Member of the Young Academy of Spain
07/2019	2 Best Poster Awards (3 rd and 4 th). International Workshop Microscale, Motion and Light, Dresden, Germany
2019	ERC Consolidator Grant 2019/ European Research Council
11/2018	Best Poster Award by Science Robotics Journal, Boston, USA
11/2017	Best poster Award. NanoBio&Med Conference 2017, Barcelona, Spain
09/2017	ERC Proof-of-Concept Grant for “Lab-in-a- Patch”. European Research Council
08/2017	Best Poster Award. Micro-Nanomachines International Conference, Wuhan, China
01/2017	Guinness ® World Record: smallest tubular man- made jet engine. Guinness World Record®
12/2016	National Research Award Young Talent2016. Generalitat de Catalunya and the Catalan Foundation for Research and Innovation (FCRi).(10.000€ Award)
06/2016	Advisory Board Member. Princess of Girona Foundation (Spanish King’s Foundation)
02/2016	ERC Proof-of-Concept Grant for “MICROCRLEANERS”. European Research Council
05/2016	TEDx Talk “Nanorobots”. Tarragona, Spain
03/2016	Relevant young person for the society Award 2016. Círculo Ecuestre (sponsored by IESE Business School, Google and Chivas the Venture). (Award: membership-cost approx. 15.000€-, IESE Focus Program (6.000€), and mentoring program)
01/2016	Advisor of Educational National Program. Working Group Education Princess of Girona Foundation
07/2015	Innovator Europe Under 35. MIT TR35 Technology Reviews
06/2015	Princess of Girona Scientific Award. Princess of Girona Foundation, Barcelona, Spain (10.000€ Personal Award)
01/2015	Selected Emerging Investigators Special Issue,Chem Communications Journal
01/2015	Future Leaders in Nano-architectonics,Sci.Tech.Adv.Mater. Journal
10/2014	Best poster award Self-propelled particles in confined spaces. Conference on Frontiers in Nano Science, Technology and Applications,Prashantinilayam, India
09/2014	MIT Technology Review 2014 Award: Top 10 Spanish Innovator under 35.“Innovator of the year”. MIT Technology Review
06/2013	Sponsored by Volkswagen Foundation:Participants attend only upon invitation and costs are paid by the sponsor, Nobel Laureate Meeting-Chemistry.Lindau, Germany
12/2012	Best poster Award,1st Herrenhäuser conference “Downscaling Science”,VW Foundation,Germany
07/2012	ERC Starting Grant 2012 (10% success rate), European Research Council
01/2012	Our record was (from 09.2010) selected to be in the Guinness Book of Records 2012. Guinness Book of Record
10/2011	IFW-IIN Research Prize as outstanding scientist.Leibniz Institute for Solid State and Materials Research Dresden (IFW),Germany. (1.000€ Personal Award)
09/2010	Guinness World Record ® for the "Smallest Man- Made Jet Engine",Guinness World Records
09/2009	Fellowship. Visiting scientist for 3 months to IFW Dresden,MANA-NIMS. Tsukuba,Japan
2007	Mobility fellowship BE-2007 for 3 months. Host:National Institute for Materials Science, Japan.Generalitat de Catalunya
08/2002	Erasmus fellowship for 5 months.Host: University of Twente, the Netherlands, EU-Spanish government

SUPERVISION OF GRADUATE STUDENTS AND POSTDOCTORAL FELLOWS

Present (2023-to date)	Leader of Smart Nanobiodevices Lab/IBEC/Spain , 10 postdocs/13 PhD/2 Master students. Postdocs: 1 B. Pinós, 2 Juan de la Cierva, 1 AECC Postdoc; PhD: 3 FPI Mineco, 1 FI (AGAUR), 1 Doct.Ind (AGAUR), 2 Severo-Ochoa Excellence PhD Fellows
2018-2022	Leader of Smart Nanobiodevices Lab/IBEC/Spain , 8 postdocs/6 PhD/5 Master students Postdocs: 3 MSCA-COFUND, 3 Juan d.l.Cierva. 1B.Pinós, 1 M.Salas, 1 J.Leader La CaixaPhD: 1 La Caixa Fellow, 2 Severo-Ochoa Excellence Fellow, 1 FPU Fellow Master Students: 12 Awarded >9/10 grades.
2013-2017	Group Leader/Max Planck for Intelligent Systems . 4 Postdocs/3 PhD/2 Master students Post-docs: 2 Alexander von Humboldt Fellows, 1 DFG Fellow; <i>Current positions</i> : 1000 Young Talents of China Award, Professor at HIT Shenzhen (Dr. Ma), MSCA Fellow (Dr. Vilela) and Freigeist-Fellow at TU Dresden (Dr. Simmchen). <i>PhD</i> : J. Katuri (output 14 papers, cover page) and J. Parmar (output 10 papers, covers, media appearance, 1 patent). Innova Award/Catalan Government, both Cum Laude by UB Barcelona/Spain.
2010-2013	Group Leader at the Institute for Integrative Nanosciences/IFW Dresden/Germany 4 Postdocs/ 5 PhD students/ 2 Master Students

Alumni: Our group members (alumni) have gone on to prominent positions: K. Villa – ICREA Professor, ICIQ, Tarragona (Spain); V.Magdanz – Ass. Prof, Univ.Waterloo (Canada); A. Bakenecker – Ass.Prof., Univ. Darmstadt (Germany); T. Patino – Ass. Prof., TU Eindhoven (The Netherlands); L.Wang – Assoc. Prof, HIT Harbin (China); M. Guix – RyC/Ass.Prof., UB (Spain), M. de Corato, RyC (Univ. Zaragoza, Spain); J. Fraire – RyC, (CSIC-IQAC, Spain).

Other notable alumni include Dr. Jemish Parmar, Director of R&D at IDEADED, Dr. Agostino Romeo, Innov. PM at Genesis Biomed; M. Serra, Clinical Research Medical Advisor at Novartis, Spain.; J. Katuri. National Labs, USA. And Exxon, USA.; A.Hortelao, MSCA Fellow. Univ.Groningen, (The Netherlands), among others.

SELECTED TEACHING ACTIVITIES

2020-present	Invited Seminar for BSc in Biotechnology and Master in Pharmacy/UB/Spain
2016-2019	Invited Seminar for Master in Nanoscience, Master in Biotechnology, Bachelors in Biotechnology/University of Barcelona/Spain.
2016-2018	Lecturer, Leadership in science/International Center for Leadership Development (ICLD)/CEDE Foundation/Spain
2015-2018	Invited Professor, Nanomotors/ Autonomous Metropolitan University of Mexico/Mexico
2010-2013	Invited Lecturer, Nanorobots and Art/ Science and Art summer school at California NanoSystem Institute (CNSI)/UCLA/ Los Ángeles, USA. (2010, 2012, 2013)
2006-2008	Assistant Professor-Analytical Chemistry, Chemistry for bachelor's degree in chemistry, Biology, Chemical Engineering/ Autonomous University of Barcelona/Spain.

ORGANISATION OF SCIENTIFIC MEETINGS

06/2024	20 th Anniversary of Nanomotors, Barcelona, Spain. Chair and main organizer: 125 participants.
07/2022	International Conference on Micro-Nanomachines, Brno, Czech republic, Scientific Committee. Postponed.

07/2020	MARSS Meeting. (postponed to 2022). Toronto, Canada. Scientific Committee.
08/2019	International Conference on Micro-Nanomachines. Harbin, China. Organizing Committee.
07/2019	ICMS-IBEC Symposium on Bioengineering. Main organizer: 120 attendants.
10/2018	IBERSensors conference. Bellaterra, Barcelona. Scientific Committee.
11/2017	“NanoBiomed conference”. Barcelona Scientific Park, Barcelona, Spain. Scientific Committee. 150+ attendants.
08/2017	International Conference of Micro- and Nanomachines. Wuhan, China. Scientific Committee: 200 attendants.
09/2016	Symposium "Biomedical Micro/Nanosystems Engineering". Max Planck Schloss Ringberg, Germany. Organizer. 44 attendants.
08/2016	International Workshop "BioNav16": Principles of Biological and Robotic Navigation. Dresden, Germany. Organizer. 50 attendants.
06/2016	International Conference "Micro-and Nano-Machines: chemical and biological nanomotors". Hannover, Germany. Organizer. 100 attendants.
09/2015	EUROMAT2015. Warsaw, Poland Topic Coordinator of Session A1.2: Active Soft Materials. 150 attendants.
04/2015	German-American Frontiers of Engineering Symposium GAFOE-2015. Potsdam, Germany. Organizing Committee of session: Nano to MicroRobotics. 80 attendants.
04/2015	MRS Spring meeting-Symposium. San Francisco, USA. Organizer of a Tutorial
07/2014	International Conference "Micro-and Nano-Machines: Challenges and perspectives". Hannover, Germany. Organizer. 100 attendants.
07/2012	International Conference "Micro-and Nano-Machines: Challenges and perspectives". Dresden, Germany. Organizer. 48 attendants.

INSTITUTIONAL RESPONSABILITIES

2019-Present	Director for the Internationalization/IBEC/Barcelona/Spain.
2024- Present	Ambassador of Princess of Girona Foundation
2019-2022	Member of IGNITE and Master’s selection Committee; BIST/Barcelona/Spain.
2016-2018	Organizer of Internal Seminars on Nanomedicine/ IBEC/Spain.
2016-2019	Member of Working Group Academics/BIST/Barcelona/Spain.

COMMISSIONS OF TRUST

2026	ERC-StG LS9 Panel Member.
2023	Agencia Española de Investigación. Panel Ramón y Cajal fellowships.
2023	Evaluator of Helmholtz Institute.
2022	ER-StG-LS9 Panel member.
2021	ERC AdvG Evaluator.
2021	Austrian Science Foundation, Project Evaluator.
2021	Israel Science Foundation, Project Evaluator.
2021	Spanish Research Agency, Project Evaluator.
2021	La Caixa Foundation expert “Junior La Caixa” program -Panel Evaluator-.
2020	ERC-StG LS9 Panel Member.
2020	Princess of Girona Scientific Award – Evaluator-.
2020	Swiss National Science Foundation- Evaluator-.

2020	ERC Panel Member for ERC-Starting Grant/ERC Synergy Grant.
2019	ERC Evaluator of ERC-StG, ERC-CoG, ERC-AdvG and ERC SyG.
2019	International Advisory Board/ Advanced Intelligent Systems Journal/ Wiley/Germany.
2019	Evaluator for Spanish Ministry for Ramón y Cajal Fellowships, Spain.
2019	Jury for the International PhD Program for La Caixa Foundation, Spain. 2018 – Member of IGNITE evaluation panel; BIST/Barcelona/Spain.
2017-2018	International Master's selection Committee, BIST/Barcelona/Spain.
2017	Evaluator. Research Foundation - Flanders (Fonds Wetenschappelijk Onderzoek Vlaanderen)
2017	European Ambassador/ Innovators Under35, MIT Tech Reviews Innovator Award.
2016	Scientific Advisory Board/ Lab on Chip Journal/ Royal Society of Chemistry, UK.
2016	Advisory Board Member/Princess of Girona Foundation,/Girona/ Spain.
2016	Evaluator/ERC CoG and ERC AdvG/European Commission.
2016	Member/ Committee of New Initiatives / Young Award Advisor/Circulo Ecuestre de Barcelona/Spain.
2016	Evaluator/ Czech Science Foundation/Czech Republic.
2016	Evaluator/Referee PhD thesis. Nanyang Technological University, Singapore.
2015	Evaluator/National Science Foundation/Singapore.
2015	Evaluator/Board of Chemical Sciences (CW)/ Netherlands Organisation for Scientific Research (NWO)/ The Netherlands.

MEMBERSHIPS OF SCIENTIFIC SOCIETIES

2020-Present	Academic Member. Young Academy of Science, Spain.
2019-Present	Member of the Spanish Royal Society of Chemistry (RSEQ), Spain.
2015-Present	Member, Materials Research Society (MRS).
2015-Present	Alexander von Humboldt Humboldtian, Germany.
2013-Present	Member, American Chemical Society (ACS).

MAJOR COLLABORATIONS from last 5 years

D. Maspoch, Catalan Institute for Nanoscience and Nanotechnology/Spain. Lipobots and MOFtors.

D.-P., Kim, POSTECH/Korea. Microfluidic fabrication of micromotors.

J. Martinez, VHIO/Spain. Nanomotors for PMP diseases.

T.E. Park, UNIST, Korea. Colorectal cancer.

A. Roig, ICMAB/Spain. Mesoporous rods as micromotors.

R. Quidant, ICFO and ETHZ. 3D tracking of motors and Au-rods.

M. Arroyo, UPC, Spain. Theory on enzyme mobility on motors

E. Julian, UAB/Spain. Generation of bladder cancer models in mice

A. Vilaseca, Hospital Clinic/Spain. Patient-derived samples of bladder cancer.

S. Swartz, Hospital Vall Hebrón/Spain. Extra-cellular vesicles.

R. Martinez-Manez, UPV/Spain. Molecular gates for trigger release of drugs.

M. Sitti, Max Planck Institute for Intelligent Systems/Germany. Magnetic control of nanorobots.

F. Ricci, Uni Roma2/ Italy. DNA binding for biosensing with active nanoparticles.

M. Popescu, Max Planck Institute for Intelligent Systems/Germany. Theory of active matter.

W. Uspal, University of Hawaii/USA. Simulations of active colloids.

J. Llop, CIC BiomaGUNE/Spain. PET-CT imaging of microbots.

E. Schäffer, University of Tübingen/Germany. Force measurements using optical Tweezers.

I. Pagonabarraga/UB/Active particle simulations near interfaces.

J. van Hest/L. Abdelmohsen/ ICMS/TU/e/ The Netherlands/ Motion of protocells and enzyme motors.

M.Filice/ Universidad Complutense de Madrid/ Lipase enzyme functionalization for motion.

L. Albertazzi, Technical University Eindhoven/The Netherlands.Super Resolution. Microscopy.

S. Osuna/IQCC at Universidad de Girona/computational Molecular Dynamics of enzymes.

X. Ma/HIT Shenzhen, China. Mesoporous silica nanomotors

E. Julián/UAB Barcelona. Bladder cancer model in mice.

INVITED TALKS

1. 03/12-05/12/2025: Invited Speaker. Collective behavior of enzymatic nanomotors in 3D and in chemical gradients. Workshop CECAM:Unveiling self-phoretic colloidal propulsion.Lausanne,Switzerland
2. 02-05/12/2025: Keynote Speaker. Self-propelled nanobots crossing biological barriers. NanoBio&Med2025. Barcelona, Spain.
3. 02/10/2025: Invited Speaker. Enzyme propelled nanobots as efficient nanotech platform for bladder cancer therapy. CaixaResearch Health Meeting. Cap Roig.Spain.
4. 18/09/2025: Keynote Speaker. Bioengineering hybrid robotics for medicine: from nanoboats to 3D Bioprinting systems. UNIST-IBEC (Korea-Spain) Forum on Next-generation Bioengineering. Ulsan, Korea.
5. 03/09/2025: Keynote Speaker. Biohybrid systems integrating tissues and electronics for drug testing and robotics. BE-FLEX2025. Cagliari, Italy.
6. 16/07/2025: Invited Speaker. Toolbox of self-propelled nanomotors for bladder cancer therapy. CRS Annual Meeting & Exposition. Philadelphia, United States.
7. 08/07/2025: Invited Speaker. Bridging Scales in Biohybrid Robotics: From Nanobots to 3D Biobots. Biohybrid Robotics Symposium. Zürich, Switzerland.
8. 18/06/2025: Invited Speaker. Nanobots: Therapeutics in Motion. NanoSeries 2025. Valencia, Spain.
9. 26/05/2025: Invited Speaker. Biocompatible chemical nanoboats and their applications in biomedicine.12th GalenusWorkshop: Bioengineering the future of drug delivery. Porto, Portugal.
10. 25/05/2025: ITB's Seminar. Chemical Nanomotors:therapeutics in motion. University of la Laguna, Tenerife,Spain.
11. 24/03/2025: Invited Speaker: Active particles crossing biological barriers. ICMS-IBEC symposium. Eindhoven, The Netherlands.
12. 25/02/2025: Invited Speaker: Nanobots in the future of Medicine. ICREA Symposium, Barcelona, Spain.
13. 11/03/2025: Invited Speaker. Imagine active and self-motile nano-systems in vivo. EMIM 2025. Bilbao,Spain.
14. 31/01/2025: Invited Speaker: Healing Nanorobots. Medicine 2044. IIS Aragón, Zaragoza, Spain

15. 30/01/2025: Keynote Speaker: Biocompatible chemical Nanobots and their applications in biomedicine 5th SPLC-CRS, IQS, Barcelona, Spain
16. 02/01/2025: Invited Speaker. Collective behaviour of swarms of chemically propelled nanobots. C-TAMP. IISC Bangalore, India.
17. 6/12/2024. Invited Speaker. Biocompatible Chemical Nanobots and Their Applications in Biomedicine. MRS Fall Meeting, Boston, USA.
18. 05/11/2024. Keynote speaker. Biocompatible chemical nanobots and their applications in biomedicine. NanoBiomedconf 2024. Barcelona, Spain.
19. 24-25/10/2024: Invited Speaker & Panel member. Engineering biocompatible swarms of enzyme-powered nanomotors for in vivo applications. Active nano/microsystems in the Spanish context. Barcelona, Spain.
20. 15/08/2024: Invited Speaker and international organizer: Chemical nanomotors in biomedical applications. ArtBio-2024, Aarhus, Denmark.
21. 30/07/2024: Invited Speaker: Enzyme-powered Nanoparticles in biomedical applications. 3rd Workshop: Molecules, Materials, Devices and Systems in Medicine, Columbia University, NYC, USA
22. 19/07/2024: Invited seminar: Engineering biomedical nanobots for cancer treatment and beyond. California Institute of Technology (Caltech), Pasadena, USA.
23. 15/07/2024: Invited Seminar: Engineering Biomedical Nanobots for cancer treatment and beyond. UC San Diego, USA.
24. 01/07/2024: Biomimicry of swarms of small swimmers by enzyme-nanomotors .MARSS Conference. Delft, Netherlands.
25. 03/06/2024: Historical Talk on nanomotors. International Conference on Nanomotors, La Pedrera, Barcelona, Spain.
26. 15/03/2024: Keynote Speaker: ICMS Annual Symposium. TU Eindhoven, The Netherlands.
27. 15/01/2024: Invited Speaker. Chemically powered nanobots: swimming nanoparticles for biomedicine. ICONAN. Nanomedicine and Nanotechnology Conference. Barcelona, Spain.
28. 21/11/2023. Keynote speaker. Treating bladder cancer with self-propelled nanobots. NanoBiomedconf 2023. Barcelona, Spain.
29. 09/10/2023: Invited Speaker. Engineering biocompatible swarms of enzyme-powered nanomotors for in vivo applications. MARSS. Abu Dhabi, United Arab Emirates.
30. 11/07/2023. Keynote speaker. Enzyme-powered nanomotors crossing biological barriers in vivo. SOMMERS, South Ontario Medical Microrobotics Symposium. U. Waterloo, Canada.
31. 26/06/2023. Invited Speaker. Swarms of chemical nanomotors for cancer treatment: the case of bladder cancer. Hamlyn Symposium on Medical Robotics. London, UK.
32. 26/04/2023: Keynote Speaker. Nanobots a new nanotherapeutic modality in biomedicine. Nano Spain Conference. Tarragona, Spain.
33. 22/11/2022: Keynote Speaker. Nanobots going in vivo. Nanobio&Med. Barcelona, Spain.
34. 06/10/2022: Invited Speaker. Swarms of chemically powered nanobots as smart nanovehicles. ACM International Conference on Nanoscale Computing and Communication. Barcelona, Spain.

35. 29/05/2022: Invited Seminar. Hybrid micro-nanorobotics: coupling enzymes to biocompatible particles for biomedical applications. Fudan University, China. Online.
36. 22/05/2022: Keynote Speaker: Swarms of enzyme-nanobots going in vivo. Neobay Robotics Forum, hosted by Science Robotics. Online.
37. 16/05/2022: Invited Speaker: Hybrid Hybrid Machines: Artificial systems powered by biological units. SynCell Conference. Den Haag, The Netherlands.
38. 10/11/2021: Invited Speaker. Next generation of autonomous Hybrid Robots. Workshop on Future of nanomachines by IBS of Nanomedicine Institute. Seoul, South Korea.
39. 08-09/11/2021: Invited Speaker. Swarms of Hybrid and biocompatible Nanobots for Cancer Nanomedicine. IBS Forum on Nanomachines for Biotechnology and Medicine. Seoul, South Korea.
40. 25/09/2021: Keynote Speaker. Next generation of medical autonomous microrobots. EKFZ Innodays, Dresden, Germany.
41. 18/09/2021: Round Table speaker. EUCYS 2021, University of Salamanca, Spain.
42. 22/05/2021: Invited Speaker. Nature Conference on nanomotors for biotech. Dresden. (online).
43. 18/03/2021: Invited Seminar. Chemically powered nanobots: from single motion to collective swarming. Department of physics. University of Lisbon, Portugal.
44. 25/11/2020: Session Chair. Tumor-targeted drug delivery systems. Bioengineering and Medtech against cancer, Paris (online event).
45. 25/11/2020: Pitch competition. Selected top12 project start-up and R&D Projects. Nanobots for bladder cancer.
46. 23/10/2020: Engineering Hybrid nano-micro and milli-robots: from nanobots to 3D Bioprinted soft Robotics Florida A&M University –CBE Seminar Series (online seminar).
47. 10/07/2020: Keynote speaker. Swarming hybrid nanobots and their imaging in vitro and in vivo. NanoBioMed Online conference (NMBO2020), ONLINE conference.
48. 10/03/2020: Invited Seminar. (Bio)Engineering Life-Like Machines across different length scales: from nanobots to 3D Biobots, ICN2 · Nanobiosensors and Bioanalytical Applications, Bellaterra, Spain.
49. 02/12/2019: Keynote speaker and discussion panellist. Tiny self-powered submarines: Nanorobots for clean water. European Research Council (ERC) Conference: “Frontier Research: Creating Pathways to Sustainability”, Brussels, Belgium.
50. 20/11/2019: Keynote talk. Nanomotors: Artificial active matter for nanomedicine. NanoBio&Med 2019, Barcelona, Spain.
51. 15/10/2019: Invited AMN Seminar. Nanorobots as novel theranostic tools: smart drug delivery and imaging. CEITEC Nanorobots Center, Brno, Czech Republic.
52. 04/09/2019: Invited Seminar. Nanomotors for environmental and biological applications. School of Materials Science and Engineering. HIT Shenzhen, China.
53. 03/09/2019: Invited Seminar. Engineering Living Systems. Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, Shenzhen. China.
54. 02/09/2019: Invited Seminar. Nanorobots and Soft Robots. SUSTECH University, Shenzhen, China.
55. 29/08/2019: Invited seminar. Chemically powered nanomotor. Chemical Engineering School, HIT Harbin, China.

56. 28/08/2019: Keynote talk. Chemical nanorobots for medicine. Workshop on nanorobots for medicine, HIT Harbin, China.
57. 28/08/2019: Invited talk. Enzyme-powered hybrid micro-nano-motors: Fundamentals towards applications. 2nd International Conference on Micro/Nanomachines, Harbin, China.
58. 24/08/2019: Invited seminar. Nanomotors and Biobots. Xiamen University, China.
59. 25/07/2019: Enzyme-powered nanomotors from fundamentals to applications. Microscale Motion and light Workshop, Dresden, Germany.
60. 16/07/2019: Invited talk. Engineering living systems across length scales. IBEC-ICMS Symposium, Barcelona, Spain.
61. 15/07/2019: Invited Seminar. NanoBOTS to 3D BioBOTS as Future tools in Robotics and medicine, University Tor Vergata, Rome, Italy.
62. 26/06/2019: Enzyme-powered Nanorobots Towards their Applications in vivo: Enhanced Delivery, Sensing and Imaging. The Hamelin Symposium on Medical Robotics, London, UK.
63. 10/05/2019: Plenary Talk: Hybrid nanomotors: bioengineered active nano-systems powered by enzymes Opening Symposium B-Cube Dresden, Germany.
64. 07/05/2019: Invited Seminar: Active nanoparticles in fluids. University of Tübingen, Germany.
65. 03/05/2019. Invited ERC-Seminar: Nanobots to 3D BioBots as future tools in robotics and medicine Brussels, Belgium.
66. 05/02/ 2019: Nanorobots para nuevas terapias y limpieza de agua. Biennal Ciutat I Ciència. La Pedrera, Barcelona, Spain.
67. 28/11/2018: Oral talk: Bioengineering hybrid machines: from Nanobots to 3D Biobots. MRS Fall Meeting, Boston, USA.
68. 22/11/2018: Keynote talk. Bioengineering hybrid machines for nanomedicine and soft robotics/NanoBioMedConf, Barcelona, Spain.
69. 13/09/2018: Invited Seminar: Enzyme powered nanomotors from fundamentals to drug delivery. ICMS at TU Eindhoven, The Netherlands.
70. 01/08/2018: Keynote talk: Nanorobots as future tools in nanomedicine (and more)/London International Youth Science Forum (LIYSF), London, UK.
71. 28/05/2018: Invited Talk: Engineering Hybrid Machines: from nanobots to 3D BioBots. Molecular Machines workshop. Columbia University, New York City, USA.
72. 25/05/2018: Invited Seminar: Synthetic multifunctional Nanoswimmers/ Synthetic Biogoly Lab/Massachusetts Institute of Technology/USA.
73. 01/02/2018. Invited Seminar: Artificial Nanoswimmers as future tools in nanomedicine/ Stanford Medical School, Molecular Imaging Program at Stanford (MIPS) Department, San Francisco, USA.
74. 04/01/2018: Panel Chair talk: Fundamentals of active particles. Aspen School of Physics. Aspen, USA.
75. 21/12/2017: Invited talk: Nanorobots. El Pais con tu futuro, Kinopolis, Madrid.
76. 15/12/2017: Plenary talk: The chemistry and the materials of Micro-/Nano-machines Dept. Mat. Sciences, Physical, Organic and Inorganic Chemistry, University of Barcelona, Spain.

77. 23/11/2017: Keynote talk: Nanorobots and their future in NanoBiomedicine II Congreso Nacional de Jóvenes Investigadores en Biomedicina., Valencia, Spain.
78. 22/11/2017: Keynote talk: Enzyme Catalysis to Power Nanovehicles Towards Nanomedicine NanoBio&Med Conf., Barcelona, Spain.
79. 29/09/2017: Keynote talk: Hybrid [Micro- and Nano-machines] towards their applications in [Nanomedicine] Nanomedicine Summer School, Hospital Vall Hebron, Barcelona, Spain.
80. 14/09/2017: Keynote talk: Biohybrid [Robotic] Systems: Learning From Nature. Workshop Chem BioNano, CSIC, Barcelona, Spain.
81. 26/08/2017: Invited talk: Chemically and Biologically Powered [Micromachines]. International Conference on Nano-Micro-Machines, Wuhan, China.
82. 08/07/2017: Seminar: Chemically engineered structures for micromotors. Institut Català d'Investigació Química (ICIQ) Tarragona, Spain.
83. 08/07/2017: Invited talk: Química en movimiento: Energía química para propulsar NanoRobots Bojos per la Química, Tarragona, Spain.
84. 07/07/2017: Plenary talk: [NanoRobots] and their potential applications in biomedicine. Institut d'Investigació Sanitària Pere Virgili (IISPV), Reus, Spain.
85. 14/06/2017: Seminar: Chemically engineered architectures for [nanomotors] Radboud University, Nijmegen, The Netherlands.
86. 11/07/2017: Opening talk: Samuel and Nanorobots, a Fantastic Voyage BIYSC, La Pedrera House, Barcelona Spain.
87. 13/06/2017: Plenary talk: Biohybrid [Robotic] Systems: Learning From Nature.
88. 09/06/2017: Jornades de Biologia Molecular, Barcelona, Spain. Plenary talk: Powering tiny particles with catalysis: [self-powered nanomachines]. EChems Conference. Milano Maritima, Italy.
89. 03/05/2017: Keynote talk: Nanorobots for biomedical and environmental applications. Catalan Society of Chemistry, Barcelona, Spain.
90. 05/04/2017: Invited talk: Experimentando un viaje alucinante. International Center for Leadership Development (CEDE) (Spain (Catalonia)).
91. 12/12/2016: Seminar: Nanomáquinas, ciencia ficción o realidad. Universidad Autónoma Metropolitana (UAM), Mexico (Mexico).
92. 22/11/2016: Invited talk: Chemical Nanomachines as active drug nanovehicles. Bionanomed 2016, Barcelona (Spain).
93. 09/11/2016: Invited talk: Nanomicrobots what for. Universitat Pompeu Fabra, Barcelona (Spain).
94. 02/11/2016: Invited talk: Enzyme powered nanomachines: Science fiction or reality. University of Rome Tor Vergata / Roma (Italy).
95. 27/10/2016: Opening talk/Master of ceremony. MIT Innovators U35 Awards/Madrid (Spain).
96. 06/10/2016: Invited talk: La ciencia, un viaje alucinante. Master of Excellence Awards of Fundació Catalunya-La Pedrera, Barcelona (Spain)
97. 22-23/09/2016: Invited talk: Nanobots: catalysis powered nanoparticles. Colloquium at the Royal Academy of Sciences, Amsterdam, The Netherlands.
98. 15/07/2015: Keynote: Nanorobots: smart self-powered nanoparticles towards biomedical applications. GABBA International Conference 2016. Porto, Portugal.

99. 28/05/2016: TED Talk: Nanorobots. TEDx Plaça del Fòrum, Tarragona, Spain.
100. 15/04/2016: Public Talk: Nanorobots: esos diminutos submarinos que nos ayudarán en el futuro Caixa Forum, Girona, Spain.
101. 08/04/2016: Opening Lecture: Cómo experimentar un viaje alucinante PhD award ceremony. Autonomous University of Barcelona, Spain.
102. 16/03/2016. Invited Talk: Cómo experimentar un viaje alucinante International Course on Leadership Development. Granada, Spain.
103. 01/03/2016. Lecture: Nano-Robots and Nano-Machines: how small can you dream them? Nano-Robots. Award ceremony Joven Relevante, Barcelona, Spain.
104. 27-29/02/2016: Invited talk: Experiments on active matter at the micro- and nano-scale. International workshop Soft Matter at interfaces. Tegernsee, Germany.
105. 23/02/2016: Invited Lecture: Nanorobots: the future smart tools in medicine?. GABBA International PhD program. Porto, Portugal.
106. 19/02/2016: Invited Lecture: Fantastic Voyage: Back where everything started. Acte premis CatalunyaLa Pedrera, Mont Sant Benet, Barcelona, Spain.
107. 11/02/2016: Lecture: Nanobots Relevantes. Círculo Ecuestre de Barcelona, Barcelona, Spain.
108. 27-19/01/2016: Invited talk: NanoBots for Medicine and more. Global Robots Expo. Madrid, Spain.
109. 3-4/12/2015: Seminar: Engineering small self-powered nano-bio-devices. POSTECH/Chemical Engineering Department , Korea, Republic of (South Korea).
110. 1-2/12/2015: Seminar: Ultra-compact smart nano-bio-devices for (bio)sensing and nanorobotics POSTECH/Chemical Engineering Department , Korea, Republic of (South Korea).
111. 22-25/09/2015: Invited talk: Strategies for controlling and guiding catalytic micro-motors Gordon Conference Oscillations Instabilities in Chemical Systems, Stowe, USA.
112. 21/09/2015: Summer School: Microswimmers based on tubular micro- and nanojets Jülich Forschungszentrum , Germany.
113. 22-25/09/2015-07/03/2016: Students residence Ramon Llull, University of Barcelona, Spain.
114. Lecture: Nanomachines. Summer School, Jülich, Germany.
115. 22/9/2015: Highlight talk. Synthesis of chemically powered nanomotors. EUROMAT. Warsaw, Poland.
116. 7-11/09/2015: Keynote speaker: Nano-bots as future trends in nano-bio-medicine. TNT Conference. Toulouse, France.
117. 06/2015: Invited Appearance at MIT TR35 Germany representing Spanish innovators U35 2015, Berlin, Germany.
118. 22/06/2015: Invited talk: Engineering Chemical Micro-and Nanomotors. Engineering Chemical Complexity, Munich, Germany.
119. 27/05/2015: Plenary talk: Fantantic Voyage: where everything started. Jornades Doctorals, UAB Bellaterra, Spain.
120. 22/05/2015: Invited talk: Active Colloidal micromotors. , ZCAM Conference, Zaragoza, Spain.
121. 16/05/2015: Invited Talk: Smart Nano-Bio-Devices. TAU-IBEC Symposium, Barcelona, Spain.
122. 15/04/2015: Introductory Speaker: Nano-to Micro-Robotics. GAFOE Meeting, Potsdam, Germany.

123. 08/04/2015: Tutorial Lectures: Bio-inspired Micro-and Nanomachines. MRS Tutorial Spring Meeting. San Francisco, USA.
124. 09/12/2014: Colloquium: Lab-in-a-tube and Nanorobotics. Chemical Physics Faculty, Universität Stuttgart, Germany.
125. 01/12/2014: Invited talk: Chemically powered nanomotors: from simple actuation to collective behavior. Duplex Discussions Meeting, Tegernsee, Germany.
126. 13/11/2014: Keynote Speaker: Chemically powered nanorobots towards a “Fantastic Voyage” NanoBioMed Conference, Barcelona, Spain.
127. 13/10/2014: Invited talk: Chemically powered Micro- and Nano-motors. Fluctuation of Complex Systems, Venice, Italy.
128. 23-25/09/2014: Keynote speaker: V Conference CIDIQ (Congreso Internacional de Química) Mexico DF, Mexico
129. 15/09/2014: Keynote Invited talk: Bioinspired catalytic nanorobots: self-powered nano-bio-devices. Special Session at E-MRS. Warsaw, Poland.
130. 02/05/2014: Invited talk: Self-powered micromotors: origin of propulsion, motion control and potential applications. Soft Matter at Interfaces 2014, Tegernsee, Germany
131. 21-25/04/2014: Oral talk: Multifunctional Micro-motors from self-folded films cleaning polluted water. MRS Spring Meeting 2014, San Francisco, USA.
132. 21-25/04/2014: Oral talk: A Versatile 3D Tubular Platform for Single Cell Analysis and Study MRS Spring Meeting 2014, San Francisco, USA.
133. 15/04/2014: Invited Lecture: Ultra-compact smart nano-bio-devices for (bio)sensing and nanorobotics Universidad Metropolitana de México Azcapotzalco. Ciudad de México, México.
134. 05-07/03/2014: Invited poster presentation: Catalytic micromotors. MANA International Symposium 2014. Tsukuba, Japan.
135. 3-4/03/2014: Invited talk: Artificial Nanomachines Materials Nanoarchitectonics (MANA) Reunion Workshop. Tsukuba, Japan.
136. 14/03/2014: Seminar: Smart Nanodevices in nanorobotics and bio-nano-engineering. Institut de Bioenginyeria de Catalunya (Ibec Barcelona). Barcelona, Spain.
137. 20/03/2014: Invited talk: Bridging cell biology, chemistry and microfluidics with engineered nanomaterials. Cfaed Festival. TU Dresden. Dresden, Germany.
138. 20/02/2014: Seminar: Catalytic Nanomotors for active transport in lab-on-chip devices. Department of Chemical Technology. TU Dresden. Dresden, Germany
139. 11/02/2014: Seminar: Smart compact devices for bioapplications. University of Heidelberg. Heidelberg, Germany.
140. 14/11/2014: Seminar: Catalytic nanomachines: fundamentals and potential applications Department of “Theory of Inhomogeneous Condensed Matter”. Max Planck Institute for Intelligent Systems, Stuttgart, Germany.

OUTREACH ACTIVITIES

- Keynote speaker in Roundtable. NanoDay. 2025
- The 5th SPLC-CRS Young Scientifics Meeting. Talk invited. Barcelona, 30-21th January 2025
- Fundació Puigvert 57th Urology course. Exchange ideas and scientific advancements.

Barcelona, 16-18th October 2024

- Talk at POSTECH Korea, 12th November 2021
- Bienal Ciudad y Ciencia. Dissemination activity “Pecha Kucha express. Barcelona, 11th June 2021
- Talk at School center. “Escoles del Pallars”, Lleida, 29th March 2021
- XIV Jornada Invesjove 2021. Online keynote., Barcelon, 26th March 2021
- ERC Workshop -Crafting your ERC proposal-. March 2021 and February 2022.
- Plenay Talk at Ateneu Maó, Menorca, Spain. 5th April 2019
- Talk at High School center “Duc de Montblanc”, Rubí. 4th April 2019
- Setmana de la Ciència Plenary Talk, Teatre La Sala de Rubí, 7th Novembre 2018, Rubí, Barcelona.
- Public talk in collaboration with “Pint of Science”, 16th May, Barcelona.
- El Pais con tu Futuro. Keynote and speech corner. Madrid, December 2017., El Pais.
- Fundació Catalunya La Pedrera: plenary talk during the celebration event of “Premis de Batxillerat” given to the best students from the Catalan system before entering the university. Samuel also gave in person the “Premis de Màster” and a plenary talk.
- Bojos per la química: Samuel gave a talk at the program “Bojos per la Química” at the ICIQ (Tarragona), a program from the same foundation. In addition, Samuel gave a round table debate about “youth and talent” at the Pedrera House, in Barcelona.
- Premi extraordinary de Batxillerat: students visiting the Group’s lab in a general basis every summer from the “Premi extraordinary de Batxillerat”, who spend two-four weeks in our lab.
- NanoInventum: lecture at the FestNano Festival organized at CosmoCaixa building on Nanorobotics.
- 10alamos9: Plenary talk at the Library from Sagrada Familia.
- Princess of Girona Foundation: Advisory Board of an Educational Program “Educando Talento Emprendedor” and others related education for young kids. Talks about robotics and future technologies in “premiados y escuelas” programs.
- CaixaForum: I have given a talk at CaixaForum (Girona) to public viewing.
- First Lego League: I gave the opening talk at the final of the First Lego League in Logroño, in front of 2000 attendees. Also discussed with kids in the “speech corner”.
- Setmana de la ciencia: Outreach talk for the public at the Scientific Park of Barcelona, organized by IBEC and PCB.
- Joves i ciència. Accepting one Student every summer for internship in our lab.

TALENT: THESIS SUPERVISED

1. PhD Dissertation: Catalytic Tubular Microjet Engines
Dr. Alexander A. Solovev
03/2012. Physical Chemistry Department, Chemnitz University of Technology.
Grade: Magna Cum Laude
2. PhD Dissertation: Rolled-up microtubes as components for Lab-on-a-Chip devices
Dr- Ing. Stefan M. Harazim
05/2012. Electrotechnic and Information Engineering Faculty, Chemnitz University of Technology
Grade: Magna Cum Laude
3. PhD Defense: Active colloids

- Dr. Jaideep Katuri
09/2018. Faculty of Physics, University of Barcelona
Grade: Excellent Cum Laude
4. PhD Defense: Micromotors for Environmental Applications
Dr. Jemish Parmar
10.2018. Faculty of Physics, University of Barcelona
Grade: Excellent Cum Laude. **Awarded with the “Premi PIONER” from CERCA.**
 5. PhD Defense: Hybrid bio-robotics: from the nanoscale to the macroscale.
Dr. Rafael Mestre
12.2020. Faculty of Physics, University of Barcelona
Grade: Excellent Cum Laude. International Award. **Awarded “Premi PIONER” from CERCA.**
 6. PhD Defense: Unraveling the Fundamental Aspects of Enzyme powered Micromotors
Dr. Xavier Arqué
01.2023. Faculty of Farmacy/Biochemistry, University of Barcelona
Grade: Excellent Cum Laude.
 7. PhD Defense: Enzyme Powered Nanomotors Towards Biomedical Applications
Dr. Ana C. Hortelao ,
10.2021. Faculty of Physics/Nanoscience, University of Barcelona.
Grade: Excellent Cum Laude.
 8. PhD Defense: An experimental and theorethical view of autocatalytic colloides interacting with interfaces
Dr. Lucas S. Palacios
03.2022.Faculty of Physics/Physics, University of Barcelona.
Grade: Excellent.
 9. PhD Defense: Design and Evaluation of Enzyme-Powered Nanobots for Crossing Biological Barriers and Treating Cancer
Dra. Meritxell Serra i Casablanças
11.2024. Faculty of Pharmacy/Biochemistry, University of Barcelona
Grade: Excellent Cum Laude. International Award. **Awarded “Premi PIONER” from CERCA**
 10. PhD Defense: Motion of enzyme-powered nanomotors in complex media
Dra. Noelia Ruiz González
12.2025. Faculty of Physics, University of Barcelona
Grade: Excellent Cum Laude
 11. Mrs. Judith Fuentes,
03.2026.Faculty of Engineering, Polytechnical University of Catalonia.

PhD THESIS ONGOING

2026-Present: Serxio Álvarez Olcina
2026-Present: Marina Rovira Mañé
2025-Present: Haohui Li
2025-Present: Yasaman Keshmiri
2025-Present: Yangming Zhang
2023-Present: Ainhoa González Caelles
2023-Present: Inés Macías Tarrio
2023-Present: Carles Prado Morales

2022-Present: Shuqin Chen

2021-Present: Kristin Fichna

MASTER THESIS FINISHED

1. Adithya N. Ananth; Grade: 1.7 (1 max 5 minimum)
09/2012. Master Nanobiophysics.
Technische Universität Dresden.
2. Laura Restrepo; Grade: 1.0 (1 maximum). Erasmus Mundus
09/2013. International Master Nanoscience and nanotechnology.
Technische Universität Dresden.
3. Jaideep Katuri; Grade: 1.3 (1 maximum)
02/2014. University of Stuttgart, Germany.
4. Varun Shridar; Grade: 1.7 (1 maximum). Erasmus Mundus Fellow.
11/2015. University- Technische Universität Darmstadt. Germany.
5. Azaam Aziz; Grade: 1.3 (1 maximum)
28/10/2015; Max Planck for Intelligent Systems and Fachhochschule Jena:
14.12.2015; Germany.
6. Lucas Palacios; Grade: 9.2/10.
09/2016. Master's Degree in Advanced Physics. Faculty of Physics,
University of Barcelona, Spain.
7. Xavier Arqué; Grade: 10/10
09/2017. Master's Degree in Molecular Biotechnology Faculty of Pharmacy, University
of Barcelona, Spain.
8. Silvia Vicente Rizo; Grade: 9.7/10
07/2017. Faculty of Physics.
University of Barcelona, Spain.
9. Natalia Salvat; Grade 9.5/10
07/2018. Faculty of Physics.
University of Barcelona, Spain.
10. Xavier Barceló; Grade 10/10, Matrícula de Honor.
07/2018. Faculty of Physics.
University of Barcelona, Spain
11. Carlos Martínez Martín; Grade 8.7/10
09/2018. Faculty of Biology.
University of Barcelona, Spain
12. Ander Eguskiza; Grade 9.5/10
06/2018. Master's in pharmacy and Biotechnology.
University Pompeu Fabra, Spain.
13. Joaquim Llàcer Wintle; Grade 9.5/10
06/2019. Master of Multidisciplinary Research in Experimental Sciences, BIST,
Barcelona.
14. Nuria Cadefau Fabregat; Grade 9/10
08/2019. Master of Nanoscience and Nanotechnology in the Graduate Program of
Nanoscale Engineering
Université de Lyon, France.

15. Xavier Andrés; Grade: 9.9/10
09/2019. Master's Degree in Molecular Biotechnology, Faculty of Farmacy, University of Barcelona, Spain
16. Guido Van Moolenbroek; Grade: 8.5/10
10/2019 Faculty of Medicine, Leiden University, the Netherlands.
17. Nerea García; Grade: 9.2/10
02/2020. Master's Degree in Biomedical Engineering. UB - UPC, Spain.
18. Chiara Greco; Grade Excellent
27/02/2020. Master's Degree in Mechanical Engineering. Politecnico di Torino, Italy.
19. Laura Armero Hernández
23/04/2021. Master's Degree in Biomaterials. Complutense University of Madrid, Spain.
20. Maria Porteiro
05.07.2021. Master Degree in Applied Materials Chemistry Faculty of Chemistry, University of Barcelona, Spain.
21. Nohemy Pereira Veiga Moyar;
31.01.2022. Master's Degree in Bioinformatics and Bioestadistics. Open University of Catalonia, Barcelona, Spain.
22. Carles Prado Morales; Grade: 9.9/10
30.07.2022. Master's Degree in Molecular Biotechnology. Faculty of Pharmacy, University of Barcelona, Spain.
23. Anna Pushkareva; Grade: 9.3/10
30.06.2024. Master's Degree in Molecular Biotechnology. Faculty of Pharmacy, University of Barcelona, Spain.
24. Yangming Zhang; Grade: 9.6/10
01.07.2025: Master's Degree in Biomedical Engineering. Faculty Physics, University of Barcelona, Spain.

MEDIA APPEARANCES

- **Achievements highlighted in different media:** Digital Trends, Huffingtonpost, Watertechnology, Science Alert, Discoverynews; ABC, El Periódico, La Vanguardia, Tendencia 21, El Economista, ABC, EFE Futuro, El Día, Hoy, El País, El Mundo Financiero, Cadena Ser, El Periódico, La Razón, El Mundo – innovadores, El Periódico. [Green Future magazine](#), Chemie.de, IHK Braunschweig, news.discovery.com, Deutschlandfunk, Gizmag. [FOX News](#), Science for the Curious Discover, The Independent, [New Scientist](#), Vice Media Inc., [Le Figaro](#) – fr, FierceDrugDelivery, Tech Times. Nanowerk, Materials Gate, RSC Chemistry World, Mother Nature Network, [Chemistry Views](#), Ingenieur.de, [Phys.org](#), Pollution Solutions, Inovation Toronto, SciTech Daily, Innovations Report, GenesisNanoTech.
- **TV:** La2 – TIPs, Informativos, RTVE – LAB24 Informativos Tele 5; TVE1, La Sexta, MDR Hier ab Vier, Canal Sur, [Antena3](#), El Punt Avui TV, TV3, and more,
- Many of the major **radio** stations like Cadena Ser, Radio Nacional de España, Calatunya Radio, RAC1, Onda Cero, and more.
- The media coverage achieved was highly significant, with a total of **503 appearances across print, radio, television, and online outlets from 2021-2025**. The cumulative daily audience reached nearly 378 million, driven

primarily by strong online visibility, which accounted for **423 mentions** and more than **355 million impressions**. Traditional media also delivered substantial impact, particularly print press, with over **16.4 million readers** reached. Overall, the estimated **advertising value** equivalent exceeded **€6.8 million**, underscoring the strong media and communication impact of the initiative.

- **A full list of media and online links can be provided upon request.**

PATENTS

1. Catalase-powered nanobots for crossing mucus barriers
Patent number: EP23383129.6
Date: 06.11.2023
Inventors: M. Serra-Casablanca, V.Di Carlo, S.Sánchez
Applicant: IBEC/ICREA
2. Printing system for obtaining biological fibers Patent number: EP203825971
Date: 03.07.2020
Inventors: S. Sánchez, R. Mestre, M. Guix, T. Patiño
Applicant: IBEC/ICREA
3. Multifunctional enzyme nanomotors for biomedical applications. Patent number: PCTEP2019083662
Date: December 2018
Publication number: EP183828961 /WO2020115124 -in national phases-
Date: 11.6.2020
Inventors: S. Sánchez, A. C. Hortelao, T.Patiño Licensed to Nanobots Therapeutics S.L.
Applicant: IBEC/ICREA
4. Portable multistage device for micromotors assisted water treatment for organic, heavy metal, microorganisms' removal. Water treatment
Patent number: EP183825264/ WO2020011995A1
Date: 13.07.2018 and publication 16.1.2020
Inventors: S. Sánchez, J. Parmar, D. Vilela, K. Villa Applicant: IBEC/ICREA
Applicant: IBEC/ICREA
5. Method for positioning e.g. sensors in micro-electro-mechanical system, involves positioning microstructure elements within frame located on or below platform or between parts of frame, where parts of frame are extended over platform
Patent number: DE102012201713 Date: 6.02.2012
Inventors: S. Harazim, S. Sánchez, O.G. Schmidt. Applicant: IFW Dresden
6. Method for manufacturing micro fluid system used in e.g. medical field, involves providing connecting element with respect to the position on the primary polymer layer
Patent number: DE102012201714 Date: 6.02.2012
Inventors: S. Harazim, S. Sánchez, O. G. Schmidt, Applicant: IFW Dresden
7. Dispergatoren und Verfahren zur Abwasseraufbereitung. (Dispersants and methods for wastewater treatment)
Patent number: DE 10 2013202544.1
Date: 18.02.2013.
Inventors: L. Soler, V. Magdanz, S. Sánchez, O.G. Schmidt. Applicant: IFW Dresden
8. Method of controlling the positioning of motile cells in liquid or gaseous media Patent number: DE102012212427 and also WO2014012801. US Patent 20,150,164,554 Date: 23.01.2014 and 2018 for US.
Inventors: V. Magdanz, S. Sánchez, O.G. Schmidt.
Applicant: IFW Dresden

MAJOR PROJECTS as PRINCIPAL INVESTIGATOR

2026	<u>Fundación SEAT/CUPRA.</u> Nanobots en movimiento para aplicaciones en articulaciones Amount: 100.000€/year extensive to 4 years (total of 400.000€)
2025-2028	<u>Subvencions a projectes d'R+D 2025 (ACCIÓ). SCALEBOTS (Nanobots Therapeutics)</u> Nanopartículas autopropulsadas para cáncer de vejiga: desarrollo de candidato y escalado industrial Amount: 627.836,55€ (total, 99,669.00 € to the IBEC group)
2025- 2028	<u>Colaboración público - privada (AEI). RADIOBOTS</u> Desarrollo preclínico de nanomotores radiomarcados para la terapia de cáncer de vejiga Amount: 1.630.092,60 € (total, 246,315.00 € to the IBEC group)
2025-2028	<u>MICIU (Spanish ministry of Research and Universities). BiOrganiBOTS</u> Nanobots Orgánicos y Biodegradables para el Tratamiento de Tumores Mucinosos Amount: 170,000.00 € (individual)
2024-2026	<u>Beca Leonardo 2024 (Visualbots)</u> Organic-based enzymatic nanobots for their In vivo visualization at photoacoustic imaging technique Amount: 40,000.00 €
2024-2026	<u>European Research Council (ERC-PoC). OrthoBots</u> Therapeutic Effect of Nanobots in the Treatment of Joint Diseases Amount: 150.000€
2023-2025	<u>BIST Ignite. TriBionics</u> Triboelectricity-powered stimulations to model muscle tissue conditions Amount: 20.000€ This project was selected as “Award” for follow-up with 50.000€
2023-2025	<u>European Research Council (ERC-PoC). MucOncoBots</u> Drug-loaded nanobots for transmucosal delivery to mucinous tumours Amount: 150.000€
2022-2025	<u>HORIZON-RIA. BIOMELD.</u> A modular framework for designing and producing biohybrid machines. Amount: 4.5Mi€ (1.036k€ to IBEC, 558k€ to the group)
2022-2025	<u>MICIU (Spanish ministry of Research and Universities). BOTS4BB.</u> Biocompatible Nanobots as efficient nanovehicles for crossing biological barriers. Amount: 284.350,00€ (individual)
2022-2024	<u>MICIU (Spanish ministry of Research and Universities).BOJOS.</u> Bots in Joints. Amount: 149.500,00€ (individual)
2022-2024	<u>AGAUR</u> SGR-Grups de recerca consolidats. Amount: 40.000,00€ (individual)
2021-2024	<u>La Caixa Foundation. BLADDEBOTS.</u> Nanobots for bladder cancer treatment. Amount: 997.946,50€ (total budget, 563k€ to the group, Coordinator)
2021-2023	<u>Lubrizol S.A.</u> Nanoswimmers in skin treatments. Amount:15.000€

2021	<u>García-Cugat Foundation</u> Nanobot-aided efficacy of growth factors in the knee. Amount: 50.415€
2020-2025	<u>European Research Council (ERC-CoG)</u> Cooperative Intelligence in Swarms of Enzyme-Nanobots (i-NANOSwarms). Amount: 1.999.819,00€
2019-2021	<u>MICIU (Spanish ministry of Research and Universities).BOTSinFLUIDS.</u> Movimiento de nanorobots biocatalíticos en fluidos biológicos y medio complejo para un transporte eficiente de fármacos. Amount: 217.800€
2019-2020	<u>CAIXAIMPULSE La Caixa Foundation. TERANOBOTS</u> Nanorobots for bladder cancer theranostics. Amount: 70.000€
2019	<u>Lipotec S.A.U.</u> Effect of a New cosmetic active ingredient in the regulation of muscular function. Amount: 108.300€
2019	<u>Lipofoods S.L.U</u> Efecto de un nuevo ingrediente activo nutraceutico en la regulación de la relajación muscular. Amount: 16.200€
2019	<u>BIST Ignite. MOFtors</u> Enzyme-powered, metal-organic framework based motors. Amount: 10.000€
2019	<u>BIST Ignite. ElectroSensBioBOts</u> Towards a new generation of programable 3D printing living biobots with nanoelectronics for sensing and local stimulation. Amount: 10.000€
2018-2020	<u>Fundación Banco Bilbao Vizcaya Argentaria. MEDIROBOTS</u> Medical micro- and nano-Robots for Molecular Imaging. Amount: 125.000€
2018-2019	<u>European Research Council (ERC-PoC). LABPATCH</u> Lab-in-a-patch for PKU self-assessment. Amount: 150.000€
2017-2018	<u>Ministerio de Economía y Competitividad (Spain). ENZWIM</u> Enzyme-powered nano-motors from mesoporous silica nanoparticles. Amount: 60.500€
2016-2018	<u>Ministerio de Economía y Competitividad (Spain). MICRODIA</u> Sistemas Lab-on-a-Chip basados en micro- nanomotores para el diagnóstico de enfermedades. Amount: 111.000€ + 88.250€ for personnel
2014	<u>Volkswagen Foundation</u> 2 st International Workshop on Micro- Nanomotors: Challenges and Perspectives. Amount: 50.000€
2014	<u>Volkswagen Stiftung</u> Symposium “Micro- and Nanomachines 2014”. Amount: 51.000€

2013-2018	<u>European Research Council (ERC Starting Grant)</u> Lab-in-a-tube and Nanorobotic Biosensors. Amount: 1.500.000€
2012-2014	<u>German Research Foundation (DFG)</u> Motion of chemically active objects in confined spaces. Amount: 340.000€
2012	<u>Volkswagen Foundation</u> 1 st International Workshop on Micro- Nanomotors: Challenges and Perspectives. Amount: 26.000€
2012-2015	<u>Volkswagen Foundation</u> Rolled-up integrative bioanalytic microsystem for single cell and biological applications. Amount: 706.000€
09-12.2009	<u>Materials Nanoarchitectonics, (MANA), Japan</u> Guest visit abroad: Self-propelled microjets. Amount: 10.000€
2009-2010	<u>International Center for Young Scientists (ICYS), Japan</u> Nanomotors. Amount: 50.000€

TOTAL: 12Mi€

FELLOWSHIPS AND INDIVIDUAL RESEARCH GRANTS

2026-2028	<u>Juan de la Cierva Posdoctoral fellowship 2024</u> State Research Agency (AEI) Florescia Lezcano Amount: 76.600€
2025-2028	<u>IBEC's International PhD Programme fellowship (Severo Ochoa)</u> Spanish Ministry of Economy and Competitiveness Collaboration with the Vall d'Hebron Institut de Recerca (VHIR) Yasaman Keshmiri Sadat Amount: 106.000€
2025-2028	<u>IBEC's International PhD Programme fellowship (Severo Ochoa)</u> Spanish Ministry of Economy and Competitiveness Collaboration with the Institute for Complex Molecular Systems (ICMS) Yangming Zhang Amount: 106.000€
2025-2028	<u>ACC Talent Posdoctoral fellowship 2025</u> AECC's own private funds David Esporrín Ubieto Amount: 181.000 €
2023-2026	<u>Ajuts Joan Oró per a la contractació de personal investigador predoctoral en formació (FI 2023)</u> Agència de Gestió d'Ajuts Universitaris i de Recerca (AGAUR) Shuqin Chen Amount: 69.225,72€
2018-2022	<u>IBEC's International PhD Programme fellowship</u> Spanish Ministry of Economy and Competitiveness Xavi Arqué Amount: 82.000€

REFEREING ACTIVITIES

Nature, Science, Science Robotics, Science Advances, Nat. Nanotech., Nat. Chem., Nat. Commun. PNAS, Chem. Rev., Chem.Soc. Rev., Nano Lett., Angew. Chem. Int. Ed., ACS Nano, J. Am. Chem. Soc, Lab Chip, Adv. Mat, Langmuir, App.Mat.Today, and many more.

EDITORIAL ACTIVITIES

Editorial Board of Adv. Intelligent Systems, Focus Editor from Lab on Chip Journal, Associate Editor from J. Micro-Bio-Robotics, Guest Editor from IEEE Transactions on NanoBioSciences and Guest Editor for the Special Themed Issue “Self-Propelled Nano- and MicroSystems” in the Nanoscale Journal from RSC.

PUBLICATIONS

Total about **190 publications**, >125 as corresponding author, **+23063 citations**, **27 cover pages**
h-index 83 Google Scholar/73 Scopus;

2025

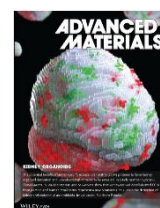
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2. Shuqin Chem, Donglei Emma Fan, Peer Fischer, Ambarish Ghosh, Kerstin Göpfrich, Ramin Golestanian, Henry Hess, Xing Ma, Bradley J Nelson, Tania Patiño Padial, Jinyao Tang, Katherine Villa, Wei Wang, Li Zhang, Ayusman Sen, Samuel Sánchez. A roadmap for next-generation nanomotors *Nat. Nanotech.*, **2025**, 1-11
3. Miriam Filippi, Diana Mock, Judith Fuentes, Mike Y. Michelis, Aiste Balciunaite, Pablo Paniagua, Raoul Hopf, Adina Barteld, Selina Eng, Asia Badolato, Jess Snedeker, Maria Guix, Samuel Sánchez, Robert K. Katzschnann. Multicellular muscle-tendon bioprinting of mechanically optimized musculoskeletal bioactuators with enhanced force transmission *Sci. Adv.*, **2025**, eadv262
4. David Esporrín-Ubieto, Juan C Fraire, Daniel Sánchez-de Alcázar, Samuel Sánchez. Engineered plasmonic and fluorescent nanomaterials for biosensing, motion, imaging and therapeutic applications *Adv.Mat.*, **2025**, 2502171
5. Afarin Khabbazian, Lauren Kwong, Aaron Lewis, Erica Liu, Noura Abdelrazec, Anna C Bakenecker, Nil Fontanals, Guillem Lopez, Samuel Sánchez, Juan Manuel Lopez, Brian Carrillo, Monica Farcas, Chris Kallweit, Alfred CH Yu, Mir Behrad Khamesee, Veronkia Magdanz. Kidney Stone Dissolution By Tetherless, Enzyme-Loaded, Soft Magnetic Miniature Robots *Adv Health. Mat*, **2025**, 2403423
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7. Xiaohui Ju, Chuanrui Chen, Cagatay M Oral, Semih Sevim, Ramin Golestanian, M Sun, N Bouzari, X Lin, Samuel Sánchez et al., Technology Roadmap of Micro/Nanorobots *ACS Nano*, **2025**, 19(27)



8. Tania Patiño Padial, Shuqin Chen, Ana C Hortelão, Ayusman Sen, **Samuel Sánchez**. Swarming intelligence in self-propelled micromotors and nanomotors *Nature Reviews Materials*, **2025**, 1-17
9. Judith Fuentes, Rafael Mestre, Maria Guix, David Esporrín-Ubieto, Ibtissam Ghailan Tribak, Noelia Ruiz-González, Tania Patiño, **Samuel Sánchez**. Bioengineering fascicle-like skeletal muscle bioactuators via pluronic-assisted co-axial 3D bioprinting (PACA-3D) *Biofabrication* **2025**,17(3), 035018
10. Brigitte Städler, Alexander N Zelikin, Julián Valero, Ebbe Sloth Andersen, **Samuel Sánchez**. Artificial Biology-Assemble, Imitate, Adapt *Adv. Biology* **2025**, 9(5), 2570102
11. Jonghyeuk Han, Hye-Jin Jeong, Jeonghan Choi, Hyeonseo Kim, Taejoon Kwon, Kyungjae Myung, Kyemyung Park, Jung In Park, **Samuel Sánchez**, Deok-Beom Jung, Chang Sik Yu, In Ho Song, Jin-Hyung Shim, Seung-Jae Myung, Hyun-Wook Kang, Tae-Eun Park. Bioprinted Patient-Derived Organoid Arrays Capture Intrinsic and Extrinsic Tumor Features for Advanced Personalized Medicine *Adv. Sci.* **2025**, 2407871
12. Noelia Ruiz-González, Daniel Sánchez-deAlcázar, David Esporrín-Ubieto, Valerio Di Carlo, **Samuel Sánchez**. Hyaluronic Acid-Based Nanomotors: Crossing Mucosal Barriers to Tackle Antimicrobial Resistance *ACS Appl. Mater. Interfaces* ,**2025**, 17(19), 27988-27999
13. Huimin Wei, Justin Ackers, Juan Fraire, **Samuel Sánchez**, Anna C. Bakenecker. Enzyme-powered magnetic nanomotors for magnetic particle imaging and magnetic fluid hyperthermia *International Journal on Magnetic Particle Imaging IJMPI*, **2025**, vol. 11 N° 1, supp 1
14. Noelia Ruiz-Gonzalez, David Esporrin-Ubieto, Il-Doo Kim, Joseph Wang, **Samuel Sánchez**. Micro- and Nanomotors: Engineered Tools for Targeted and Efficient Biomedicine *ACS nano*, **2025**, 19(9), 8411-8432 (**Front Cover Image**)
15. Anthony Jesús Martínez, Majid Basharat, Shuqin Chen, **Samuel Sánchez**, Katherine Villa. Flow-Active Liquid Marbles as Microreactors for Photocatalytic Micromotors *Small* **2025**,e05439
16. Jinwei Lin, Qiaoxin Guan, Jiangqi Feng, Shuqin Chen, Leilei Xu, Jianguo Guan, **Samuel Sánchez**. Interactions Between Active Matters and Endogenous Fields. *Adv.Mat.***2025**, e03091
17. Judith Fuentes, Maria Guix, Zoran M Cenev, Anna C Bakencker, Noelia Ruiz-González, Grégory Beaune, Jaako VI Timonen, **Samuel Sánchez**, Veronika Magdanz. Ferrofluid-Based Bioink for 3D Printed Skeletal Muscle Tissues with Enhanced Force and Magnetic Response *Adv.Mater.Interfaces* **2025**, 12, 2400824
18. Jinwei Lin, Shuqin Chen, Florencia Lezcano, Zhengshang Li, Leilei Xu, Jianguo Guan, **Samuel Sánchez**. Collective Dynamics of Urease-Based Nanomotors in a Chemical Gradient *Small* **2025**, 2502212
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23. Juan C Fraire, Carles Prado-Morales, Ana Aldaz Sagredo, Ainhua G Caelles, Florencia Lezcano, Xander Peetroons, Anna C Bakenecker, Valerio Di Carlo, **Samuel Sánchez**. Swarms of Enzymatic Nanobots for Efficient Gene Delivery *ACS Appl. Mater. Interfaces* **2024**, 16, 36, 47192–47205
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27. Brenda G Molina, Judith Fuentes, Carlos Alemán, **Samuel Sánchez**. Merging BioActuation and BioCapacitive properties: A 3D bioprinted devices to self-stimulate using self-stored energy *Biosens. Bioelectron* **2024**, 251, 116117
28. Tania Patiño Padial, Erica Del Grosso, Serena Gentile, Lorena Baranda Pellejero, Rafael Mestre, Lars JMM Paffen, **Samuel Sánchez**, Francesco Ricci. Synthetic DNA-based Swimmers Driven by Enzyme Catalysis *J. Am. Chem. Soc.* **2024**, 146, 18, 12664–12671 **(Front Cover Image)**
29. Cristina Simó, Meritxell Serra-Casablanques, Ana C Hortelao, Valerio Di Carlo, Sandra Guallar- Garrido, Sandra Plaza-García, Rosa Maria Rabanal, Pedro Ramos-Cabrer, Balbino Yagüe, Laura Aguado, Lúdia Bardia, Sébastien Tosi, Vanessa Gómez-Vallejo, Abraham Martín, Tania Patiño, Esther Julián, Julien Colombelli, Jordi Llop, **Samuel Sánchez**. Urease-powered nanobots for radionuclide bladder cancer therapy *Nat. Nanotechnol.* **2024**, 19, 554–564 **(Front Cover Image)**
30. Noelia Ruiz-González, David Esporrín-Ubieto, Ana C Hortelao, Juan C Fraire, Anna C Bakenecker, Marta Guri-Canals, Ramón Cugat, José María Carrillo, Montserrat Garcia-Batlletbó, Patricia Laiz, Tania Patiño, **Samuel Sánchez**. Swarms of Enzyme-Powered Nanomotors Enhance the Diffusion of Macromolecules in Viscous Media *Small* **2024**, 20(11), 2309387



31. Shuqin Chen, Carles Prado-Morales, Daniel Sánchez-deAlcázar, **Samuel Sánchez**. Enzymatic micro/nanomotors in biomedicine: from single motors to swarms *J. Mater. Chem. B*. **2024**, 12 (11), 2711-2719
32. Tania Patiño, Joaquin Llacer-Wintle, Sílvia Pujals, Lorenzo Albertazzi, **Samuel Sánchez**. Unveiling protein corona formation around self-propelled enzyme nanomotors by nanoscopy *Nanoscale* **2024**, 16(6), 2904-2912

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52. L. Palacios, S. Tchoumakov, M Guix, I Pagonabarraga, **S. Sánchez**, A. Grushin, Guided accumulation of active particles by topological design of a second-order skin effect. *Nature Commun.* **2021**. 12, 4691.
53. R Mestre, LS Palacios, A Miguel-López, X Arqué, I Pagonabarraga, **S. Sánchez**. Extraction of the propulsive speed of catalytic nano-and micro-motors under different motion dynamics. **2021**. arXiv preprint arXiv:2007.15316



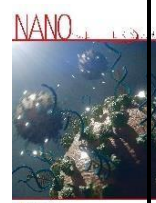
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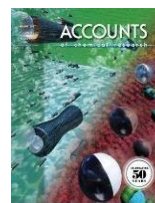
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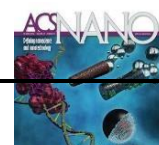
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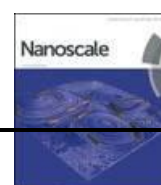


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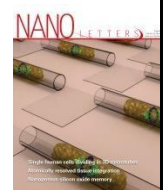
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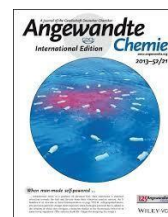
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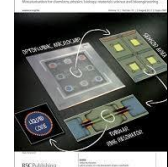
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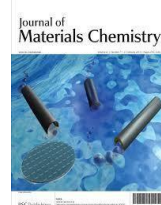
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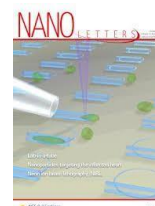


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