



Meet the contributors

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This topical collection is dedicated to those researchers whose daily lab work is the bread and butter of any good research project: Early-Career Researchers (ECRs). We thank all ECRs for their dedication and enthusiasm, which keeps chemistry alive and has resulted in the fantastic articles published herein.

This exceptional collection provides a voice and a place to present ECRs' research work – enjoy reading and meeting our contributors.



Miguel Aller Pellitero received his PhD from the Autonomous University of Barcelona (Spain) in 2019, working at the Microelectronics Institute of Barcelona (CSIC). Since then, he has been working as a postdoctoral research fellow at the Johns Hopkins University School of Medicine (Baltimore, USA). His research has been focused on the development of enzymatic and aptamer-based electrochemical biosensors for health-monitoring applications.

Published in the topical collection featuring *Promising Early-Career (Bio)Analytical Researchers* with guest editors Antje J. Baeumner, María C. Moreno-Bondi, Sabine Szunerits, and Qiuquan Wang.

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Laís Canniatti Brazaca received her MS and PhD degrees from São Carlos Institute of Physics, University of São Paulo (IFSC/USP), Brazil, in 2015 and 2019, respectively. She is currently a postdoctoral researcher in the Whitesides Research Group, Harvard University. Her specialties include biosensors for medical diagnosis, microfabrication, electrode modification, nanomaterials for sensing applications, and paper-based devices.

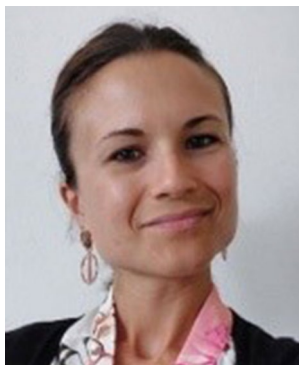


Alexander Bury is a final-year MRC PhD candidate based at both the Wellcome Centre for Mitochondrial Research (Newcastle University), supervised by Drs. Gavin Hudson, Amy Vincent and Angela Pyle, and at the Bragg

Centre for Materials Research (University of Leeds), supervised by Dr. Paolo Actis. Based on a long-held fascination in the involvement of mitochondrial DNA mutations in neurodegenerative disease and pathological ageing, including periods working as a research assistant at Imperial College London and the Institute of Genetic Medicine (Newcastle University), Alex is carving a research niche employing novel bio-nanotechnologies (subcellular biopsy, nanobiopsy, SICM) to overcome existing challenges in the investigation of mitochondrial disease.



Noelia Caballero-Casero is a postdoctoral researcher in the Supramolecular Analytical Chemistry group of the University of Córdoba. She is focused on the development of analytical methodologies with target and non-target approaches and the synthesis and application of supramolecular solvents for organic contaminant determination and the valorization of agri-food residues. She is highly involved in the transfer of knowledge to society, and, as result, she has been granted one international and two national patents.

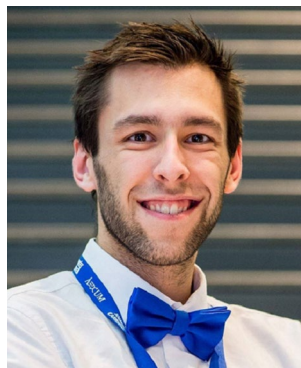


Martina Catani has been Assistant Professor in analytical chemistry at the University of Ferrara (Department of Chemical, Pharmaceutical and Agricultural Sciences) since July 2021. She received a PhD in chemical sciences in 2018 from the same university. She works in the field of liquid chromatography for both analytical and preparative

purposes. Her main research activities are focused on the fundamentals of kinetic and thermodynamic phenomena in chiral and achiral HPLC and SFC; the separation of cannabinoids and bio-macromolecules; and the purification of polypeptides, oligonucleotides, and proteins by means of single-column and continuous countercurrent multicol-column preparative LC. She is the author of more than 40 papers in peer-reviewed journals, and she has presented her research activities at more than 20 national and international scientific meetings. She has been the recipient of the international “Csaba Horváth Young Scientist Award” at HPLC2018 Washington (Washington, DC, USA) and of the national “2021 Young Researcher Award” conferred by the Analytical Chemistry Division of the Italian Chemical Society.



Simone Cavallera is a post-doctoral research fellow in the Bioanalytics Group, Department of Chemistry, University of Turin, Italy. His work is focussed on immunoanalytical methods for bioassays. His research field is based on the study, development, and optimisation of lateral-flow immunoassays (LFIA) for many applications from toxins (e.g., mycotoxins), drugs (e.g., antiretroviral drugs, hormones), and contaminants (e.g., residual antibiotics) to immune response, viral and bacterial antigens. His main research is strongly focussed on the study and development of a LFIA strategic approach for the rapid diagnosis of human (SARS CoV-2, HIV) and animal (visceral leishmaniasis, foot-and-mouth diseases) infectious diseases.



Benjamin Charron has obtained his BSc at the University of Montreal before moving on to the PhD program in analytical chemistry at the University of Montreal under the supervision of Jean-François Masson. He has worked on surface optimisation and characterization as well as various algorithms for data processing and spectral identification using machine learning. His research interests lie in surface plasmon resonance, SERS, chemometrics, machine learning, and instrument development.



David Clases became Assistant Professor for Analytical Chemistry at the University of Graz, Austria, in December 2021. He employs elemental mass spectrometry and associated hyphenated techniques to study the abundance, speciation, and distribution of elements in a biomedical and environmental context. He is interested in the application of analytical chemistry at the nano- and microscale and develops new approaches to characterise and utilise emerging nanomaterials with the aim of improving analytical capabilities.



Rong Chi obtained her bachelor's degree from the Department of Biochemical Science and Technology, National Taiwan University. She is currently enrolled in the master's program offered by the Department of Chemistry at National Taiwan University, where she is conducting her research under the supervision of Prof. Ja-an Annie Ho in the fields of DNA nanotechnology and biosensor development.



Lorenzo Cucinotta is a PhD student in chemical sciences at the University of Messina in collaboration with the Fondazione Edmund Mach. His current research deals with the evaluation of the $^{13}\text{C}/^{12}\text{C}$ isotopic ratio of key volatile compounds in premium products by employing monodimensional and multidimensional gas chromatography coupled to isotopic ratio mass spectrometry, in order to define specific genuineness ranges and unveil fraudulent additions.



Daniel Delafield is a PhD candidate at the University of Wisconsin-Madison, performing research under the supervision of Dr. Lingjun Li. With a background in bottom-up and top-down proteomics, glycoproteomics and ion mobility, he is currently investigating novel separation strategies for discovery glycoproteomics and developing analytical platforms for multi-tier glycoform investigation. Further applications involve investigating aberrant protein glycosylation in human disease and leveraging computer science and machine learning for unique biomolecular and proteomic insights.



Taylor M. Domenick, PhD, is a graduate of Prof. Richard Yost's group at the University of Florida, where she received several awards, including the Eastman Analytical Chemistry fellowship and an ORISE fellowship to conduct research at the Centers for Disease Control and Prevention in Atlanta, Georgia. Her background is in the development of ion-mobility mass spectrometric methods for enhancing coverage of the cellular metabolome. Presently, she is a research scientist at Solvay Specialty Polymers in Alpharetta, Georgia, where she is investigating both ion mobility and mass spectrometry based platforms for complex material characterization.



Coraline Duroux obtained a master's degree in chemical control and analysis at the University of Dijon (France). She performed her PhD at the Institute of Analytical Sciences at Villeurbanne, with Agnès Hagège, on the interaction of metal ions with various forms of amyloid- β thanks to miniaturized techniques.



Nafiseh Fahimi-kashani is Assistant Professor of Analytical Chemistry at Isfahan University of Technology. Her research mainly focuses on the development of sensor arrays using plasmonic and luminescent nanomaterials for the determination and discrimination of important chemical and biological active compounds.



Tiantian Fang received her PhD in chemical biology from the University of Science and Technology of China in 2019. She is now a postdoctoral researcher at the Institute of Chemistry, Chinese Academy of Sciences. Her research focuses on the interactions between proteins and metal-based anticancer complexes as well as bioimaging using high-resolution mass spectrometry (i.e., ToF-SIMS, LA-ICP-MS).



Kim Greis is a PhD candidate at the Freie Universität Berlin and Fritz Haber Institute, funded by the Luxembourg National Research Fund. He is interested in characterizing elusive intermediates via cryogenic gas-phase infrared spectroscopy and computational chemistry. In 2022, he joined the group of Prof. Mark Johnson at Yale University as a Fulbright Scholar.



Lucas Faria is a postdoctoral researcher at the Center for Research on Electroanalysis, Federal University of Uberlândia, Brazil. He has experience in the development of electrochemical sensors with carbon-based materials for monitoring antibiotics in biological, food and pharmaceutical samples through hydrodynamic systems such as flow injection and batch-injection analysis. Currently, his work is focused on the development of electrochemical devices using 3D printing for forensic applications.



Joana R. L. Guerreiro received her PhD in chemistry (2015) from the University of Porto, Portugal, in collaboration with Aarhus University, Denmark. Afterward, she worked as a postdoctoral researcher at iNANO (Denmark) for one year and at the International Iberian Nanotechnology Laboratory (Portugal) for four years. In 2021, she was awarded with a junior research position and since April she has been working at the Centre of Biological Engineering – University of Minho. Her main research interests focus on the development of optical biosensors, synthesis of metallic nanostructures, design of microfluidic systems, and paper-based devices for the detection of target analytes (biomarkers, DNA), applied to the health and environmental fields.



Qiang Han received his PhD from and continued his postdoctoral research in analytical chemistry at Tsinghua University. He is currently an engineer in the Analysis Center at Tsinghua University. His research interests focus on chromatography/mass spectrometry analysis and the development of novel functional materials and their applications in separation science.



Xue Jiang was promoted in 2021 to Associate Professor at Sichuan Normal University, Chengdu, Sichuan, China, and is presently a visiting scholar at Tsinghua University, Beijing, China. She received her PhD from Sichuan University before she began her teaching and research career on analytical spectral analysis and instrumentation, as well as nanofunctional materials for bioanalysis.



Deng-Ying Huang has a keen interest in analytical chemistry. She was a master program student in the Department of Applied Chemistry, National Chi Nan University (Puli, Nantou, Taiwan), when she got involved in the apoE-HDL project.



Carla Kirschbaum is a PhD student at the Freie Universität Berlin and guest scientist at the Fritz Haber Institute, funded by the German Chemical Industry Association VCI. Her research is focused on lipid analysis using innovative mass spectrometry based techniques, such as ion-mobility mass spectrometry and gas-phase infrared spectroscopy.



Mohit Kumar is Junior Leader at the Institute for Bio-engineering of Catalonia (IBEC) in Barcelona, Spain. He became a La Caixa Junior Leader Fellow in 2021 to start his independent research career. His interdisciplinary research focusses on utilizing advanced analytical methods to probe dynamic self-assembly in real time. Currently, he is developing soft material and active matter for applications in nanomedicine.



Yujian Lai is a postdoctoral researcher at Hangzhou Institute for Advanced Study of the Chinese Academy of Sciences in China. He mainly focuses on the development of analytical methods for engineering nanomaterials and microplastics in environmental and biological matrixes.



Jing Li now is a PhD student at the Southern University of Science and Technology under the supervision of Prof. Xiaojiang Xie. Her research interest currently focuses on developing functional fluorescent probes for the detection of bio-relevant chemical species.

Amir Lifshitz (without photo) is a graduate student at the Institute of Life Sciences, The Hebrew University of Jerusalem, Israel. He has been working for several years on developing *Escherichia coli* based bioluminescent bioreporters for the detection of a broad spectrum of explosives (both military-grade and improvised). He has implemented in his studies live-cell logic-gate circuits, to increase the specificity and selectivity of broad-spectrum sensors.



Pei-Ying Lin is currently a PhD candidate in the Department of Biochemical Science and Technology, National Taiwan University (Taipei, Taiwan), where she is conducting her research under the supervision of Prof. Ja-an Annie Ho. Her research interests include the design of nucleic acid biosensors based on the triplex DNA nanostructure using fluorescence or surface plasmon resonance as signal outputs.



Valentina Marassi has been Junior Assistant Professor in Analytical Chemistry at the Department of Chemistry (University of Bologna, Italy) since November 2021, where she manages the activity of the Separation Science Lab, obtaining grants from the Ministry of Education and from national bodies (UNIPHARMA, Marco Polo). Her research is focused on the development of analytical methods based on native fractionation and characterization of innovative structured materials in nanomedicine, drug stability, nanorisk assessment and safety-by-design. She has been an invited speaker at international conferences on separation science and analytical chemistry.



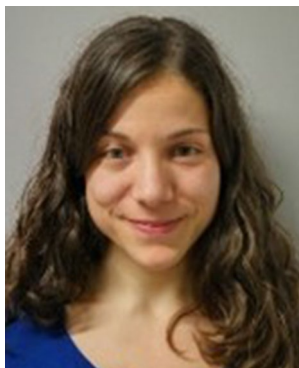
Elisabetta Mazzotta became Associate Professor of Analytical Chemistry at the Department of Biological and Environmental Sciences and Technologies of the University of Salento, in Lecce (Italy), in early 2022. Her scientific activity is mainly devoted to the development of biomimetic sensors based on molecularly imprinted polymers (MIPs), and their application to electrochemical and optical sensing. Her research activity is also focused on nanosized materials, ranging from the electrocatalytic properties of metal nanoparticles to the synthesis of micro- and nanostructured polymers, their chemical surface characterization by the XPS technique and their application in electrochemical sensors.



Emiliano Martínez-Periñán is Associate Professor at the Department of Analytical Chemistry and Instrumental Analysis of Universidad Autónoma de Madrid. He works in the Sensors and Biosensors group (led by Prof. M^a Encarnación Lorenzo). His has been working on the development of new functionalized nanomaterials with application in the sensor and biosensor fields and in the development of new electrocatalysts for analytical and energy applications.



Jaime Millán-Santiago is a PhD student at the Department of Analytical Chemistry of the University of Córdoba (UCO, Spain). His current research is based on the use of lignocellulosic materials in sample preparation, including the analysis of biofluids by mass spectrometry with forensic and clinical purposes.



Lidia Montero is a postdoctoral researcher at the Applied Analytical Chemistry Department of the University of Duisburg-Essen (Germany). Previously, she developed her research in the Foodomics laboratory of the Food Science Research Institute (CIAL-CSIC, Spain). Her main research lines are related to the development of advanced multidimensional analytical methods (LCxLC-MS, LC-IM-MS) for the evaluation of food quality, authenticity, and bioactivity. She received the PhD Extraordinary Award from the Faculty of Sciences of the Universidad Autónoma de Madrid and the first award granted by the Spanish Society of Chromatography and Related Techniques (SECyTA 2015, Castellón de la Plana, Spain). She was also a finalist of the Csaba Horváth Young Scientist Award (HPLC 2016, San Francisco, USA).



Soumya Mukherjee is a postdoctoral researcher in the Biomolecular Mass Spectrometry and Proteomics group at Utrecht University in Utrecht, Netherlands. He was the recipient of the prestigious IBRO-APRC Exchange fellowship (2014) and Australia Endeavour Research fellowship (2018). He has been working on the development of mass spectrometric methods for the detection of post-translational modifications (PTMs) of proteins, such as phosphorylation, isomerization, and citrullination, in diseases such as Alzheimer's and Parkinson's disease. He is interested in applying these techniques to understand the molecular mechanisms of neurodegeneration.



Katarína Nemčėková is a young researcher at the Institute of Analytical Chemistry, Faculty of Chemical and Food Technology of Slovak University of Technology in Bratislava (Slovakia). She won the award for an excellent Q1 publication, ranked among the first 30 best publications of the Slovak University of Technology. She has been focusing on the development of electrochemical biosensors for the detection of potentially toxic species and biomarkers for health diagnostics and prevention.



Tatchanun Ngamdee is a PhD student in the Sensor Technology Laboratory, Department of Biotechnology, School of Bioresources and Technology, King Mongkut's University of Technology Thonburi, Bangkok, Thailand. Her present interests are in the fields of electrochemical biosensors, miRNA detection, and point-of-care diagnostic devices.



Pavel S. Pidenko is a PhD student at the Institute of Chemistry, Saratov State University (Russia). His main research focuses on molecular imprinting, immunochemistry, and optical sensing of biomolecules. The developed sensors can be applied in food and environmental monitoring. He has authored or coauthored more than 20 articles in the past five years, and his current *h* index is 5 (March 2022). He has been awarded numerous prizes, including a scholarship from the Free State of Bavaria.



Ferra Pinnock is a PhD candidate in the Robert Frederick Smith School of Chemical and Biomolecular Engineering at Cornell University. She is a recipient of the Cornell Sloan Fellowship and the Howard Hughes Medical Institute's Gilliam Graduate Fellowship. Her research seeks to develop bio-mimetic microfluidic platforms that recapitulate cellular processes, such as glycosylation, in cell-free systems. She is currently working to realize glycosylation-on-a-chip technologies for the cell-free biosynthesis and engineering of glycolipids for fundamental and applied research.



Fernando Pradanas-González is a PhD student in the Department of Analytical Chemistry at the Complutense University of Madrid. His research is carried out in the Group of Chemical Optosensors & Applied Photochemistry (GSOLFA), under the supervision of Prof. María C. Moreno-Bondi and Assoc. Prof. Elena Benito-Peña. His research is focused on the development of new optical biosensing platforms for the analysis of mycotoxins in foodstuffs. He is currently working on the production of mycotoxin-mimetic peptides, obtained by phage display, for their application in innovative optical detection schemes for the control of these contaminants in complex food matrices.



Hai-Long Qian was promoted to Associate Professor in the School of Food Science and Technology at Jiangnan University in May 2019. His research interests mainly focus on advanced porous materials for sample pretreatment and chromatography in food and the environment.



Teresa Rodrigues is a PhD student in the Biosensors and Technologies group of the Austrian Institute of Technology affiliated to BOKU University of Natural Resources and Life Sciences. She is developing scientific works in the field of graphene field-effect transistor biosensors for the early detection of clinical and airborne analytes.



Adrián Sánchez-Visedo is a PhD student in the Analytical and Bioanalytical Spectrometry group (GEAB) at the University of Oviedo, Spain. He is currently working on the development of point-of-care biosensing strategies based on spectroscopic detection, through the implementation of nanoparticles with isothermal genetic amplification techniques, for their application in the detection of biomarkers of infections. He was awarded, at the International Congress on Analytical Nanoscience and Nanotechnology – IX NyNA 2019, with a prize for communication in the poster category for his innovative and particularly significant analytical research.



Lucia Sarcina is currently a research fellow at the University of Bari (Italy) and she finalized an industrial PhD project (2018–2021) in chemical and molecular sciences focused on the study of a standalone and disposable bio-electronic HIV sensor for point-of-care applications. At the age of 27, she is the co-author of 13 publications in international journals and she has made 14 international conference contributions. She has expertise in the characterization of modified gold surfaces, used as transducing systems for pathogen bio-recognition.



Juliane R. Sempionatto is currently a postdoctoral researcher at Caltech in Prof. Wei Gao's group. She received her PhD in nanoengineering from UCSD, working with Prof. Joseph Wang. She has expertise in developing wearable electrochemical sensors to monitor medically relevant biomarkers in sweat, saliva, tears, and interstitial fluid. Her research interests include soft and stretchable electronics, high-performance electrochemical biosensors, and biofuel cells. She is one of the recipients of the prestigious Siebel Scholar award (class of 2021).



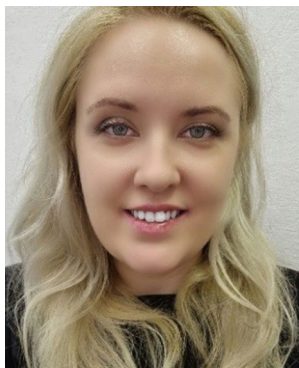
Seung Won Shin has been Research Professor at the School of Integrative Engineering, Chung-Ang University, since January 2021. He is working on multiplexed biomarker detection. Currently, his research focuses on the development of PCR primers and probes for specific amplification of cancer-associated single-nucleotide variants based on nucleic acid thermodynamics and molecular dynamics.



Jozef Sochr is a young researcher at the Institute of Analytical Chemistry, Faculty of Chemical and Food Technology of the Slovak University of Technology. He has experience with atomic absorption spectroscopy and electrochemical sensors based on boron-doped diamond. Currently, he focuses on the preparation and utilization of biosensors based on DNA and enzymes to investigate interactions of various compounds towards the DNA structure and to determine the content of compounds in samples.



Maria Soler is a senior researcher of the Nanobiosensors and Bioanalytical Applications group (NanoB2A) led by Prof. Laura M. Lechuga, at the Catalan Institute of Nanoscience and Nanotechnology (ICN2) in Barcelona (Spain). She obtained her PhD in biochemistry, molecular biology, and biomedicine in 2015 from the Autonomous University of Barcelona (UAB). The work was recognized with the Extraordinary Doctorate Award in 2016, and the Pioneer 2015 Award, for a thesis with special interest in technology transfer and commercialization. Her current research lines involve the design and development of novel nanophotonic biosensors for biomedical applications, with particular focus on sensor biofunctionalization methods and technology validation for point-of-care clinical diagnostics and novel therapeutic immunoengineering studies.



Veronika Svitková is a young researcher at the Institute of Analytical Chemistry, Faculty of Chemical and Food Technology, Slovak University of Technology in Bratislava, Slovakia. She received an award from Metrohm Czech Republic for the best publication by a young electroanalytical chemist, received a “Dean’s Prize” for outstanding fulfillment of academic duties and extraordinary results in research during doctoral studies, and was also awarded the “Marta Sališová Prize”, at the 73rd Congress of Chemists, by the Slovak Chemical Society. Currently, she focuses on the construction and application of biosensors for the detection of potential risk species as well as the investigation of DNA–guest interactions using electrochemical and optical techniques.



Francesca Torrini will soon defend her PhD thesis in chemical sciences under the supervision of Prof. M. Minunni and Prof. S. Scarano at the University of Florence, Department of Chemistry “Ugo Schiff”. She has been working for the last four years in the field of bioanalytical chemistry, mainly in developing diagnostic assays using catecholamine-based biopolymers, i.e., MIPs (molecularly imprinted polymers) to detect biomarkers of clinical interest. She is currently continuing her research on nanoMIPs for immunotherapy purposes, as Principal Investigator of a project funded by ‘Fondazione Roche per la Ricerca 2020’.



Ching-Ying Tsai is currently a doctoral student in the Department of Biochemical Science and Technology, National Taiwan University, Taipei, Taiwan. Her current research project is focused on development of DNA-based biosensors, especially electrochemical biosensors.



Alberto Valdés is a postdoctoral researcher in the Foodomics Laboratory at the Institute of Food Science Research – National Research Council (CIAL-CSIC, Spain). His research activity is focused on i) the development and application of advanced analytical methods to investigate the effects of natural food ingredients, natural extracts or foods, on the transcriptome, proteome and metabolome in different models; and ii) the identification of signal transduction pathways, metabolic processes, mechanisms of action, and the discovery of potential (bio) markers altered by those compounds using bioinformatics tools.



Chang Wang is Associate Research Fellow at the Food Safety Institute, Chinese Academy of Inspection and Quarantine. He is presiding over a project of the 13th Five-Year National Key R & D Program, and a project of the China Postdoctoral Science Foundation. His current research is focused on analytical chemistry, especially the application of liquid chromatography coupled with mass spectrometry to glycobiology and food safety.



Yu-Ling Wu is a doctoral student in the Department of Biochemical Science and Technology, National Taiwan University (Taipei, Taiwan), where she is conducting her research under the supervision of Prof. Ja-an Annie Ho. She has a keen interest in developing label-free DNA-based biosensors, especially with the use of DNA-templated metal nanoclusters as the fluorescence signal element.



Shuting Xu is now a postdoctoral researcher at the Institute of Analytical Food Safety, School of Food Science and Technology, Jiangnan University, and she received her PhD from the College of Chemistry and Molecular Engineering, Peking University. Her research interests focus on the establishment of novel mass spectrometric methods and their applications in fast screening and ultrasensitive detection of biomarkers, and she has been working for several years on the development of organic mass spectrometric immunoassays and organic mass cytometry.



Ying Yu is a Ph.D. candidate of geochemistry at Chengdu University of Technology (China). She received her bachelor's degree from Chengdu University of Technology (China) in 2017. She has been working for several years on the development of new photochemical reaction systems of elements and the exploration of their analytical/environmental applications. She has published ten scientific papers in this area.



Shakiba Zeinali is a PhD student in Prof. Pawliszyn's research group. Her area of expertise is in the development of filter-incorporated needle-trap devices to trap droplets/particles from aerosol samples. The goal is to combine multiple required methods for analysis of aerosol samples into one integrated device.



Hua Zhang is Postdoctoral Research Associate in Prof. Lingjun Li's lab at the University of Wisconsin-Madison. He is focusing on the development of novel mass spectrometry imaging (MSI) approaches for high-precision molecular structural elucidation and spatial distribution study of potential disease biomarkers through single-cell analysis and glycoproteomic/lipidomic visualization.

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