# Welcome to the FlowTex 2023 Cytometry Conference

### Tuesday, March 21, 2023

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|---|---|
| 8:45 – 9:00 | Workshop Opening Remarks |
| 9:00 – 11:50 | **Panel Design Workshop** |
| 12:30 – 5:15 | **Data Analysis Workshop** |

### Wednesday, March 22, 2023

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|---|---|
| 8:45 – 9:00 | Opening Remarks |
| 9:00 – 12:00 | **Clinical Cytometry Session** |
| 1:00 – 2:35 | **Translational Cytometry Session** |
| 3:05 – 5:00 | **Cytometry Core Lab Roundtable** |

### Thursday, March 23, 2023

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|---|---|
| 8:30 – 10:05 | **Advanced Technology Session** |
| 10:35 – 11:50 | **Experimental Design Session** |
| 1:45 – 2:30 | **Emerging Scientist Session** |
| 2:30 – 4:00 | **Cell Sorting Session** |
| 4:00 – 4:30 | Closing Remarks & Raffle |

## Conference Sponsors

**Tuesday, March 21, 2023**

## Panel Design Workshop

**8:00-8:45**   Registration & Breakfast

**8:45-9:00**   Opening Remarks by FlowTex Founder and Treasurer **Joel Sederstrom**

**9:00-9:50**   **Kelly Lundsten** *The Landscape of Fluorophores*

**9:50-10:10**   **Nicolas Loof** *BD Research Cloud*

**10:10-10:40** Coffee Break

**10:40-11:30** **Diana Bonilla Escobar** *How to build a successful 40 color panel*

**11:30-11:50** **Omar Abouzid** *A New Automated and Intelligent Panel Designer: Application for Panel Design on the Aurora 5L (OMIP-69), Sony ID7000, BD Fortessa*

**11:50-12:30 Lunch Sponsored by Fluorofinder**

## Data Analysis Workshop

**12:30-1:45**   **Nicolas Loof** *Unsupervised analysis using algorithms in FlowJo v10*

**1:45-2:15**   Coffee Break

**2:15-3:30**   **Robin Kamucheka** *Utilizing FCS Express to Demystify the Complexity of Creating High Dimensional Analysis Strategies*

**3:30-4:00**   Coffee Break

**4:00-5:15**   **Geoff Kraker** *Revisiting a Classic: What a little more time and a lot more experience can teach us*

# Wednesday, March 22, 2023

## Clinical Cytometry Session

**8:00-8:45**  Registration & Breakfast

**8:45-9:00**  Opening Remarks by FlowTex President **Ville Meretoja**

**9:00-9:50**  **Megan McCausland** *Spectral Flow Cytometry in the Clinical Arena: A robust platform for immune monitoring and biomarker discovery in clinical trials*

**9:50-10:40**  **David Ng** *I'm sorry, Dave. I'm afraid I can't do that…or can I? Bringing Machine Learning to the Clinical Flow Cytometry Lab*

**10:40-11:10** Coffee Break

**11:10-12:00** **Sa Wang** *Development and validation of a 12-color Flow Cytometry Assay for Acute Myeloid Leukemia Minimal Residual/Measurable Disease (AML MRD)*

**12:00-1:00**  **Lunch**

## Translational Cytometry Session

**1:00-1:50**  **Patricia Darrah** *Investigating correlates of protection against tuberculosis following IV BCG immunization in macaques*

**1:50-2:35**  **Jonni Moore**  *Leveraging the Academic Cytomics SRL as a Partner in Precision Diagnostics*

**2:35-3:05**  Coffee Break

## Cytometry Core Lab Roundtable

**3:05-3:50**  **Ana Longhini** *Setting up a panel design service: challenges and opportunities*

**3:50-4:35**  **Patricia Rogers** *What's next? The future of flow cytometry core facilities*

**4:35-5:00**  **Roundtable Discussion Jonni Moore, Ana Longhini & Patricia Rogers**— Moderated by **Rui Gardner**

**Thursday, March 23, 2023**

## Advanced Technology Session

**8:00-8:30**　Registration & Breakfast

**8:30-9:20**　**John Hickey** *Tissue Architecture Driven by Immune Cells*

**9:20-10:05**　**Dan Freeman** *TerraFlow, a New High Parameter Data Analysis Tool, Reveals Systemic T-cell Exhaustion and Dysfunctional Cytokine Production in Classical Hodgkin Lymphoma*

**10:05-10:35** Coffee break

## Experimental Design Session

**10:35-11:05** **Meredith Weglarz** *I'll just use what's in the box*

**11:05-11:50** **David Gravano** *Teach a Man to Fish: Empowering Researchers in Cytometry Experimental Execution and Data Analysis*

**11:50-1:45**　**Lunch & Ice Cream Social**

## Emerging Scientist Session

**1:45-2:00**　**James Lee** *Versatile Phenotype-Activated Cell Sorting*

**2:00-2:15**　**Vera Adema** *Flow cytometry-based assays to detect erythroid maturation in SF3B1-mutant myelodysplasic syndromes with ringed sideroblasts*

**2:15-2:30**　**Michela Marcatti** *Flow Cytometry-Proximity Ligation Assay: A method to study synaptic protein-protein interactions of isolated human synaptosomes (syn-FlowPLA)*

## Cell Sorting Session

**2:30-3:15**　**Evan Jellison** *What are we sorting? Basic cellular immunology for flow cytometrists*

**3:15-4:00**　**Karen Clise-Dwyer** *Cell sorting and sort logic: Making timely decisions at the cell sorter*

**4:00-4:30**　Closing Remarks & Raffle Prizes

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# Speaker Biographies

**Omar Abouzid, MS,** EasyPanel, A New Automated and Intelligent Panel Designer: Application for Panel Design on the Aurora 5L (OMIP-69), Sony ID7000, BD Fortessa.

Omar is the co-founder of EasyPanel, a Paris-based startup developing a fully-automated an intelligent tool for flow cytometry panel design (traditional and spectral), now licensed to 70+ flow core facilities (academic, biotech and large pharma). EasyPanel's proprietary algorithm minimizes spillover/spread between fluorochromes, matches antigens to fluorochromes based on their expression level, coexpression profile, fluorochromes brightness and commercial availability at BD, Biolegend, ThermoFisher, Miltenyi Biotec, Biotechne and others...Omar is also an MBA candidate at the Massachusetts Institute of Technology and a Master's graduate in Biosciences from INSA Lyon (France).

**Diana Bonilla Escobar, PhD, SCYM (ASCP) CM,** *Dealing with Autofluorescence by using Full Spectrum Profiling (FSP$^{TM}$)*

Diana Bonilla is a Microbiologist and Immunologist, with a Ph.D. from Texas A&M University, a postdoctoral degree from Baylor College of Medicine and an ASCP-accreditation as a cytometry specialist. She has more than 20 years of experience as a biomedical scientist for a variety of applications, including infectious diseases and cancer, working as a senior scientist at MD Anderson Cancer Center. She was one of the ISAC SRL emerging leaders and is highly involved in ISAC educational activities and task forces. She currently works as the Global Scientific Director for Cytek Biosciences.

**Karen Clise-Dwyer, PhD,** *Cell sorting and sort logic: Making timely decisions at the cell sorter*

Karen Clise-Dwyer earned her PhD at the University of Wisconsin-Madison, where she studied B lymphocyte deficiency, and then did a postdoctoral fellowship at the Trudeau Institute in Saranac Lake, NY where she studied CD4 T cell function in aging. She has directed UT MD Anderson's Advanced Cytometry and Sorting Facility since 2008. She is an Associate Professor in the Departments of Hematopoietic Biology & Malignancy and Stem Cell Transplantation and has been a professional cytometrist for over 20 years. Her research at MD Anderson focuses on single cell analyses in leukemia. She is a past-president of FlowTex and has been a member of the FlowTex organizing committee since it was formed in 2007.

**Patricia Darrah, PhD,** *Investigating correlates of protection against tuberculosis following IV BCG immunization in macaques*

Dr. Darrah received her PhD in Microbiology and Immunology from Temple University School of Medicine in 2001. She then joined Robert Seder's Cellular Immunology Section at the NIH Vaccine Research Center where she began using flow cytometry to understand vaccine-mediated protection—demonstrating the role of multifunctional CD4 T cells as a correlate of protection against *Leishmania major* infection in mice. She became a Staff Scientist in 2009 and transitioned to tuberculosis (TB) research in a nonhuman primate model, becoming Head of the VRC's Tuberculosis Unit under Bob Seder and Mario Roederer in 2016. Her work focuses on how vaccine route and dose influence immunity and protection against TB and on defining correlates of protection to facilitate translation of novel TB vaccines from pre-clinical animal models into humans.

**Dan Freeman, PhD,** *TerraFlow, A New High Parameter Data Analysis Tool, Reveals Systemic T-Cell Exhaustion and Dysfunctional Cytokine Production in Classical Hodgkin Lymphoma*

Since first teaching himself how to code when he should've been studying for the MCAT, Dan has been obsessed with using science and technology to hack outstanding challenges in health and society. Dan first learned about flow cytometry when working for Dr. Pratip Chattopdhyay at NYU Medical School. When his lab shut down during the pandemic, Dan turned his attention to flow analysis. He founded TerraFlow in his Brooklyn walkup, eventually helping clients like Novartis and Cleveland Clinic extract rich biological narratives from their single-cell datasets. Dan continues to grow TerraFlow while completing a PhD in computational biology at Harvard Medical School and teaching the undergraduate course "Moonshots: Ideas and Technologies Shaping the Future of Healthcare".

**David Gravano, PhD,** *Teach a Man to Fish: Empowering Researchers in Cytometry Experimental Execution and Data Analysis*

David Gravano is the Technical Director of Cytometry in the Stem Cell Instrumentation Foundry at University of California Merced. He earned his PhD at UC Merced in developmental immunology before performing postdoctoral work on regulatory T cell function at St. Jude Children's Hospital in Memphis, TN. In his role as an SRL director he oversees cytometry services for a broad and cross-disciplinary user base. He has worked for several years to implement changes to align his SRL with ISAC's best practices. He is a current ISAC emerging leader and serves on the ISAC SRL Recognition Program Task Force.

**John Hickey, PhD,** *Tissue Architecture Driven by Immune Cells*

John received his PhD in Biomedical Engineering from Johns Hopkins University, and is a postdoctoral fellow in the lab of Garry Nolan at Stanford where he uses and builds systems biology tools to describe spatial relationships between cells in tissues. His work has been recognized with receipt of multiple awards like the NSF Graduate Fellowship, ARCS Scholar, Siebel Scholar, Hans J. Prochaska Award, and American Cancer Society Postdoctoral Fellowship. In this seminar, John will provide answers to: How does cellular organization of the intestine change from the small intestine to colon? How does the cellular microenvironment contribute to chronic inflammation induced cancers where epithelial cells change from normal to metaplastic to dysplastic and finally to tumor? How do we design cellular therapies with capacity for changing their microenvironment in mind? How do we make sense of spatial-omics datasets and extract additional meaning?



**Evan Jellison, PhD,** *What are we sorting? Basic cellular immunology for flow cytometrists.*

Evan earned his doctoral degree from the University of Massachusetts Medical School, where he studied immune responses to viral infections. He then entered into postdoctoral training at UCONN School of Medicine studying immune tolerance in memory T cells. Throughout his training, flow cytometry has played a vital role in Evan's research and he gained substantial expertise in the technology. This ultimately resulted in him being hired to continue on at UCONN School of Medicine as a professor and director of flow cytometry. In this role, Evan continues to play an important role in nearly every aspect of research at the medical school, while training and educating students, fellows, and even the occasional P.I. Recently, Evan has migrated some of his expertise from the SRL into the clinical lab where he is the supervisor for clinical flow cytometry at UCONN's John Dempsey Hospital. Evan is an active member of his regional flow cytometry societies (Metroflow and New England Cytometry) and maintains an active membership role with ISAC, serving on both the ISAC Biosafety Committee and as chair of the Flow Cytometry Content sub-committee.



**Robin Kamucheka,** Utilizing FCS Express to Demystify the Complexity of Creating High Dimensional Analysis Strategies

Robin graduated summa cum laude from the Honors College with a BS in Biology from the University of Texas-San Antonio. She brings many years of flow and image cytometry experience to De Novo Software. She has designed, executed, and analyzed multiple experimental protocols for blood samples generated from human and animal research. Prior to cytometry work, she studied Chromosome 18 abnormalities and genetic expression in humans and Arabidopsis plants. Now at De Novo Software, Robin uses her unique background to partner with FCS Express customers to meet their data analysis objectives.

**Geoff Kraker,** *Revisiting a Classic: What a little more time and a lot more experience can teach us.*

Geoff Kraker is a Senior Application Scientist at OMIQ with over 14 years of experience in cytometry spanning from academic flow cores to instrument manufacturers and several cloud-based analysis platforms. He's a persistent advocate for data quality and is passionate about educating people in the field on approachable strategies for high-dimensional cytometry analysis.

**Ana Longhini, PhD,** *Setting up a panel design service: challenges and opportunities*

Ana is the Scientific Manager in the Flow Cytometry Core Facility at Memorial Sloan Kettering Cancer Center. She started working with flow cytometry early in her career as a Field Application Specialist for BD, just after finishing her master's degree in Immunology. In that time, she was responsible for training and educating new users in many different applications. In 2008, she joined the University of Campinas in Brazil to obtain her PhD in Immunology and to run the Flow Cytometry Lab at the Hematology Center, working with different types of diseases, cells, and assays. Ana moved to the USA in 2017 to start a Post-doc in a Stem Cell lab at the University of Alabama and later she was hired by UAB to work. at the Flow Cytometry Core, where she helped researchers in several applications such as sorting and image flow. In 2020, Ana worked as a Flow Cytometry Coordinator at the Immunotherapy Platform at MD Anderson Cancer Center, where she gained experience in high parameter panel design and unsupervised analysis of clinical trials. She has been collaborating with researchers in developing protocols and large panels of antibodies resulting in several publications. Ana is passionate about science and enjoys teaching flow cytometry. She is a member of the MetroFlow Steering Committee and serves on the ISAC SRL Content Subcommittee
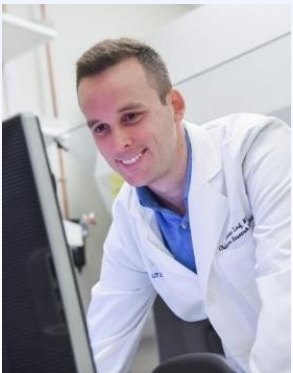
**Nicolas Loof, MS,** *Unsupervised analysis using algorithms in FlowJo v10*

Nicolas Loof has 10+ years of experience in the field of Flow Cytometry. He is currently a Senior Application Scientist, Multi-Omics Specialist at BD Biosciences. Between 2010-2012 Nicolas served as a Flow Cytometry SRL manager at Baylor Institute for Immunology Research and in 2012 he joined UT Southwestern in Dallas, Texas as the Director of the Moody Foundation Flow Cytometry facility servicing over 120 laboratories. In 2021 Nicolas moved to industry and joined BD-FlowJo. He is also a recognized Member of ISAC since 2010, a former member of the ABRF Flow Cytometry Research Group and a FlowTex committee member since 2011.

**Kelly Lundsten,** *The Landscape of Fluorophores*

Kelly Lundsten is a subject matter expert in fluorescence chemistry, flow cytometry and microscopy with 20 years of professional experience supporting assay design in advanced cellular applications, tools and platforms. Previously working with Molecular Probes, Invitrogen, Biolegend and Thermo Fisher, Kelly has contributed in various capacities from the design of complex panels, troubleshooting cellular assays, designing new fluorophores to further enable spectral cytometry applications and validating advanced instrumentation. Kelly now works at FluoroFinder as Director of Strategic Product Innovation working on tools to further advance the cytometry community.

**Megan McCausland,** *Spectral Flow Cytometry in the Clinical Arena: A robust platform for immune monitoring and biomarker discovery in clinical trials.*

Megan McCausland is the Scientific Advisor for Flow Cytometry at $Q^2$ Solutions, where she serves as a flow cytometry subject matter expert, engaging with clients to design state-of-the-art high-parameter panels to support global clinical trials across broad portfolio of indications. She joined $Q^2$ in 2013 as an Assay Development Scientist in the Translation Science Laboratory where she was responsible for development, validation and global implementation of multi-parameter flow cytometry assays. More recently, she has led the global deployment of the Cytek Aurora spectral cytometer as $Q^2$ Solutions' choice for their next generation flow cytometry platform. Prior to joining $Q^2$ Solutions, Megan spent 13 years in academia studying the generation and maintenance of immune memory at Emory University and La Jolla Institute for Immunology. She holds a BS in Biology from James Madison University.

**Jonni Moore, PhD,** *Leveraging the Academic Cytomics SRL as a Partner in Precision Diagnostics*

Jonni Moore, Ph.D. is the founding Faculty Director of Penn Cytomics and Professor of Pathology and Laboratory Medicine, Perelman School of Medicine. She has led the SRL to 30 years of National Cancer Institute's highest level of recognition for a shared resource. (exceptional). One of the world's leading experts in flow cytometry, she is looked to as a thought leader in cutting-edge applications of deep phenotyping flow cytometry in translational and clinical settings. Dr. Moore is also the founding director of the Clinical Cytometry Laboratory at the Hospital of the University of Pennsylvania and led that lab until 2016. She has over 150 peer-reviewed publications and is a frequent invited speaker at national and international meetings. She holds several patents for unique applications of flow cytometry in cardiology, toxicology and oncology. Building on her experiences in basic and translational research as well as clinical diagnosis, she has led the effort at Penn to bring technologies from the newly developing field of cytomics to investigators in diverse disciplines across the campus.

**David Ng, MD,** *I'm sorry Dave. I'm afraid I can't do that…or can I?*

David Ng is an Assistant Professor in the Department of Pathology at the University of Utah as well as a Hematopathologist, Scientific Director of Applied Artificial Intelligence, and Medical Director of Hematologic Flow Cytometry at ARUP Laboratories. He received his Bachelor's in Electrical Engineering from the University of Illinois at Urbana Champaign, Medical Degree from UI-Chicago, residency at Dartmouth Hitchcock Medical Center, and fellowship at the University of Washington. He has a special interest in the development and application of machine learning to clinical flow cytometry as well as implementation of high color flow panels to diagnostic and measurable residual disease testing.

**Patricia Rogers,** *What's next? The future of flow cytometry core facilities*

Patricia Rogers is the Associate Director of the Flow Cytometry Facility at the Broad Institute of MIT and Harvard and has worked in the field of flow cytometry for over 16 years. Patricia founded and has been leading the Broad Flow Facility for the past six years, which supports around 400 researchers from over 30 groups and programs. The facility has grown rapidly and now includes over 20 flow cytometers, genomics, and imaging instrumentation.

**Sa Wang, MD,** *Development and Validation of a 12-color Flow Cytometry Assay for Acute Myeloid Leukemia Minimal Residual/Measurable Disease (AML MRD)*

Dr. Sa Wang is a professor of pathology and the section chief of the flow cytometry in the Department of Hematopathology, The University of Texas MD Anderson Cancer Center. Dr. Wang's clinical expertise and research interest are in hematolymphoid neoplasms including the use of histopathology, flow cytometry and molecular genetics for disease diagnosis, classification and risk stratification. Dr. Wang has published over 290 original studies, 33 review articles and 25 book chapters for 7 reference books, an editor and author for "Diagnosis of Blood and Bone Marrow Disorders". Dr. Wang is an associate editor for Cytometry B Clinical Cytometry, council member, and currently the vice president for the International Clinical Cytometry Society. Dr. Wang has taught or directed many CME courses and served as organizer, moderator, panelist, or session chair at various meetings and workshops sponsored by USCAP, CAP, ASCP, ICCS, IAP, AMLI, SH-EAH, and EH etc, and an invited speaker at many institutions. Dr. Wang has participated in the writing practice guidelines for acute leukemia diagnosis as a joined effort by the CAP and ASH. Dr. Wang is one of the session chairs for the recent International Consensus Classification (ICC) of hematolymphoid neoplasms, a member of the AML MRD and MDS flow cytometry ELN groups. Dr. Wang has obtained multiple industrial funds to study tumor biomarkers.
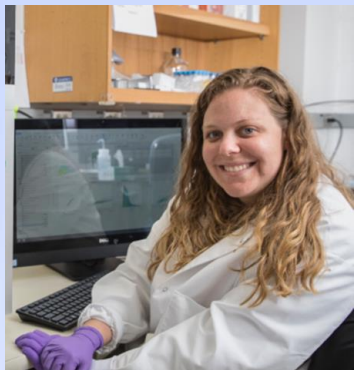
**Meredith Weglarz, MLA, SCYM,** *I'll just use what's in the box.*

Meredith Weglarz is currently managing the flow cytometry core at The University of Texas Medical Branch in Galveston Texas. Meredith previously helped manage the Stanford Shared FACS Facility before moving to Texas last year. She has worked in cores in both Academic and Industry settings and is a certified Specialist in Cytometry (SCYM) with over 10 years of flow cytometry experience, and knowledge. She is an active member of ISAC and is a committee member of the Flow Content Committee. She is a recent new member of FlowTex.

# Emerging Scientist Speaker Biographies



**Vera Adema,** *Flow cytometry-based assays to detect erythroid maturation in SF3B1-mutant myelodysplasic syndromes with ringed sideroblasts*

Dr. Adema is a post-doctoral fellow in the laboratory of Dr. Simona Colla in the Department of Leukemia at the University of Texas MD Anderson Cancer Center since 2020. She received her Master's and Ph.D. degree in cell biology in 2009 and 2016, respectively, from the Autonomous University of Barcelona (Spain). Dr. Adema has been trained in several prominent laboratories with a strong background of transformative work in myelodysplastic syndromes (MDS). This includes her Ph.D. training in Dr. Sole's lab at the Josep Carreras Leukaemia Research Institute and a postdoctoral fellowship at Dr. Maciejewski's lab at the Cleveland Clinic. From the beginning of her scientific career, Dr. Adema's research interest has been in the field of bone marrow failure disorders, particularly MDS. To date, MDS remains incurable with nontransplantation therapy and no new curative treatment for MDS has been developed in the last 10 years. At Dr. Colla's lab her research is focused on understanding the mechanistic consequences of SF3B1 mutations in patients with MDS and ringed sideroblasts. Dr. Adema described how SF3B1 mutations lead to the activation of the EIF2AK1 pathway in response to heme deficiency. Using mechanistic approaches, she successfully showed that EIF2AK1inhibition overcomes terminal erythroid differentiation. This project was awarded with the Tito Bastianello Award, from the MDS Foundation and it has been recently published in the Blood Cancer Discovery journal in 2022 (Adema et al., Blood Cancer Discovery 2022).

**James Lee, PhD,** *Versatile Phenotype-Activated Cell Sorting*
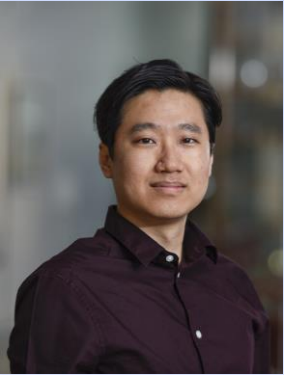
James Lee is a post-doctoral scholar in the St-Pierre Lab in the Department of Neuroscience at Baylor College of Medicine. James develops techniques that combine microscopy and flow cytometry. He uses computer vision, optics, and synthetic biology to enable experiments that were previously difficult or impossible to conduct. For example, he recently developed a versatile workflow called SPOTlight that can rapidly isolate individual cells with interesting spatial and temporal properties. For this work, James was awarded the Tony B. Travel Award from Society for Laboratory Automation and Screening (SLAS) and Innovation Fellowship from Rice University. James received his M.Sc. in Infection and Immunity at University College London and his Ph.D. in Systems, Synthetic, and Physical Biology at Rice University



**Michela Marcatti, PhD,** *Flow Cytometry-Proximity Ligation Assay: A method to study synaptic protein-protein interactions of isolated human synaptosomes (syn-FlowPLA)*

Michela Marcatti is a Research Scientist at the Mitchell Center for Neurodegenerative Disease (MCND) at the Neurology Department of the University of Texas Medical Branch (UTMB) at Galveston. She earned her Ph.D. in "Biomedicine e Neuroscience (BioNec)" – Experimental Oncobiology" at University of Palermo, Italy. As a Ph.D student, she spent one year at the Biotech Research and Innovation Centre (BRIC) in Copenhagen, Denmark. After graduation she joined UTMB as post-doctoral fellow at the Anesthesiology Department and then at the Neurology Department where she was advanced as research scientist of the MCDN. During these years she expanded her knowledge in cellular biology, therapeutic strategies, molecular biology, mitochondria, inflammation, brain biology and diseases and she developed many lab skills. Since she joined the MCDN her research focuses on Alzheimer's Disease (AD) and flow cytometry has been an indispensable tool to investigate the molecular mechanisms at the basis of the synaptic vulnerability and toxicity that cause AD cognitive decline.