FlowTex 2020 Speaker Biographies

Maria Teresa Sabrina Bertilaccio, PhD, *Immunomodulation in Chronic Lymphocytic Leukemia*

Dr. Bertilaccio is an Assistant Professor, RFA in the Department of Experimental Therapeutics at MD Anderson Cancer Center. She obtained a PhD Degree in Molecular Medicine/Immunology from San Raffaele University in Milan, where she investigated novel strategies of immunotherapy in prostate cancer. During the past years Dr. Bertilaccio has focused her scientific interests on translational research and cancer by giving important insights (i) in developing novel animal models of lymphoid malignancies, (ii) in identification of significant mechanisms of cancer pathogenesis, (iii) in exploiting innate and adaptive immunity for innovative therapeutic strategies in solid and lymphoid tumors, (iv) in designing novel therapeutic strategies for Chronic Lymphocytic Leukemia (CLL). Her recent work on trabectedin and its immunomodulatory activity has led to the first clinical trial with trabectedin in CLL, now open for enrollment at MD Anderson.

Pratip Chattopadhyay, PhD, *Molecular Cytometry: Optimization, Characterization, and Application in Immuno-oncology*

Pratip Chattopadhyay, PhD is an Associate Professor (Pathology) and founding Director of NYU Langone Health's Precision Immunology Laboratory (PIL). His laboratory performs independent research in tumor immunology and provides cutting-edge immune monitoring services for a wide variety of biomedical disciplines (cancer, infectious disease, rheumatology). He uses high parameter cytometry technologies, including 30-parameter flow cytometry and combined protein/mRNA analysis by RNA sequencing (molecular cytometry), to reveal biomarkers that predict patient outcomes, better understand disease pathogenesis, and inform rational design of combination drug therapies. Dr. Chattopadhyay has a history of innovative work in the cytometry and immunoassay space. In 2005, as a post-doctoral fellow in Mario Roederer's laboratory (VRC/NIH), he developed a novel assay for enumeration and isolation of antigen-specific CD4+ T-cells, based on CD154 expression (Chattopadhyay, et al. Nature Medicine, 2005). In 2006, he reported the first 18-color flow cytometry experiments, which were used to comprehensively characterize antigen-specific T-cells against multiple antigenic epitopes in the same tube (Chattopadhyay, et al. Nature Medicine 2006); this study was the first use of quantum dots for flow cytometry. In 2008, he performed the first flow cytometry experiments with the Brilliant family of fluorescent dyes, which were published in 2010. This work increased the multiplexing capability of advanced flow cytometers, culminating in the development of the most advanced flow cytometry system in the world (30-parameter flow cytometry). Dr. Chattopadhyay co-led this effort for the Roederer Lab with BD Biosciences. He also contributed to the development of CITE-seq (benchmarking the new technology against flow cytometry, Nature Methods 2017). Finally, Dr. Chattopadhyay played a key role in the development of a number of bioinformatics tools for analyzing

high parameter data, including SPICE (Roederer), flowType and R-chyoptimyx (Aghaheepour and Brinkman), and CytoBrute (new from the Chattopadhyay lab). Recently, the lab introduced a unique tool for building high parameter flow cytometry panels, known as Color Wheel. Dr. Chattopadhyay serves as an Associate Editor for Cytometry and the Journal for Immunological Methods. He was the Scientific Chair for CYTO2019. He is a proud graduate of the Johns Hopkins Bloomberg School of Public Health (Ph.D.) and the University of Virginia (B.A.).

Tyler Curiel, MD, MPH, *Using flow cytometry to understand mechanisms for cancer immunotherapy*

Dr. Tyler Curiel is a physician-scientist with clinical expertise in phase I experimental therapeutics and gynecologic cancers. His laboratory expertise is in human immunology with an emphasis on understanding the immunopathologic basis of human diseases including cancer, infections and autoimmunity. He has significant administrative expertise as past chief of two different academic divisions of hematology and medical oncology, director of a general clinical research center and executive director of an NCI-designated cancer center. He translates his group's discoveries into novel clinical trials. Dr. Curiel's initial work in human immunology focused on anti-pathogen immunity that helped to develop important research techniques and collaborations that supported current endeavors. At the Baylor Institute for Immunology Research, Dr. Curiel was fortunate to get much on-the-job experience in dendritic cell biology. These efforts grounded his work that was done at Tulane where is group extended these early dendritic efforts to include studies of dendritic cells in the tumor microenvironment, helping launch detailed studies by many investigators on tumor microenvironmental cells. Studies extended to include tumor microenvironmental regulatory T cells (Tregs) which spawned many additional studies of their microenvironmental effects in cancer, among his most important contributions to date. His research team's current focus is understanding immune dysregulation in cancer as a means to understand cancer immunopathogenesis and develop novel cancer immunotherapies. Their goal is to define basic mechanisms of disease immunopathogenesis that can be used to understand disease development and progression, and to guide development of effective therapies for cancer, autoimmunity, infections and age-related debilities. The group has been continuously funded by the NIH since 1987.

Michael Curran, PhD, *Pro-inflammatory remodeling of the pancreatic cancer stroma by STING agonists of ascending potency*

In four years at the University of Virginia, Dr. Curran completed B.A. degrees in biology and foreign affairs and a minor in computer science while receiving accolades for the best undergraduate laboratory research project. He next received a Ph.D. in Immunology from Stanford University where he was awarded the McDevitt prize for the best graduate thesis in his year. Dr. Curran was the first recipient of the prestigious American Cancer Society Levy Fellowship to fund his post-doctoral studies in the lab of Dr. James P. Allison. While pursuing his postdoctoral studies at

Memorial Sloan-Kettering Cancer Center, Dr. Curran published several influential manuscripts describing how T cell co-stimulatory pathways could be modulated in tandem to mediate immunologic rejection of melanomas in mice. Dr. Curran described how combination blockade of the T cell co-inhibitory receptors CTLA-4 and PD-1 promoted the rejection of a majority of murine melanomas. This work supported the launch of a Phase I clinical trial in which greater than 50% of metastatic melanoma patients experienced objective clinical responses - a result so unprecedented that this became the first FDA-approved immunotherapy combination. In addition, his subsequent immunologic studies of 4-1BB agonist antibodies earned him the Society for the Immunotherapy of Cancer's prestigious Presidential Award. At the MD Anderson Cancer Center, Dr. Curran is an Associate Professor of Immunology as well as co-Scientific Director of the Oncology Research for Biologics and Immunotherapy Translation (ORBIT) program that coordinates development and production of clinical immunotherapeutic antibodies. The Curran Lab seeks to discover the underlying mechanisms of immune resistance in the "coldest" tumors, pancreatic and prostate adenocarcinoma and glioblastoma, so that rational therapeutic interventions can be developed to restore T cell infiltration and sensitivity to T cell checkpoint blockade (for which TIL are the substrate).

Joe DiGiuseppe, MD, PhD, *High-Dimensional Multicolor Panel Design for Clinical Flow Cytometry: Real-World Challenges and Practical Solutions*

Joseph DiGiuseppe, MD, PhD received his M.D. and Ph.D. from Washington University in St. Louis, and subsequently completed residency and fellowship training in anatomic/clinical pathology and hematologic pathology at Johns Hopkins. He has directed the flow cytometry laboratory at Hartford Hospital since 1998, and is a past president of the International Clinical Cytometry Society. Joe is a practicing hematopathologist who fell in love with flow cytometry during his training with Mike Borowitz at Johns Hopkins. Since then he has been directing the flow cytometry lab at Hartford Hospital, and more recently, he has joined the TexFlow consortium, which has been developing 10-color panels suitable for clinical use.

Ryan Duggan, *Dissecting the Tumor Micro-Environment using High Dimensional Spectral Cytometry*

Ryan Duggan is currently a Senior Scientist in Immuno-Oncology and team leader of the Oncology Flow Cytometry group at AbbVie, Inc. in North Chicago, IL. Prior to this, he was the director of the flow cytometry core facility at the University of Chicago. His current interests revolve around using single-cell technologies to better understand the immune system's role in solid tumor cancers, focusing most of his attention towards the interface between high dimensional fluorescence cytometry and single cell genomics platforms.

Kathleen Gallagher, PhD, *Standardized approach to phenotyping for Cell therapy Clinical Trials*

Dr. Gallagher's principal interest is in the development of assays for the characterization and monitoring of immune responses to immunotherapeutic treatments in patients with cancer. The Immune Monitoring Laboratory in MGH focuses on the provision of a high quality service to support clinical trials performed at Mass General Hospital, with a particular focus on CAR-T therapies. In her previous role in the UK, Dr. Gallagher directed an ISO-15189 accredited immunophenotyping referral service in Birmingham University. In addition to routine flow cytometry for diagnosis and monitoring of hematological malignancies and immunodeficiencies, she also validated a sensitive flow measurable residual disease (MRD) assay for the NCRI AM18 and AML19 MRD trials. She was responsible for overseeing processing and analysis of over 2,000 patient samples from both national and international sites. Prior to her role as a clinical scientist, Dr. Gallagher's PhD and post-doctoral roles focused on anti-viral T cell and NK immune responses in patients with chronic viral infections. Her career goal is to help to improve patient outcomes and personalized treatments in order to maximize efficacy and minimize treatment-related toxicity.

Irene Gañan-Gomez, PhD, *Characterization of abnormal hematopoietic stem and progenitor cell hierarchies in myelodysplastic syndromes*

Dr. Ganan-Gomez's pre-doctoral studies in the Department of Systems Biology at Universidad de Alcala (Madrid, Spain) focused on the molecular mechanisms underlying resistance to cell death in myeloid leukemias. Under Dr. Guillermo Garcia-Manero in the Department of Leukemia at MD Anderson Cancer Center, she specialized in the pathogenesis of myelodysplastic syndromes (MDS) as she studied the involvement of epigenetic deregulation and innate immunity in MDS and conducted research on the role of microRNAs in this disease. In 2014, Dr. Ganan-Gomez returned to MDACC as a Postdoctoral Fellow to continue her research on MDS pathogenesis with a focus on the hematopoietic stem cell (HSC) origin of the disease, mentored by Dr. Simona Colla. Dr. Ganan-Gomez gained especial interest in HSC-intrinsic mechanisms that lead to the differentiation abnormalities that characterize the MDS phenotype and, particularly, in those that drive therapy failure and disease progression. In this period, she elucidated the role of specific HSC subpopulations in those processes and characterized molecular mechanisms involved. She successfully identified and validated specific molecular targets as key factors in MDS progression, and proposed different targeted therapeutic approaches to treat progressive disease. Dr. Ganan-Gomez's current research is aimed at (a) understanding the cellular and molecular mechanisms involved in the hematopoietic differentiation abnormalities characteristic of MDS in treatment-naïve patients and patients who fail standard therapy, and (b) unraveling the stem cell mechanisms driving pre-MDS syndromes such as idiopathic and clonal cytopenias of unknown significance.

George Makedonas, PhD, *Flow Cytometry is a Paramount Method of Immune Surveillance of Astronauts during Spaceflight*

Dr. Makedonas is passionate about discovering the precise mechanisms that govern protective human immune responses, and then applying this knowledge towards the development of strategic therapeutic interventions. For his doctoral thesis, he hypothesized that individuals who remain HIV sero-negative despite consistent behavior at high risk for HIV acquisition possess a protective HIV-specific CD8 T cell response. Dr. Makedonas' work characterized enhanced such activity in those individuals compared to unexposed, healthy controls, thereby supporting the paradigm of CTL as an immune correlate of protection against HIV. As a post-doctoral fellow, he mastered characterizations of antigen-specific human T cells via their polyfunctional capacity. Dr. Makedonas defined rapid perforin upregulation as a novel output of CD8 T cell cytotoxicity and a means by which CTL sustain their serial killing capacity. He applied this technology to define the anti-HIV CTL response in infected subjects during acute infection, and discovered an acute defect in HIV-specific CTL function that likely serves as a harbinger of rapid disease progression. At Baylor College of Medicine, Dr. Makedonas expanded his expertise in multi-parametric analyses to profile monocytes/macrophages, NK cells, and B cells. In addition to infectious diseases, Dr. Makedonas applied my skill to a plethora of disease conditions, including transplantation, allergy, primary immunodeficiency, and autoimmunity. He collaborated with BCM's Vaccine Trials Evaluation Unit (VTEU) to assess the efficacy of three separate putative influenza vaccines, as well as another for RSV. At NASA, Dr. Makedonas has continued his pursuit of new insight into immunodeficiency; the space frontier poses a magnificent challenge to the human immune system.

Andy Rawstron, PhD, *Monitoring Response to Treatments containing Therapeutic Antibodies Targeting B-Cells*

Andy Rawstron is a Consultant Clinical Scientist at HMDS Leeds and visiting Professor with the Epidemiology and Cancer Statistics Group at University of York. His primary focus is the development and application of assays for the diagnosis and monitoring of B-cell disorders. He has established highly sensitive techniques for minimal residual disease (MRD) detection in CLL and myeloma that have been applied to many UK and international clinical trials, subsequently leading international efforts to standardise MRD detection for use as a trial endpoint to accelerate drug development. He has adapted MRD techniques to investigate the earliest stages in B-cell neoplasia and also to enable high-sensitivity monitoring of normal B-cell subsets for optimising B-cell depletion therapy in musculoskeletal disorders. Andy developed and leads a national award-winning service for monitoring people with chronic malignancies before and after treatment so that they can receive high quality disease management in a local setting.

Joe Trotter, *Computational Cell Sorting: New Tools and Methods*

Joe Trotter, Principal Scientist, BD Fellow, is a key flow cytometry expert of BD Biosciences. He was honored as a 2010 Wesley J. Howe Award of BD Fellow not only for his outstanding contributions to the flow cytometry business of BD Biosciences, but for his extensive contributions over 30 years to the field of flow cytometry. Joe has been contributing to the development of flow cytometry beginning with collaborations in the 1970's, while in the laboratories of Robert Holley and Renato Dulbecco at the Salk Institute, with the early Los Alamos National Laboratory flow cytometry engineering efforts which helped to establish flow as a key tool in biology and medicine. While at Salk, to address user needs he built several early high-performance cytometers, including a multi-laser/multi-parameter cell sorter in the mid 1980's with customized software developed at Los Alamos that could be configured with either a cuvette based or a jet-in-air flow cell design. He served as Director of Flow Cytometry at the Salk Institute for well over a decade before taking the role of Flow Cytometry Core Lab Director at The Scripps Research Institute in the mid 1990's. Prior to joining BD Biosciences in 2000, Joe's interest in flow cytometry software and data visualization motivated him to develop the flow cytometry data analysis WinMDI, which for many years was downloaded and used by thousands of investigators worldwide to analyze and publish their data.