

NK2022 Trainee Session Bios

MODERATORS

Stephen Waggoner, PhD

I am a tenured Associate Professor at Cincinnati Children's Hospital in the Division of Human Genetics. My path to an academic position was fairly conventional with few gaps or sharp turns. I did high school and undergraduate laboratory internships at the National Cancer Institute and at a Biotech company, undergraduate studies at a small liberal arts school in Maryland (St. Mary's College of Maryland), a PhD in Microbiology at the University of Virginia, and a single postdoc in Viral Immunology at the University of Massachusetts Medical School. While my trajectory to academics was straight, the scientific path to genetics/rheumatology-focused divisions at a pediatric hospital was marked by serendipity and adaptability. Doing molecular cancer work sparked an interest in pathogens, after which I quickly came to favor viruses over bacteria. While researching hepatitis C virus manipulation of human antigen presenting cells during my thesis, I recognized that killer lymphocytes were much cooler and that an immunology could benefit from experience in animal models. I jumped into checkpoint inhibition work in mouse model of virus infection, and accidentally discovered an NK cell phenotype. On the job trail, I struggled with my fit in conventional Microbiology and Immunology departments until I was unexpectedly invited to join a division of clinical rheumatologists, bioinformaticists, and geneticists. This opportunity shifted the focus of my work from virus infection and vaccines to include significant molecular and genetic themed studies that span a spectrum of human immune diseases. I would encourage those following in my footsteps to be flexible and open to opportunity as you travel your career journey, and to trust your instincts when making hard decisions.

Melissa Berrien-Elliott, PhD

I am an Instructor in Medicine at Washington University interested in clinical and translational immunology. My graduate studies were in understanding immune checkpoint for CD8 T cells in murine models. I became interested in human immunology and translational immunology and to that end joined Dr. Fehniger's lab where we have worked on using memory-like NK cells in the clinic. I am currently looking for my next position and am exploring a lot of options. My general advice is to work in an environment that supports your goals and development. I strive to live a fulfilling life, and just hope success follows.

ACADEMIC PANELISTS

Catherine Blish, MD/PhD

I am a Professor in the Department of Medicine and the Immunology Program at Stanford University School of Medicine. I also serve as the Associate Dean for Basic and Translational Research at the Stanford University School of Medicine, as the co-Director of the Stanford Medical Scientist Training Program (MSTP, the MD-PhD Program), and the Executive Director of the Stanford Biosafety Level-3 laboratory. I am also an Investigator of the Chan Zuckerberg Biohub, which affords me funds to pursue high-risk research. I studied biochemistry at the University of California, Davis, before completing my MD and PhD at the University of Washington, followed by residency in internal medicine and fellowship training in infectious diseases at the University of Washington. My research is dedicated to learning how to harness the immune system to prevent and cure diseases. I studies host-pathogen interactions, with a particular focus on innate immune responses to a diverse array of pathogens including HIV, dengue virus, influenza, tuberculosis, and SARS-CoV-2. I divide my time between research, clinical practice in infectious diseases, teaching, and my administrative roles, and have been fortunate to receive awards for mentoring and research. This all sounds very linear and the classic MD-PhD path, right? Unless you realize that at the end of my PhD, I was burnt out, frustrated, and convinced that I

would likely not do research again. I completed my medical training, and was a resident in primary care internal medicine, before interest in HIV drew me into performing fellowship in infectious diseases. As I decided to stay in Seattle for personal reasons.... I had to join a lab for the last 2 years of fellowship. To my surprise, research became fun again. My message—follow your heart and interests at that moment, you may never be able to predict where it will lead you.

Emily Mace, PhD

I am a tenure-track Assistant Professor of Pediatric Immunology at Columbia University Irving Medical Center. I grew up in British Columbia, Canada, but have lived in the US since 2010. My path to an academic career started later, as I left high school in grade 11 and returned to community college in my mid-20's to finish high school and begin an undergraduate degree. I then transferred to a degree-granting university to complete a BSc in Microbiology and Immunology. I spent a year working as a technician before completing my PhD at the Terry Fox Lab (BC Cancer Research Center), and subsequently went on to do postdoctoral training at the Children's Hospital of Philadelphia and Baylor College of Medicine. I really enjoy running a lab as an academic researcher and have always been motivated to understand basic mechanisms of immune cell biology, especially using microscopes and image analysis. My career goals as a trainee were relatively uncomplicated because I have always just been motivated to keep doing the science that I am interested in until that no longer becomes an option, and the academic environment has always represented the place where I could do that with the most freedom and autonomy. Nonetheless, it would have been impossible for me to predict, even as a graduate student or postdoc, the exact path that my career would take. Being open to opportunities as they arise, being resilient, and having the privilege of working with supportive mentors in non-toxic lab environments have all contributed to my continued satisfaction with being a scientist. While some of these things include an element of luck (and privilege!), my advice to trainees is to be self-aware and realistic about what your needs and interests are when you are looking for a lab or mentor, and to be open to opportunity and challenges that provide the opportunity for growth.

Nicole Marquardt, PhD

I am currently a "Senior Research Specialist" and Team Leader at the Center for Infectious Medicine (CIM), Department for Medicine Huddinge, Karolinska Institutet, Sweden, after having finished my Assistant Professor at the end of 2021. Born and raised in Hannover, Germany, I studied Biology (Diploma) in Hannover, with the aim to become a Zoologist. However, it turned out that Immunology piqued my curiosity, and I happened to be lucky to be able to perform an undergraduate laboratory internship, my PhD, as well as few months of postdoctoral studies in the group of Prof. Roland Jacobs (Hannover Medical School), who had a strong research focus on NK cells. During my PhD, my work shifted from murine NK cells in tissues towards human NK cell development and interaction with other cell types, and I defended in March 2011. Few weeks before my defense, a postdoc position offer at Karolinska Institutet was sent out via the SNI email list – that position matched my interests by 100%, and I applied within 30 minutes. Again, I was lucky, and I got recruited as a postdoc to the group of Jakob Michaelsson working on human NK cells in viral infections, fetal tissues, and NK cell development. While I was less passionate about NK cell development, NK cells in viral infections and in human tissues still fascinates me. My postdoc lasted rather long, until 2018, when I 'had' to become an Assistant Professor. At the end of 2019, I additionally became Team leader and started to supervise one postdoc who is still successfully working in my Team. In 2020 and 2021, I secured significant funding, hired one PhD student, and finally felt somewhat 'independent'. My research focus that I developed over time is on NK cells in human tissues – in particular the lung – both in healthy individuals but of course also in related diseases such as respiratory viral infections and lung cancer. I am extremely interested in the role and potential clinical relevance of NK cells in these settings. Together, there were no notable gaps, and only one significant change in location during my career until this point. It may sound like an easy career trajectory, but being an academic researcher is rarely without struggle. My advice would be to do what you are really passionate about and to find your niche, something where you accept that you may have to add self-motivated night and weekend shifts to achieve your aims. Also, learn to collaborate early on, and practice grant writing and manuscript writing.

Katy Rezvani, MD/PhD

I am the Sally Cooper Murray Chair in Cancer Research, Professor of Medicine, Chief of Section for Cellular Therapy, Director of Translational Research and Director of the GMP Facility at MD Anderson Cancer Center. I also serve as the Executive Director of the Adoptive Cell Therapy Platform at MD Anderson. My research laboratory focuses on the role of natural killer (NK) cells in mediating immunity against hematologic and solid tumors. The goal of this research is to understand mechanisms of tumor-induced NK cell dysfunction and to develop strategies to genetically engineer NK cells in order to enhance their in vivo anti-tumor activity and persistence. Findings from my lab have led to the approval and funding of several investigator-initiated clinical trials of NK cell immunotherapy in patients with hematologic malignancies and solid tumors, as well as the first-in-human clinical trial of off-the-shelf CAR-transduced cord blood NK cells in patients with relapsed/refractory lymphoid malignancies. My work is supported by multiple grants from the National Cancer Institute, the Leukemia and Lymphoma Society, the American Cancer Society, Stand Up to Cancer and the Cancer Prevention & Research Institute of Texas (CPRIT). I completed my medical training at University College London, followed by Fellowships of the Royal College of Physicians and the Royal College of Pathologists of the United Kingdom, a Ph.D. in Immunology from Imperial College London and postdoctoral studies at the National Institutes of Health.

Tim O'Sullivan, PhD

I am an Assistant Professor in the Department of Microbiology, Immunology and Molecular Genetics at UCLA. My path to a faculty position in immunology is quite uncommon. In college, I was studying bioengineering before I started working with plants as an undergraduate at Cornell University. This research got me more interested in basic biology, and I was absolutely floored by everything we still didn't know about our immune system. This led to a research internship with Michael McHeyzer Williams at Scripps looking at B cell responses to viral infection, a technician position with Linda Bradley, and eventually me applying to 1 PhD program in at UCSD. It was a risky gamble. I was very rough around the edges and was probably more into live music than research at the time. Somehow, they let me in. Entering graduate school, I knew I wanted to work on the immune response to cancer, a topic considered taboo at the time (pre-checkpoint blockade). My work with a young faculty member Jack Bui uncovered that tumor associated macrophages and NK cells can reject spontaneously induced fibrosarcoma cell lines in the absence of the adaptive immune system. Of course, I didn't really know much about the basic biology of NK cells after my PhD so I went to do a postdoc with Joe Sun at MSKCC when he was an Assistant Member. What could be perceived by many as yet another risky career move ended up being the best decision for my career. Joe and I made many discoveries about the basic biology of type 1 innate lymphoid cells (ILC1). Luckily for me, I was able to ride the ILC hype train into a faculty position at UCLA before yet again completely changing my research focus. Long story short: follow where the data leads you, pursue what you find exciting (especially if it is risky) and push yourself to study new topics and acquire new skills.

Dimitra Peppas, MBBS/PhD

I am a group leader and Honorary HIV Consultant at the Institute of Immunity and Transplantation (IIT), University College London (UCL). Becoming a physician scientist with an interest in the multifaceted clinical and scientific aspects of viral infection was a natural progression from my dual training in basic science and medicine. I completed my undergraduate medical training at UCL and furthered my interest in translational research by obtaining an academic clinical fellowship in infectious diseases at UCL. This supportive platform of training enabled me to explore different research ideas and served as a stepping stone to obtaining an MRC Phd fellowship, investigating the role of Natural Killer cells in chronic Hepatitis B virus infection. Following a small research hiatus after my PhD, to complete my clinical training, I obtained an MRC clinician scientist fellowship, changing the focus of my research into HIV infection at University of Oxford. This allowed me to explore the role of NK cells in HIV infection and to

build on previous findings on their immunoregulatory role. Recognizing an unmet clinical need in the field of HBV/HIV coinfection, I moved institutions to establish a research lab at IIT, UCL, aligning my clinical and research work. I currently lead a research program focusing on translational research and the identification of new targets for 'cure' strategies supported by an R01 award. On paper my academic trajectory looks straightforward, in reality I have negotiated difficult transitions and the usual setbacks of starting a new lab. My advice to my younger self would be to embrace collaborations early, view challenges as opportunities, prioritize progress and find a good mentor to inject pragmatism and perspective when contemplating difficult decisions.

INDUSTRY PANELISTS

Adil Duru, PhD

I trained as a post-doctoral fellow at the Cell and Gene Therapy Group, Center for Hematology and Regenerative Medicine (HERM) at Karolinska Institute in Stockholm, Sweden. Prior to that position I earned my Ph.D. at the Center for Infectious Medicine (CIM) at Karolinska Institute. From 2015 until 2020, I was an Assistant Professor in the Nova Southeastern University Cell Therapy Institute studying NK cell interactions with tumors. I recently moved to Glycostem Therapeutics in the Netherlands where I am working to develop novel robust and efficient immunotherapy regimens for high-risk cancers with a special focus on multiple myeloma, sarcomas, pancreatic and prostate cancer.

Bob Igarashi, PhD

I am Head of Discovery and Pre-clinical Development at Kiadis, a Sanofi company. I am originally trained as a physical biochemist and have adapted to NK cell biology and immunology over the last decade. Several years ago, academic collaborators and I, including Dean Lee and Alicja Copik, started an academic spin-off CytoSen. I exited from academics in Dec of 2017 to drive CytoSen, later being acquired by a Dutch company Kiadis in May 2019. Subsequently, we engaged with Sanofi initially through a license agreement in July 2020 and then announced to be fully acquired by Sanofi in November of 2020. Originally as CSO of CytoSen, I functioned in multiple aspects (research, CMC, ClinDev, IR). At Kiadis, we built a de novo NK cell research group that now contributes cell therapy pipeline as part of Sanofi Oncology, with groups in Amsterdam and Orlando that interact globally with other Sanofi units. Some notable aspects of my career trajectory include moving from academia to commercial startup to big pharma over a span of four years. These rapid transitions from academic scientist to commercial entrepreneur, from small to very large organizations, and from the freedom of academic hypothesis-driven science to highly regulated, multiplexed stakeholder-driven research taught me a lot. My advice and sage counsel I've received from others is as follows: (i) no matter what, care about people and treat people well, (ii) be more concerned with asking the right questions and less about having the right answers... failure comes from not knowing the things that are unknown, and don't be afraid of what you don't know, and (iii) be ready to take "good" risks on career, science, etc. For myself, scientifically transitioning from intricate mechanistic enzymology to complex immunology was the most scientifically difficult but intellectually inspiring things that occurred to me.

Nina Möker, PhD

I am a R&D Director for the development of allogeneic immunotherapy for cancer at Miltenyi Biotec in Bergisch Gladbach, Germany. In my current position I am leading a highly motivated and innovative team focusing on two major areas. One is the development of a comprehensive solution package for the manufacturing and analytics of gene engineered Natural Killer cells. The second topic focuses on preclinical research of NK cells and $\gamma\delta$ T cells for anticancer immunotherapy. Prior to joining Miltenyi Biotec and dedicating myself to allogeneic cell therapy, I have gained experience in big and medium-sized pharma focusing on the very different topics of antibody- and small molecule-based drug discovery. Already before my PhD, many senior career experts have advised me to exactly know what I want and in what areas I want to work to be able to follow a straight forward path. For me, that has

never been the case. I have always been driven by enthusiasm and opportunity. This has led me over microbiology and antibiotic research to antibacterial antibodies and from there via anticancer antibodies to cell and gene therapy. Which -as of now- I find the most promising and exciting! So my advice to everyone at the beginning of their career is to follow your interest and what excites you most – and to be aware that this may well change over your journey.

Ryan Sullivan, PhD

I am Vice President & Head of NK Cell Research at Wugen. Prior to my role at Wugen, I was Principal Scientist at Novartis Institutes for Biomedical Research where I held positions of increasing responsibility for over 5 years. I led a group responsible for developing drugs to improve the anti-cancer response of NK cells, overseeing the progression of a portfolio of therapeutics across multiple mechanisms of action. I earned his Ph.D. in Immunology from the Washington University in St. Louis where I studied the role of miRNAs in NK cell function, before moving to Boston for post-doctoral research on the role of NK cells in cancer immunotherapy at the Dana-Farber Cancer Institute. Advice to Trainees: My fantastic advisor and mentor, Glenn Dranoff, was recruited to Novartis during my post-doc – which came as a massive and not-so-welcome surprise. He convinced me to give industry a shot, and I'm so glad that I did. Keep an eye out for opportunities, as they will come at unforeseen times and from unexpected angles.

DUAL TRACK PANELISTS (academia/industry, academia/editorsip)

Evren Alici, MD/PhD

I am an associate professor in the department of medicine, division of hematology at Karolinska Institutet, Stockholm, Sweden. I lead a research group of 22 very talented individuals who focus their efforts, as agnostic as they can, on NK cell-based therapeutic approaches. My father is an emeritus professor in orthopedics and my mother is an emeritus professor in clinical immunology. As one would suspect, I got infected with both interests and did my medical studies in Izmir, Turkey. I then started voluntary work as well as specialist training in orthopedics and traumatology and traveled 4 continents finally ending up in Stockholm where I got involved in immunotherapy and gene therapy. We performed the first gene marking study in Sweden as well as the first allogeneic NK cell-based therapy in refractory cancer patients in what one may call a basket trial. Thereafter, I got very interested in the role of NK cells in patients with multiple myeloma and their induced recognition of autologous tumor cells. It led to an interesting discovery with ex vivo expanded and activated NK cells may be able to control myeloma development, especially in early lines of treatment. To be able to enable a clinical study, I co-founded a company with 12 other colleagues from our institute and we managed to fund an academic-sponsored clinical trial where we could see some signs of efficacy in a very small group of patients. This trial enabled us to expand into a randomized combination trial where we started also to utilize ADCC properties of the infusion product. It is an exciting journey where one of my PhD students that defended his thesis is now the principal investigator of this trial. In parallel, during the last 18 years, I got more and more interested in genetically modified NK cells which led to protocols and utilization strategies that are currently being utilized in numerous clinical trials. We have also identified that NK cells can be more susceptible to genetic modification by simply transiently blocking intracellular viral sensing pathways. This enabled a lot of other approaches and another company creation, this time in the USA where we met a fantastic group of individuals that manage the company side and I can focus on ideation. I'm sure I forgot a lot of steps in between but this is, in a nutshell, what I recall spontaneously. I love the environment we are in and my collaborators and colleagues have led me to sit over a Christmas break with Hans-Gustaf to write a grant application to Sweden's innovations office (a governmental body) which granted Hans-Gustaf, Kalle, and me to create a national competence center on next-generation NK cell-based therapies. This in turn further enabled our collaborations with industry partners as well as other research groups. The fun is just beginning!

Chiara Romagnani, MD/PhD

I am full Professor of Immunology at the Charité Medical University Berlin, lead the Innate Immunity lab at the German Rheumatism Center (DRFZ), and am a Chair of the Leibniz Campus “Chronic Inflammation”. My research focuses on understanding the signals and molecular mechanisms driving activation, differentiation and adaptation of innate lymphoid cells. Having studied Medicine at the University of Florence in Italy, I was seized by a fascination for immunology at home, throughout my studies, and from AK Abbas at Harvard Medical School. Being passionate about both clinical work and basic research, I trained as an oncologist at the National Cancer Institute in Genova, Italy, and simultaneously joined the lab of Lorenzo Moretta at the University of Genova, where we identified HLA-E-restricted T cells. In the following three years I trained as a PhD in Lorenzo’s lab working on NK-DC interactions and then moved to the DRFZ in Berlin with an EMBO fellowship. At the DRFZ, I was first appointed as group leader and developed my line of research on innate lymphoid cells. I was awarded the DFG Heisenberg Professorship and then appointed full Professor at the Charité. As Chair of the Berlin Graduate School in Immunology and Infectious Disease (ZIBI), I am actively involved in PhD student training and post-doc mentoring programs. My work is supported by multiple grants mainly from the German Research Council and the ERC.