**ZHENG JENNY ZHANG, MD, MS**

(A brief career autobiography)

**A. Overview**

I was trained as a transplant surgeon and practiced in a prestigious transplant center (Tongji Organ Transplantation Institute/Tongji Hospital) in China from 1983-1990, and additionally passed USMLE examination (step 1 &step 2, 2011), but determined to pursue a research career. My research career began at the multi-organ transplant center in the University of Western Ontario in London, Canada in the early 1990s, while I had three-year postdoctoral training and afterwards, worked as a junior faculty (instructor/lecturer) for approximately four years before being recruited as a research assistant professor by Northwestern University, Chicago, USA in 1998. I was promoted to the rank of research associate professor in 2006 and then full research professor in 2015. I am currently a PI with serval research grants awarded by external funding sources (e.g. NIH, DOD/Army, McCormick Foundation with several pending NIH grant applications. I have published >100 articles, including original research, reviews and book chapters, in peer-reviewed journals as first author, co-author, senior corresponding author in transplant-immunology and microsurgery.

When the comprehensive transplant center (CTC) was launched in 2009, the microsurgery core was created, and I was appointed as the director for CTC microsurgery core. Under my leadership, Core has provided services to 25+ PIs in ~20 different departments cross NU campuses and external academic institutes in US (UC, UIowa, USO) and Canada (UWO at London/Ontario, UBC at Vancouver). I have assisted multiple PIs, in the CTC and the Department of Surgery as well as investigators from other departments in Northwestern University, to promote their research and secure external research funding. The core name was changed to Microsurgery and Preclinical Research Core in 2020 as the scope of the core service has substantially broadened with much expanded portfolio (include cell isolation and phenotyping biochemistry tests and drug development in addition to microsurgical procedures). The core has become a sophistical preclinical research facility and a central resource known to many PIs NU and in the field of transplantation.

I have achieved external professional recognition by serving as an invited speaker/presenter/abstract reviewer/moderator for national and international conferences as well as several peer-reviewed professional journals. I have been a board member and Treasurer for the international society of experimental microsurgery (ISEM) since 2016 and was recently elected as the president elect of ISEM in 2023 and will be the president in 2025. The core has been a self-sustaining core in which all staff's salaries and supplies are from the core rechange center and my research grants.

**B. Education and training**

I received my MD in 1983 from Tongji Medical University (TMU) in Wuhan, China as a top student (top 1% percentile by national exam) in my class. I completed surgical resident training in Tongji Hospital (the 2nd teaching hospital of TMU in1988. During my residency, I also received a Master of Science Degree in transplant immunology at the same university in 1988 and my thesis is entitled “Cordyceps Sinensis-I as an immunosuppressant in heterotopic heart allograft model in rats”. As the youngest investigator in the year (1988), I received a research award by Chinese National Nature Science Foundation for my research on the role of Cordyceps Sinensis-I as an immunosuppressant in organ transplantation. To further develop my research career, I took a challenging yet exciting research opportunity in Canada and began my research training in the University of Western Ontario, London, Canada in the early 1990 and completed three-year post-doctoral research training in 1993. In addition, I have also completed several other professional trainings, among which include NU continue education – Project Management (in 2000) and Kellogg - Leadership and management in Core Facilities (2014)

**C. Career path and achievement**

I have followed a research career path that is filled with a long track record of collaborations and community services/professional activities and research publications. My research has been focused on using preclinical transplant models to understand molecular mechanisms of transplant rejection and immunoregulation and to identify therapeutic targets that can potentially mitigate transplant injuries and induce transplant tolerance.

***1. Earlier research career at Western University or university of western Ontario), London, Canada (~8yrs)***

Upon completion of three-year post-doctoral research training at the multi-organ transplant center in 1993, I was initially offered a permanent position as a microsurgical specialist and granted a permanent residency status by Canadian Immigration based on my research achievement and special research skills. I decided to pursue an academic research career in organ transplantation and was promoted as an instructor and lecturer at the multi-organ transplant program in the University of Western Ontario, London, Canada over a span of approximately four years. During my tenure in London's transplant program, I developed two new microsurgical transplant procedures in mice including mouse small bowel and kidney transplantation that had not previously been established with good success elsewhere. The techniques I published have been extensively used in transplant research by many centers in the world. I also played a significant part in numerous research projects involving evaluation of cellular and molecular mechanisms of rejection, development of novel anti-rejection remedies as well as mechanistic studies of Xenotransplantation using both rodents and non-human primate models. I authored and co-authored numerous manuscripts, and book chapters including a paper published in ***Nature*** that was primarily based on my work. I conducted workshop to teach surgical residents and fellows from Canada, US, Brazil, Italy, France and Germany in these methods. I was awarded as a ***Young Investigator Award*** by the American Society of Transplant Physicians in 1997. I served as a member on the local organizing committee and **program director** for the 4th Congress of International Society of Experimental Microsurgery.

***2. Research at Northwestern University, Chicago, Illinois (from 3/1998 to now)***

I was recruited as a research assistant professor by the Division of Organ Transplant in the Department of Surgery at Northwestern University in March of 1998. I was expected to extend our research capacity in preclinical research using in vivo surgical models and to help Drs Jonathan Fryer and Dr Michael Abecassis to secure external funding, with a promise of support to apply for my own fundings as a PI.

In the first few years since I joined Northwestern, I worked closely with Dr. Jonathan Fryer on two research areas: investigating mechanisms underlying small bowel (SB) allograft rejection and developing therapeutic strategy for xenotransplantation under. We utilized the mouse model of vascularized SB transplantation that I first developed and published to examine whether and how SB mucosal responses to luminal antigens influence SB allograft rejection (funded by SSAT), we demonstrated that foreign antigen-induced activation of donor-derived T cells initiates SB allograft rejection by inducing epithelial production of a Th1-like profile of NFB dependent cytokines and CXC chemokines such as IP-10 that enhance infiltration of host T cells and NK cells in SB allografts. These novel findings led us to examine the role of epithelial NFB activation as an early event mediating the SB rejection (funded by NIH R21). These studies have resulted in a number of original papers published in peer-reviewed journals (Transplantation, Journal of Immunology, and Gastroenterology) and numerous presentations in international scientific conferences. I co-authored several internal and external grant applications on SB transplant research with Drs. Fryer and Terry Barrett, which included a NIH funded R21 grant entitled "permeability changes in small bowel allograft rejection" and a grant on T cell differentiation in Crohn’s disease funded by Crohn’s and Colitis Foundation (CCFA). At the same time, we also worked on two xenotransplant projects funded by a private company and an internal grant (as PI), respectively, and published several papers on xenotransplantation.

While working with Dr Fryer, I was also working with Dr. Abecassis on the cytomegalovirus (CMV) reactivation project as a co-investigator, to investigate cellular and molecular mechanisms of CMV reactivation in transplantation. I was responsible for developing mouse kidney transplant models for the study of inflammatory mediators (soluble factors, signaling pathways, and epigenetic factors that induce CMV reactivation. This work led to the discovery of the role of transplant ischemia/reperfusion injury mediated inflammatory cytokine signaling and transcription factor activation in MCMV reactivation following kidney transplantation. more recently, we have reported for the first time a novel two-hit mechanism of CMV reactivation with transplant I/R injury being the first hit that triggers transcriptional reactivation of latent CMV genome and immunosuppression being the second hit that allows DNA replication and dissemination. This project has received continuous NIH funding support including 3 RO1s, 2 R21s and 1 P01 for more than 20 years. As a co-Investigator on multiple R01s/R21s, and the core A leader and project 1 leader on the P01 (2015 -2021), I was instrumental in the grant applications, study designs, supervision and execution of the experiments and publication of the research findings. My recent NIH R21 funding award allows continuing this line of research with a plan to expand this work to a new R01.

I was promoted to a research associate professor of surgery in the fall 2007 and have been research full professor since 2015. In addition to my primary research projects as the above-described funded by NIH, I have continued my research in transplant rejection, tolerance induction and vascularized composite allotransplantation (VCA) and have been collaborating with investigators (e.g. Lorenzo Gallon, Joe Leventhal, Jennifer Schneiderman, Josh Levinsky, John Rogers, across NU campuses. This collaborative work has resulted in multiple publications (including recent publications in *Science* as co-senior author) and *Kidney international* as a senior author. I have been a PI on two research grants funded by Frankel and McCormick Foundations, respectively. More recently, as the initiating PI, I received a DOD multi-PI grant on VCA. In addition, I have also been in collaboration with external PIs from other academic institutions such as UC, OSU, UBC, etc., which led to several publications in higher profile journals including *JCI, Nature Biotechnology, AJT,* respectively*.* Moreover, I have served as a PI on several sponsored research projects funded by pharmaceutical and biotech companies (Baxter and Aplimmune, Transimmune, Betalin, *etc.*).

***3. Core Services at NU CTC***

As the director of CTC Microsurgery & Preclinical Research Core (MPRC) at CTC, I have devoted major effort to lead the Core. The core began with one surgeon and one surgical microscope supporting 2 investigators in the Division of Transplantation. Under my leadership, Core has significantly expanded service scope and user basis and laboratory space with additional equipment and increased service portfolios. The core facility contains state-of-the-art operating microscopes including four Zeiss OPMI® operating microscopes with dual binocular heads and two Zeiss Stereo Zoom Microscopes (STEMI SV6) along with four aseptic surgical units that allow for routine performance of 6-8 vascularized transplant procedures daily. In addition, the facility holds a murine intensive care unit that provides an appropriate environment for postoperative animals to recover from surgery as well as other separate areas designated as animal prep areas, animal autopsy and tissue sampling areas. In addition to providing small animal surgical models, the core also provides diagnostic tests, cell isolation and immune assessments and microsurgical skill trainings. I have recruited and trained a team of microvascular surgeons who are proficient in performing organ transplant surgeries in both rats and mice. Over the last ten years or so, the core has served all interested investigators in the Northwestern University community with more than 6000 small animal transplantation and other surgical procedures. In addition to provide technical services, I have also helped multiple PIs (e.g. Jason Wertheim, Ankit Bharat, Danial Batlle, *etc*) on experiment design, data analysis/interpretation, troubleshooting and new model development and to secure external fundings. In addition, I have served as a member on review panel for NU office of research core facilities equipment funding. The core has received multiple awards (2019-2020) from NU/FSM for excellence in core services (see 2022 FSM core report). For many years, my salary has been mainly supported by my own research grants (65% - 75%); only about 25% to 40% of my salary has been charged to the core recharge center, which has allowed a lower rate for each service that the core provides and benefited all PIs who have used core service.

**Teaching/Mentoring/Tranees**

Although as a research faculty I do not have teaching responsibilities, I have enjoyed teaching DGP students (DGP 440, Introduction to Immunology, two chapters – humoral immunity and transplant immunology) since 2015. I have been serving as a lecturer and/or judge for CTC Summer Student Immersion Program since 2019. I have been mentoring supervising and a mentor for trainees (>20) at all levels, including postdoctoral fellows, surgical residents, medical students and undergraduates, who are interested in the experimental transplant research in my lab. Among them, four trainees (Chris Chow, 2005; Xueqiong Wang, 2011; and Junsheng Ye, 2013, Longhui Qui 2018) received young investigator awards by national or international scientific organizations (AST and ITA). I have received multiple DOS research mentoring/teaching awards (FY19-21).

**Extramural activities and recognition**

As the Core director and a researcher professor, I have had a unique opportunity to collaborate with numerous investigators and project members in both Northwestern University and other academic institutions nationally and internationally, which have led to increased recognition of my contributions to Northwestern University and to the field of transplantation. I have served as an invited speaker at multiple research seminars in Northwestern and other academic institution as well as in the international conferences. I have been a keynote speaker at the 12th-14th Congress of the International Society for Experimental Microsurgery (ISEM). I have served as the treasurer and councilor in the board of ISEM and was elected as the President Elect in 2023. I also served as a member in the local organizing committee for the 6th Congress of the International Xenotransplantation Association and a member in the International Scientific Committee for the 12th-15th Congress of the ISEM. I have been invited multiple times as a chair or a moderator for scientific sessions in the national and international conferences (ATC, ISEM, ASN). I have been an abstract reviewer (multiple conferences, ATC, ISEM) since 2012 and a manuscript reviewer for multiple journals (Transplantation, AJT, Frontier, Scientific report) since 2010. I have been a Scientist Reviewer for DOD CDMRP grant review panels since 2022