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SAVE THE DATE

The First Ever WINS Retreat (open to all WINS members) will take place in Snowbird, Utah, on July 7-8, 2017. You and your family are invited for rafting, mountain biking and rock climbing. Stay for the AANS/CNS Joint Section on Neurotrauma and Critical Care Meeting in conjunction with the National Neurotrauma Society beginning July 9, 2017.

NEWS WOMEN IN NEUROSURGERY

Spring 2016

Message from the Chair

Women in Neurosurgery (WINS) is now entering its third year as a joint section of the American Association of Neurological Surgeons (AANS) and the Congress of Neurological Surgeons (CNS), and I am delighted to report that it remains the fastest growing joint section, with membership increasing 20 percent from 143 in 2014 to 173 in 2015. Nearly half the joint section chairs and scientific program chairs for AANS Annual Scientific Meetings and sections meetings in 2015 and 2016 were women. In addition, women represent an increasing proportion of academic neurosurgeons, as a manuscript by incoming WINS chair, Stacey Quintero Wolfe, MD, FAANS, will attest. The WINS mentorship program continues to thrive with 19 new mentor assignments in 2015.

In an election year, it is common for the politicos to invent monikers for their targeted demographics. The "soccer moms" of a decade ago were replaced with the "hockey moms" of 2012. In keeping with that spirit, a new demographic is



Uzma Samadani, MD, PhD, FAANS

emerging in our own political sphere: the "neurosurgery mom" is a real phenomenon. The daughters of Isabelle M. Germano, MD, FAANS, and Odette A. Harris, MD, MPH, FAANS, will shortly be publishing a book telling the story of neurosurgical moms from their own perspective.

The WINS accomplishments for 2015-2016 include a follow-up publication to the 2015 manuscript assessing attrition among neurosurgery residents. The 2015 manuscript looked at residents who began training between 1990 and 1999 and found that 146 women matched into residency spots over 10 years, of whom 92 became board certified. There was 17 percent attrition during residency for this cohort.

The newer manuscript investigates resident enrollment and attrition between 2000 and 2009 and found that 240 women matched during this decade. Board certification rates and residency attrition for this cohort of residents will not be apparent until 2024; however, 41 of these women experienced attrition from the field during residency, which suggests that attrition during residency, at 17 percent, is relatively unchanged from the previous decade and remains a challenge to be addressed.

In 2012, 21 women became board certified. Fifteen women became board certified in 2013, 11 in 2014, nine in 2015 and nine already in May 2016, meaning that certification of any women

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WINners in the News

Julie Pilitsis, MD, PhD

By: Rachel Blue

Rachel received her undergraduate training in Molecular Genetics at The Ohio State University. She is currently a third year medical student at the University of Minnesota Medical School pursuing a career in neurosurgery. Her interests include brain mapping and functional neurosurgery.



where she graduated with Distinction in Research. "Neurosurgery was serendipitous," recalls Dr. Pilitsis; she had enjoyed research from a young age, and as a medical student, began working in a neurology lab with neurosurgical residents. They invited her into the OR and from there, she was hooked. From Albany, she then matriculated to the neurosurgical residency program at Wayne State University, which had a PhD program built into its training. She received her PhD in physiology under Dr. John Phillis.

At her new position, Dr Pilitsis will be leading a department of 16 PhD faculty members and 13 MS/PhD candidates in creating translational research opportunities as well as working on a variety of paramount research projects. Exploring the response of pain nuclei in deep brain stimulation, evaluating the efficacy of brain stimulation in the prevention of seizure activity and investigating Interleaving Deep Brain Stimulation, a technique that creates better clinical outcomes while minimizing side effects, are just a few of the exciting new ventures the department will be spearheading.

But for Dr. Pilitsis, these innovative projects are just the beginning. "I am

most excited to work with so many well-researched professors and students who inspire me every day," says Dr. Pilitsis. "I am eager to lead outreach efforts in our region to bring new and innovative ideas to fruition."

On her path to success, Dr. Pilitsis has remained remarkably well-balanced. "I have learned that there is a need for personal time and decompression when you are constantly on the go," reflects Dr. Pilitsis. She enjoys spending time with her husband and two children, practicing yoga, reading, traveling and partaking in unique dining experiences.

In a field that can be burdened with competition, it is important to celebrate the successes of one another. There is a quote that Dr. Pilitsis uses at the end of her presentations that encompasses this well: "If you want to go fast, go alone. If you want to go far, go together."



Julie Pilitsis, MD, PhD, FAANS

Message from the Chair (continued)

at all during the October 2016 American Board of Neurological Surgeons (ABNS) examination administration will represent a turnaround from the downtrend of 2015.

In this edition of the newsletter, we celebrate the accomplishments of our own with a new column titled "WINners in the News." Medical student, Sam Cramer, (who will be starting neurosurgery residency this July at the University of

Minnesota) writes about neurosurgical pioneer Alexa I. Canady, MD, FAANS(L), while third year medical student, Rachel Blue, writes about Julie G. Pilitsis, MD, PhD, FAANS. Another "WINners in the News" article highlights the new practice of Edie E. Zusman, MD, FAANS.

In addition, MD candidate Anja Srienc, PhD, reviews the emerging controversy on whether dementia other than Creutzfeld-Jacob may be transmitted by prions. Ciara

D. Harraher, MD, FAANS, writes about diversity in the Western Neurosurgical Society, and neurosurgery resident Paramita Das, MD, writes about the National Institute of Health's (NIH) Petra Kaufman, MD, MSc.

It has been my pleasure to serve as your chair for WINS in 2015-2016 as women continue to grow in number and voice within the field of neurosurgery!

WINners in the News: Edie Zusman Forges Innovative New Program in Northern California

Edie Zusman, MD, FAANS, begins her tenure as chief of Neurosurgery and medical director, Neuroscience Program Development, at NorthBay Medical Center in Fairfield, Calif., joined by two colleagues, long-time friends and WINS Members, Sherry Taylor, MD, PhD, FAANS, and Kawanaa Carter, MD.

With a goal to focus on the continuum of neurosurgical care, Dr. Zusman is developing an innovative neurosurgery program that employs neuroscience navigators and integrates a 100,000 square-foot wellness center, complete with gym and therapy pools, with a multidisciplinary approach for comprehensive spine and concussion/traumatic brain injury clinics, among others.

NorthBay has both fee-for-service and their own insured/capitated patients. "We are very motivated to address both the cost and quality issues facing health-care – and specifically neurosurgery – today

by developing a program that streamlines and enhances care throughout the continuum to improve each patient's experience and outcome," she said.

Dr. Zusman, who completed an MBA three years ago, said the program is designed to create incentives for providers to do what is best for the patient and also for patients to engage in healthful activities that may prevent the need for surgery and also improve hospital readmissions after



Edie E. Zusman, MD, MBA

surgery. The neurosurgeons work their chosen schedules and contribute to the program in ways that best compliment their skills and expertise, with additional neurosurgical providers available for cross coverage and back-up for the Level II Trauma Center and Primary Stroke Service.

Dr. Zusman is especially excited to work with Drs. Taylor and Carter. She met Dr. Taylor, then a medical student at the University of California, Davis (UC Davis), while she was a resident. Dr. Taylor later helped Dr. Zusman get her epilepsy surgical fellowship at the University of California, San Francisco (UCSF).

Dr. Taylor joins NorthBay after an impressive seven-year tenure building a large neurosurgery program as chief of Neurosurgery at Baystate Medical Center in Springfield, Mass.; the only Level I trauma center in western Massachusetts.



Sherry Taylor, MD, PhD

"I am thrilled to join Dr. Zusman, my long-time friend and colleague," Dr. Taylor said. "I look forward to supporting her in building a thriving neuroscience practice at NorthBay."

Dr. Carter met Dr. Zusman when she was a graduate student in professor Dan Lowenstein's lab at UCSF, and the two women shared a passion for understanding and treating epilepsy.

"I admired her then and convinced her to become my mentor," Dr. Carter said. "Since that time, she has guided me throughout my career, and we have remained good friends. After my internship at UCSF, I joined Dr. Zusman's lab

and managed research projects for her. She was instrumental in me moving to Sacramento, Calif., to complete my residency at UC Davis Medical Center."

Dr. Carter joins NorthBay after working most recently in private practice in Folsom, Calif. She also has served a staff neurosurgeon at two Level II Trauma Centers.

She said she is excited and honored to now work side-by-side with Drs. Zusman and Taylor.

"I am looking forward to growing personally and professionally in the midst of two great women," she said.

Dr. Zusman moves to NorthBay after four years as medical director, Neuroscience Program Development at Sutter East Bay Neuroscience Institute, Eden Medical Center in Castro Valley, Calif. Prior to that, Dr. Zusman served as chief of Neurosurgery, Sutter General and Sutter Memorial Hospitals and medical director, Adult Neurosurgery for Sutter Neuroscience Institute in Sacramento, Calif. She also worked as assistant professor, Neurological Surgery at UC Davis Medical Center, where she founded the Multidisciplinary Brain Tumor Program and Bronte Epilepsy Research Laboratory.

"It means the world to me to be working on this exciting new project with two fantastic women who started their careers in neurosurgery together with me 20 years ago," she said.



Kawanaa Carter, MD

Can Surgery Spread Alzheimer's Pathology?

Anja I. Srienc is a third-year medical student in the Medical Scientist Training Program (MSTP) at the University of Minnesota. She completed her undergraduate degree in Biomedical Sciences at University College Utrecht in Utrecht, Netherlands. In 2015, she earned her PhD in Neuroscience, studying ischemic retinal injury. She intends to pursue a career in academic neurosurgery.

Creutzfeldt-Jakob Disease (CJD) is a disease caused by pathogenically misfolded proteins, known as prions, that induce progressive neurodegeneration. Under healthy conditions, the cytoplasmic PrP protein is highly expressed in neurons, and its function has been implicated in development, learning and memory and protection against metal toxicity. However, when exposed to its misfolded prionic variant, the native PrP undergoes a conformational change, transforming into a disease-inducing prion. This snowball effect accounts for the remarkable "spread" of these misfolded proteins.

But, what makes prions particularly dangerous is their incredible resistance to degradation: endogenous proteases are unable to break down misfolded PrP, allowing them to accumulate in neurons and cause disease. Prions are also resistant to the conventional sterilization techniques used for surgical equipment, as was sadly discovered when two epilepsy patients contracted CJD from stereotaxic electrodes that had previously been used on a CJD-positive patient. For this reason, surgical equipment that comes into contact with prions must undergo an extreme and costly sterilization process to be safe for use on subsequent patients.

Interestingly, misfolded proteins lie at the heart of other neurodegenerative diseases, most notably, Alzheimer's disease. Unlike CJD, Alzheimer's disease has not been shown to have infectious characteristics. However, a recent study

published in Nature has found evidence to the contrary, suggesting that iatrogenic spread of Alzheimer's in human patients may be possible.

Since the 1970's, there have been no additional confirmed cases of CJD as a result of contaminated surgical equipment. However, iatrogenic spread of CJD has occurred from contaminated transplant tissue, blood transfusions and human growth hormone (HGH) therapy. HGH was extracted and pooled from cadavers and administered as an intramuscular injection as treatment for short stature in children. Of the HGH injections given between 1958 and 1985, some were contaminated with prions and now account for a significant proportion of iatrogenic CJD cases, with over 200 reported patients.

In a study published in September 2015, Jaunmuktane et al. sought to characterize iatrogenic CJD in patients who had received HGH treatments. Using histological techniques to analyze post-mortem brain tissue, the authors discovered that six out of eight patients who had received HGH and contracted CJD also demonstrated definitive histological evidence of Alzheimer's pathology. Most surprisingly, this observation could not be explained by coincidental genetic predisposition to Alzheimer's or by a synergistic effect of CJD to promote Alzheimer's-like histological changes. Rather, these data imply that hGH treatment may have spread Alzheimer's proteins in a manner similar to CJD.

This is the first demonstration that Alzheimer's disease may be spread between human patients. These findings are consistent with animal studies that have shown that Alzheimer's disease can be spread between animals by injection of diseased brain homogenate. However, it is

still unclear whether rates of Alzheimer's disease are higher among all HGH-treated patients.

Larger cohort-based and mechanistic studies are needed to determine whether Alzheimer's disease can truly be spread through contact with biological tissue. However, it may be difficult to reach definitive conclusions. For one, it could be challenging to link a slowly progressing disease back to a single exposure to blood or tissue or a surgical instrument. Additionally, histologic evidence of amyloid plaques or neurofibrillary tangles does not necessarily imply clinical Alzheimer's disease.

Regardless, the findings presented by Jaunmuktane et al. raise the interesting, and quite concerning, possibility that the misfolded proteins of Alzheimer's disease may carry infectious potential, much like CJD prions, and could be spread through surgical means.

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Ciara D. Harraher, MD, FAANS
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The Western Neurosurgical Society (WNS) was formed in 1955 with the purpose of establishing a smaller group of invited members who would meet every year to discuss science and clinical research. I “heard through the grapevine” about this meeting that occurs in wonderful places and offers a sense of community on a regional level. I have been an active member since 2013 and enjoy my involvement on many committees. However, it is not surprising that our demographics remain fairly homogeneous. Last year, Gary Steinberg, MD, PhD, FAANS; WNS president, directed our membership committee to study diversity with respect to age, sex and racial/ethnic representation within our organization and make recommendations on how to make improvements. We determined that the first female member joined in 1989, and by 2014, there were seven female members (3.7 percent of total membership). Other historical demographic data could not be reliably obtained. To investigate the current status, we devised a simple survey that we sent out to all 191 members. The survey questions captured basic demographics and were also designed to assess physician’s attitudes, behaviors and experiences regarding diversity.

Results

Our total response rate to the survey was 60 percent.

- 34 percent of members are >70 years old with >90 percent older than 50 years.
- 95 percent of members are male.
- 86 percent identified as White, 11 percent as Asian-American, 1 percent as African-American, 1 percent as Middle Eastern and 1 percent as Eurasian.
- 30 percent classified themselves as Academic, 24 percent as Private-Practice, 19 percent as Employed Physicians and 28 percent as Retired. 10 percent work part-time.

When asked to rank the barriers to diversity from greatest to least:

- Rigors of training and practice was reported as the most significant barrier followed next by lack of exposure to neurosurgery in training, lack of mentorship and lack of quality applicants being the least significant barrier.

When asked if diversity amongst neurosurgeons affects patient care and/or outcomes:

- 68 percent felt neutral or that diversity rarely affects patient care and/or outcomes.

When asked how increasing diversity would affect the climate or culture in neurosurgery:

- 45 percent felt that increasing diversity would have no affect;
- 35 percent felt it would improve climate somewhat;
- 12 percent felt it would improve climate considerably; and
- 4 percent felt it would worsen the climate.

When asked if they felt a sense of belonging or community in both the WNS and neurosurgery as a profession:

- There was a greater sense of community in the WNS than in neurosurgery as a profession (78 percent vs. 62 percent); and
- 12 percent feel a limited or no sense of belonging in neurosurgery as a profession.

Like many regional societies that are meant to provide a more intimate forum that will improve collegiality, our society is in fact the epitome of an “old, white, boys club.” Furthermore, most members do not really feel that changing this will make much difference, and some feel that it will make the climate worse.

Well, is all hope lost? Why even join these exclusive organizations? I would argue that we should and MUST join and be-

come active in our local neurosurgery organizations because diversity does matter, both to our profession and our patients.

Why Diversity Matters

By 2050, racial and ethnic minorities will account for half of the U.S. population, with African-Americans, Hispanics and Native Americans totaling 25 percent of the U.S. population but only 6 percent of practicing physicians. The U.S. Census data from 2013 states that in California, the population is 38.4 percent Hispanic/Latino compared to the 17.1 percent Hispanic/Latino population throughout the entire U.S. The WNS is predominantly made up of members from California, and based on our survey results, there are no Hispanic neurosurgeons and only one African-American neurosurgeon.

The Association of American Medical Colleges (AAMC) Diversity in Physician Workforce: Facts and Figures 2006 states that the benefits of a diverse physician workforce include:

- Improved access
 - Minority physicians are more likely to treat minority patients and indigent patients and practice in underserved communities.
- **RESULT: Patients present and are treated earlier in their disease course.**
- Increased patient satisfaction
 - Higher levels of trust, respect and increased likelihood of referral when patients are treated by someone in their racial/ethnic group
- **RESULT: Better compliance with treatments**
- Ensuring culturally competent care
 - Being in a diverse learning environment in medical school (and residency) will shape how future physicians behave toward racial/ethnic minorities and patients and colleagues.

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- **RESULT: Improved communication**

Within neurosurgery literature, there are few publications that explicitly address issues in diversity. In Benzil et al., the American Association of Neurological Surgeons (AANS) asked this organization (WINS) to compose a white paper on the recruitment and retention of female residents and surgeons. The salient points were:

- Women have different leadership styles that emphasize teamwork.
 - This will be vital in our changing healthcare climate where collaboration is embraced.
- Women may have different practice styles.
 - More patient-oriented
- Female patients experience higher satisfaction when care is delivered by a female physician.

So what are the numbers now? In 2015, the American Board of Neurological Surgeons (ABNS) report that there are 266 active female members (7 percent of the total amount of active neurosurgeons). The proportion is higher amongst our trainees, but the issue of retention of women in neurosurgery still exists. In 2014, there were 220 female residents in Accreditation Council for Graduate Medical Education (ACGME) programs (16 percent of total residents). However, Renfrow et al., showed that in neurosurgery there is a disparity between the attrition of male (5.3 percent) and female residents (17 percent).

Recommendations to Improve Diversity

- Improve outreach to young neurosurgeons and minority neurosurgeons by:
 - Sponsoring young faculty/colleagues to join regional societies

- Encouraging senior residents/fellows to present as guests at meetings
 - Support funding
- Educating trainees about neurosurgical societies:
 - Young Neurosurgeons Committee (YNC)
 - AANS/Congress of Neurological Surgeons (CNS) Section on Women in Neurosurgery (WINS)
- Educate neurosurgeons on research related to topics on diversity in medicine so they realize the importance of addressing these issues as they relate to physician and patient satisfaction.
- Provide mentorship and a path to leadership roles for young and minority members.
 - Maintain a zero threshold for discrimination and harassment and beware of making assumptions.
 - Female students have described exclusion from “boys clubs”, not being taught as much and assumptions that they would not pursue surgery as factors in NOT choosing surgery as a specialty.
 - If neurosurgery seeks to attract the ‘best and brightest’ members, then acceptance of changing generational norms is essential.
 - Our survey identified that the rigors of training and practice was felt to be the greatest barrier to diversity in neurosurgery.
 - Are these factors as valid now in the age of work-hour restrictions?
 - Accept that there are generational differences across all medicine in attitudes towards work-life balance (men and women).

- Child-bearing and primary responsibility for child-rearing often falls on women.
 - Considerations for establishing job-sharing, consistent parental leave policies and on-site daycare facilities

It is encouraging that the AANS recently tasked WINS to draft a white paper relating to issues of pregnancy and maternity leave in neurosurgery. I eagerly await the results of the recent survey and hope that we, as members of WINS, all will respond.

In summary, while the numbers still look bleak, I have seen a tremendous change in the 12 years since I started my path in neurosurgery as the only female resident in a program without any female faculty. In fact, last week our hospital opened the first female surgeon locker room thanks to the efforts of myself and others (including men) on our Surgical Steering committee. While these small steps may seem inconsequential, over time they become progress.

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Dr. Alexa Canady: Trailblazing Woman Neurosurgeon

Alexa Irene Canady, MD, FAANS(L), was the first African-American woman trained in neurological surgery. She began medical school and residency in the



1970s, a time when the feminist and civil rights movements were beginning to realize significant gains in higher education. The decade saw a several-fold increase in the number of woman and African Americans applying to U.S. medical schools (3)./ Despite these advances, women, and African-American women in particular, represented a small minority of U.S. physicians. The gender and racial disparity was further amplified in neurological surgery, a specialty that could count only 22 women (none of whom were African American) among their ranks by the end of the 1970s (2).

Dr. Canady was born in Lansing, Mich., on Nov. 7, 1950. She obtained her BS in zoology in 1971 at the University of Michigan. As an undergraduate, Dr. Canady became interested in medicine after receiving a fellowship to promote the health sciences among minority students. The fellowship provided support for her to work in the laboratory of Dr. Art Bloom, a pediatric geneticist, where she was exposed to and fell in love with medicine. She pursued this passion at the University of Michigan School of Medicine, interested in neuroscience from the very beginning. She sought early exposure to the field, first by shadowing a pediatric neurologist and later a family friend arranged for her to shadow a neurosurgeon, an experience that solidified her career trajectory. From that point forward, she spent her elective time with the neurosurgery department (1). Dr. Canady was an extremely successful medical student, as exemplified by her election to the Galens Honorary Medical Society and the Alpha Omega Alpha Medical Honor Society. She received her MD with cum laude distinction in 1975.

After completing medical school, Dr. Canady moved to New Haven, Conn., to begin an internship year in general surgery at Yale University-New Haven Hospital. One month into her internship, Dr. Canady received a call from Shelley Chou, MD, the chairman of neurosurgery at the University of Minnesota. Dr. Chou offered a position in Minnesota's residency program, an unexpected offer that Dr. Canady wanted time to consider as she had hoped to be offered a position at Yale. However, Dr. Chou's offer was contingent upon a quick response, before Yale's offers were announced. Therefore, Dr. Canady decided she could not wait for a possible appointment at Yale and accepted the position at Minnesota (1).

During the remainder of her intern year, Dr. Canady was fortunate to spend much of her time learning procedures and operations with the neurosurgery team. Because of this early exposure, Dr. Canady began neurosurgical residency at the University of Minnesota a very competent junior resident (1).

Her training at the University of Minnesota was from 1976-1981 where she was the first female to complete neurosurgical residency in the state and the first African American female to become a neurosurgeon (4). Furthermore, Dr. Canady had several notable achievements during residency, including securing grants from the American Cancer Society, as well as the Minnesota Medical Foundation, to investigate the role of surface receptors in tumor-genesis with the goal of identify therapeutic antagonists. She also passed the PhD written examination prior to completing residency (4). Dr. Canady was highly regarded by the neurosurgical faculty as a superior resident and excellent surgeon with high moral and ethical character (4).

Exceptional performance propelled Dr. Canady into a prestigious fellowship in pediatric neurosurgery at the Children's Hospital of Philadelphia under Luis Schut, MD, FAANS(L), from 1981-1982. Her first post-graduate position was an appointment to the faculty of Henry Ford Hospital, in Detroit, and then as

faculty in pediatric neurosurgery at the Children's Hospital of Michigan. After a year of practice, she passed the American Board of Neurological Surgery (ABNS) examination in 1984, making her the first African-American woman to achieve this certification. Several years later, Dr. Canady was named an associate professor at Wayne State University School of Medicine, and in 1991, she was promoted to vice chair of the department of neurological surgery. In 1993, she was appointed chief of neurosurgery at the Children's Hospital of Michigan.

As Dr. Canady ascended the ranks of academia, her innovative approaches to the treatment of pediatric trauma began to receive worldwide recognition. In parallel with Dr. Canady's personal achievements, Child magazine ranked the Children's Hospital of Michigan ninth among the "10 Best Children's Hospitals in America" in 2001, and Dr. Canady was selected as the hospital's most outstanding representative physician (4). Dr. Canady retired as the Peter Schotanus Professor of pediatric neurosurgery and vice chair of the Wayne State department of neurosurgery in 2001. After a brief retirement, Dr. Canady began practicing again in Pensacola, Fla., in response to the need for pediatric neurosurgical expertise in the Florida panhandle.

Given the enormous strides in gender and racial equality that have been made in the period since Dr. Canady first began her training, it is difficult, and perhaps nearly impossible, for the current generation of trainees to comprehend the nearly insurmountable obstacles Dr. Canady overcame in pursuit of her dream. Her perseverance is evidenced not only by her successful completion of neurosurgical training, but also by her scientific contributions to the field and continued professional growth that propelled her to significant leadership positions later in her career.



Samuel Cramer is an MD/PhD candidate in his final year of medical school at the University of Minnesota, where he will begin neurosurgical residency in the summer of 2016.

Meet Petra Kaufman, MD – She May be Funding or Expediting Your Research!

Petra Kaufman, MD, is the director of both the Office of Rare Diseases Research and the Division of Clinical Innovation at the National Center for Advancing Translational Sciences (NCATS). Her work focuses on engaging a broad range of stakeholders to accelerate translation from discovery to health benefits through the use of innovative methods and tools in translational research and training

Before joining NCATS, Dr. Kaufmann was the director of the Office of Clinical Research at the National Institute of Neurological Disorders and Stroke (NINDS), where she worked with investigators to plan and execute a large portfolio of clinical research studies and trials in neurological disorders, including many in rare diseases. She established NeuroNEXT, a trial network for Phase II trials using a central institutional review board, streamlined contracting, active patient participation in all project phases and a scientific and legal framework for partnership with industry.

A native of Germany, Dr. Kaufmann earned her MD from the University of Bonn and her MSc in biostatistics from Columbia Uni-

versity's Mailman School of Public Health. She trained in neurology and clinical neurophysiology at Columbia University and completed a postdoctoral fellowship in the molecular biology area of mitochondrial diseases at Columbia's H. Houston Merritt Clinical Research Center for Muscular Dystrophy and Related Diseases.

Before joining NINDS, Kaufmann was a tenured associate professor of neurology at Columbia, where she worked as a researcher and clinician in the neuromuscular

division, the electromyography laboratories and the pediatric neuromuscular clinic. Dr. Kaufmann is board-certified in neurology, neuromuscular medicine and electrodiagnostic medicine. She currently sees patients in the Muscular Dystrophy Association Clinic at Children's National Medical Center in Washington, D.C.

Paramita Das, MD. Dr. Das is a PGY-6 neurosurgery resident at the University of Minneapolis with an interest in brain tumors and skull base.

Dr. Alexa Canady (continued)

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