A Chat with New NICHD Office of Education Director, Dr. Erin Walsh

Congratulations to Dr. Erin Walsh on her appointment as Director of the NICHD Office of Education!

Dr. Walsh, former postdoctoral fellow in the Woodgate laboratory at NICHD, served as the NICHD Office of Education's Associate Director from 2019 to 2020 and Acting Director since the end of 2020. As Director, she will continue leading the office in the creation and management of training programs for all NICHD Division of Intramural Research (DIR) and Division of Intramural Population Health Research (DIPHR) postbaccalaureate, postdoctoral, and clinical fellows and graduate students. Prior to her postdoctoral studies at NICHD, Dr. Walsh attended Penn State University, where she earned her PhD in cellular and molecular biology.

Please join us in congratulating Dr. Walsh on her new appointment as the next Director of the Education Office. Learn more about her early interest in science, meaningful mentorship experiences throughout her scientific career, and the life lessons she's picked up along the way in her Q&A with The NICHD Connection.

When did you realize you wanted to pursue a career in science, and what has your career path looked like?

I've been obsessed with science since I was a child. My mom bought me books about the solar system; as a nurse, she frequently took me into work with her on Take your Child to Work Day; and one of my favorite holiday gifts was a microscope—my mom even helped me prepare a blood smear so I could look at red blood cells, which I thought was so cool! At the same time, I was frequently setting up pretend classrooms in my bedroom so I could read to my little sister and our stuffed animals.

Later I realized that biology was, by far, my favorite subject and in high school my career plans were to become a high school biology teacher (my

(continued on page 3)
Letter from the Editor

Eyes to the sky—the Perseid meteor shower peaks this month in the predawn hours of Thursday, August 12. With good visibility and a little luck, you might see nearly 50 to 100 meteors per hour radiating from the constellation Perseus. There is something so satisfying about seeing a bright streak across the sky in between long stretches of waiting. In that way, watching a meteor shower is a bit like research. But boy do those moments of excitement make the waiting worth it.

I’ll keep my remaining words brief, because I’m eager for you to read the rest of this issue. We are upon our annual retreat recap, made available thanks to the generous writing contributions from several NICHD fellows. Check out their 16th Annual Fellows Meeting talk summaries on page 6. On our front page, you’ll find a Q&A with the new NICHD Office of Education Director, Dr. Erin Walsh. Learn about her journey from a young girl reading books about the solar system to her current position as Director—and a few life lessons in between.

Enjoy the rest of your summer. Stay cool, stay safe, and we’ll see you next month (it’ll be worth the wait)!

Your Editor in Chief,
Shana R. Spindler, PhD

Please send questions, comments, and ideas to our editor at shana.spindler@nih.gov.
A Chat with New NICHD Office of Education Director, Dr. Erin Walsh

AP biology teacher was one of my role models). In college I briefly considered a career in environmental law, but the first time I stepped foot in a cell biology lab I was immediately sucked into the world of research. I felt this incredible drive to absorb as much information as I could about genetics, molecular biology and biochemistry and couldn’t wait to tell my family and friends about the latest scientific discoveries—yes, I’m a self-proclaimed nerd! I always loved school, so graduate school was a no-brainer for me. Like many other trainees, I ended up having to change labs during my third year; but this actually turned out to be a positive experience for me as I landed in a wonderful lab with an incredibly dedicated and supportive mentor (another strong role model for me!), plus several other graduate students and lab staff who became very close friends.

After graduate school, I did my postdoc at NICHD in Dr. Roger Woodgate’s lab, and I was offered an adjunct lecturer position teaching undergraduate biochemistry. Not only did I find teaching enjoyable, but I also found it extremely rewarding and energizing to build mentoring connections, on the individual level, with students who would come to me for extra help or for graduate/medical school advising. Thinking back to my childhood and early career plans, I suppose I always had a strong internal drive to teach and mentor. When Dr. Yvette Pittman offered me a detail position in the Office of Education, I jumped at the opportunity—and (as much as I hate cliches!) the rest is history!

Do you have any mentors that stand out? What makes them memorable?

Yes! I have had many incredible mentors, and I think this is the key to perseverance and success for any professional. To be honest, my positive AND negative mentor experiences stand out; I have developed my own mentoring style by reflecting on both. Notably, I always found it particularly helpful when my mentors have been honest about their own struggles and vulnerabilities. It’s important to be mindful of the fact that we are all humans with our own strengths and accomplishments, failures, setbacks, and personal issues. On the other hand, the more difficult situations have been with mentors who had too much on their plate to prioritize the mentor-mentee relationship at that time. Though challenging, these situations have helped me remain mindful of time management so that I can do my best to carve out time for my mentees.

(continued on page 4)
A Chat with New NICHD Office of Education Director, Dr. Erin Walsh
(continued from page 3)

Throughout the pandemic, many fellows have encountered struggles with their home and work lives. What are your thoughts on persevering through difficult times?

Reach out to others for support (friends, colleagues, mentors)! Don’t be afraid to be honest about your struggle(s) and definitely don't be afraid to ask for help. There are so many outstanding resources available to you at NIH and all it takes is a quick email to set up an appointment. In fact, my office can help facilitate an email correspondence on your behalf—just send me a message (erin.walsh@nih.gov).

What do you want fellows to know about the NICHD Office of Education?

We create training resources and programming to fit the needs of our community of fellows. To make sure you get the training and career development you need, always feel free to provide us feedback and/or let us know if you have ideas for workshops, seminars, or other programs!

What is your top piece of advice for NICHD fellows?

Don’t avoid difficult conversations. You don’t necessarily have to tackle them alone (see below), but avoidance delays, and can exacerbate, concerns and conflicts. Not only will communication help you resolve so many of your professional conflicts now, but it will also give you practice for managing conflicts that arise down the road. And yes, conflict is an inevitable fact of life. Plan for a productive and effective line of communication and be prepared to receive feedback. Remember that not everyone will view a situation from your perspective but discussing it will help ensure understanding and resolution. You can always schedule an appointment with me for guidance/support on how to have a difficult conversation (erin.walsh@nih.gov). You can also reach out to the NIH Office of the Ombudsman for support (https://ombudsman.nih.gov).
Sixteenth Annual Fellows Retreat Recap

The NICHD Sixteenth Annual Meeting of Postdoctoral, Clinical, and Visiting Fellows, Graduate Students and Postbacs took place virtually on May 25, 2021. Acting Scientific Director Dr. Mary Dasso* opened the day with a welcome to fellows, helpful information about training during the COVID-19 pandemic, successful outcomes from our intramural diversity initiatives, and a big congratulations to our many early career awardees!

Following the Scientific Director’s opening presentation, fellows learned about new treatments—and possibly even cures—for Sickle Cell Disease, a devastating blood condition suffered by millions around the world, during Dr. John Tisdale's keynote talk. After Dr. Tisdale's inspiring keynote, fellows presented exciting research throughout the day, and Dr. Gisela “Gigi” Storz offered her thoughts on the importance of inclusivity and diversity in science.

Please enjoy the following recap of the 2021 Virtual Fellows Retreat—all written by NICHD fellows.

*Editor’s Note: As of June 2021, Dr. Chris McBain, chief of the Section on Cellular and Synaptic Physiology, is the NICHD Acting Scientific Director.

CURING SICKLE CELL DISEASE IS AN URGENT HEALTHCARE NEED
By Paul Elizalde

Sickle cell disease (SCD) is an inherited red blood cell disorder characterized by anemia, severe pain, end organ damage, and early mortality. Dr. James Herrick first reported SCD in 1910 when he observed the sickle shape of a sick patient’s red blood cells under a microscope. Decades later, Dr. Linus Pauling identified changes to the chemical structure of hemoglobin, the protein responsible for carrying oxygen, in patients with SCD. Dr. Pauling subsequently coined the term “molecular disease,” with SCD having the first molecular disease designation. SCD affects about 100,000 people in the United States and millions in Africa and India. In his keynote talk, John F. Tisdale, MD, emphasized the urgent need to find a cure for SCD and presented his lab’s progress in developing that cure.

Dr. Tisdale began his talk by telling the virtual audience that “not everything worked” and what he was about to present were just the highlights. He focused on advances in bone marrow transplants and gene therapy as curative approaches to treating SCD.

(continued on page 6)
Sixteenth Annual Fellows Retreat Recap

(continued from page 5)

Dr. Tisdale spoke about two bone marrow transplant strategies: (1) allogenic (using bone marrow cells from healthy donors) and (2) autologous (using a patient’s own cells after modifying the cells with gene therapy). These strategies aim to fix the disease by correcting hemoglobin structure in at least 20% of the cells.

Clinical trials have established bone marrow transplantation as a one-time cure for SCD. In allogenic transplantation, doctors deplete bone marrow stem cells in patients with disease and then replenish the stem cells from healthy donors. This gives patients with SCD an ability to produce red blood cells with normal hemoglobin, rather than the mutant form that leads to the disease. The Tisdale lab developed an allogenic transplant strategy using sibling donors to minimize the need for subsequent immunosuppression, which can lead to other health problems. This strategy resulted in over 90% efficiency in curing patients with SCD. However, this and other allogenic transplantation approaches are limited by donor availability.

In autologous bone marrow transplants, doctors extract and modify the patient’s own cells. Dr. Tisdale and his colleagues have evaluated several gene therapy methods using viruses to introduce a correct copy of the hemoglobin gene into red blood cell precursors from patients with SCD. He explained that additional studies need to address concerns regarding selection of the optimal virus, cell growth conditions while introducing the hemoglobin gene, and genomic placement and expression of the gene.

Another autologous method for curing SCD uses targeted gene editing to allow patient bone marrow stem cells to produce fetal hemoglobin, removing the need for a donor. SCD occurs when patients switch from making fetal to adult hemoglobin. The Tisdale lab currently studies the use of CRISPR to activate the production of fetal hemoglobin in patient bone marrow stem cells.

With the breadth of ongoing SCD research, “access to and participation in clinical trials should improve the outlook for patients with SCD,” Dr. Tisdale said to conclude his keynote presentation.

(continued on page 7)
LEGIONELLA HIJACKS HOST CELL SIGNALING BY RECRUITING NRAS DURING INFECTION
By Ashley Pratt

Hijacking is a common strategy employed by pathogens to promote the progression of infection within the target organism. An infectious agent can utilize this strategy by manipulating the natural machinery or processes within a host cell to support its own proliferation. *Legionella* is a type of bacteria that employs these manipulation strategies. As a pathogen that is responsible for a severe form of pneumonia in humans, *Legionella* infects host cells by secreting over 300 different effector proteins to establish a *Legionella*-containing vacuole (LCV). While studying *Legionella* infection, Stephanie Lehman, PhD, and her colleagues in the Machner laboratory and collaborator Chad Williamson, PhD (NICHD Cell Biology & Neurobiology Branch) came across the surprising discovery that NRas, a type of Ras-GTPase, strongly colocalizes with the LCV throughout the duration of infection. Upon further investigation, they determined that NRas is specifically recruited, among many different Ras isoforms, and is active on the LCV.

Using a CRISPR silencing system, the group was able to identify an effector protein that forms a complex with NRas and is essential for NRas recruitment to the LCV. They have named this effector “defective NRas recruitment” or DeNR. Dr. Lehman’s current model proposes that *Legionella* secrete DeNR to recruit NRas to the LCV, where NRas activity can promote infection through some unknown mechanism. Future work aims to identify this mechanism and any related effects.

(continued on page 8)
Sixteenth Annual Fellows Retreat Recap

(continued from page 7)

HIGH ACCEPTABILITY IN NEW ORAL CONTRACEPTIVE PROTOTYPE FOR MEN
By Jessica Gleason, PhD

Currently, there are no reversible contraceptive methods available for men beyond the use of male condoms—and men want more contraception options. Development of an oral hormonal contraceptive for men has been a challenge because some types that completely block testosterone can cause side effects that men find unacceptable. Researchers in the NICHD Contraceptive Development Program have been working on a different type of hormonal contraception, called progestogenic androgens. Like other hormone-based male contraceptives, these new prototypes work by blocking sperm production. But will they cause fewer undesirable side effects by not blocking testosterone completely?

Frances Fernando, a postbaccalaureate fellow within the program, evaluated the acceptability of two new oral contraceptives for men, comparing them to placebo groups. After 28 days of taking one of the new pills each day, men reported high levels of satisfaction and willingness to use this medication as their primary form of birth control. These results indicate high acceptability for use of these new oral contraceptive measures, which could lead to more widespread use in the future. The Contraceptive Development Program is also testing new formulations of progestogenic androgens for use as injectables or as a topical gel for men.

(continued on page 9)
ALTERNATE MECHANISM OF RETROVIRAL CDNA INTEGRATION THAT IS INTEGRASE-INDEPENDENT

By Ashley Pratt

HIV, the virus that is responsible for AIDS, remains a major global health threat that afflicts millions of people today. Current research into the mechanism of HIV infection bolsters progress on finding effective therapeutics. Researchers have been determined to understand the process of HIV cDNA insertion into the host cell genome with the help of viral protein integrase.

Although we know that HIV cDNA integrates into the host genome via the integrase protein, some studies have revealed that retroviral cDNA integration is still possible in the absence of integrase function. Inhibitors of integrase already exist as a therapeutic intervention for HIV, but these inhibitors cannot block the integrase-independent cDNA insertions. To address this issue, postdoc Feng Li, PhD, and his colleagues in the Levin laboratory use retrotransposon Tf1 as a model to study mechanisms of retroviral integrase-independent insertion.

Through library amplification and logo analysis (a bioinformatics approach to analyze aligned sequences), the team characterized sequence patterns of cDNA insertion, leading them to consider a mechanism of homologous recombination. They found that the single-stranded annealing activity of Rad52 is essential for integrase-independent insertions in their model. Dr. Li plans to explore these integrase-independent insertions directly in HIV pathogenesis, which could have significant therapeutic applications in treating and preventing HIV infections.

(continued on page 10)
Sixteenth Annual Fellows Retreat Recap
(continued from page 9)

MENTORING PERSPECTIVE: BATTLING INSECURITY AND INEQUITY BY DR. GISELA STORZ
By Anna Vlachos

Gisela Storz, PhD, a 30-year NICHD investigator and mentor, delivered an honest account of her scientific journey, from her insecurities to the significance of mentorship and diversity in her life. Embarking on a career in science can be a daunting journey filled with uncertainty and anxiety, particularly for members of the scientific community who experience social and institutional inequalities. Dr. Storz, a first-generation American who struggled through her own encounters with inequities in life, expressed her positive outlook and offered encouraging words to those going through similar situations.

During her talk on battling insecurity and inequity, Dr. Storz articulated the lessons she picked up throughout her career. She explained that insecurity occurs constantly in academia: when questioning one’s intelligence and position in the scientific community or when doubting the relevancy and importance of one’s work. However, Dr. Storz argued that these doubts are part of the process and that battling insecurity eventually leads to strength. She encouraged fellows to capitalize on strengths to pave out a scientific career, but Dr. Storz also emphasized the importance of acknowledging and challenging weaknesses.

Quality mentorship can be incredibly impactful when facing insecurity. Excellent communication with mentors is key. As important as one’s senior mentors are, Dr. Storz said that much can be gained from informal mentors such as peers or junior colleagues. She expressed that such a diversity of opinions can provide unique perspectives and support.

Diversity in science is very important, whether it be diversity in race, gender, and nationality or in scientific backgrounds and institutions. Dr. Storz helped initiate the NIH Equity Committee, which strives to address pay and demographic inequalities in the NIH community by looking at the population data and highlighting where inequities exist. Increasing and embracing diversity, Dr. Storz explained, makes science more interesting and exciting, which leads towards more productive and groundbreaking research. Currently, Dr. Storz advocates for diverse mentorship in scientific institutions and tackles inequalities head on—a feat, she said, that is easier to accomplish when surrounded by scientists of various positions and backgrounds.

(continued on page 11)
Sixteenth Annual Fellows Retreat Recap
(continued from page 10)

ADVERSE OUTCOMES FOR PREGNANT WOMEN WITH DISABILITIES AND THEIR NEWBORNS
By Theemeshni Govender*

Pregnant women with disabilities and their newborns have a higher risk of severe morbidities and mortality. Much of the increased risk for adverse outcomes stems from high rates of preterm birth in this population, but maternal disability itself directly affects some outcomes, such as admission into intensive care units.

Postdoc Jessica Gleason, PhD, examines health outcomes in this understudied population of pregnant women and their infants. To do this, Dr. Gleason utilizes data from the Consortium on Safe Labor (CSL, n = 223,385) to identify pregnant women with physical, intellectual, and/or sensory disabilities who had singleton births and the infants born to these mothers.

Based on her findings, Dr. Gleason highlights the need to address stigma around childbirth for women with disabilities. She suggests incorporating interventions that target barriers to prenatal care—which is usually delayed in this population—such as improving physical access. Additionally, she advocates for targeted interventions that help prevent preterm birth to decrease neonatal morbidity. Dr. Gleason’s work has implications for future policy updates as well as the implementation of clinical practices that improve health outcomes among pregnant women with disabilities and their infants.

*Ms. Govender thanks Dr. Pablo Vidal-Ribas for his helpful insight

(continued on page 12)
Sixteenth Annual Fellows Retreat Recap
(continued from page 11)

UNDERSTANDING THE GENETIC DIVERSITY OF INTERNEURONS
BY STUDYING THEIR EARLIEST CELLULAR FORMS
By Hayli Spence

GABAergic interneurons originate in the ventral telencephalon during development and are responsible for tightly controlling the activity of excitatory neurons in the brain. Disruption of their development or function can lead to the emergence of serious neurological disorders such as epilepsy, schizophrenia, and autism. Dongjin Lee, PhD, a postdoctoral fellow in the Petros laboratory, studies the genetic and neurobiological mechanisms behind the differentiation of embryonic ventricle cells into GABAergic interneurons.

Dr. Lee’s work employs several techniques to determine the origination site of different interneuron subtypes in the developing brain. In his current project, Dr. Lee uses single-cell RNA sequencing and RNAscope in-situ hybridization to look at transcriptional profiles across embryonic neurogenic zones within the ventral telencephalon. Most importantly, his work suggests that transcriptional heterogeneity across microenvironments vary between ventral telencephalic regions and within each region. In the context of these results, the diversity of GABAergic interneurons makes a lot of sense. Moving forward, Dr. Lee aims to use the over- and under-expression of candidate genes selected from this study to identify how microenvironment differences affect the fate determination of GABAergic interneurons.

(continued on page 13)
NEW DRUG SHOWS PROMISE IN REDUCING INFLAMMATION ASSOCIATED WITH OBESITY

By Jessica Gleason, PhD

Obesity is a pressing public health issue with far reaching impacts. At the individual level, increased body mass index (BMI) and adipose tissue can change the way immune cells interact with the body’s tissues. These changes often lead to chronic inflammation and increased insulin resistance, which can put people at risk for developing metabolic syndrome and diabetes. At NICHD, Tushar P. Patel, PhD, a postdoctoral fellow in the Yanovski laboratory, is working as part of a team to test whether the anti-inflammatory drug colchicine can block some of the harmful effects of obesity on immune cells.

After three months of taking the drug, participants with obesity in a randomized controlled trial (RCT) had improved insulin sensitivity and lower inflammatory biomarkers than participants who took placebo. Dr. Patel’s analyses found improvements in the types of immune cells in circulation, which might explain the reduction in inflammatory molecules. The long-term effects of colchicine are unknown, but additional research is important as current diabetes treatments can cause uncomfortable side effects. Dr. Patel and colleagues have initiated a larger follow up RCT in 240 participants, including 40 adolescents, to determine if colchicine is a viable preventive treatment for obesity-related metabolic syndromes and diabetes.
August Announcements

HAVE YOU HEARD ABOUT STRIVE?

NICHD launched its STRategies to enRich Inclusion and achieve Equity (STRIVE) Initiative to improve equity, diversity, and inclusion (EDI) in all aspects of its research and workforce. STRIVE, which complements NIH UNITE, focuses on taking action to improve EDI within NICHD and the scientific community, and expand health disparities research to develop solutions.

STRIVE will be conducting virtual workshops that will bring together stakeholders from diverse sectors to discuss health disparities research, identify knowledge gaps, and help chart a bold course for future activities.

The August workshops will be:

**AUGUST 4, 2021**
How Social Identity Can Impact and Promote Health: A Look Across Populations, Lifespans, and Generations
10:00 AM–4:00 PM (EDT)

**AUGUST 25, 2021**
Societal Influences on Health and Health Disparities During Childhood
12:30 PM–5:00 PM (EDT)

To register for this and future workshops in the series, please visit the STRIVE workshop website. Also, check back next month in The NICHD Connection for our “Deconstructing Bias” column on structural racism.

DUE NEXT MONTH: INTRAMURAL RESEARCH FELLOWSHIP (IRF)

Funding opportunity for all NICHD fellows

In 2017, DIR launched the Intramural Research Fellowship (IRF), a competitive research funding opportunity for NICHD postdoctoral, visiting, and clinical fellows. Its main objective is to promote grant writing among our intramural trainees, while enhancing awareness of the various components of an NIH grant application.

The IRF submission date is **Monday, September 8, 2021**.

For more information on the IRF, please visit NICHD Intramural Research Fellowships or email Dr. Triesta Fowler (fowlerlt@mail.nih.gov).

*(continued on page 15)*
August Announcements  
(continued from page 14)

DUE NEXT MONTH: SALZMAN VIROLOGY AWARD APPLICATION

The Salzman Virology Awards honor the 40-year career of Dr. Norman P. Salzman in virology research and his accomplishments in mentoring of young scientists. Two awards will be given. One postdoctoral fellow will receive a plaque and an award of $2,500. One graduate student/postbaccalaureate trainee will receive a plaque and an award of $1,000. The mentors of the awardees will each receive a plaque. The winners will give talks during the virtual 23rd Annual Norman P. Salzman Memorial Symposium in Basic and Clinical Virology on Monday, November 8, while selected other applicants will be invited to present posters.

The application due date for the Salzman Virology Awards is September 13, 2021. Application forms and eligibility information can be found at fnih.org/SalzmanSymposium.

NICHD NEW POSTBAC ORIENTATION SESSION

Wednesday, September 15, 1–2 PM

Our institute has approximately 100 postbacs conducting both clinical and basic science research. The Office of Education would like to bring our postbacs together to meet each other and discuss opportunities for service and leadership, along with the various resources and services available to you at NICHD and NIH-wide.

We aim to enrich fellows’ NIH experience with career development, outreach, and social activities. Learn about:

» NIH Library resources
» The Annual Postbac Seminar Series
» Opportunities for enhancing your science communications skills
» Shadowing opportunities in the NIH Clinical Center
» NICHD Office of Education Services & Resources
» The Office of Intramural Training and Education
» Medical & Graduate School Application Support
» And more!

The NICHD Postbac Orientation Session is mandatory for all postbacs who started on or after January 2021. To register, please contact Ms. Katherine Lamb (katherine.lamb@nih.gov).
August Events

TUESDAY–THURSDAY, AUGUST 3–5
Virtual Summer Presentation Week

If you are a summer intern, Summer Research Presentation Week is your time to share the research and creative projects you have been conducting at the NIH with the broader NIH community and your family and friends! At the same time, you will develop your communication and networking skills.

Please visit the OITE Virtual Summer Presentation Week website for more information.

MONDAY, AUGUST 9, 1–2:30 PM
Job Interviewing Workshop
Led by Public Speaking Coach Scott Morgan

If you are actively looking for a job this year, we strongly recommend you attend this informative and dynamic workshop. During this session you will learn tips for perfecting the broad interviewing skills needed to secure scientific positions (job talks, chalk talks, and the interview itself) and increasing your comfort level and confidence. You will have the opportunity to analyze expected questions, themes, and dilemmas through interactive exercises and peer review.

Participants can also schedule an individual one-hour coaching session with Scott prior to a scheduled job interview. To register for this virtual workshop, please email Ms. Katherine Lamb (katherine.lamb@nih.gov).

ONGOING EVENTS AROUND CAMPUS
NIH-Wide Office of Intramural Training and Education (OITE) Events
For more information and registration, please visit Upcoming OITE Events.

NIH Library Training and Events
For more information and registration, please visit the NIH Library Calendar.