

YEAR IN REVIEW







A NEW YEAR IS THE PERFECT TIME TO REFLECT on all we've accomplished in the last 12 months and look forward to a promising future.

In 2021, physicians at UPMC and the University of Pittsburgh School of Medicine faced the second year of the COVID-19 global pandemic. Our frontline workers stood steadfast during these difficult times and served our communities with the highest quality care and compassion. Despite these ongoing challenges, our physicians and researchers continued to discover new and better ways to care for and treat complex conditions and diseases.

It is with pride that I share the accomplishments of our team with those of you who know us best. From therapies to partially restore vision to new cancer immunotherapies, to efforts to combat disparities in care, our 2021 accomplishments embody UPMC's and Pitt's tradition of excellence and innovation.

# Joon Sup Lee, MD

Senior Vice President, UPMC
President, UPMC Physician Services
Vice Dean for Clinical Affairs,
University of Pittsburgh School of Medicine



New Endoscopic Surgery Developed to Treat Medically Intractable Epilepsy

A multidisciplinary surgical team from the UPMC Comprehensive Epilepsy Center, the UPMC Center for Cranial Base Surgery, and the departments of Neurological Surgery, Neurology, and Otolaryngology has developed a new endoscopic sublabial transmaxillary approach called the Endoscopic Far-Anterior Temporal Pole Approach designed to treat cases of medically intractable mesial temporal lobe epilepsy.



From left to right: Jorge Gonzalez-Martinez, MD, PhD Paul A. Gardner, MD Carl Snyderman, MD, MBA

The surgical team includes Jorge Gonzalez-Martinez, **MD, PhD**, UPMC endowed chair in epilepsy surgery; Paul A. Gardner, MD, Peter J. Jannetta professor of neurological surgery and codirector of the UPMC Center for Cranial Base Surgery; and Carl Snyderman, MD, MBA, codirector of the UPMC Center for Cranial Base Surgery. The approach allows for a more precise and complete resection of target tissues while avoiding cortical areas important to cognition and eliminating the need for a craniotomy.

The work to expand the surgical treatment options for intractable mesial temporal lobe epilepsy **builds** upon UPMC's decades of excellence and clinical firsts in endoscopic surgical approaches for epilepsy, brain and skull base tumors, and head and neck cancers.



"Patients are feeling like they have a better understanding of their disease and of how to take care of their disease themselves — there's a sense of empowerment that comes out of that."

- Eric Dueweke, MD

# **UPMC Heart Failure Experts Integrate** Remote Monitoring Technology Into Patient Care

Patients at the UPMC Advanced Heart Failure Center now have access to innovative remote monitoring technology that allows them to monitor their own health more closely, efficiently, and cost effectively. Led by Eric Dueweke, MD, a UPMC Heart and Vascular Institute cardiologist, Connected Care is a remote monitoring program designed to reduce hospital readmissions and empower patients to take control of their heart care at home.

Connected Care for heart failure patients builds upon UPMC's legacy of innovations in health care technology. As part of the program's expansion, UPMC's cardiology team began integrating patients' own smart devices into the process. More than 90% of the 1,500 individuals surveyed were satisfied with using the device.

"Our early data is showing that patients come out of remote monitoring feeling like they have a better understanding of their disease, and of how to take care of their disease themselves — there's a sense of empowerment that comes out of that," Dr. Dueweke said.

# **UPMC Offers Experimental Treatment** for Heart Arrhythmia

UPMC Shadyside is the first hospital in the Pittsburgh area to use radiation to treat refractory ventricular tachycardia. In May 2021, the U.S. Food and Drug Administration granted "Breakthrough Device Designation" for the use of stereotactic body radiation therapy (SBRT) to treat ventricular tachycardia.

"We are essentially trying to stop these abnormal rhythms, similar to catheter ablation, SBRT is noninvasive and can reach a deeper area of the heart that cannot be easily accessed using catheter ablation," said **Adam Olson, MD**, a radiation oncologist at UPMC Hillman Cancer Center.

# New Technology Aims to Restore **Movement** in Paralyzed Arms

In a paper published in *Nature Communications*, Marco Capogrosso, PhD, assistant professor and director of the Spinal Cord Simulation Laboratory in the Department of Neurological Surgery, proposed a new technology to improve arm and hand movements in individuals with arm paralysis due to spinal cord injury, stroke, or other movement disorders. Dr. Capogrosso and his team combined physics simulations with experiments in macaque monkeys and humans to demonstrate that epidural electrical stimulation of specific regions in the spinal cord can be used to activate arm and hand muscles.

# **UPMC Combats Nursing Shortage** With New Travel Staffing Agency

UPMC has created UPMC Travel Staffing, a new in-house travel staffing agency as a solution to the nationwide nursing shortage and to attract and retain highly skilled nurses and surgical technologists to its workforce. The program builds on UPMC's strong global reputation as a health care innovator and leader. UPMC is believed to be the first health system in the country to launch its own staffing agency.

UPMC, like virtually every health care system in the nation, has brought in external travel nurses and surgical technologists to help at the bedside and in operating rooms throughout the past year. The goal of UPMC Travel Staffing is to rely less on outside agency staff and empower UPMC employees who would like to travel to UPMC hospitals across Pennsylvania, Maryland, and New York — wherever and whenever the need is greatest. This new program will provide needed support for our frontline caregivers and career growth opportunities for UPMC nurses and surgical technologists interested in travel.

# Smartphone App Could Improve Prenatal Care and Reduce Racial Disparities



A new study published in JAMA Network Open evaluated preeclampsia risk and a patient's adherence to aspirin recommendations by comparing medical records to results of patient

surveys conducted with the MyHealthyPregnancy smartphone app. The app was developed by UPMC, University of Pittsburgh, and Carnegie Mellon University researchers. "We built the MyHealthyPregnancy platform — which is a patient-facing smartphone app and a providerfacing portal — to help identify preeclampsia risk factors and other risks related to preterm birth earlier than possible through routine prenatal care," said lead author **Tamar** Krishnamurti, PhD, assistant professor of medicine and clinical and translational science. The researchers say that digital tools like the app could help address racial disparities in preeclampsia rates by identifying people at risk early in their pregnancies.



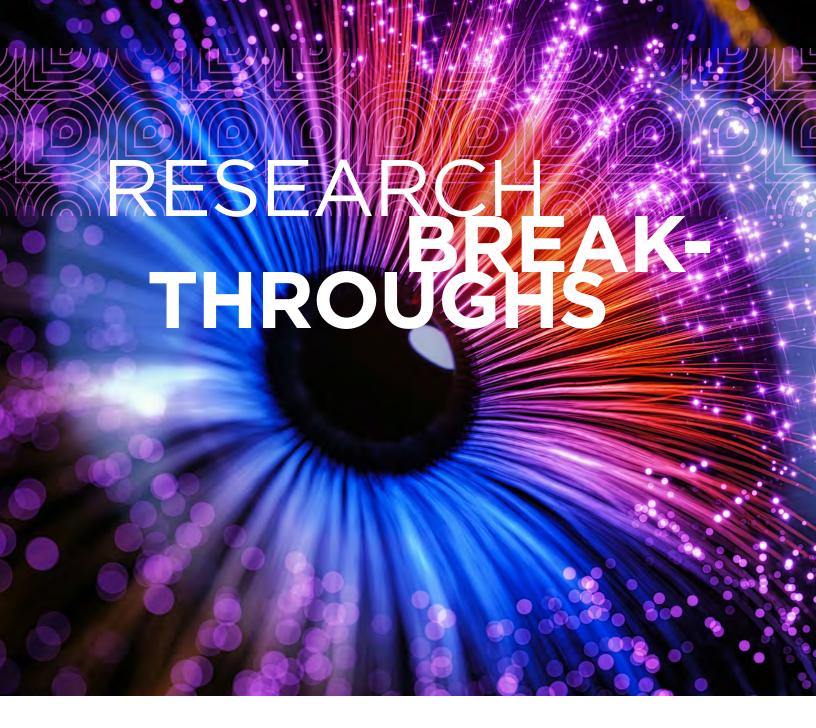




UPMC and the University of Pittsburgh will participate in a clinical trial to study the safety and effectiveness of a new brain-computer interface to help people with severe paralysis. The National Institutes of Health has awarded a \$10 million grant to Carnegie Mellon University, UPMC, Mount Sinai Health System and Synchron, collectively, to initiate a U.S. COMMAND clinical trial of a motor neuroprosthesis.

# Sense of Touch Improves Control of Robotic Arm

In a paper published in *Science*, a team of bioengineers from the University of Pittsburgh Rehab Neural Engineering Labs describe how adding brain stimulation that evokes tactile sensations makes it easier for the operator to manipulate a brain-controlled robotic arm. Cosenior authors **Jennifer Collinger, PhD**, and **Robert Gaunt, PhD**, are both associate professors in the University of Pittsburgh Department of Physical Medicine and Rehabilitation.



Pitt and CMU Scientists Improve the Quick **Detection** of Infectious Disease Outbreaks

Scientists at the University of Pittsburgh School of Medicine and Carnegie Mellon University greatly improved the guick detection of infectious disease outbreaks within a hospital setting over traditional methods for tracking outbreaks. The results, published in the journal Clinical Infectious Diseases, indicate a way for health systems to identify and then stop hospital-based infectious disease outbreaks in their tracks, saving lives and cutting costs.

The Enhanced Detection System for Healthcare-Associated Transmission (EDS-HAT) couples the recent development of affordable genomic sequencing with computer algorithms connected to the vast trove of data in electronic health records. When the sequencing detects that any two or more patients in a hospital have near-identical strains of an infection, machine learning quickly mines those patients' electronic health records for commonalities — whether that be close proximity of hospital beds, a procedure using the same equipment, or a shared health care provider — alerting infection preventionists to investigate and halt further transmission.



## For the First Time, Optogenetic Therapy Partially Restores Patient's Vision

In a paper published in *Nature Medicine*, scientists from Paris, Pittsburgh, and Basel, Switzerland, reported the first-ever case of partial vision recovery in a blind patient after optogenetic therapy. The pioneering study describes the first time a patient with any neurodegenerative disease has achieved partial functional recovery using optogenetic tools.

"I hope it will be a major breakthrough," said lead author, José-Alain Sahel, MD, chair of the Department of Ophthalmology and director of the UPMC Eye Center. "This paper is a culmination of more than 12 years of work."

"The eye is a very complex system that allows our vision to adapt to different levels of light," said Sahel. "But complex systems are very fragile — so when vision disappears, there are few treatments left aside from using prosthetics or reactivating remaining cells in the retina."



For this study, researchers injected the patient with an adenovirus-associated vector that carried genetic information encoding a light-sensing protein, ChrimsonR. The technique uses special goggles equipped with a camera to detect changes in light intensity pixel-bypixel as distinct events. The transformed image from the camera is then projected as discrete light pulses onto the retina in real time. The results were remarkable. After a period of adjusting and learning how to use the technology, the patient was able to locate, identify, and count different objects using the treated eye while wearing the goggles.

"Our initial findings are robust and very encouraging. Our team is enthusiastically moving forward with our studies."

- José-Alain Sahel, MD



# **UPMC Study Shows Efficacy** of Combination Immunotherapy for Advanced Melanoma



Jason J. Luke, MD, FACP, an associate professor in the Division of Hematology/ Oncology and director of the Cancer Immunotherapeutics Center at UPMC Hillman Cancer Center, conceived of, designed,

and was principal investigator for a clinical trial investigating the use of pembrolizumab, an anti-PD-1 agent, in combination with ipilimumab, a CTLA-4 inhibitor, for the treatment of advanced melanoma. The multicenter study, which was funded by a grant through the Merck Investigator Studies Program and published in the *Journal of* Clinical Oncology, showed safety and efficacy in a cohort of 70 patients.

Based on the findings from this study, the U.S. Food and Drug Administration granted approval for the use of pembrolizumab to treat stage IIB and stage IIC melanoma in both adult and pediatric patients after complete resection.

## **Brain Tissue Inflammation** Drives Alzheimer's Disease

For the first time ever, researchers from the University of Pittsburgh School of Medicine showed that neuroinflammation in living patients is not merely a consequence of Alzheimer's disease progression. Rather, it is a key upstream mechanism that is indispensable for disease development. Tharick Pascoal, MD, PhD, assistant professor of psychiatry and neurology and lead author of a paper published in *Nature Medicine*, found that targeting neuroinflammation might be beneficial for people with early-stage Alzheimer's disease. It also might help reverse or at least slow down the accumulation of pathologic tau protein in the brain and stave off dementia.



# Novel Immunotherapy **Boosts** Long-Term Stroke Recovery in Mice

Specialized immune cells that accumulate in the brain in the days and weeks after a stroke promote neural functions in mice. Those findings by researchers at the University of Pittsburgh School of Medicine Department of Neurology point to a potential immunotherapy that might boost recovery after the acute injury is over.

The study, published in *Immunity*, demonstrated that a population of specialized immune cells, called regulatory T (Treg) cells, serves as tissue repair engineers to promote functional recovery after stroke and remains active for weeks after the injury. "The beauty of this treatment is in its wide therapeutic window," said senior author Xiaoming Hu, MD, PhD, associate professor.

Research Links Respiratory Microbiome to Outcomes in the Critically III Patient on Mechanical Ventilation



A research study led by Georgios D. Kitsios, MD, PhD, an assistant professor in Pitt Medicine's Division of Pulmonary, Allergy, and Critical Care Medicine, reinforces the critical role of the microbiome in the

upper and lower respiratory tract in critically ill patients needing mechanical ventilator support for acute respiratory failure. The study, published in the American Journal of Respiratory and Critical Care Medicine, shows that respiratory tract dysbiosis, or disruption of microbial communities, is correlated with both an exacerbated inflammatory response and worse patient outcomes, including lower 30-day survival.





Anson Conrad Smith, MD

# Enhancing Diversity and **Promoting Health Equity** in Medicine

Under the leadership of its chair, Mark T. Gladwin, MD, the University of Pittsburgh Department of Medicine established an endowed fund to create and support the Conrad Smith Leadership Council. The Council is named in honor of **Anson Conrad** Smith, MD, a longtime UPMC Heart and Vascular Institute cardiologist and Department of Medicine faculty member, in recognition of his efforts to promote equity and diversity. The Council provides resources for internal medicine residents interested in the study and promotion of equity and diversity in health care. Overseeing the Council are Naudia Jonassaint, MD, MHS, vice chair for diversity, equity, and inclusion, and **Anastasia White**, diversity and inclusion program coordinator, in the Department of Medicine.

Published Editorial Cites the Urgent and Ongoing Need for Diversity, Inclusion, and Equity in Cardiology

UPMC Heart and Vascular Institute physicians Katie Berlacher, MD, MS, FACC, and Amber Johnson, MD, MBA, along with colleagues, published an editorial in the Journal of the American Heart Association, presenting evidence that establishing a more diverse workforce improves outcomes in clinical care and research. The current data indicate that increasing the number of underrepresented groups enhances the cultural competence of majority race physicians; will improve the care received by minority patients; will ensure that underserved and disadvantaged communities have a steady supply of physicians dedicated to their care; and will enhance the inclusivity and impact of medicine.



"Patient health improves when the diversity of medical providers increases. The necessity to ensure it happens is imperative."

- Naudia Jonassaint, MD, MHS



## Bridging Postpartum Hypertension Care

Lack of postpartum care is what led maternal fetal medicine physician Alisse Hauspurg, MD, to create the Postpartum Hypertension Program at UPMC Magee-Womens Hospital. It is one of only a handful of clinics in the country that focuses on postpartum care for women with hypertensive disorders of pregnancy.



# **UPMC Among Best Places to Work** for Women and Diverse Managers

UPMC was named #2 on Diversity MBA's Best Places to Work for Women and Diverse Managers. The diversity and inclusion infrastructure at UPMC is comprised of a staff devoted to advancing the organization's diversity and inclusion agenda. Spearheaded by the UPMC Center for Engagement and Inclusion, this agenda is centered on the organization's core values of dignity and respect. "As one of the country's largest academic medical centers, improving the health and health status of the communities we serve is at the core of our mission," said James E. Taylor, PhD, chief diversity, inclusion, and talent management officer at UPMC.





Center, the University of Pittsburgh School of Medicine. and New Jersey-based biotechnology company Avalon GloboCare Corp. aims to develop new cancer immunotherapy approaches and streamline manufacturing processes to bring these powerful treatments to cancer patients within days instead of weeks.

The collaboration is led by Yen-Michael S. Hsu, MD, PhD. director of the Immunologic Monitoring and Cellular Products Laboratory (IMCPL) at UPMC Hillman. As an FDA-registered, Foundation for the Accreditation of Cellular Therapy-accredited laboratory, the IMCPL supports investigator-initiated research and technical expertise in translating laboratory research into clinical biologic products. The mission of the lab is to deliver high-quality and safe translation of cuttingedge scientific breakthroughs into cellular therapies for improving cancer care and human health.

# Study Shows **Fecal Transplant** Boosts Cancer Immunotherapy

Researchers at UPMC Hillman Cancer Center and the National Cancer Institute demonstrated that changing the gut microbiome can help patients with advanced melanoma who never previously responded to immunotherapy. The results of this proof-of-principle phase II clinical trial were published in Science.



# **Novasenta Launched** by UPMC Physicians and Researchers to Discover and Develop Cancer Treatments

UPMC launched Novasenta, a drug discovery and development company seeking novel and effective treatments for cancer. Based on years of cancer research and a machine learning-enabled platform that drives the discovery of potential drug targets, Novasenta focuses on the tumor microenvironment or the ecosystem that surrounds and constantly interacts with the tumor inside the body — to develop immunotherapies. Greg Delgoffe, PhD, Robert Ferris, MD, PhD, and Dario Vignali, PhD, founded the company, now led by Mani Mohindru, PhD, who joined as CEO in April 2021.

## PROMOTIONS AND APPOINTMENTS



#### Leslie C. Davis Named CEO

The UPMC Board of Directors unanimously selected Leslie C. Davis to succeed Jeffrey A. Romoff as president and chief executive officer. Davis has more than 30 years of health care experience, serving most recently as president of the Health Services Division at UPMC. Davis says UPMC will continue to build upon its culture of innovation in the years ahead — with a particular focus on the patient experience. "There shouldn't be a patient who wants

to go anywhere else," Davis said. She hopes to see UPMC's world-renowned specialty services spread from Pittsburgh to all the domestic and international regions that it serves. At the core of this growth is a commitment to caring for patients.

**Katie Berlacher, MD, MS, FACC**, has been chosen as the next vice chair of the American College of Cardiology's Annual Scientific Session.

**Johannes Bonatti, MD**, an internationally respected and pioneering figure in the use of robotic surgical technologies for cardiothoracic surgery, joined the UPMC Heart and Vascular Institute.

**Barinder S. Hansra, MD**, has joined the UPMC Heart and Vascular Institute as a critical care attending physician at UPMC Presbyterian.

**MaCalus V. Hogan, MD, MBA**, has been installed as a member-at-large for the Orthopaedic Foot & Ankle Foundation board of directors. **Amy Houtrow, MD, PhD, MPH**, endowed professor in the Department of Physical Medicine and Rehabilitation at Pitt Medicine, was recently appointed to the Pennsylvania Statewide Independent Living Council board of directors.

**Dempsey L. Hughes, MD**, has joined the Thomas E. Starzl Transplantation Institute and the UPMC Center for Liver Diseases as clinical assistant professor.

**Taofeek K. Owonikoko, MD, PhD**, joined the UPMC Hillman Cancer Center and Pitt Medicine's Department of Medicine as chief of the Division of Hematology/Oncology.

**Page B. Pennell, MD**, was appointed as chair of the Department of Neurology at UPMC and Pitt Medicine. She comes to Pittsburgh from Harvard Medical School, where she served as a professor and vice chair for academic affairs in the Department of Neurology.

**Sebastian E. Sattui, MD, MS**, assistant professor at Pitt Medicine Division of Rheumatology and Clinical Immunology, is the new director of the UPMC Vasculitis Center.

**Robert Schoen, MD, MPH**, is leading the newly launched FORTE/NRG-CC005 colorectal cancer prevention study as protocol chair. **Jeffrey Dueker, MD, MPH**, is assistant protocol chair. Both serve on the faculty of Pitt Medicine's Division of Gastroenterology, Hepatology, and Nutrition, where Dr. Schoen serves as division chief.

UPMC has named veteran health care executive **Elizabeth Wild, MBA**, as president of UPMC Hillman Cancer Center, the region's only National Cancer Institute-designated Comprehensive Cancer Center.



### **AWARDS** AND **HONORS**

The National Pancreas Foundation (NPF) has recognized **UPMC Hillman Cancer Center** as an approved NPF Center of Excellence for the treatment of pancreatic cancer and pancreatitis. This is the second time UPMC Hillman has received this designation.

A new \$10.7 million, five-year project led by the **University of Pittsburgh Graduate School of Public** Health and Washington University School of Medicine in St. Louis aims to identify the genetic variants, genes, and pathways that lead to formation of plagues and tangles. These two specific biomarkers begin accumulating in the brains of people with Alzheimer's 15 to 25 years before they show symptoms.

UPMC Hillman Cancer Center immunologist and melanoma researcher **Diwakar Davar, MD**, is the 2021 recipient of the Sy Holzer Endowed Immunotherapy Research Award to advance innovative research in cancer immunotherapy.

**Richard H. Duerr, MD**, from the Division of Gastroenterology, Hepatology and Nutrition, was awarded a Uniting to Care & Cure Award from the Crohn's & Colitis Foundation.

Kathleen Hwang, MD, professor of urology at the University of Pittsburgh School of Medicine and director of male reproductive health at the UPMC Men's Health Center, was recently awarded a P50 grant from the National Institute of Child Health and Development.

Bruce Jacobs, MD, MPH, assistant professor of urology at the University of Pittsburgh School of Medicine, was recently awarded a research scholar grant from the American Cancer Society.

Pitt Medicine Division of Endocrinology and Metabolism faculty member Ruya Liu, MD, PhD, has been awarded a Samuel and Emma Winters Foundation grant to support her project titled "C5X Emerging as a Novel Target for Cardiomyocyte Renewal and Heart Regeneration."

Anna Evans Phillips, MD, MS, received her first NIH/ NIDDK RO1 grant to study "Pancreatic Quantitative Sensory Testing (P-QST) to Predict Treatment Response for Pain in Chronic Pancreatitis."

Boris Rosin, MD, PhD, a clinical instructor in Pitt Medicine's Department of Ophthalmology, received a \$375,000 grant from the Foundation Fighting Blindness as a career development award for his work in exploring the role of central nervous system changes in the course and treatment of inherited retinal dystrophies.

Jack Rozel, MD, MSL, has received the Allegheny County Medical Society Ralph C. Wilde Leadership Award. The award recognizes a physician who demonstrates exceptional skill in clinical care of patients and dedication to the ideals of the medical profession as a teacher or leader

José-Alain Sahel, MD, received a 2021 Science Breakthrough of the Year award from the Falling Walls Foundation. He was recognized in the life sciences category for "Breaking the Wall to Restoring Vision for Retinal Degeneration."

Amy Wagner, MD, received the Carolyn Braddom Ritzler Research Award for her profound impact on the science and practice of physical medicine and rehabilitation.

Evan L. "Jake" Waxman, MD, PhD, received the 2021 Straatsma Award for Excellence in Resident Education from the Association of University Professors of Ophthalmology and the American Academy of Ophthalmology.

Kurt Weiss, MD, associate professor and vice chair of translational research at Pitt Medicine, was awarded the 2021 OutSmarting Osteosarcoma grant by the MIB Agents, a nonprofit association.

**Andrew Williams, MD**, received the Research to Prevent Blindness and American Academy of Ophthalmology Award for IRIS® Registry Research in 2021.





UPMC mourns the passing of Freddie H. Fu, MD, the creator of its world-renowned sports medicine program, long-time chair of the Department of Orthopaedic Surgery, and head team physician for Pitt's Department of Athletics.

Dr. Fu was one of the most recognized and beloved physicians in Pittsburgh and is acclaimed worldwide for his innovative research and teaching, leading to many clinical advancements in sports medicine and orthopaedic care, particularly in treating knee injuries. Throughout his life and career, Dr. Fu worked passionately to always set the bar higher for his local, national, and international medical/surgical colleagues, thousands of medical students, and surgical residents and fellows who came to Pittsburgh to learn from the best.

Dr. Fu set the bar higher most of all for his tens of thousands of patients — elite, professional, Olympic, and amateur athletes from around the globe as well as nonathletes from around the corner — who sought his expert clinical care. As an ardent proponent and supporter of diversity in medicine, Dr. Fu developed one of the most ethnically- and gender-diverse academic and clinical departments in the country. He also is known for his enormous impact on the entire Pittsburgh region as a deeply devoted and enthusiastic community ambassador. actively serving for more than 30 years on the boards of numerous nonprofit organizations and life-enriching initiatives.



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