TRAINING
THE NEXT GENERATION

National Institutes of Health
Clinical Center

MRSP

MEDICAL RESEARCH SCHOLARS PROGRAM
RESEARCH COMPENDIUM 2026



2026

"The future of American medicine depends on the scientists we invest in today. The NIH MRSP is immersing talented future clinicians in the full breadth of NIH's research enterprise, from basic discovery to clinical translation. Their accomplishments are a testament to what becomes possible when curiosity meets rigorous science."

—Jay Bhattacharya, M.D., Ph.D.
Director, National Institutes of Health

https://www.cc.nih.gov/training/mrsp

ABOUT THE NIH MRSP

The NIH's mission is to strengthen our nation's research capacity, broaden our research base and inspire a passion for science in current and future generations of clinician-scientists. Recognizing that successful biomedical research depends on the talent and dedication of the scientific workforce, the NIH supports MRSP and other innovative training programs that foster scientific creativity and exploration. MRSP is a 10.5-12-month residential research immersion program in which scholars engage in mentored basic, clinical, or translational research projects that match their professional interests and career goals.

The MRSP is distinguished from other training programs by the scholars' unique access to the full continuum of NIH biomedical research—the bench, the bedside, and beyond—from molecular biology to artificial intelligence for image reconstruction, from computational biology to clinical trials and epidemiology. The MRSP scholars join laboratories and clinical research facilities that are among the most extensive and highly regarded in the world, with access to the NIH's 27 intramural Institutes and Centers, NIH seminars and tutorials, and teaching rounds at the NIH Clinical Center, America's Research Hospital. Scholars spend the majority of time in their research laboratories, under the mentorship of a fulltime NIH investigator whom they select, and also participate in a complementary curriculum of professional development and leadership opportunities.

Funding support for the MRSP occurs through a public-private partnership, supported by the NIH and private donations procured by the Foundation for the National Institutes of Health (FNIH). The FNIH was established by Congress in 1990 as a not-for-profit 501(c)(3) charitable organization. As an independent organization, it raises private funds and creates public private partnerships to support the mission of the NIH. The Shared Resources Subcommittee (SRS) of the NIH Board of Scientific Directors funds the MRSP as a signature program in the NIH's mission of training future clinician-scientists. The MRSP also works in partnership with the National Institute of General Medical Sciences (NIGMS) to fund students from NIGMS Institutional Development Award (IDeA) states and commonwealths, to promote scientific careers in those states.

The 2025-2026 Class of MRSP was comprised of 30 outstanding scholars representing 27 different medical and dental schools across 16 different states, as well as the District of Columbia and Puerto Rico. With a tremendous amount of resiliency, this class successfully completed projects with a broad range of basic and translational science spanning from imaging and diagnostic innovation to machine learning, to immunotherapy and health outcomes research.
This compendium demonstrates not only the successes of a year-long research immersion, but the potential of each Scholar and the future discoveries they will make. It is a privilege to support these emerging clinician-scientists and to share their work with you.



2025-2026 MRSP CLASS



Amy Banks
University of California at Los Angeles School of Dentistry



Yiling Dong
George Washington University School of Medicine and Health Sciences



Pavan Bhimalli
University of Wisconsin School of Medicine and Public Health



Megan Ezuede
Northwestern University Feinberg School of Medicine



Honesty Boone
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Roopa Gorur
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Vamsi Chodisetty
Case Western Reserve University School of Medicine



Randall Jones
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Han Dewan
University of Maryland School of Medicine



Rikhil Makwana
Chicago Medical School at Rosalind Franklin University of Medicine and Science



Davis Meadors
Indiana University School of Medicine



David Pellei
Columbia University College of Dental Medicine



Nitin Nadella
University of Missouri - Kansas City School of Medicine



Jessica Riopedre
FIU Herbert Wertheim College of Medicine



Raj Nair
Eastern Virginia Medical School



Aaliyah Schultz
State University of New York, Downstate Medical Center College of Medicine



Migelle Paolo Orobia
University of California at San Francisco School of Dentistry



Emily Scoville
Duke University School of Medicine



Kingsley Osei-Karikari
Weill Cornell Medical College of Cornell University



Shrey Shah
Rutgers New Jersey Medical School



Virali Patel
Sidney Kimmel Medical College at Thomas Jefferson University



Deven Singh
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Mark Solter
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Tadana Vazquez-Rothschuh
Ponce Health Sciences University School of Medicine



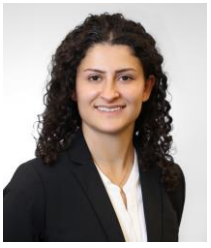
Madyson Williams
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Elena Wilson
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Sophia Xiao
University of Iowa Carver College of Medicine



Rana Yakhshi Tafti
Chicago Medical School at Rosalind Franklin University of Medicine and Science

MRSP Academic Curriculum



CLINICAL TEACHING ROUNDS

This conversational series covers the continuum of bench to bedside research with a particular focus on the patients participating in clinical protocols at the NIH Clinical Center.
MRSP Scholar have the opportunity to engage with both research physicians as well as patients.

GREAT TEACHERS

These colloquia feature nationally renowned academicians and leaders who are invited to the NIH as part of the Clinical Center Grand Rounds Series.

JOURNAL CLUB

Scholars select recent biomedical publications to illustrate key research principles, with a goal of teaching and engaging the audience while developing important presentation skills. Each journal club includes an assigned faculty mentor who works to help shape a more unified and educational presentation.

MedEd LEADERSHIP SERIES

This series features interactive workshops and hands-on skills building to support career growth and leadership. Topics include interview preparation, return to clinical practice, publication and CV development, communication skills, and personal wellness.

PROCESS OF DISCOVERY

This seminar series provides Scholars with career insight directly from NIH leaders and established principal investigators as they discuss their paths of scientific discovery and visions for the future.

RESEARCH ABSTRACTS





Amy Banks

MULTIMODAL ASSESSMENT OF TEMPOROMANDIBULAR DISORDER IN LOEYS-DIETZ SYNDROME

Loeys-Dietz syndrome (LDS) is a connective tissue disorder characterized by aortic aneurysms, arterial tortuosity, and craniofacial abnormalities. LDS-causing mutations have been identified along the TGF-β pathway corresponding to LDS Types 1-6. Although craniofacial and oral manifestations of LDS have been increasingly described, temporomandibular joint (TMJ) involvement remains incompletely characterized. This study used a multimodal approach to assess TMJ abnormalities in individuals with LDS.

Thirty-nine participants with LDS underwent cone-beam computed tomography (CBCT) review and clinical assessment. Symptom questionnaire data were available for 28 participants and Oral Health Impact Profile-14 (OHIP-14) data for 37. CBCT scans were evaluated for TMJ degenerative changes, including osteophyte formation, flattening, cortical irregularity, subchondral sclerosis, cysts, condylar resorption, cortical erosion, and narrow joint space, as well as morphologic abnormalities such as abnormal condylar shape, condylar hypoplasia, condylar hyperplasia, and bifid condyle.

TMJ abnormalities were common in the LDS cohort, with both degenerative and morphologic findings observed across age groups. However, total CBCT-defined degenerative burden was not significantly associated with TMJ dysfunction, TMJ pain, or OHIP-14 scores after adjustment for age and sex, suggesting that radiographic severity may not directly correspond to symptom burden or oral health-related quality of life in LDS. In an exploratory pilot analysis of 16 CBCT scans, an explainable deep learning and biomechanical modeling framework identified TMJ disorder morphological risk factors with 75% accuracy, supporting the potential of advanced imaging analysis to refine TMJ phenotyping. Ultrasound was also explored as a radiation-free, point-of-care imaging modality for TMJ assessment, with ongoing protocol development aimed at improving reproducibility and facilitating image interpretation.

These findings support TMJ abnormalities as a common feature of LDS and highlight the value of multimodal imaging approaches for improving characterization of TMD in this population.

MENTOR:
Janice S. Lee, D.D.S, M.D., M.S.
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Deputy Director, NIH Intramural Clinical Research

INSTITUTE:
National Institute of Dental and Craniofacial Research

Pavan Bhimalli

DUAL ANTIGEN TARGETING IN CAR-T CELL THERAPY FOR HEPATOCELLULAR CARCINOMA

Hepatocellular carcinoma (HCC) remains a major global health burden, often presenting at advanced stages where treatment options show limited efficacy. Alpha-fetoprotein (AFP) and glypican-3 (GPC3) are frequently expressed tumor-associated antigens in HCC and represent promising targets for T cell receptor (TCR) and chimeric antigen receptor (CAR) T cell therapies. Because antigen escape may limit the efficacy of single-antigen targeting, we evaluated whether dual targeting of AFP and GPC3 could improve antitumor activity.

We compared two monospecific T cell therapies currently being evaluated in early-phase clinical trials, an HLA-A2 restricted AFP-specific TCR and a GPC3-CAR, administered alone or as a mixed-cell product. We also generated a bispecific construct encoding both receptors on a single plasmid, enabling individual T cells to recognize both targets. These constructs were tested against HCC cell lines expressing GPC3 and producing AFP, including HLA-A2-positive HepG2 cells and HLA-A2-negative Hep3B cells, the latter modeling loss of the AFP-TCR recognition axis.

In preliminary studies, the bispecific construct demonstrated enhanced killing of HepG2 cells and maintained activity against Hep3B cells comparable to the GPC3-CAR, suggesting retained function when AFP-TCR targeting was unavailable. The mixed-cell product performed similarly to the GPC3-CAR in HepG2 but showed reduced killing in Hep3B. IFN-γ production followed similar trends. In serial killing assays, bispecific T cells maintained more consistent cytotoxic activity across repeated tumor exposures, suggesting improved functional persistence compared with monospecific and mixed conditions.

In vivo, NSG mice bearing HepG2 xenografts were treated with the same constructs, with a CD19-CAR included as a transduction control. Mixed dosing improved tumor control compared with either monospecific therapy, while mixed and bispecific dual-targeting approaches showed similar efficacy.

Overall, these preliminary data support dual AFP/GPC3 targeting as a promising strategy for HCC immunotherapy. Further studies are needed to define mechanisms of persistence, exhaustion, and long-term efficacy.

MENTOR:
Tim F. Greten, M.D.
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INSTITUTE:
National Cancer Institute, Center for Cancer Research

Honesty Boone

MALOCCLUSION IN FIBROUS DYSPLASIA: CHARACTERIZATION, PREVALENCE, AND RISK FACTORS

Fibrous dysplasia (FD) is a rare, mosaic bone disorder in which normal bone is replaced with expansile fibro-osseous tissue. This disorder stems from a postzygotic somatic mutation in *GNAS* and may be associated with endocrinopathies as a part of McCune-Albright syndrome (MAS). Craniofacial involvement is common and can lead to potential sequalae such as facial asymmetry, vision impairment, and hearing loss. The presence of these morbidities can often overshadow the dentoskeletal manifestations of patients with FD. To address this, we conducted a study to characterize, determine the prevalence, and evaluate the risk factors associated with malocclusion.

A retrospective analysis of imaging and clinical data was performed from 188 patients with craniofacial FD enrolled in a long-standing NIH FD/MAS natural history study. Using computed tomography (CT) imaging, skeletal relationships of the gnathic bones were classified according to a standardized system including Class I (orthognathic), Class II (malocclusion with prognathic maxilla and/or retrognathic mandible), and Class III (malocclusion with retrognathic maxilla and/or prognathic mandible). Cohort analyses were further stratified to identify potential clinical factors associated with malocclusion, including age, sex, endocrinopathies, skeletal FD burden, and a history of bisphosphonate therapy.

Malocclusion was highly prevalent in patients with craniofacial FD, with an increased prevalence of Class II (29%) and Class III (13%) skeletal relationships compared with population norms (15% and 5%, respectively). Evaluation of facial profiles showed deviation from expected norms, with straight, convex, and concave profiles all variably associated with Class II and/or Class III malocclusion in this cohort. Growth hormone excess and hypophosphatemia were statistically associated with a higher prevalence of Class III malocclusion.

These findings highlight that skeletal malocclusion is a highly prevalent and overlooked manifestation of FD/MAS that contributes to craniofacial morbidity. The association between endocrinopathies and Class III skeletal malocclusion should prompt in additional evaluation and monitoring for affected patients. Multidisciplinary management and care between craniofacial and medical specialists are critical to optimize care and improve outcomes for patients with craniofacial FD.

MENTOR:
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Gabriella Chefitz

GEOGRAPHIC VARIATION IN POLYOMAVIRUS-ASSOCIATED MERKEL CELL CARCINOMA ACROSS THE UNITED STATES

Merkel Cell Carcinoma (MCC) is an aggressive neuroendocrine skin cancer. Virus-positive MCC is driven by integrated Merkel cell polyomavirus (MCPyV), whereas UV mutagenesis drives virus-negative MCC. In the U.S., the prevalence of virus positivity for MCC tumors is typically reported as 70-80%. We sought to determine whether MCC virus positivity varies with U.S. geographic region using pooled institutional data.

We systematically identified published studies reporting on MCC virus status. Analyzing results from 16 U.S. study sites in 13 states, we pooled cases to calculate the mean virus positivity within geographical regions. To compare regions, we fit a binomial logistic regression model to aggregated study-level counts for MCPyV positivity, with geographical region as a categorical predictor and the Northeast specified as the reference. Overall, MCC virus positivity varied by region ($p=0.00016$). Relative to 76% MCPyV positivity in the Northeast, 59% in the South (OR 0.45, 95% CI 0.24-0.84; $p=0.012$) and 57% in the Midwest (OR 0.41, 95% CI 0.25-0.68; $p=0.0006$) were significantly lower, whereas 77% in the West failed to show a difference (OR 1.01, 95% CI 0.51-2.00; $p=0.98$).

Our findings strongly suggest geographical variation in MCPyV tumor positivity across the U.S., with lower MCC virus positivity in the South and Midwest. Although virus status does not currently direct MCC management, it is a well-established prognostic biomarker. Understanding regional differences in MCC virus positivity will also be important for planning clinical trials where virus status may be an inclusion criterion (e.g., MCPyV therapeutic vaccines). The precise reasons for regional differences remain unclear. Our analyses are based on aggregated study-level data and therefore could not adjust for patient-level factors such as individual UV exposure, occupational history, and immunosuppression. These limitations highlight the need for larger, harmonized datasets to further investigate regional MCC differences.

MENTOR:
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Vamsi Chodisetty

ASSOCIATION BETWEEN HOSPITALS' FINANCIAL HEALTH AND STAFFED-BED CAPACITY IN THE UNITED STATES

Hospital occupancy in the United States has risen substantially since the COVID-19 pandemic, driven by a contraction in staffed bed supply rather than by patient volume, yet whether pre-pandemic hospital financial position contributed to this contraction remains unknown. We therefore examined whether pre-pandemic operating margin and pre-pandemic months cash on hand were associated with the change in staffed bed capacity through 2023 among US acute care hospitals.

This retrospective cohort study linked the 2018 to 2024 American Hospital Association (AHA) Annual Survey, the RAND Hospital Database (2018 to 2023), and the CDC National Healthcare Safety Network. The primary sample comprised 1,523 acute care hospitals contributing 80,771 hospital-week observations across 2023, with a parallel sensitivity analysis of 914 critical access hospitals. Both pre-pandemic exposures were modeled in parallel linear regressions, with the outcome defined as the change in total facility beds set up and staffed between the pre-pandemic baseline (mean of 2018 and 2019) and 2023.

Neither pre-pandemic operating margin (0.38 beds per percentage point; 95% CI, –14.13 to 14.89) nor pre-pandemic months cash on hand (0.32 beds per month; 95% CI, –0.07 to 0.71) was associated with staffed bed change, and no prespecified interaction reached significance in either model. In contrast, larger bed size, system affiliation, higher case mix index, and greater registered nurse staffing were each independently associated with bed expansion, whereas private nonprofit and for-profit ownership were associated with smaller gains than government ownership. Among critical access hospitals, months cash on hand interacted with ICU presence (0.25; 95% CI, 0.03 to 0.47; P = .03).

In this national cohort, pre-pandemic financial position was not associated with post-pandemic recovery of staffed bed capacity. The concurrent structural and staffing associations instead implicate clinical labor markets, rather than balance-sheet pressure, as the operative constraint.

MENTOR:
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INSTITUTE:
NIH Clinical Center

Han Dewan

CONDUCTING CILIOGENESIS: THE ROLE OF FOXJ1 IN THE DEVELOPING INNER EAR

Forkhead Box J1 (FOXJ1) is a transcription factor with a conserved role in motile ciliogenesis. Our group has previously shown a role for RFX family transcription factors, also known regulators of ciliogenesis, in development and maintenance of the hair bundle. FOXJ1 is expressed in hair cells and in other systems works with members of RFX to regulate ciliogenesis. In this study, we characterize the role of FOXJ1 in the developing inner ear in two conditional knockout (cKO) mouse models through behavioral, histological, and transcriptomic analysis.

The spatiotemporal pattern of *Foxj1* in the inner ear was recorded using RNAscope. To establish the role of FOXJ1 in hair cells, we generated two cKO mouse models on a C57BL/6J background: *Foxj1;Gfi1-cre* (deletion at embryonic day (E) 13.5) and *Foxj1;Fgf20-cre* (deletion at E11.5). Auditory and vestibular function were evaluated with auditory brainstem response testing and vestibular sensory evoked potential testing at 1-month and 3-month timepoints. Histologic differences were evaluated using whole-mount immunohistochemistry of the cochlea and vestibular organs with acetylated tubulin staining to visualize the kinocilium. To understand the downstream regulatory pathways, single-cell RNA sequencing of postnatal day 1 vestibular organs from *Foxj1* cKO and wildtype mice was performed.

Foxj1 is specifically expressed in cochlear and vestibular hair cells and neurons at E16 and P2, with loss of expression in cochlear hair cells by P30. Preliminary results indicate that deletion of *Foxj1* at E11.5 or E13.5 does not impact hearing or balance function up to 3 months of age. Although gross morphology of inner ear organs and cochlear hair cells is maintained after Foxj1 deletion, utricular kinocilia are shortened in *Gfi1-Cre;Foxj1* cKO. Transcriptomic changes reflect a robust and specific downregulation of cilium-related gene expression.

These results suggest that *Foxj1* expression in hair cells influences kinocilium length, but that neither loss of *Foxj1* nor shortened vestibular kinocilia affect hearing or balance function in mice.

MENTOR:
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Senior Investigator and Chief, Neurotology Branch

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Yiling Dong

ASSOCIATION OF MIDLIFE OBESITY AND ADIPOSITY MEASURES WITH LATE-LIFE BRAIN AMYLOID DEPOSITION: THE ATHEROSCLEROSIS RISK IN COMMUNITIES (ARIC) STUDY

Midlife obesity is a risk factor for dementia, but mechanisms underlying this association are not fully understood. Furthermore, most current studies only use body mass index (BMI) to measure obesity, which does not differentiate fat distribution, which can influence disease risk. In this Atherosclerosis Risk in Communities (ARIC) study, we investigated the association of obesity, measured using BMI, waist circumference (WC), and waist-to-hip ratio (WHR), in midlife and late-life with late-life brain amyloid on florbetapir PET imaging as a marker of Alzheimer's disease pathogenesis in dementia-free adults.

Adiposity measures (categorical BMI, sex-specific WC, sex-specific WHR; defined using standard clinical cutpoints) were measured at midlife (ages 45-64) and late-life (ages 67-95). Logistic regressions were used to assess the relationship between adiposity measures and amyloid positivity (Ab+; standardized uptake value ratio>1.2) on PET scan in models adjusted for demographics and risk factors. Stratified models were performed with additional formal testing of an interaction term to test for effect modification.

In 801 participants (365 Ab+), midlife obese, but not overweight, BMI was associated with increased odds of Ab+ vs normal BMI (OR 1.73, 95% CI 1.13-2.66). No associations were seen with midlife WC or WHR or any late-life adiposity measure. Males had higher odds of Ab+ associated with high-risk midlife WHR (OR 2.74, 95% CI 1.38-5.43; vs females: OR 0.92, 95% CI 0.60-1.39; p-interaction<0.05), with similar patterns for late-life WHR and WC. APOE e4 non-carriers had increased risk of Ab+ associated with midlife obese BMI (OR 2.21, 95% CI 1.36-3.59), whereas carriers did not (OR 0.93, 95% CI 0.38-2.33; p-interaction<0.05).

Midlife obese BMI is associated with Ab+, but other adiposity markers generally were not. Midlife adiposity measures conferred stronger effects on Ab+ in males and APOE e4 non-carriers, compared to respective counterparts. Future studies should evaluate associations of obesity to other markers of dementia pathology.

MENTOR:
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National Institute of Neurological Disorders and Stroke

Megan Ezuede

HEART FAILURE MORTALITY IN THE SOUTHERN COMMUNITY COHORT STUDY

Heart failure (HF) is a major contributor to cardiovascular mortality in the United States (US) with a higher incidence among rural compared to urban residents. Yet, there is limited evidence on the association between rurality and mortality risk among adults with HF and on whether this association differs by race and sex. Does the risk of mortality vary by rurality among participants with incident HF in the Southern Community Cohort Study (SCCS), a prospective cohort of low-income adults from 12 southeastern US states?

A total of 7537 participants with incident HF were identified from enrollment (2002-2009) through 2016 using Centers of Medicaid and Medicare services (CMS) linkage and ICD 9/10 HF codes. Rurality was defined at enrollment by Rural-Urban Commuting Area codes. Analyses were stratified by race (non-Hispanic Black and White) and sex. We estimated survival probability at 5-years post HF diagnosis by the Kaplan–Meier method. Using Cox proportional hazard regression models, we estimated: 1) hazard ratios (HRs) and 95% confidence intervals (CIs) for all-cause mortality, and 2) subdistribution HRs for cardiovascular (CV) mortality, by rurality, with sequential adjustment for demographics, clinical comorbidities, health behaviors, and sociocultural factors. Non-CV deaths were treated as competing risks to CV mortality.

Overall, 24.7% of participants resided in rural areas. Rural participants were older, more likely to be married, had less educational attainment, were more sedentary, and had higher neighborhood deprivation; clinical comorbidities, race, and income were mostly similar compared to urban participants. Within 5 years of incident HF diagnosis, 29.4% rural and 31% of urban participants died, with an overall median follow-up time of 53 months.

In the overall cohort, rural residence was associated with a lower risk of all-cause mortality (HR: 0.91; 95% CI: 0.84-0.99) with adjustment for demographics and clinical comorbidities (Figure 1). Further adjustment for health behaviors and sociocultural factors attenuated the association. Stratification by race and sex showed lower risk of all-cause mortality among rural White women (HR: 0.80, 95% CI: 0.64-0.99) but no difference for Black individuals and White men. There were no significant association between rurality and the risk of CV mortality.

These findings highlight the importance of comprehensively evaluating exposures when examining the risk of HF mortality in populations

MENTOR:
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INSTITUTE:
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Roopa Gorur

INVESTIGATING STING IN ADRENOCORTICAL CARCINOMA

Adrenocortical carcinoma (ACC) is a rare and aggressive neuroendocrine malignancy with limited therapeutic options and poor clinical outcomes. Increasing evidence suggests that the cyclic GMP–AMP synthase–stimulator of interferon genes (cGAS–STING) pathway plays a critical role inducing both pro-tumor and anti-tumor effects. However, the mechanisms regulating STING signaling in ACC remain poorly understood. This study investigates the relationship between Delta-like noncanonical Notch ligand 1 (DLK1), a cell surface protein highly expressed in ACC, and STING signaling using ACC cell lines and patient-derived organoids (PDOs).

DLK1 knockout (KO) models were generated using both CRISPR and nucleofection methods. Western blot and flow cytometry analyses confirmed successful DLK1 reduction in multiple models. In an ACC cell line derived from the University of Colorado, DLK1 KO resulted in increased STING expression, suggesting a potential inverse relationship between DLK1 and STING signaling. However, this pattern was not consistently observed across PDO models, highlighting the heterogeneity of ACC biology. To further characterize downstream STING signaling, the expression of canonical STING-associated chemokines, CCL5, was assessed following treatment with a STING agonist. While high-STING ACC cell lines demonstrated increased CCL5 expression, several PDO models with elevated STING failed to show a similar response. RNA sequencing identified CXCL14, a noncanonical chemokine associated with immune regulation and tumor suppression, as significantly elevated in high-STING ACC models. ELISA analysis further confirmed increased CXCL14 secretion in DLK1 KO cells with elevated STING expression.

These findings suggest that CXCL14 may represent a novel downstream effector of STING signaling in ACC. Ongoing studies aim to further define the functional relationship between DLK1, STING, and CXCL14 in shaping the immune microenvironment of ACC.

MENTOR:
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Hyungee Ha

INTERPRETATION OF ADAPTIVE OPTICS FEATURES IN AGE-RELATED MACULAR DEGENERATION USING OPTICAL COHERENCE TOMOGRAPHY CO-REGISTRATION

Adaptive optics (AO) ophthalmoscopy enables microscopic visualization of retinal changes in age-related macular degeneration (AMD). Efforts continue to improve interpretation of disease-related changes in AO imaging to broaden its potential utility. Here, we co-localized AO features with known optical coherence tomography (OCT) biomarkers such as ellipsoid zone (EZ) attenuation to assess its applicability.
To quantitatively characterize AO features in relation to OCT biomarkers and develop an AO grading framework, a retrospective analysis was conducted using images from a longitudinal study within the group. 173 registered AO-OCT pairs from 79 eyes of 46 patients were reviewed over mean follow-up of 2.2 years. Within each co-localized region, AO features and corresponding OCT biomarkers were independently graded using a 3-point scale, and their agreement was quantified with Cohen's kappa.
The strongest agreement was observed between EZ attenuation on OCT and hyporeflective clumps (HRCs) on AO (κ=0.60). The second strongest agreement was between hyperreflective foci (HRF) on OCT and increased AO background reflectivity (κ=0.52). Unlike prior reports linking primarily HRCs with geographic atrophy (GA) or OCT HRF, we found only slight agreement with GA (κ=0.12) and HRF (κ=0.15).

Drusen, the most prevalent OCT biomarker in AMD, showed agreement with both hyperreflective and hyporeflective borders on AO (κ=0.49 and 0.29, respectively). Although prior AO studies described heterogeneous rim reflectivity, its patterns have not been well characterized. Hyporeflective rims were most often observed at the drusen periphery, particularly in areas of deeper curvature (~90°) and in valleys between adjacent drusen. Whereas hyperreflective rims were more common along the inner aspect toward the drusen peak.

These findings provide a quantitative framework for AO-OCT analysis in AMD. We found HRCs as the AO feature most strongly associated with EZ attenuation. Further studies are needed to clarify the biological basis and longitudinal significance of these features in AMD progression.

MENTOR:
Emily Y. Chew, M.D.
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Randall Jones

NEUROFUNCTIONAL AND BEHAVIORAL RESPONSES TO ACUTE KETAMINE DURING EMOTIONAL FACE-MATCHING TASK-BASED MRI

Ketamine produces rapid antidepressant response in treatment-resistant depression (TRD), but the mechanisms underlying its interaction with emotional processing remain poorly understood. No study has examined task-evoked brain activity during ketamine infusion itself, nor applied psychophysiological interaction (PPI) analysis to characterize ketamine's modulation of task-dependent connectivity during emotional processing in TRD.

Twenty-five adults with TRD completed a randomized, double-blind, placebo-controlled crossover study receiving intravenous ketamine (0.5mg/kg) and saline placebo, separated by a one-week washout. 3T BOLD fMRI was acquired during an emotional face-matching task at three timepoints: before, during, and post-infusion. Whole-brain activation and PPI connectivity analyses used linear mixed-effects models. Brain-clinical models tested whether neural changes were associated with Montgomery-Asberg Depression Rating Scale (MADRS) scores at 230 minutes post-infusion.

Ketamine reduced MADRS scores relative to placebo at 120 minutes ($d = -0.43$, $p < .001$) and 230 minutes ($d = -0.46$, $p < .001$) post-infusion, and impaired face-matching performance, with the strongest effects for sad faces. Post-infusion, ketamine was associated with activation in bilateral parietal and dorsal frontal regions. PPI changes were widespread with distinct temporal profiles: anterior cingulate seeds showed increased PPI connectivity with occipitoparietal regions during infusion, amygdala and insula seeds showed decreased connectivity with parietal regions post-infusion, and fusiform face area seeds showed enhanced PPI connectivity with midline and subcortical structures post-infusion. No significant brain-clinical associations were observed.

Ketamine selectively disrupts emotional face processing in TRD while sparing non-emotional task performance. Concurrent parietal recruitment may reflect a compensatory shift toward dorsal attentional processing strategies following lower-order processing disruption. PPI changes emerge earlier and more broadly than activation changes, suggesting task-modulated connectivity may capture an important dimension of ketamine-induced neural change. These findings integrate the known blunting of negative emotional processing under ketamine with a specific neural mechanism and identify a candidate neural signature that future work may relate to antidepressant response.

MENTOR:
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Rikhil Makwana

THE DEVELOPMENT OF AN ARTIFICIAL INTELLIGENCE MODEL FOR THE AUTOMATED DETECTION OF HEAD AND NECK SQUAMOUS CELL CANCERS

Head and neck squamous cell carcinoma (HNSCC) presents in later stages leading to poor prognosis. We developed a multi-class segmentation artificial intelligence (AI) model for head and neck squamous cell carcinoma (HNSCC) and lymph node (LN) involvement on contrast-enhanced CT (CECT).
We included 1382 CECT scans from 1355 patients (male = 1098; female = 257; mean age = 61.7 years; standard deviation = 10.2 years) from four cohorts: cohort 1 (n = 113 patients), from "The Cancer Genome Atlas Head-Neck Squamous Cell Carcinoma Collection" of patients with HNSCC; cohort 2 (n = 150 patients), publicly available dataset of patients with oropharynx squamous cell carcinoma (OPSCC); cohort 3 (n = 33 patients), patients with OPSCC participating in clinical trials NCT04432597 and NCT05996523; cohort 4 (n=1059) consisted of an open-source dataset of patients with HNSCC. Cohort 1 and 3 scans were manually contoured by a radiologist (B.T.). Cohort 2 and 4 scans were contoured by open-source data providers. An AI model was trained (n = 217 scans) using nn-UNet and validated against unseen 1138 scans. Performance metrics included sensitivity and accuracy with 95% confidence intervals and DICE score coefficients (DSC).

The AI model had a tumor sensitivity of 0.90 [0.89, 0.92], accuracy of 0.90 [0.88, 0.92], and a DSC of 0.43. When identifying involved LN, the model had a sensitivity of 0.86 [0.83, 0.88], accuracy of 0.84 [0.82, 0.86], and a DSC of 0.56.

The developed AI model is performant at detecting lesions and metastatic LNs. Prospective validation is necessary prior to widespread clinical implementation.

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Davis Meadors

TERMINAL DISEASE AND PATIENT QUALIFICATION FOR PHYSICIAN-ASSISTED DEATH: A SURVEY OF THE US PUBLIC

Physician-assisted death (PAD) laws in the US restrict eligibility to adults with terminal disease, defined as a medically confirmed, incurable, irreversible disease that will produce death within six months. Narrow eligibility was intended to address concerns about a slippery slope. However, US patients have received PAD after discontinuing treatment for eating disorders and after voluntarily stopping eating and drinking in very early-stage dementia. Further, some argue that lack of access to effective treatment may not prohibit PAD in practice.

Given several states have legalized PAD through referenda, public opinion is crucial. Thus, we surveyed US adults about terminal disease PAD. Respondents (n=2,512) were quota sampled to represent the general population in age, sex, race/ethnicity, education, and political party affiliation. Respondents received seven hypothetical scenarios: four concerning cancer and diabetes patients who refuse or cannot afford standard treatment and three concerning patients who stop eating and drinking and request PAD with very early dementia, an eating disorder, or bereavement.

While 63% approved of allowing PAD in general, a minority expected US laws to permit PAD for scenario patients, ranging from 40% for a cancer patient who refuses effective treatment to 17% for a bereaved patient who has stopped eating and drinking. 42% and 20% personally approved of PAD in the same scenarios. Lack of terminal illness was the leading reason respondents did not believe each patient would be eligible. Greater income and education associated positively with approval of PAD in general, but negatively for scenario patients. Only male sex and liberal political leaning associated with more approving attitudes in the scenarios.

Our results suggest that US constituencies expect terminal disease restrictions to prohibit PAD in the types of cases presented. Limited public approval of PAD in the scenarios may reflect resistance to broader eligibility or permissive interpretations of terminal disease.

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Nitin Nadella

REDEFINING AZITHROMYCIN RESPONSE FOR CHRONIC LUNG ALLOGRAFT DYSFUNCTION PROPHYLAXIS: A cfDNA ANALYSIS

Chronic Lung Allograft Dysfunction (CLAD) affects half of lung transplant (LTx) recipients within five years, conferring significant mortality risk. Despite widespread use of prophylactic azithromycin, its efficacy profile remains unclear.
This study used plasma cell-free DNA (cfDNA) to assess azithromycin response and stratify patients into response-driven cohorts for risk of CLAD development.

Plasma levels of donor-derived cfDNA (ddcfDNA) and recipient-derived cfDNA (rdcfDNA) were measured via a SNP-based digital droplet PCR approach. Clinical data was obtained directly from participating sites. PFT response was quantified as the percent change at 3 months after initiation relative to baseline. cfDNA response utilized rdcfDNA and was quantified as the change in time-normalized AUC values in the 180 days around azithromycin initiation. The primary composite endpoint was CLAD development, as per 2019 ISHLT consensus criteria. Secondary outcomes included CLAD progressors, defined by those with either a 10% decline in FEV1 or FVC in the 180 days after CLAD diagnosis, and CLAD non-progressors.

A total of 82 LTx recipients were included. ΔAUC rdcfDNA significantly differentiated patients who developed CLAD from those who did not (AUC change of 0.289 log10 copies/ml vs 0.060 log10 copies/ml, respectively with p=0.0007) and further stratified patients into CLAD progressors, CLAD non-progressors and no CLAD subgroups (KW p=0.0003). Conventional PFT measures did not stratify patients who subsequently developed CLAD vs did not (FEV1 %change: 9 vs 11, respectively, p=0.855). Using ΔAUC rdcfDNA, azithromycin non-responders showed a nearly 2.5-fold higher risk of developing CLAD compared to responders (HR: 2.35, 95% CI: 0.90- 6.13, p=0.036 (one-sided)).

This study demonstrates that rdcfDNA may serve as a better noninvasive biomarker for Azithromycin response profiling compared to conventional spirometry to stratify those with an increased risk of CLAD development.

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Migelle Paolo Orobia

DERIVING AND CHARACTERIZING CRISPR/CAS9 KNOCK-IN MURINE ORAL SQUAMOUS CELL CARCINOMA CELL LINES IN C57BL/6 MICE FOR IMPROVED UNDERSTANDING OF IMMUNE CHECKPOINT BLOCKADE INHIBITORS IN HEAD AND NECK CANCER

Head and neck cancer (HNC) is the seventh most common malignancy worldwide. Despite aggressive multimodal therapy, including surgery with or without chemotherapy and radiotherapy, long-term survival remains limited. Immune checkpoint blockade (ICB) with PD-1 inhibitors has improved outcomes for some patients with recurrent or metastatic head and neck squamous cell carcinoma (HNSCC), but clinical benefit remains limited to a minority of patients, with approximately 36% 1-year survival and 14% objective response rates. New mechanistic strategies are therefore needed to enhance ICB efficacy.

To address this need, we established two Cas9-expressing murine oral squamous cell carcinoma lines, mCas9OSCC, from oral tumors induced by 4-nitroquinoline 1-oxide in Cas9 knock-in C57BL/6 mice. These syngeneic models retain inducible Cas9 activity, grow both orthotopically in the tongue and subcutaneously in immunocompetent hosts, and recapitulate key genomic features of human HNSCC, including mutational profiles that closely resemble human disease. Compared with established translational models such as MOC1 and MOC2, mCas9OSCC provides a genetically tractable platform for rapid in vivo CRISPR screening within an intact tumor–immune microenvironment.

Building on prior genome-wide and in vivo CRISPR knockout screens in HNSCC and other solid tumors, this platform will allow us to systematically interrogate candidate synthetic lethal interactions that regulate response to ICB. We will use pooled CRISPR libraries to target oncogenic and therapy-relevant pathways, including cell-cycle regulation, PI3K/mTOR signaling, and epigenetic control, in tumors treated with anti–PD-1 and anti–CTLA-4 blockade. By linking individual gene losses to altered tumor growth, immune remodeling, and checkpoint response, we aim to identify actionable vulnerabilities that can be therapeutically exploited.

This work will establish mCas9OSCC as a powerful immunocompetent platform for functional cancer genomics and may reveal rational combination strategies to improve immunotherapy outcomes for patients with HNSCC.

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Kingsley Osei-Karkari

SYSTEMIC LIPIDOMIC REMODELING IN HIDRADENITIS SUPPURATIVA AND ITS ESCALATION WITH DISEASE SEVERITY

Hidradenitis suppurativa (HS) is a chronic inflammatory disease increasingly recognized as a systemic condition. Prior metabolomic studies suggest lipid perturbations in HS; however, severity-stratified analyses remain limited. We hypothesized that circulating lipidomic alterations not only distinguish HS from controls but also scale with disease severity.

Serum samples were analyzed using MALDI mass spectrometry–based metabolomics. Disease versus control comparisons included 58 samples; severity modeling across Hurley stages I–III included 46 samples. Differential abundance testing with false discovery rate correction, multivariate modeling with permutation validation, and ordered trend analyses were performed, incorporating random effects for repeated measures.

Unsupervised NMDS demonstrated global lipidomic separation between HS and controls. Differential analysis identified directional alterations characterized by increased sphingolipids and decreased selected glycerophospholipids. Lipid-class coherence revealed coordinated sphingolipid enrichment and phospholipid depletion consistent with inflammatory membrane remodeling. Severity modeling demonstrated ordered, stage-dependent metabolic patterns across Hurley stages. The largest metabolic inflection occurred between Hurley stages II and III, with advanced disease marked by diffuse, multi-class lipid reorganization.

HS exhibits systemic lipidomic remodeling that escalates with clinical severity. Progressive, multi-class lipid reorganization supports a model of inflammatory membrane lipid reprogramming and identifies candidate severity-associated biomarkers for future validation.
This cross-sectional analysis was conducted within a single cohort; serum profiles may be influenced by metabolic comorbidities.

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MATERNAL CARDIOVASCULAR RISK DURING LABOR AND DELIVERY IN TWINS AND TRIPLETS VERSUS SINGLETONS

To compare the risk of cardiovascular events (CVE) during labor and delivery (L&D) in multifetal (twins and triplets) versus singleton pregnancies. In a secondary analysis of women in the Consortium on Safe Labor cohort, maternal baseline characteristics, mode of delivery, obstetric outcomes, and ICD-9-CM codes were collected from medical records. Relative risks (RR, 95% CI) of CVE for women with twin and triplet pregnancies compared to women with singleton pregnancies were calculated using adjusted modified Poisson regression with robust standard error, and stratified by HDP status.

Of 174,883 pregnancies, 4,013 (2.3%) were twin and 167 (0.1%) were triplet. The rate of CVE during L&D was 0.4% in women with a singleton, 1.0% in twin, and 1.8% in triplet pregnancy ($p < 0.001$). Overall, twin pregnancies had a higher risk of CVE during L&D than singleton pregnancies [RR 2.34, 95% CI: 1.71-3.20], and this risk was further elevated in twin pregnancies complicated by HDP [RR 2.72, 95% CI: 1.66-4.48]. These associations remained statistically significant after adjusting for mode of delivery [RR 2.22, 95% CI: 1.35-3.67]. In pregnancies not affected by HDP, twin pregnancies had a higher risk of CVE [RR 1.73, 95% CI: 1.11-2.69] than singleton pregnancies, but the risk was null after adjusting for mode of delivery [RR 1.03, 95% CI: 0.66-1.61]. Triplet pregnancy was not associated with increased risk of CVE in any model.

Twin gestation increases cardiovascular event risk during labor and delivery, with risk magnitude modified by hypertensive disorders of pregnancy and mode of delivery. The increased cardiovascular risk may contribute to the increased risk of severe maternal morbidity and mortality observed in multifetal pregnancies.

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David Pellei

DIFFERENTIATION OF IPSCS INTO LATERAL PLATE MESODERM TO REPAIR CARTILAGE DEFECTS WITH FIBRIN MICROBEADS

Articular cartilage after injury is plagued by its limited intrinsic healing capacity. Cell treatments often result in formation of fibrocartilage, while in other approaches, newly formed cartilage may undergo hypertrophy into bone tissue, neither of which recapitulate the smooth, shear-resistant surface of articular cartilage in the joint. Our lab previously identified hyaluronic acid-coated fibrin-thrombin microbeads (HyA-FMBs) as a biomaterial that prevents hypertrophy of cartilage. When HyA-FMBs are transplanted into articular defects with bone marrow stromal cells or induced pluripotent stem cell (iPSC)-derived paraxial chondroprogenitors, we observe markedly reduced hypertrophy. However, paraxial mesoderm generates cartilage in the axial skeleton, whereas limb articular cartilage arises from the lateral plate mesoderm. There are significant differences between these two types of cartilage. Consequently, we hypothesized that cartilage derived from iPSCs differentiated into lateral plate mesoderm will be more efficacious in regenerating osteoarthritic limb joints.

We developed a protocol to produce 3D chondrocyte organoids through the lateral plate mesoderm pathway. Optimizing conditions across three healthy iPSC lines to improve their formation, viability, and chondrogenic phenotype, we were able to generate organoids capable of transplantation and evaluated their compatibility with HyA-FMBs. While demonstrating a robust cartilage phenotype alone, they still showed evidence of transitioning to bone, consistent with our previous observations. These lateral plate chondrocyte organoids have been transplanted ectopically, and future studies will evaluate their performance in an osteochondral defect model.

In parallel, we are currently reproducing HyA-FMBs, aiming to create a good manufacturing practice (GMP)-compliant protocol for translation to a preclinical model. Finally, we applied this lateral plate chondrocyte organoid model to patient-derived iPSCs from Jansen's metaphyseal chondrodysplasia, a rare skeletal disease (PTH1R mutation) affecting endochondral bone formation from cartilage. Altogether, we hope to establish a developmentally informed pathway for cell therapy and delivery in articular joint repair, biomaterial translation, and rare disease modeling.

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Raj Nair

DEVELOPMENT OF NANOBODY BASED OPTICAL PHENOTYPING

Amyotrophic lateral sclerosis (ALS) is a devastating neurodegenerative disease with over 50 disease-relevant genes and approximately 100 mutations per gene, creating an enormous challenge for systematic functional characterization. A key bottleneck in scalable ALS research is the efficient sorting and enrichment of genetically perturbed cells expressing tagged proteins of interest. This project aimed to develop and validate a nanobody-based optical phenotyping system to address this challenge in iNeurons.

We employed the ALFA Nanobody-Guided Endogenous Labeling (ANGEL) system, in which an anti-ALFAtag single-domain antibody (NbALFA), commonly known as Nanobody ALFA, fused to a fluorescent protein (FP) is stabilized only upon binding an ALFA-tagged protein of interest. To maximize signal discrimination, we leveraged the N-degron pathway by engineering arginine as the N-terminal residue of NbALFA, maximizing the nanobody's baseline destabilization. We then tested RNbALFA fused to three fluorescent proteins, mEmerald, mGreenLantern, and mNeonGreen, in induced pluripotent stem cells (iPSCs) via PiggyBac, transposase mediated stable integration. Across all three FPs, RNbALFA generated a distinct signal over background in cells with high ALFA-tagged protein expression. However, signal quality was poor at low-to-intermediate expression levels. These findings demonstrate the feasibility of nanobody-based cell enrichment while highlighting the need for improved signal amplification strategies for endogenously tagged proteins expressed at physiological levels.

Future directions include optimizing delivery by testing single-site stable RNbALFA integration and mRNA-based transient expression. Beyond enrichment, this system can be extended to pulldown studies characterizing protein interaction networks, as well as acute protein degradation and mislocalization experiments to further elucidate ALS pathophysiology

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Jessica Riopedre

CLINICAL FINDINGS SUGGESTIVE OF MOSAIC TUBEROUS SCLEROSIS COMPLEX IN INDIVIDUALS WITH APPARENT SPORADIC LYMPHANGIOLEIOMYOMATOSIS

Lymphangioleiomyomatosis (LAM) is a rare, progressive cystic lung disease that occurs predominantly in women of reproductive age. It exists as sporadic LAM (S-LAM) and in association with tuberous sclerosis complex (TSC-LAM), an autosomal dominant disorder characterized by multisystem hamartomas. While S-LAM and TSC-LAM have traditionally been considered distinct conditions, emerging evidence suggest that they are part of a spectrum involving varying degrees of mosaicism. In this study, we investigated whether a subset of patients diagnosed with S-LAM may have TSC mosaicism. We analyzed 63 adult women with S-LAM who had negative brain imaging and no family history of TSC. Clinical assessment identified 27 patients who had subtle, non-diagnostic features suggestive of TSC mosaicism, including a solitary cutaneous finding, >4 sclerotic bone lesions (SBLs), and multiple bilateral renal angiomyolipomas (AMLs).

Targeted next-generation sequencing of blood and skin DNA detected pathogenic mosaic TSC2 variants in 6/27 (22%) individuals. Of these, pathogenic variants were identified in 0/4 individuals with a solitary cutaneous finding, 0/8 with >4 SBLs, 1/6 with multiple bilateral AMLs, 2/4 with solitary cutaneous finding and >4 SBLs, 2/3 with solitary cutaneous finding and multiple bilateral AMLs, and 1/2 with >4 SBLs and multiple bilateral AMLs. Overall, TSC2 pathogenic variants were significantly more frequent in individuals with two suggestive clinical feature (5/8, 63%) than in those with one suggestive feature (1/19, 5%) ($p=0.0025$).

Our findings suggest that in this series of patients with S-LAM, 27 women had clinical findings suggestive of mosaic TSC, and 6 (22%) had genetic findings of low-level mosaicism for a TSC2 mutation. Importantly, combinations of subtle or solitary TSC-related findings may serve as important clinical indicators of underlying mosaicism. Recognition of these patterns may improve diagnostic accuracy and inform genetic testing, clinical surveillance, and family planning.

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Aaliyah Schultz

POST-OPERATIVE SERUM PROLACTIN MAY PREDICT IMPENDING HYPOPITUITARISM FOLLOWING TRANSSPHENOIDAL SURGERY

Symptomatic pituitary adenomas are treated with transsphenoidal surgery (TSS) or radiation, sometimes resulting in hypopituitarism. Early prediction of hypopituitarism after TSS is important for identifying patients who may require long-term hormone replacement therapy, but standard pituitary hormone assays are often uninterpretable immediately after surgery. At the NIH, clinicians obtain high-density hormone data (cortisol, prolactin (PRL), growth hormone etc.) in the hours and days following TSS. Previously, we have shown that tight correlations exist between postoperative serum cortisol levels and remission from Cushing's Disease (CD) (cis-effect). Here, we hypothesized that a trans-effect on pituitary hormones after surgery can detect hypopituitarism immediately following surgery. We focused on postoperative PRL as an indicator for pituitary health following TSS.

We retrospectively analyzed 413 TSS at the National Institutes of Health from 2013 to 2025. Hypopituitarism was defined at one year from surgery if patients were prescribed replacement hormone(s) not prescribed before surgery. Of 242 cases with postoperative PRL data, 16 were excluded because PRL was not measured within 10 days of TSS, 42 were lost to follow-up, and 8 received radiation within 1 year, yielding 176 patients. Hormone levels were compared between patients who developed hypopituitarism and those who did not using Welch's t-test.

In Cushing's Disease, mean postoperative PRL was significantly lower among patients with new onset hypopituitarism than among those who did not develop it (1.97 vs 10.79 µg/L, $p=2.92e^{-5}$). PRL did not distinguish hypopituitarism in nonfunctioning pituitary adenomas, growth hormone-secreting, or prolactin-secreting tumors. Other hormones were not predictive for hypopituitarism.

Our results establish the utility of measuring PRL in postoperative period following TSS for CD. In the patient cohort with CD, the deleterious effect of TSS can be detected as a trans-effect on PRL levels. Serum PRL in the days following surgery can provide clinicians with an accurate tool to detect impending hypopituitarism.

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Emily Scoville

PROTEOMIC EVALUATION OF THE PULMONARY IMMUNE ENVIRONMENT IN PATIENTS ON VENOVENOUS EXTRACORPOREAL MEMBRANE OXYGENATION

Venovenous extracorporeal membrane oxygenation (VV-ECMO) is a rescue therapy for patients with severe acute respiratory distress syndrome (ARDS). Its impact on the pulmonary immune environment remains poorly understood.

In a retrospective cohort study, bronchoalveolar lavage (BAL) was collected from 19 adults with ARDS on VV-ECMO. Archived BAL from healthy controls (n=7) was used for comparison. Clinical data including demographics and time from VV-ECMO cannulation to BAL were collected. The lung proteome was assessed using a proximal extension assay targeting 276 unique proteins. Results are reported as normalized protein expression. Differences between clinical groups were assessed using two-sample t-tests and Spearman correlation. Results were adjusted for age and sex, and surrogate variable analysis was performed to account for unmeasured biological factors. Biological themes were identified using Metascape and Ingenuity Pathway Analysis, including software associated AI extensions.

Fifty-nine proteins had increased differential expression when comparing VV-ECMO patients to controls (FDR 5%). Pathway analysis showed activation of an integrated inflammatory and immune cell regulatory network, characterized by inflammatory cytokine and chemokine signaling, hematopoiesis, inflammation-driven cellular regeneration and tissue repair. Time from VV-ECMO cannulation to sample collection (range: 0-44 days) correlated with the expression of 25 proteins, with 15 increasing and 10 decreasing over time. Markers of innate and adaptive immunity, epithelial injury and activation, and extracellular matrix remodeling and tissue repair were amongst those that increased over time. Markers of vascular stress, cell damage or lysis, and oxidative stress response decreased over time.

Evaluation of the lung proteome in ECMO patients revealed a distinct pro-inflammatory environment compared to healthy controls, characterized by coordinated immuno-inflammatory regulatory network. Over time our data suggest a systems-level evolution of the immune response characterized by increased adaptive immune responses and tissue repair and decreased oxidative stress and immunometabolic responses. This study highlights the need for further investigation.

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DEVELOPMENT OF CELL LINES AND ORGANOIDS FROM CHEMICAL CARCINOGEN-INDUCED SINONASAL TUMORS

Sinonasal malignancies are rare, histologically diverse tumors for which limited model systems hinder mechanistic and therapeutic studies. To develop tractable models that better capture environmental carcinogenesis, we exposed C57BL/6J mice to N-nitrosodimethylamine by oral gavage twice weekly for 12 weeks and B6C3F1/J mice to diethylnitrosamine intranasally five times weekly for 12 weeks. Mice were surveilled with serial microCT, and tumors were harvested for histopathology, immunophenotyping, whole-exome sequencing, and derivation of cell lines and organoids. Tumor growth was delayed, with radiographic progression observed up to 12 months after treatment.

Among 12 histologically characterized tumors, chemical carcinogenesis produced multiple sinonasal histologies, including olfactory neuroblastoma, squamous cell carcinoma, adenocarcinoma, and poorly differentiated tumors. Immunohistochemistry confirmed lineage features across representative lesions, including p63/cytokeratin expression in squamous tumors and synaptophysin/chromogranin/NSE enrichment in neuroendocrine tumors. Whole-exome sequencing demonstrated high tumor mutational burden and recurrent Nf1, Trp53 and Rasa1 alterations, implicating Ras-GAP/RAS-MAPK pathway disruption as a shared feature of carcinogen-associated sinonasal tumorigenesis. Four tumors were successfully propagated as cell lines and/or organoids and used for target-guided drug testing. MEK inhibition with trametinib reduced colony formation and decreased cell viability significantly in the nanomolar range in all lines tested. Western blotting confirmed on-target suppression of phosphorylated ERK1/2 at nanomolar doses.

These data establish a chemically induced murine platform that generates diverse, culturable sinonasal tumor models and reveals recurrent NF1-associated MAPK dependence. Ongoing studies will determine whether derived lines form syngeneic tumors and whether MEK inhibition can sensitize immune-cold sinonasal tumors to immunotherapy.

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INTRAPROCEDURAL CONE-BEAM CT BASED VASCULAR NAVIGATION PLANNER WITH AUTOMATIC C-ARM VIEW SELECTION

Endovascular locoregional therapies in interventional oncology (IO) involve catheter navigation to tumor-feeding arteries under fluoroscopic guidance. The fluoroscopic C-arm position is frequently adjusted to improve visualization of the intended catheter path, complicated by anatomic variants and tumor-specific anatomic changes. This work developed software for intraprocedural cone-beam CT (CBCT) based endovascular navigation that segments the hepatic arteries, identifies branch points, and selects optimal C-arm views. Following development using an abdominal aortic vascular phantom, feasibility testing was performed in swine (n=2) under a protocol approved by the Animal Care Use Committee (ACUC). Views for each vessel bifurcation along a path from the origin of the celiac trunk to distal hepatic arteries were automatically selected from an intraprocedural CBCT angiogram. The software runtime for each automated planning step from segmentation to simulated image generation was recorded. All experiments were performed with the Apple MacBook Pro 16-inch (Apple M1 Pro chip). Digital subtraction angiography (DSA) for each achievable C-arm position was compared to the software's corresponding simulated view via similarity registration and a subsequent calculation of bifurcation angular error. The average software runtime was 8. 6 +/- 0.1 sec. 73% (8/11) of bifurcation-specific views were physically achievable given the spatial constraints of C-arm movement. Additional analysis in one swine demonstrated that the user-specified path length was 151.7 mm with a mean vessel diameter of 2.1 mm. Simulated fluoroscopic images were registered to the corresponding digital subtraction angiograms (n = 6) with a mean branch angular error of 22.5º ±14.6. Overall, an intraprocedural vascular navigation software that automatically selects C-arm views within seconds was developed and evaluated in a vascular phantom and swine. Future work is warranted to demonstrate a reduction in procedure time and radiation dose, facilitating safer and more effective endovascular interventions.

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PROSPECTIVE EVALUATION FOR EXTRAMEDULLARY DISEASE IN RELAPSED/REFRACTORY B-CELL ACUTE LYMPHOBLASTIC LEUKEMIA: INTEGRATION OF PET/CT AND CORRELATIVE BIOMARKERS

Non-central nervous system extramedullary disease (non-CNS EMD) is an emerging mechanism of resistance in relapsed/refractory B-cell acute lymphoblastic leukemia (R/R B-ALL), particularly in the immunotherapy era. Non-CNS EMD sites may serve as sanctuaries from systemic immune therapies, yet the true incidence and clinical significance of non-CNS EMD remain unclear because whole-body imaging is not routinely performed.

We conducted a prospective single-center cohort study evaluating FDG PET/CT imaging and correlative molecular biomarkers in 16 patients (10 adults, 6 pediatric; median age 21.5 years) with R/R B-ALL undergoing evaluation for CAR T-cell therapy at the NCI. Baseline PET/CT was obtained prior to infusion, with follow-up imaging in patients with identified non-CNS EMD. Quantitative imaging metrics were generated using artificial intelligence (AI)-assisted lesion segmentation with expert radiologist validation. Correlative biomarkers included cell-free DNA (cfDNA), next-generation sequencing (NGS), and flow cytometry.

Baseline FDG PET/CT identified non-CNS EMD in 44% of patients (7/16), including 50% of adults and 33% of pediatric patients. Disease was multifocal in all affected patients, with a mean of 3 involved sites per patient. The most common sites were lymph nodes (100%), kidneys (57%), testes (43%), and soft tissue (43%). Median SUVmax was 17.0. In one patient, widespread non-CNS EMD was identified despite negative bone marrow flow cytometry. A prior history of non-CNS EMD was significantly associated with baseline EMD detection ($p=0.035$). Peripheral blood cfDNA detected leukemic sequences in 15/16 (93.8%) patients with active disease and identified isolated non-CNS EMD in 3 patients with otherwise negative standard biomarkers.

Prospective whole-body imaging revealed a high prevalence of multifocal non-CNS EMD. Integration of whole-body imaging with cfDNA may enable more comprehensive disease evaluation in patients with R/R B-ALL. Larger prospective studies are needed to define the true incidence and clinical significance of non-CNS EMD.

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Tadana Vazquez-Rothschuh

CHRONIC PELVIC PAIN AND QUALITY OF LIFE IN INDIVIDUALS WITH MAYER-ROKITANSKY-KÜSTER-HAUSER (MRKH) SYNDROME: AN INTERNATIONAL CROSS-SECTIONAL SURVEY

Mayer-Rokitansky-Küster-Hauser (MRKH) syndrome, or Müllerian agenesis, is a rare congenital condition characterized by the absence or underdevelopment of Müllerian structures. It affects 46, XX individuals with prevalence of 1 in 4,500–5,000 individuals. It is classified as Type I (isolated) or Type II (multiorgan anomalies). Data evaluating chronic pelvic pain (CPP) and quality of life (QoL) remain limited.

We aimed to assess the prevalence of CPP among individuals with MRKH while evaluating associated patient characteristics and QoL. We hypothesized that CPP is more prevalent among individuals with MRKH compared to the general population and associated greater impairment across QoL domains. A cross-sectional questionnaire assessing sexual health measures and pain was distributed through the BeautifulYou MRKH support group listserv and social media accounts from March to June 2025. Validated questionnaires were utilized for CPP (CPPQ-Mohedo) and QoL (PROMIS-29). Inclusion criteria included age ≥18 years and diagnosis of MRKH. Data was collected through REDCap database and inferential analyses were performed.

Of 315 participants, 201 completed CPP and QoL sections. Among these, 101 (50.2%) reported CPP. Logistic regression demonstrated higher odds of CPP among individuals MRKH Type II and <20 years. QoL in the overall cohort was comparable to population norms; however, stratifying those with CPP revealed statistically significant impairment in Pain Intensity, Anxiety, Depression, and Fatigue ($p < 0.001$). Linear regression revealed MRKH Type II and history of abdominal surgery have strong association with CPP, with statistically significant impact on Pain Interference and Physical Function ($p=0.02$ and $p<0.003$, respectively).

Prevalence of CPP in this cohort exceeds estimates reported in the general population (4-16%). Causes among this cohort are unknown and imaging should be considered to identify structural contributors such as Müllerian remnants and endometriosis. Further research and longitudinal follow up is needed to elucidate the underlying cause of CPP and its impact on QoL in this cohort.

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Madyson Williams

PSYCHOSOCIAL AND NEIGHBORHOOD RISKS ASSOCIATE WITH LOWER OBJECTIVELY MEASURED PHYSICAL ACTIVITY: EVIDENCE FROM THE ALL OF US RESEARCH PROGRAM

Psychosocial and neighborhood factors contribute to chronic disease risk in part by shaping physical activity (PA). However, there is limited evidence analyzing these relationships in large, diverse national cohorts using objectively measured PA. We examined associations between psychosocial and neighborhood risk and Fitbit-measured PA in the All of Us Research Program.

A cross-sectional analysis of adults (≥18 years) with Social Factors of Health survey data and wearables data (n=24,571) was conducted. Survey questions were grouped and scored according to validated questionnaires. Higher scores corresponded to less favorable psychosocial or neighborhood conditions. Average daily steps were derived from Fitbit intraday step data, with valid days defined as ≥10 hours of wear time and ≥100 steps. Multivariable linear regression models examined associations between continuous factor scores and daily steps, with adjustments for sociodemographic and anthropometric variables.

Participants had an average of 7236 daily steps (51.7±15.7 years, 69.0% female, 78.0% White, 7.1% Black, 5.4% Hispanic). Baseline differences in PA were observed across demographic groups, with lower step counts among individuals who were Black, female, low-income, elderly, and had obesity. In fully adjusted models, each 1-SD increase in Cohen's Perceived Stress Scale (β=-411.1, $p<0.001$), UCLA Loneliness Scale (β=-309.1, $p<0.001$), PANES crime subscale (β=-102.9, $p<0.001$), and PANES walkability subscale (β=-223.7, $p<0.001$) was associated with significantly lower daily steps. Stratification showed stronger inverse associations of perceived stress($p<0.001$) and discrimination ($p=0.01$) with daily steps in females.

Several psychosocial and neighborhood factors were associated with lower objectively measured physical activity in a large, diverse cohort. Perceived stress, loneliness, crime, and poor neighborhood walkability showed the strongest inverse associations with daily step counts. Interventions focused on improving psychosocial risk and neighborhood conditions may increase PA engagement. Future work will analyze how these factors associate with chronic disease risk.

MENTOR:
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INSTITUTE:
National Heart, Lung, and Blood Institute

Elena Wilson

CHARACTERIZATION OF NOVEL GENETIC MUTATION AS A COLOBOMA-CAUSING GENE

Coloboma occurs in 1 in 10,000 live births and can cause up to 10% of childhood blindness. It occurs during incomplete closure of the optic fissure during embryonic eye development. Recently, while genotyping patients with coloboma, my lab discovered a new mutation in a gene in three unrelated patients.

To demonstrate that this gene causes coloboma, we initially conducted in situ hybridization at 24 hours post fertilization (hpf), 36 hpf, 48 hpf, and 72hpf to visualize where the gene was being expressed. We found that it was expressed in the eye during development, particularly in retinal ganglion cells. We then proceeded to conduct morpholino experiments where anti-sense oligonucleotides were injected into single cell stage zebrafish embryos. We used two different types of morpholinos: ATG and splice block. We found the 4ng and 3ng ATG morpholinos to be too potent, so we decreased the dose to 2, 1.5, and 1 ng. The zebrafish at 72 hpf expressed the coloboma phenotype. Additionally, some fish had a bent tail phenotype and heart edema. All phenotypes were counted. We then used a splice block morpholino and saw the same coloboma phenotype. To validate our splice block, we used RNA isolation and demonstrated that the injected embryos had a reduced band and a slightly higher molecular weight band demonstrating that our morpholino had worked.

Next steps will be to validate the ATG morpholinos by rescuing them usinghuman mRNA and waiting for the CRISPR mutant fish to develop and genotype them. We will then cross the founders to create a heterozygous F1 generation, and we will genotype these fish as well. Overall, identifying this gene will allow for gene therapies to be developed and ideally help treat coloboma prior to its development in utero.

MENTORS:
Brian P. Brooks, M.D. Ph.D.
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Emily Y. Chew, M.D.
NIH Distinguished Investigator, Clinical Trials Branch, Division of Epidemiology and Clinical Applications

INSTITUTE:
National Eye Institute

Sophia Xiao

CHARACTERIZATION OF FLOXURIDINE-MEDIATED BILIARY INJURY TO UNVEIL NOVEL TOXICITY MITIGATION STRATEGIES

Hepatic artery infusion pump (HAIP) delivery of floxuridine is increasingly employed to treat liver-limited metastases. Floxuridine, a pyrimidine analogue, is ideal for HAIP due to its high first-pass metabolism and short half-life. However, its efficacy is limited by biliary toxicity; elevations in liver enzymes prompt dose reduction and even termination to prevent biliary sclerosis development.

To characterize floxuridine-mediated biliary injury, we use the cystic duct as an analogue for the common bile duct, as they share common cell populations and architecture. Cystic ducts procured from cholecystectomies are placed in the Hernandez lab's ex vivo perfusion system. Bathed in autologous patient plasma, cystic duct can be maintained for 96h without tissue or cell deterioration. 96h ex vivo cystic duct treated with floxuridine demonstrated greater peribiliary gland and epithelial damage compared to non-treated. Analysis of treated cystic duct perfusate additionally demonstrated elevated IL-13. Similarly, patients after 2 weeks of HAIP floxuridine-dexamethasone had elevated serum IL-13, and high baseline IL-13 also correlated with alkaline phosphatase. To further elucidate the damage mechanism, we developed a Xenium spatial transcriptomics experiment to capture floxuridine treatment effects on ex vivo cystic duct tissue.

Concomitant exploration of novel mitigation strategies for floxuridine biliary toxicity began with a high-throughput drug screen of nearly 3000 agents. We identified agents that lessened floxuridine toxicity in healthy cholangiocytes without compromising efficacy in malignant cell lines. We focused on n-acetylcysteine (NAC), given its known roles in toxin-induced liver injury. In 72h-MTT cytotoxicity and 7-day colony formation assays, 5 μM NAC in combination with 40nM floxuridine demonstrated improved viability in stem cholangiocytes ($p=0.0109$).

Further work will focus on validation in complex models, including patient-derived organoids and ex vivo cystic ducts, to demonstrate mitigation of floxuridine-incurred biliary toxicity.

MENTOR:
Jonathan Hernandez, M.D.
Investigator, Liver Metastasis Biology Section; Surgical Oncology Program

INSTITUTE:
National Cancer Institute, Center for Cancer Research

Rana Yakshi Tafti

INTESTINAL BARRIER DYSFUNCTION SHAPES NEUROINFLAMMATION IN A SEX-DEPENDENT MANNER

Autoimmune diseases are highly prevalent in the United States and occur more frequently in women than in men. Individuals diagnosed with one autoimmune disease are also at an increased risk of developing additional autoimmune disorder, as exemplified by the epidemiological association between multiple sclerosis (MS) and inflammatory bowel disease (IBD). This link may reflect bidirectional immunological crosstalk via the gut-brain immune axis, through which intestinal immune perturbations influence CNS autoimmune responses. Given these associations, we hypothesized that intestinal inflammation may alter intestinal immune homeostasis and reshape neuroinflammation in a sex-dependent manner.

To test this, we used the experimental autoimmune encephalomyelitis (EAE) model of MS and induced subclinical colitis in male and female mice by administrating 2% Dextran Sodium Sulfate (DSS). DSS treatment reduced clinical disease severity more substantially in females than in males. By contrast, intestinal inflammation resulted in a 10-fold reduction of CNS-infiltrating $CD4^+$T cells in males compared to a 3.7-fold reduction in females, suggesting that clinical protection and CNS T cell accumulation are differentially regulated by sex. CNS-infiltrating $CD4^+$T cells showed no difference in CD69 or Ki-67 expression between DSS-treated and untreated EAE mice across the disease course. However, DSS-treatment reduced the frequency and cytokine production of polyfunctional GM-CSF^+ IFN-g^+ IL-$17A^+$ Th17 $CD4^+$ T cells in the CNS.

Together, these findings suggests that intestinal inflammation reshapes the CNS autoimmune response in a sex-dependent manner by altering both $CD4^+$ T cell accumulation and effector function.

MENTOR:
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INSTITUTE:
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PUBLICATIONS, ABSTRACTS, CONFERENCES/MEETINGS AND AWARDS



9 Awards



29%
1st Author

24 Publications Accepted, Submitted, Under Review or In Progress

67%
1st Author

61 Abstracts

40 Conferences and Meetings

PUBLICATIONS

ACCEPTED - PREPRINT - IN PRESS - PUBLISHED

- **Chefitz G**, Martin MR, Vilasi SM, Saito Y, Jarvis JE, Hallaert P, Reed DJ, Shalhout SZ, Brownell I. Merkel Cell Carcinoma Virus Positivity Ranges From 57% to 77% in the United States Based on Geographic Region: A Pooled Cohort Study. J Am Acad. [In Press].
- Shalhout SZ, Fragano A, **Chefitz G**, Andrew TW, Lachance K, Kulikauskas R, Nghiem P, Brownell I. (2026). "Immunotherapy Significantly Improves Merkel Cell Carcinoma-Specific Survival: A Single-Cohort Propensity Score-Matched Analysis." medRxiv [Preprint]. doi: 10.64898/2026.03.05.26347615
- **Nadella N**, Carr S. Multi-Agent Pleurodesis: A New Horizon in Management. AME Case Rep. 2026 [Accepted]
- Agbor-Enoh S, Fraser E, Nadella N, Andargie TE, Alnababteh M. %dd-cfDNA: The New Frontier for Heart/Lung Transplant Surveillance? Transpl Int. 2025 Dec 29;38:15555. doi: 10.3389/ti.2025.15555.
- Jordan J, Rose-Ward S, **Osei-Karikari K**, Myles I. (2025). Possible treatment of topical steroid withdrawal with methylene blue case report: implications for mitochondrial pathology. Case Rep. in Dermatol., 17(1), 438–443.
- Vijendra A, Kunkle C, Jordan J, Erickson A, **Osei-Karikari K**, Ratley G, Myles I. (2025). Molecular connections between inflammation and social determinants of health. Front. Epidemiol. (Online), 5, 1683955.
- **Osei-Karikari K**, Jones K, Erickson A, Myles I. (2026). Emerging microbiome-based therapies for atopic eczema: clinical insights and future development. Expert Opin. Emerg. Drugs.
- Laws MT, Bhatt D, Mandal D, Ramavenkat N, Asuzu DT, Stoica S, Rampalli I, Mullaney D, Laraba L, Odom H, Ravindra N, Varghese S, **Schultz A**, Tang T, Zhang X, Shern JF, Elkahloun A, Sisay B, Maric D, Johnson K, Abdullaev Z, Aldape K, Hertzano RP, Kim HN, Parkinson D, Chittiboina P. “Variable Schwann cell merlin inactivation is targetable with TEAD1 inhibition in schwannomas.” bioRxiv [Preprint]. (2025) doi: 10.1101/2025.11.15.688608.
- Ma J, Culbert A, Chang T, **Solter ML**, Ruppin E, Rejeski K, Shah NN. Predictive Models in CAR T-cell Therapy: Challenges and Opportunities. Blood Cancer Discov. 2026 Aug 11:OF1-OF23. doi: 10.1158/2643-3230.BCD-25-0458. Epub ahead of print. PMID: 42578568; PMCID: PMC13463384.
- Lamplugh C*, **Solter ML***, Dreyzin A, Martin K, Highfill S, Stroncek D, Shah NN. Impact of infusion time on post CAR T-cell survival in B-ALL. Blood Immunology & Cellular Therapy (In press) [Accepted] *Equal contribution
- Powell-Wiley TM, **Williams M**, Davis EM. Clinician’s Corner: Telehealth for Cardiovascular Care in Rural Populations. Circulation. 2026 Jul 28; 154(4):400-404. doi: 10.1161/circulationaha.126.079442
- Friedman LR, Smith EC, Sarvestani AL, Eade AV, Ho J, Pu T, Larrain C, Hannah CE, Magee T, Smith KM, Satterwhite A, **Xiao S**, Burke JF, Sinha S, Desai PP, Remmert K, Cavnar MJ, Gulley JL, Schlom J, del Rivero J, Hernandez JM. Study Protocol: Targeted Delivery of Interleukin12 in Combination with Hepatic Artery Infusion Pump Therapy for Patients with Adrenocortical Carcinoma Liver Metastases. BMC Cancer. 2026 Jun 27. doi: 10.1186/s12885-026-16425-0.
- Ho J, **Xiao S**, Hernandez JM. Hepatic Artery Infusion Pump Therapy for Intrahepatic Cholangiocarcinoma: Indications and Outcomes. J Gastrointest Cancer. 2025;56(1):242. doi:10.1007/s12029-025-01374-x
- Sarvestani AL, Ruff S, Remmert K, Teke M, Verbus E, Saif A, Garmendia-Cedillos M, Rossi A, Rainey A, Nomie K, Sinha S, Wach MM, Ryan C, Gregory SN, Desi P, Panda AK, Smith EC, Ayabe R, McDonald JD, Gupta S, Pu T, Khan T, Lambdin J, Luberice K, Lux SC, Hong H, Alexander I, Akmal SR, Rehman S, **Xiao S**, Ho J, Burke J, Hannah CE, Livanova A, Tyshevich A, Kurpe S, Kravets A, Salem B, Vibe D, Tkachukv A, Belozerova B, Sarachakov A, Barykin E, Kushnarev V, Postovalova E, Bagaev A, Kedei N, Hernandez M, Karim B, Butcher D, Matta J, Kelly M, Singh J, Prickett TD, Hodge J, Andresson T, Yaffe MB, Shevach EM, Kleiner D, Davis JL, Blakely AM, Hernandez JM. A simple circuit to sustain intact tumor microenvironments for complex drug interrogations. Preprint. bioRxiv. 2025;2025.10.26.684624. PMID: 41279433.

PUBLICATIONS

SUBMITTED AND UNDER REVIEW

- Amirahmadi R, **Chodisetty V**, Mancera A, Diao G, Walker M, Badesch B, Warner S, Stapp EK, Kadri SS. Association between hospitals' financial health and staffed-bed capacity in the United States. JAMA Health Forum. [Submitted]
- **Makwana RD**, Haque F, Harmon SA, Turkbey EB, Gulley JL, Allen CT, Turkbey IB. Development of a Deep Learning Model for the Automated Detection of Head and Neck Squamous Cell Cancers on Contrast Enhanced CT. Acad Radiol. [Under review].
- **Makwana RD**, Haque F, Harmon SA, Turkbey EB, Gulley JL, Allen CT, Turkbey IB. Development of a Deep Learning Model for the Automated Detection of Head and Neck Squamous Cell Cancers on Contrast Enhanced CT. Acad Radiol. [Under review].
- **Osei-Karikari K**, Byrd A, Okoye G, Myles I. Beyond hurley staging: toward a multimodal framework for hidradenitis suppurativa severity assessment. JAAD Rev. [Under Review]
- Chowdhury F, Coyne C, Zadu A, **Osei-Karikari K**, Byrd A. Hidradenitis suppurativa: the male perspective. JAAD. [Under Review]
- **Solter ML**, Wang YJ, Li G, Haque F, Duncan BB, Wu X, Harmon S, Yates B, Delgado Colon D, Wang HW, Yuan C, Patel N, Giordani VM, Sachs CM, Hoang CN, Molina JC, Rankin AW, Foley T, McGrath C, Gava F, Lamplugh C, Dreyzin A, Silbert SK, Turkbey B, Mena E, Turkbey EB, Sundby RT, Shah NN. Integrating PET/CT and correlative biomarkers for prospective evaluation of extramedullary disease in relapsed/refractory B-ALL: implications for CAR T-cell therapy. JITC.[Under Review]
- Vu K., Gunti S., Viswanathan R., Nandal A., Larkin R., **Shah S**., Ding Y., Cho S., Zou J., Ramolia S., Hoke A., Barbosa S., Gallia G., Rooper L., Floudas C., Cheng H., Miller C., Guest M., Notaro M., Raziuddin A., Sun Z., Wu X., Faraji F., Lechner M., Comoglio F., Edmondson E., Chari R., London N. In vivo CRISPR screening identifies NF1/RASA1/TP53 co-mutations and downstream MEK signaling as a common key mechanism of sinonasal tumorigenesis. Nat Commun [Under Review]
- London N., Bracken-Clarke D., Xue E., Brownell I., Mydlarz W., Turkbey E., Steinberg S., Cordes L., Marté J., **Shah S**., Manu M., Sargi Z., Gulley J., Floudas C. Bintrafusp Alfa for patients with recurrent or metastatic olfactory neuroblastoma. Cancer Immunol Immunother [Under Review]
- Mohottige D, **Williams M**, Boulware LE, Norris KC, Powell-Wiley, TM. Social Determinants of Cardiovascular and Kidney Outcomes: Prioritizing Action and Equity for All. Clin J Am Soc Nephrol. [Under review]
- Ducich NH, Ho J, Pu T, **Xiao S**, Burke JF, Smith EC, Smith KM, Satterwhite AA, Desai PP, Remmert K, Kimmerling RJ, del Rivero J, Hernandez JM. A rapid, genome-agnostic approach to personalized systemic therapy for patients with adrenocortical carcinoma. Discov Oncol. [Under review]

ABSTRACTS

- **Banks A**, Almpani K, Lee JS. An Update of the Craniofacial Anomalies Index for Loeys-Dietz Syndrome. American Association of Dental, Oral, and Craniofacial Research Annual Meeting, San Diego, CA; Mar.25 –28, 2026. [Poster presentation]
- **Boone HD**, Williams Z, Kram V, Boyce AM. Dental Malocclusion in Patients with Fibrous Dysplasia. International Association for Dental, Oral, and Craniofacial Research 2026 Annual Meeting, San Diego, CA; Mar. 25-28, 2026. [Poster Presentation].
- Shalhout SZ, Fragano A, **Chefitz G**, Andrew TW, Lachance K, Kulikauskas R, Nghiem P, Brownell I. (2026). "Immunotherapy Significantly Improves Merkel Cell Carcinoma-Specific Survival: A Single-Cohort Propensity Score-Matched Analysis." medRxiv [Preprint]. doi: 10.64898/2026.03.05.26347615
- **Chefitz G**, Collado L, Vilasi S, Sakamoto K, Nagao C, Brownell I. Dermatitis from Merkel cell polyomavirus oncogene expression in mice. 6th Inflammatory Skin Disease Summit, Mount Sinai, New York, NY; Nov., 2025. [Poster presentation]
- **Chefitz G**, Saito J, Royer MC, Brownell I. Disseminated Superficial Actinic Porokeratosis Inflammatory Reaction After Combination PD-L1 and Topoisomerase Inhibition, Resolved by Topical Lovastatin. Gross and Microscopic Symposium, American Academy of Dermatology Annual Meeting, Denver, CO; Mar., 2026. [Podium presentation]
- **Chefitz G**, Fragano A, Andrew TW, Shalhout SZ, Brownell I. Adoption of Immunotherapy Has Improved Merkel Cell Carcinoma Survival. American Academy of Dermatology Annual Meeting, Denver, CO; Mar., 2026. [Poster presentation]
- **Chefitz G**, Saito Y, Sroka D, Shelach N, Corn B, Brownell I. Real-World Impact of Panitumumab Skin Toxicity in Cancer Treatment: A Retrospective Cohort Study. Oncodermatology Society Meeting, American Academy of Dermatology, Denver, CO; Mar., 2026. [Podium presentation]
- **Chefitz G**, Plagens RN, Helmstetter A, Abdulla F, Evans MG, Oberley M, Bryant DA, Bustos MA, Lou E, Shalhout SZ, Brownell I. A Quantitative Next-Generation Sequencing Approach for Accurate Classification of Merkel Cell Polyomavirus Status in Tumor Samples. 4th International Merkel Cell Carcinoma Symposium, Mass General Brigham, Boston, MA; Apr. 2026.[Podium and Poster presentation]
- **Chefitz G**, Brownell I. Merkel cell carcinoma. 2026 Murtha Cancer Center's Virtual Skin Care Summit at Walter Reed, Bethesda, MD; May 2026. [Podium presentation]
- Badesch B, Warner S, Liu S, Diao G, Walker M, Drobish I, **Chodisetty V**, De Jonge J, Rauch J, Kadri S. Comparing care patterns and outcomes for close-aged patients with sepsis in pediatric vs adult ICUs: a fuzzy regression discontinuity design study of adolescents and young adults. Oral presentation at: American Thoracic Society International Conference; May 15-20, 2026; Orlando, FL
- Badesch B, Warner S, Liu S, Diao G, Walker M, Drobish I, **Chodisetty V**, De Jonge J, Rauch J, Kadri S. Comparing care patterns and outcomes for sepsis in pediatric vs adult ICUs: a fuzzy regression discontinuity design study of adolescents and young adults. Poster presented at: NHLBI Retreat; March 13, 2026; Bethesda, MD
- Amirahmadi R, **Chodisetty V**, Mancera A, Walker MK, Badesch B, Warner S, Kadri SS. Association between hospital financial health and post-pandemic hospital occupancy levels in US hospitals. Presented at: National Heart, Lung, and Blood Institute Annual Retreat; March 13, 2026; Bethesda, MD.
- Yek C, Walker MK, Warner S, **Chodisetty V**, Klompas M, Rhee C, Demirkale CY, Kadri SS. Uptake of rapid diagnostics for antimicrobial resistance detection using nucleic acid amplification in US hospitals 2018-2024. Presented at: Interdisciplinary Meeting on Antimicrobial Resistance and Innovation (IMARI); January 28-30, 2026.
- **Dong Y**, Morrill VN, Wong DF, Mosley TH, Hughes TM, Windham BG, Lutsey PL, Gottesman RF. Association of midlife and late-life obesity and adiposity measures with late-life brain amyloid deposition: an Atherosclerosis Risk in Communities study. International Stroke Conference 2026, New Orleans, LA; Feb. 4-6, 2026. [Oral presentation]

ABSTRACTS

- **Ezeude MO**, Gutierrez Torres DS, Powell-Wiley TM, Lipworth L, Xu M, Gupta DK, Roger, VL. Risk of All-Cause and Cardiovascular Mortality Among Adults with Heart Failure: The Southern Community Cohort Study. Inaugural NIH IRP Health Disparities Research Workshop, June 16-17, 2026. [Oral Presentation]
- **Ezeude MO**, Hashemian M, Henriquez-Santos G, Powell-Wiley TM, Roger VL. Racial Differences in Rural-Urban Health: Cardiovascular Risk Factors in the United States. Inaugural NIH IRP Health Disparities Research Workshop, June 16-17, 2026. [Poster presentation]
- **Ezeude MO**, Hashemian M, Henriquez-Santos G, Roger VL. Rural-Urban Differences In Diabetes And Obesity Prevalence In The United States, 2018-2024. American Diabetes Association 86th Scientific Sessions; New Orleans, LA; June 5-8, 2026. [Poster presentation]
- **Ha H**, De Silva T, Hébert M, Indurkar A, Cukras C, Chew EY. Spatial correlation of ellipsoid zone and retinal pigment epithelium loss with flood-illumination adaptive optics reflectivity changes in age-related macular degeneration. Association for Research in Vision and Ophthalmology Annual Meeting, Denver, CO; May 3–7, 2026. [Poster presentation]
- Indurkar A, Hébert M, **Ha H**, Wilson E, Keenan TDL, De Silva T, Chew EY. Long-term longitudinal changes in outer retinal hyperreflectivity and ellipsoid zone in macular telangiectasia type 2 and association with optical coherence tomography angiography flow. Association for Research in Vision and Ophthalmology Annual Meeting, Denver, CO; May 3–7, 2026.[Poster presentation]Jones RS, Chang C, Zarate CA, Evans JW. Neurofunctional and Behavioral Responses to Acute Ketamine During Emotional Face-Matching Task-Based MRI. Society of Biological Society Annual Meeting, New York, New York; Apr. 30–May 2, 2026. [Poster presentation]
- **Makwana RD**, Haque F, Harmon SA, Zhang H, Floudas CS, Turkbey IB. Automated AI-Approach for Detecting Lesions and Enlarged Lymph Nodes in Head and Neck Squamous Cell Carcinoma using CT. American Society of Neuroradiology Annual Meeting, Austin, Texas; May 17, 2026 [Poster presentation]
- Esengur OT, Stevenson EJ, **Makwana RD**, Wunsch DC, Yilmaz EC, Harmon SA, Merino MJ, Wood BJ, Choyke PL, Pinto PA, Turkbey IB. Reassessing Biopsy Benefit in PI-RADS 1–3 Patients Using Prostate-Specific Antigen–Based Risk Stratification. Center for Prostate Disease Research Scientific Retreat, Bethesda, MD; April 29, 2026 [Poster presentation]
- **Makwana RD**, Stevenson EJ, Esengur OT, Harmon SA, Choyke PL, Pinto PA, Gurram S, Turkbey IB. A multi-variate clinical model for the determination of clinically significant prostate cancer from PI-RADS 3 lesions on multiparametric MRI. Center for Prostate Disease Research Scientific Retreat, Bethesda, MD; April 29, 2026 [Poster presentation]
- **Nadella N**, Andargie T, Fraser E, Kong H, Park W, Jang MK, Agbor-Enoh S. Heart Transplant Candidates Show a Distinct Cell-free DNA Profile that Correlates with their Performance Status. National Heart, Lung, and Blood Institute All Staff Retreat, Bethesda MD; Mar 13, 2026 [Poster Presentation]
- Andargie T, Tran L, Tian X, Hill T, Redekar N, **Nadella N**, Kong H. et al. Cell-free DNA to risk-stratify patients during viral outbreaks, SARS-CoV-2 as a prototype. National Heart, Lung, and Blood Institute All Staff Retreat, Bethesda MD; Mar 13, 2026 [Poster Presentation]
- Fraser E, Andargie T, Park A, **Nadella N**. et al. 26-A-9071-ACC Nuclear Cell-Free DNA at Heart Transplant Listing is Associated with Waitlist Status Worsening and Pre-Transplant Mortality. JACC. 2026 Apr, 87 (13_Supplement) A679. [Podium Presentation]
- **Nadella N**, Grewal S, Andargie T, Liu I, Park W, Matthew J, Kong H, Alnababteh, Jang NK, Agbor-Enoh S. Cell-free DNA Outperforms Spirometry in Azithromycin Response Assessment for CLAD Risk Stratification. Metropolitan DC Thoracic Society Annual Meeting, Fairfax, VA; Apr 15, 2026 [Poster Presentation]

ABSTRACTS

- **Nadella N**, Andargie T, Fraser E, Kong H, Jang MK, Park W, Redekar N, Hill T, Valantine H, Agbor-Enoh S. Cell-Free DNA as a Non-Invasive Marker to Identify Wait-list Patients at Risk of Status Progression. International Society for Heart and Lung Transplantation 46th Annual Meeting and Scientific Sessions, Toronto ON Canada; Apr 22- Apr 25, 2026. J. Heart Lung Transplant. 2026 45(5 Suppl): 750. [Poster Presentation]
- Liu I, Alnababteh, Kong H, **Nadella N**, Ohnuki Y, Park W, Jang MK, Agbor-Enoh S. Cell-free DNA and its Associations with Lung-Transplant Outcomes. International Society for Heart and Lung Transplantation 46th Annual Meeting and Scientific Sessions, Toronto ON Canada; Apr 22- Apr 25, 2026. [Poster Presentation]
- **Osei-Karikari K**, Jalin J, Carmona-Rivera C, Byrd A, Okoye G, Myles I. Distinct metabolic pathways of hidradenitis suppurativa and severity-associated biomarkers. 22nd Annual Skin of Color Society Scientific Symposium, Denver, CO; Mar. 26, 2026. [Podium presentation]
- **Osei-Karikari K**, Jalin J, Carmona-Rivera C, Byrd A, Okoye G, Myles I. Metabolic pathway disruptions in hidradenitis suppurativa and severity-associated biomarkers. New England Science Symposium, Harvard University, Boston, MA; Mar. 28, 2026. [Poster presentation]
- **Osei-Karikari K**, Jalin J, Carmona-Rivera C, Byrd A, Okoye G, Myles I. Systemic lipidomic pathways alterations in hidradenitis suppurativa (HS) and their association with HS disease severity. Howard University Research Symposium, Washington, DC; Apr. 20-23, 2026. [Podium presentation]
- **Osei-Karikari K**, Jalin J, Carmona-Rivera C, Byrd A, Okoye G, Myles I. Systemic lipidomic remodeling in hidradenitis suppurativa and its escalation with disease severity. Society for Investigative Dermatology (SID) Annual Meeting, Chicago, IL; May 13-17, 2026. [Poster presentation]
- **Osei-Karikari K**, Jalin J, Carmona-Rivera C, Byrd A, Okoye G, Myles I. Distinct metabolic pathways of hidradenitis suppurativa and severity-associated biomarkers. Medical Student Virtual Research Symposium, Mass General Brigham Department of Dermatology, Boston, MA; May 20, 2026. [Poster presentation]
- **Patel V**, Gleason JL, Lim SX, Chen Z, He D, Grewal J, Grantz KL. Risk of maternal cardiovascular events during childbirth in twins and triplets versus singletons. Society for Maternal-Fetal Medicine Annual Pregnancy Meeting, Las Vegas, NV; Feb. 8-13, 2026. [Poster presentation]
- **Patel V**, Thornburgh S, He D, St Ville M, Chen Z, Grewal J, Grantz KL. Fetal body composition and organ volumes by parity: NICHD Fetal 3D Study. NICHD Fellow's Retreat, Bethesda, MD; Apr. 17, 2026. [Poster presentation]
- **Riopedre J**, Bou Farhat E, Jones A, Julien-Williams P, Choyke PL, Moss J, Kwiatkowski D, Darling TN. A solitary cutaneous finding and ≥4 sclerotic bone lesions in patients with lymphangioleiomymatosis suggests mosaic tuberous sclerosis complex. National Heart, Lung, and Blood Institute Division of Intramural Research (DIR) All Staff Retreat; March 13th, 2026; Bethesda, MD [Poster Presentation]. Also accepted to the Society for Investigative Dermatology Annual Meeting; May 13-16, 2026; Chicago, IL [Concurrent Minisymposium: Oral presentation].
- **Riopedre J**, Bou Farhat E, Barzallo DK, Treichel AM, Cartron AM, Jones A, Julien-Williams P, Choyke PL, Darling TN, Kwiatkowski D, Moss J. Clinical findings suggestive of mosaic tuberous sclerosis complex in individuals with apparent sporadic lymphangioleiomyomatosis. NIH Medical Research Scholars Program Research Symposium; May 5-6, 2026; Bethesda, MD. [Oral presentation].
- **Riopedre J**, Bou Farhat E, Jones A, Julien-Williams P, Choyke PL, Moss J, Kwiatkowski D, Darling TN. A solitary hypomelanotic macule in patients with lymphangioleiomymatosis suggests mosaic tuberous sclerosis complex. American Academy of Dermatology Annual Meeting; March 27-31, 2026; Denver, CO. [Poster and Oral Presentation].

ABSTRACTS

- **Scoville E**, SM Kanth, P Torabi-Parizi. Proteomic evaluation of the pulmonary immune environment in patients on venovenous extracorporeal membrane oxygenation. National Institutes of Health NHLBI Annual Division of Intramural Research Conference; 2026 Mar 13; Bethesda, MD. [Poster presentation]
- **Shah, S**., Ramolia, S., Robbins, Y., et al. Spatial Immune Correlates from the BARON Trial: Multiplex Immunofluorescence of Olfactory Neuroblastoma. North American Skull Base Society, San Diego, USA; Mar. 5-8, 2026. [Podium Presentation]
- **Shah, S**., Ramolia, S., Robbins, Y., et al. Spatial immunoprofiling of olfactory neuroblastoma treated with bintrafusp alfa in the BARON trial using multiplex immunofluorescence and HALO. International Network for Sinonasal Cancer Research, Bethesda, MD, USA; Mar. 19-20, 2026. [Oral Presentation]
- Vu K., Gunti S., Viswanathan R., Nandal A., Larkin R., **Shah S**., Ding Y., Cho S., Zou J., Ramolia S., Hoke A., Barbosa S., Gallia G., Rooper L., Floudas C., Cheng H., Miller C., Guest M., Notaro M., Raziuddin A., Sun Z., Wu X., Faraji F., Lechner M., Comoglio F., Edmondson E., Chari R., London N. Mouse Models of Olfactory Neuroblastoma. International Network for Sinonasal Cancer Research, Bethesda, MD, USA; Mar. 19-20, 2026. [Oral Presentation]
- Gunti S., Vu K., Viswanathan R., Nandal A., Larkin R., **Shah S**., Ding Y., Cho S., Zou J., Ramolia S., Hoke A., Barbosa S., Gallia G., Rooper L., Floudas C., Cheng H., Miller C., Guest M., Notaro M., Raziuddin A., Sun Z., Wu X., Faraji F., Lechner M., Comoglio F., Edmondson E., Chari R., London N. Sensitivity of murine and human sinonasal cancer calls to MEK inhibitors. International Network for Sinonasal Cancer Research, Bethesda, MD, USA; Mar. 19-20, 2026. [Oral Presentation]
- **Singh D**, Mikhail AS, Varble N, Gallagher A, Morhard R, Huber N, Karanian JW, Pritchard WF, Wood BJ. Evaluation of locally delivered radiopaque immunotherapy via percutaneous injection in ex vivo bovine liver and swine. Society of Interventional Oncology Annual Meeting, Savannah, GA; Feb 4 – 8, 2026. [Poster presentation].
- Gallagher A, Saccenti L, Mikhail AS, **Singh D**, Peña O, Bakhutashvilli I, Wood BJ, Pritchard WF, Karanian JK. Preclinical characterization of a novel 360º steerable needle for localized precision drug delivery via percutaneous, endovascular, and endobronchial approaches. Society of Interventional Oncology Annual Meeting, Savannah, GA; Feb 4 – 8, 2026. [Poster presentation].
- Peña O, Saccenti L, Varble N, **Singh D**, Gallagher A, Karanian JW, Pritchard WF, Li M, Wood BJ. The current status of augmented reality for percutaneous and endovascular procedures. The International Symposium on Endovascular Therapy, Miami Beach, FL; Feb 9 – 12, 2026. [Poster presentation].
- Saccenti L, Peña O, Hazen L, **Singh D**, Gallagher A, Mikhail AS, Pritchard WF, Karanian JW, Li M. Novel acousto-optic sensor stylet for needle tip tracking, needle tip imaging, and tissue characterization compared to capabilities of electromagnetic tracking. Society of Interventional Radiology Annual Meeting, Toronto, CA; Apr 11 – 15, 2026. [Oral presentation].
- Saccenti L, **Singh D**, Pena O, Chu N, Gallagher A, Mikhail A, Bakhutashvili I, Pritchard W, Karanian J, Li M. In vivo accuracy of needle tracking with acousto-optic sensor and potential applications of internal imaging from the perspective of the needle tip. The European Conference on Interventional Oncology, Basel, CH; Apr 26-30, 2026. [Oral Presentation].
- Saccenti L, **Singh D**, Pena O, Chu N, Gallagher A, Mikhail A, Bakhutashvili I, Pritchard W, Karanian J, Li M. Real-time 3D needle tip tracking with acousto-optic sensor for ultrasound-guided interventions. The European Conference on Interventional Oncology, Basel, CH; Apr 26-30, 2026. [Oral Presentation].
- Mikhail AS, **Singh D**, Gallagher A, Morhard R, Saccenti L, Wood BJ, Karanian JW, Pritchard WF. Thermosensitive in-situ forming hydrogel improves local delivery of rose bengal after percutaneous hepatic injection in swine. Cardiovascular and Interventional Radiological Society of Europe Annual Congress, Copenhagen, DK; Sep 5-9, 2026. [Poster Presentation].

ABSTRACTS

- **Solter ML**, Wang YJ, Li G, Turkbey EB, Mena E, Duncan BB, Wu X, Haque F, Harmon S, Silbert SK, Yates B, Delgado Colon D, Giordani VM, Hoang C, Molina J, Rankin A, Wang HW, Foley T, Gava F, O'Koren C, Dreyzin A, McGrath C, Yuan C, Turkbey B, Sundby RT, Shah NN. Making the case: incorporating FDG PET/CT in relapsed/refractory B-ALL for evaluation of non-CNS EMD. American Society of Pediatric Hematology/Oncology Annual Meeting, Minneapolis, MN; Apr. 29–May 2, 2026. [Poster]
- **Vazquez-Rothschuh TA**, King J, Gharib A, Turkbey E, Kaur H, Das K, Gomez-Lobo V. Characterization of Retained Gonads in Complete Androgen Insensitivity Syndrome: MRI, Hormonal and Tumor Marker features. World Congress Pediatric Adolescent Gynecology (WCPAG) and NASPAG's 40th Annual Clinical and Research Meeting, San Francisco, CA; April 24, 2026. [Poster Presentation]
- **Vazquez-Rothschuh TA**, Porcino J, Das K, Gomez-Lobo V. Chronic Pelvic Pain and Quality of Life in Individuals with Mayer-Rokitansky-Küster-Hauser Syndrome (MRKH): An International Cross-Sectional Survey. 10th Anniversary Vivian W. Pinn Symposium, Bethesda, MD; May 11, 2026. [Poster Presentation]
- **Williams M**, Powell-Wiley TM, Reynolds ST, Sandler D, Aquino-Peterson E, Tolentino KJ, Marah M, Lopez De Leon S, Saurabh A, Mendelsohn LG, Baumer Y, Andrews MR. Psychosocial Adversity Associates with Lipid Profiles Among African American Women in Resource-Limited Neighborhoods: Findings from the Step It Up Community-Engaged, Digital Health-Enabled Physical Activity Intervention. American Heart Association EPI/Lifestyle Scientific Sessions. Boston, MA; Mar. 17-20, 2026. [Poster presentation]
- **Williams M**, Powell-Wiley TM, Reynolds ST, Sandler D, Aquino-Peterson E, Tolentino KJ, Marah M, Lopez De Leon S, Saurabh A, Mendelsohn LG, Baumer Y, Andrews MR. Psychosocial Adversity Associates with Lipid Profiles Among African American Women in Resource-Limited Neighborhoods: Findings from the Step It Up Community-Engaged, Digital Health-Enabled Physical Activity Intervention. National Heart, Lung, and Blood Institute Division of Intramural Research Retreat. Bethesda, MD; Mar. 13, 2026. [Poster presentation]
- Deepak T, Baumer Y, Andrews M, Aquino Peterson E, Saurabh A, Huang A, Lopez De Leon SJ, **Williams M**, Mendelsohn LG, Marah M, Tolentino KJ, Wells AL, Deguzman SM, Redai AT, Powell-Wiley TM. Neighborhood Crime Exposure and Vascular Aging: Findings from the Stress in the City Geospatial Study. National Heart, Lung, and Blood Institute Division of Intramural Research Retreat. Bethesda, MD; Mar. 13, 2026. [Poster presentation]
- **Wilson, E**, Naik, A, Bender, C, Ehasan, U, Guan, B, Neelathi, UM, Brooks, BP. Novel NR6A1 Variants Define an Emerging Genetic Mechanism for Coloboma. Association for Research in Vision and Ophthalmology Annual Meeting, Denver, Colorado; May 3-7, 2026. [Poster Presentation]
- Indurkar, A, Herbert, M, Ha, H, **Wilson, E**, Keenan, T, De Siliva, T, Chew, EY. Association for Research in Vision and Ophthalmology Annual Meeting, Denver, Colorado; May 3-7, 2026. [Poster Presentation]
- **Xiao S**, Eade A, Celades C, et al. IL-13 levels are elevated in floxuridine-treated patient plasma and ex vivo cystic duct perfusates. 2026 Society of Surgical Oncology Annual Meeting, Phoenix, AZ; Mar. 5-7, 2026. [Podium]
- **Xiao** S, Eade A, Celades C, et al. IL-13 levels are elevated in floxuridine-treated patient plasma and ex vivo cystic duct perfusates. 2026 CCR Fellows and Young Investigators Colloquium, Shady MD; May 14-15, 2026. [Poster]

CONFERENCES AND MEETINGS

- American Academy of Dermatology Annual Meeting, Denver, CO Mar. 27-31, 2026.
- American Academy of Neurology 2026 Annual Meeting, Chicago, IL; Apr. 18-22, 2026.
- American Association for Pediatric Ophthalmology and Strabismus, Boston, MA; March 18-22
- American College of Obstetricians and Gynecologists (ACOG) Annual Clinical and Scientific Meeting, Washington DC; May 3-5, 2026.
- American Diabetes Association 86th Scientific Sessions; New Orleans, LA; June 5-8, 2026.
- American Heart Association EPI/Lifestyle Scientific Sessions, Boston, MA; Mar. 17-20, 2026.
- American Neurological Association 150th Annual Meeting, Baltimore, MD; Sep. 13-16, 2025.
- American Society of Pediatric Hematology/Oncology Annual Meeting, Minneapolis, MN; Apr. 29–May 2, 2026.
- American Thoracic Society International Conference, Orlando, FL; May 16 – 21, 2026.
- Annual Gynecologic Pain Research Virtual Meeting, Virtual; May 12, 2026.
- Annual Medical Education Conference; Pittsburgh, PA; April 1-5, 2026.
- Association for Research in Otolaryngology 49th Annual MidWinter Meeting, San Juan, PR; Feb. 7-11, 2026.
- Association for Research in Vision and Ophthalmology Annual Meeting, Denver, CO; May 3–7, 2026.
- Atlantic Dermatology Conference, New York City, NY; May 1-3, 2026.
- Children's Cancer Foundation Inc. 10th Annual Research Symposium, Greenbelt, MD; Jun. 3, 2026.
- Combined Otolaryngology Spring Meeting, Pheonix, AZ; April. 22-26, 2026.
- Conference of the Diabetes in Pregnancy Study Group, Fairfax, VA; Nov 6-7, 2025.
- Congress of Neurological Surgeons, Los Angeles, CA; Oct 10-14, 2025.
- Global Cardiovascular Clinical Trialists Forum; Washington, D.C.; Dec. 8-10, 2025.
- Inflammatory Skin Disease Summit, Mount Sinai, New York, NY: Nov. 13-15, 2025.
- Interdisciplinary Meeting on Antimicrobial Resistance and Innovation (IMARI), 1st Annual Meeting, Las Vegas, NV; Jan. 28–30, 2026.
- International Association for Dental, Oral, and Craniofacial Research/American Association of Dental, Oral, and Craniofacial Research Annual Meeting, San Diego, CA; Mar.25 –28, 2026
- International Merkel Cell Carcinoma Symposium, Mass General Brigham, Boston, MA, Apr. 27-28, 2026.
- International Network for Sinonasal Cancer Research 2026 Annual Meeting, Bethesda, MD; Mar. 19-20, 2026.
- International Society for Heart and Lung Transplantation 46th Annual Meeting and Scientific Sessions, Toronto, ON Canada; Apr 22- Apr 25, 2026
- International Stroke Conference 2026, New Orleans, LA; Feb. 4-6, 2026.
- Metropolitan DC Thoracic Society Annual Meeting, Fairfax, VA; Apr 15, 2026
- New England Science Symposium, Boston, MA; Mar. 28. 2026.
- North American Skull Base Society 35th Annual Meeting, San Diego, CA; Mar. 5-8, 2026.
- North American Society for Pediatric and Adolescent Gynecology Annual Cinical and Research Meeting held with 21st World Congress Pediatric Adolescent Gynecology, San Francisco, CA; April 23-25, 2026.
- Pennsylvania Academy of Dermatology, 57th Annual Scientific Meeting, Philadelphia, PA; Sept 18-21, 2025.
- Radiological Society of North America Annual Meeting, Chicago, IL; Nov 30 – Dec 4, 2025. [Virtual]
- Skin of Color Society Annual Scientific Symposium, Denver, CO; Mar. 26, 2026.
- Skin of Color Society Meeting the Challenge Summit; Washington, D.C.; Dec. 5-6, 2025.
- Society for Investigative Dermatology Annual Meeting, Chicago, IL; May 13-17, 2026.
- Society for Maternal-Fetal Medicine 2026 Annual Pregnancy Meeting, Las Vegas, NV; Feb 8-13, 2026.
- Society of Biological Society Annual Meeting, New York, New York; Apr. 30–May 2, 2026.
- Society of Interventional Oncology Annual Meeting, Savannah, GA; Feb 4 – 8, 2026.
- Society of Surgical Oncology Annual Meeting, Phoenix, AZ; Mar. 5-7, 2026.
- Society of Thoracic Surgeons 62nd Annual Meeting, New Orleans, LA; Jan 29- Feb 1, 2026.

AWARDS

Gabriella Cheftiz
- Oral Abstract Winner, 4th International Merkel Cell Carcinoma Symposium, 2026
- Travel Award, 4th International Merkel Cell Carcinoma Symposium, 2026

Nitin Nadella
- Recipient, Looking to the Future Scholarship, Society of Thoracic Surgeons, 2026

Kingsley Osei-KariKari
- 2nd place oral abstract presentation, Skin of Color Society (SOCS) Scientific Symposium, 2026.
- Distinct presenter of honor award, Howard University Dermatology Research Symposium, 2026

Jessica Riopedre
- Society for Investigative Dermatology, Travel Award, 2026

Shrey Shah
- Certificate of Best Oral Presentation Award – INSICA/EUSICA 2026 Annual meeting

Mark Solter
- Best Poster Award, Pediatric Oncology Branch Research Roundup, National Cancer Institute, May 21, 2026

Elena Wilson
- Knights Templar Eye Foundation Ophthalmology Resident/Medical Student Travel Grant

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