2025 NATIONAL GWIS CONFERENCE

SCIENCE FOR THE COMMUNITY:

Celebrating INCLUSIVITY *and Engagement*

THURSDAY, JUNE 19 – SATURDAY, JUNE 21

SAINT LOUIS UNIVERSITY MEDICAL CAMPUS
LEARNING RESOURCES CENTER (LRC)
3544 HICKORY ST.
ST LOUIS, MO

SCHEDULE AT A GLANCE

Conference Venue	Banquet
Saint Louis University Medical Campus Learning Resources Center (LRC) 3544 Hickory St. St. Louis, MO 63104	Saint Louis Science Center GROW Pavilion 5050 Oakland Ave. St. Louis, MO 63110

Thursday, June 19	9am-4pm	National Council Meeting
Friday, June 20	9am-2pm	Grand Chapter Meeting
	2:45-4pm	Anheuser-Busch Brewery Tour
	5-7pm	Urban Chestnut Grove Brewery & Bierhall
Saturday, June 21	9am-4pm	Scientific Conference
	5:30-8:30pm	Conference Banquet

THURSDAY, JUNE 19

GWIS National Council Meeting
9am-4pm | Room C108

Saint Louis University Medical Campus
Learning Resources Center (LRC)
3544 Hickory St. | St. Louis, MO 63104

This is a closed meeting for the GWIS board of directors and national executive board members only.

FRIDAY, JUNE 20

GWIS Grand Chapter Meeting
9am-2pm | Room C108

Saint Louis University Medical Campus
Learning Resources Center (LRC)
3544 Hickory St. | St. Louis, MO 63104

Open to all registrants. Attendance is required for GWIS board of directors, national executive board members, standing committee members, and GWIS chapter presidents/national liaisons.

9:00-9:15am	Call to Order
9:15-9:30am	Presentation of FY 2026
9:30-9:45am	Presentation of Fellowship Winners & Honorable Mention
9:45-10:00am	Programming Updates & Announcements
10:00-10:15am	Presentation of Honorary Membership Award Recommendations
10:15-10:45am	DEI Discussion Details
10:45-11:00am	Break
11:00am-12:00pm	Chapter Updates
12:00-12:30pm	Lunch
12:30-1:00pm	Discussion
1:00-2:00pm	Installation of New Officers

GWIS Social Outing: Anheuser-Busch Brewery Tour

2:45-4pm

1200 Lynch St. | St. Louis, MO 63118

GWIS Networking Dinner: Urban Chestnut Grove Brewery & Bierhall

5-7pm

4465 Manchester Ave. | St. Louis, MO 63110
Generously hosted by Bayer

SATURDAY, JUNE 21

GWIS Scientific Conference
9am-4pm

Saint Louis University Medical Campus
Learning Resources Center (LRC)
3544 Hickory St. | St. Louis, MO 63104

9:00 – 9:30am	Auditorium A	Coffee, Registration, Opening Remarks
9:30 – 10:45am	Rooms 110-111	**Career Pathways Panels**
	Rooms 112-113	**Flash Talks**
10:45 – 11:00am	Corridor B	Break
11:00a-12:00p	**Auditorium A**	**Keynote Speaker: Cynthia Chapple**
12:00-1:30pm	Rooms 105-106	Lunch
	Corridors A-D	Poster Sessions
1:30-2:30pm	Rooms 110-111	**Community Engagement Panel** Elaine Cha, St. Louis Public Radio Dr. Sheila Grigsby, UMSL College of Nursing Kiley Bednar, Community Innovation and Action Center
	Rooms 112-113	**Research Panel** *Smart Systems and Soft Tissues: Interdisciplinary Frontiers in Tech and Biology*
2:30-2:45pm	Corridor B	Break
2:45-3:45pm	Rooms 110-111	**Grant Writing Panel** Cynthia Jobe, UMSL Director of Research Development Dr. Leah Windsor, University of Memphis Dr. Rachel Wamser, UMSL Psychological Sciences
	Rooms 112-113	**Research Panel** *From Brain to Body: Emerging Insights in Individualized Medicine*
3:45-4:00pm	Auditorium A	**Closing Remarks**

GWIS Conference Banquet

5:30-8:30pm

St. Louis Science Center GROW Pavilion
5050 Oakland Ave. | St. Louis, MO 63110

Dinner buffet, cash bar, and awards ceremony included for all in-person registrations.
Meet and network with other conference attendees, GWIS members, and other community members and professionals passionate about STEM. If you wish to bring a guest that is not registered for the conference, please contact Carissa Philippi (philippic@umsl.edu, 651-338-1431) to purchase an extra ticket ($10/person).

SMART SYSTEMS AND SOFT TISSUES:
INTERDISCIPLINARY FRONTIERS IN TECH AND BIOLOGY

MNv4-YOLO: Infrared Object Detection for Edge Deployment via MobileNetV4 and SlideLoss

Jiali Zhang
Missouri University of Science and Technology

Infrared imaging has emerged as a robust solution for urban object detection under low-light and adverse weather conditions, offering advantages over traditional visible-light cameras. However, challenges such as class imbalance, thermal noise, and computational constraints can hinder model performance in practical settings. To address these issues, we evaluate multiple YOLO variants on the FLIR ADAS V2 dataset, ultimately choosing YOLOv8 as our baseline for its balanced accuracy and efficiency. Building upon this, we propose an enhanced infrared detection framework, MNv4_YOLO, by substituting YOLOv8's CSPDarknet backbone with the more lightweight and efficient MobileNetV4. This modification reduces computational overhead by 1.5% while maintaining robust accuracy. Furthermore, we introduce a novel SlideLoss function that adaptively prioritizes underrepresented or occluded samples, improving precision without sacrificing recall. Validated on the FLIR ADAS V2 benchmark, our model achieves competitive mAP and high precision while operating at only 6.7 GFLOPs, making it suitable for real-time edge deployment in urban environments. Overall, MNv4_YOLO effectively addresses the dual challenge of maintaining detection quality while minimizing computational costs.

The age-associated increased ovarian stiffness impairs follicle development and oocyte quality by inducing a fibroinflammatory response

Sara Pietroforte, PhD
Washington University School of Medicine Department of Obstetrics and Gynecology
Co-authors: Makenzie Plough, Farners Amargant i Riera

Reproductive aging is associated with decline in oocyte quantity and quality. With aging ovaries become stiffer, however, how stiffness impacts ovarian function and oocyte quality is unknown. Here, we used an alginate-encapsulated in vitro system that mimics age-associated changes in ovarian microenvironment. We synthesized hydrogel recapitulating soft (young-0.5%:1.79±0.08kPa) and stiff (old-2%:4.56±2.03kPa) environments to culture for 12days secondary follicles from pre-pubertal mice. Follicles cultured in stiff environment showed significant reduction in size (0.5%:226.9±17.4um;2%:160.8±9.9um,p<0.0001). These differences were triggered by granulosa cells (GCs;0.5%:160.04±13.4um;2%:103.37±16.5um,p<0.0001), suggesting that GCs are not proliferating in stiff environment. We then isolated oocytes at D12 and found that quality significantly declined in 2%, with 68.9±16.8% of oocytes degenerated. Since the effects of stiffness on follicle growth were evident at D4, we cultured 120 follicles in 0.5% or 2%, and analyzed them by RNAseq at 3,6,12,24h. We first analyzed follicles' transcriptome at each timepoint comparing 0.5%vs2%. We identified few differentially expressed genes (DEG) at 3h, a peak at 6h, followed by a decrease which

reached plateau at 12h-24h. DEGs at 6h were involved in response to external stimuli, and inflammation. In a time-dependent analysis, we identified 1029 DEGs in follicles cultured in 2%, and most of the upregulated genes were associated with collagen and extracellular matrix (ECM) remodeling. In 0.5%, 1282 DEGs were identified, with upregulation of cell cycle and metabolism-related genes.
Overall, we demonstrated that follicles are mechanosensitive, and that stiffness impairs follicle development and quality, triggering a fibroinflammatory phenotype. These findings suggest stiffness as novel regulator of ovarian aging.

Cells-on-computers

Premila Samuel Russell, PhD
Saint Louis University Department of Chemistry

Various life-sustaining processes are hidden within our cells from the space and time resolutions of traditional experiments. In addressing these challenges, I will discuss my recent projects centered on using computational chemistry approaches to model and simulate segments of a human cancer cell variant. These cell segment models have allowed me to discover atomic details of biologically-relevant transformations and interactions that occur within cell environments at high temporal resolution. My long-term goal is to construct a range of models across different human cell types. These models will be used as platforms to both simulate structural mechanisms of cell-specific diseases and screen for drugs that potentially could be used to treat these diseases.

FROM BRAIN TO BODY: EMERGING INSIGHTS IN INDIVIDUALIZED MEDICINE

Melody Meets Mind: Emotional Outcomes of Piano Interventions and Rhythmic Variation in Traumatic Brain Injury

Dana Zafarani
Saint Louis University

Traumatic Brain Injury (TBI) is caused by an external force and can lead to temporary or permanent impairments in physical, cognitive, or psychosocial function, including damage to the frontal lobe. This often disrupts behavior, decision-making, communication, judgment, and emotional regulation, leading to irritability, anger, and difficulty with self-control. With growing evidence supporting music as a therapeutic tool for emotional and cognitive recovery, this study aimed to investigate how piano chord structures and rhythmic variations affect emotional responses in an individual with TBI caused by physical impact. In this study, the participant was exposed to four piano chord variations using both major (C, G, D♯, E) and minor (E, D♯, A, E) scales, each differing in rhythm and volume. After each variation, the participant identified their emotional reaction using a chart and recorded the emotion they resonated with most. While major chords typically evoke positive emotions and minor chords are associated with melancholy in individuals without TBI, the participant showed a positive emotional response to the minor scale—an atypical result. Notably, the fourth variation was played in a staccato style, characterized by short, sharply detached notes often perceived as abrupt or jarring; yet, it

elicited feelings of joy and happiness. These unexpected responses suggest potential alterations in emotional processing due to brain injury. Future research could replicate this study with individuals who have sustained similar TBIs or compare results with neurotypical controls. Expanding the study across diverse age groups offers a foundation for further exploration in music therapy and neuropsychological research.

Adipose tissue biology, metabolic function, and effect of weight loss in women with lipedema

Silvia Gonzalez-Nieves
Saint Louis University School of Medicine
Co-authors: Gordon I. Smith, Jun Yoshino, Anja Fuchs, Bruce W. Patterson, Thomas F. Wright, Samuel Klein, Vincenza Cifarelli

Lipedema is a chronic condition characterized by excessive subcutaneous adipose tissue (AT) in the hips, buttocks, and limbs, leading to pain, limited mobility, and reduced quality of life. The underlying metabolic and immune changes in AT are poorly understood. Although diet-induced weight loss is a cornerstone treatment for obesity, liposuction remains the standard for lipedema, as anecdotal reports suggest diet alone often does not reduce lower-body fat in these patients.
We conducted two studies to investigate metabolic and immune characteristics in lipedema. Study 1 involved a comprehensive whole-body, organ-level, and cellular analysis comparing individuals with lipedema to BMI-matched controls. We assessed body composition, plasma inflammatory markers, adipokines, AT immune cell profiles, gene expression, and metabolic function across three groups: lean healthy women (Lean), women with obesity without lipedema (Obese), and women with obesity and lipedema (Obese-LIP). In Study 2, we examined whether ~8–10% diet-induced weight loss in Obese-LIP individuals produced typical AT remodeling and metabolic improvements.
Compared to the Obese group, Obese-LIP individuals showed: i) reduced abdominal and increased leg-specific fat mass, ii) improved insulin-stimulated glucose disposal, and iii) increased M1-like macrophages in lower versus upper body fat. Lower expression of angiogenesis-related genes (VEGFC, ANG, SOX17, THBS4) was seen in femoral versus abdominal depots. Diet-induced weight loss reduced both upper and lower-limb fat and improved insulin sensitivity but had minimal effects on AT remodeling.
Our findings suggest that diet-induced weight loss can reduce leg fat and improve insulin sensitivity in lipedema, supporting diet as a first-line treatment before liposuction.

Inclusion of Female and Male Mice in Preclinical Ischemic Stroke Studies: Findings from Nutritional Deficiencies in Vitamin B12

Nafisa Jadavji, PhD, FAHA
Southern Illinois University School of Medicine

Ischemic stroke is the leading cause of death and disability worldwide. Women have more risk factors and worse outcomes compared to men. One of the many reasons these problems exist is that over 90% of preclinical studies use strictly male mice, whereas all clinical studies use equal numbers of

male and female participants. This makes clinical findings favor better outcomes in males. We study preclinical ischemic stroke with a focus on nutrition which is a modifiable risk factor. In this area, clinical research has demonstrated that reduced levels of vitamin B12 in the body increase risk of ischemic stroke and lead to worse outcomes afterwards. Our work has shown that adult male and female mice maintained on vitamin B12 deficiency (vit B12 def) had impaired stroke outcomes. Male mice maintained on a vit B12 def diet performed poorly on motor tasks. In tissue, vit. B12 def male mice showed more total apoptosis within the ischemic damage region. The vit B12 def male mice also had increased levels of a marker for neuronal survival. In brain tissue, we did not observe any differences between female groups. This is an interesting finding considering research has shown that men are more susceptible to a vitamin B12 deficiency, our data aligns with it. Furthermore, our data highlights how sex impacts outcomes after ischemic stroke. These results from our studies emphasize the importance of studying of sex differences in preclinical stroke experiments and the possibility of individualized medicine focusing on nutritional status of each patient.