

APRIL 22, 2024

GRADUATE STUDENT ORGANIZATION RESEARCH SYMPOSIUM



THANK YOU!

First, we thank you for dedicating your time and attending our 2024 GSO Research Symposium.

For the first time, our symposium is being hosted at TMC3. We thank Bill McKeon and Ashley McPhail for welcoming us to the space. Thank you to Dr. Claudio Soto for sharing his excellent research and experience with us. Thank you to our 15 vendors for their generous support. Thank you to Dr. Julian Hurdle and the Postdoctoral Association for sponsoring breakfast and their endless support. A special thank you to Dr. Kenneth S. Ramos, Dr. Stefan Siwko, Dr. Kristen Neill, Jennifer Cain, and Andrew Chansamouth for their constant support of the GSO and the amazing events we have achieved in the past year. We are truly grateful.

We are excited to welcome each of you today and hope you are inspired by the research to be presented!

Sincerely, Your 2023-2024 Graduate Student Organization

Bettina Hoden Tingshawan

Ashley Series May Carli

Hormon HAM Minsun Gon

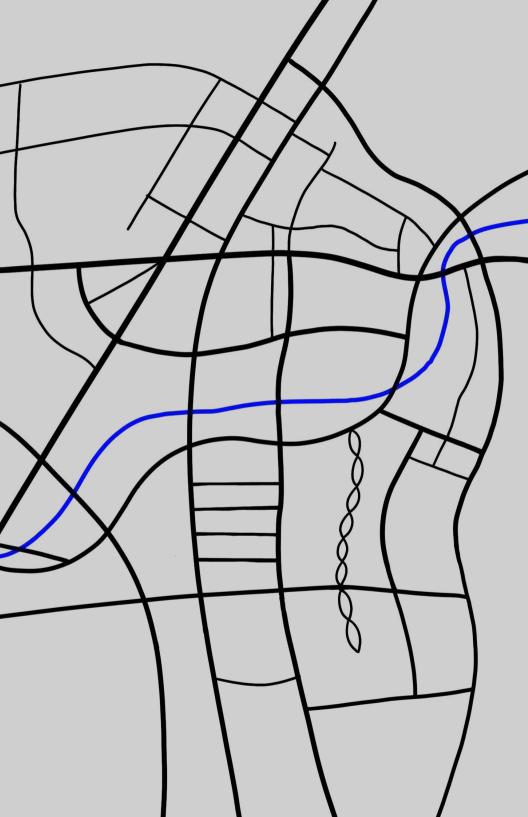
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President Vice President Secretary Treasurer Social Chair Media Chair Outreach BCS Liaison GPSG Officer GIC Officer LEEP Officer First Year Rep Bettina Hoden Yingshan Wang Ashley Suris Maryn Cavalier Hannah Reeves Stacey Jeon Anh Vo Xiaoxuan Liu Uffaf Khan Ann McKelvey Wei Zhao Nesha Rubin





PROGRAM OUTLINE	6
KEYNOTE SPEAKERS	8
ORAL GROUP 1 STUDENT PRESENTERS	9
POSTER SESSION 1	10
POSTER SESSION 2	11
ORAL GROUP 2 STUDENT PRESENTERS	12
ORAL GROUP 3 POSTDOC PRESENTERS	13
PROGRAM FACULTY	15
CEDP	16
	18
CTCR	20
СGРМ	22
POSTDOCTORAL ASSOCIATION	24
ADVANCED TECHNOLOGY CORES	25
2023-2024 STUDENT PUBLICATIONS	26
2023-2024 GSO EVENTS	28
NOTES	30
SCIBINGO	31

OUTLINE PROGRAM

9:00 - 9:30 AM

9:30 - 10:00 AM

- 10:00 11:00 AM
- 11:00 11:10 AM
- 11:10 11:15 AM
- 11:15 12:00 PM
 - 12:00 1:00 PM
 - 1:00 2:15 PM
 - 2:15 3:15 PM
 - 3:15 3:30 PM
 - 3:30 4:45 PM
 - 4:45 5:00 PM

5:00 - 6:00 PM

Arrival and Registration Breakfast Sponsored by the PDA

Openings from Dr. Kenneth S. Ramos TMC3 Welcomes from Bill McKeon TMC3 Initiatives from Ashley McPhail

Research Keynote from Dr. Claudio Soto

Break

Remarks from GSO President

Oral Group 1 Student Presentations

Lunch

Posters and Vendor Exhibition

Oral Group 2 Student Presentations

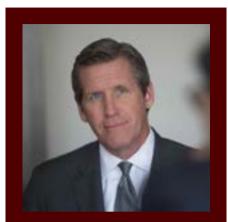
Break

Oral Group 3 Post-doc Presentations

Raffle Prizes Oral and Poster Presentation Awards Service Award Winner Announcement

Social hour

KEYNOTE SPEAKERS



Bill McKeon

President and CEO, Texas Medical Center



Ashley McPhail

Chief External Affairs and Administration Officer, Texas Medical Center

"New Concepts and Translational Approaches to Combat Neurodegenerative Diseases"



Claudio Soto, Ph.D.

Huffington Distinguished University Chair

Professor of Neurology

Director, Mitchell Center for Alzhemer's Disease and Related Brain Disorders

University of Texas McGovern Medical School at Houston

ORAL GROUP 1 STUDENT PRESENTERS

11:15 - 11:30 AM

Ashley Suris

Targeting Epigenetic and Transcriptional Aberrations in Leukemia with Nanobody Technologies

11:30 - 11:45 AM

Maryn Cavalier

Unraveling the Epigenetic Regulation of Senescence-Associated Heterochromatic Foci Formation: Implications for Aging and Healthy Aging Interventions

11:45 - 12:00 PM

Yuhan Yang

Cardiac Specific Tet Deficiency Impedes Normal Systemic Energy Homeostasis in Adult Mice



POSTER SESSION 1 1:00 - 1:35 PM

P1	Zihan Zhang
A Reversible Chemogenetic Switch fo	r CAR-T Cells
P2	Ziying Liu
Ectopic FGFR1 Activates SREBP2 to I Cholesterol Uptake in Prostate Cance	•
P3	Bettina Hoden
Functional Interactions between To Retrotransposon Signaling in Lung Ca	•
P4	Yingshan Wang
Integrative Analysis of Long-Read DM Clinicopathological Profiles of LINE- Cell Lung Cancer	
P5	Nivedhitha Mohan
BAZ1A as a Master Regulator of Apoptosis, and Senescence in Colored	0 1 <i>,</i>
P6	Javier Villela
A Phenotypic Model for Cancer Metab	olism
P7	Isaac Prah
Discovery of Vancomycin Resistant with gdpP Deletion, Showing Survival	



POSTER SESSION 2 1:35 - 2:10 PM

P8 Xinjie Wang
Global Distribution of Cardiac Exosomes after Myocardia Infarction
P9 Stacey Jeon
High-throughput Cell-Free DNA Methylation Profiling of Nippl Aspirate Fluid in Breast Cancer
P10 Hannah Reeve
Iron Transporter: FeoB1, and Pyruvate Contribute to the Toxi Biosynthesis Pathway in Clostridioides Difficile
P11 Elias Per
"Pleozyme" Targeting of Cellular Senescence in Friedreich's Ataxia
P12 Jorge Enrique Tovar Pere
Immunomodulatory Activity of Intermittent Low-dose Erlotinib Plu Sulindac: Implications for Hereditary and Sporadic Colorecta Cancer
P13 Karthik Moul
SOD1 Overexpression and Dysregulated Resilience to Hydroge Sulfide in Down Syndrome: Pleiotropic Opportunities for a Nove

Nanozyme Therapeutic



ORAL GROUP 2 STUDENT PRESENTERS

2:15 - 2:30 PM

Kajol Harsh

Jack Wang

Epigenetic Alterations Modulate Nuclear Stiffness in Mouse Embryonic Stem Cells

2:30 - 2:45 AM

A Novel Image-based Computational Framework to Estimate the Material Properties of Human Coronary Lesions

2:45 - 3:00 PM

David Jiang

A Computational Framework to Optimize the Mechanical Behavior of Tissue-engineered Vascular Grafts

3:00 - 3:15 PM

Linh Huynh

A Novel Connection Between the Ras Proto-oncogene and the Hippo/Warts/Yap Pathway



ORAL GROUP 3 POSTDOC PRESENTERS

3:30 - 3:45 PM

Evaluation of De Novo Fatty Acid Biosynthesis as a Narrow-Spectrum Approach for Clostridioides difficile infection

3:45 - 4:00 PM

Inhibiting the cGAS-STING pathway in myeloid cells effectively improves myocardial healing related to TET2 deficiencyinduced DNA damage response

4:00 - 4:15 PM

Developing novel nanobodies against the DNA 5-methylcytosine dioxygenases TET2

TET2 deficiency results in transcription-replication conflicts through R-loop accumulation

4:30	-	4:45	ΡM
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Perturbation of TET2 condensation promotes genome-wide promiscuous DNA hypomethylation to curtail leukemia cell growth

Chetna Dureia

Shaohai Fang

Xiaoli Cai

Junhua Huang

Kunjal Rathod

5 - 4.00 F M

Dear Attendees,

It is with great pleasure that I welcome you to the 2024 Graduate Student Research Symposium hosted by the GSO. This event stands as a testament to the dedication, innovation, and scholarly pursuit embodied by our graduate student community at the Institute of Biosciences and Technology.

The symposium provides a platform for showcasing the research endeavors of our trainees and fosters interdisciplinary collaboration, networking, and the exchange of ideas. Importantly, our time together serves as a reminder of the importance of collaboration in addressing the complex challenges of our world today.

I extend my sincerest gratitude to the GSO for their outstanding efforts in organizing this event, as well as to the faculty mentors and sponsors who support the academic pursuits of our learners.

To the graduate student and postdoctoral fellow presenters, I commend your dedication, passion, and commitment to advancing scientific inquiry. Your work embodies the ethos of our Institute, and I am confident that your contributions will leave a lasting impact on society.

I wish you all a fruitful and enriching symposium experience, filled with meaningful discussions, insightful presentations, and valuable connections.

Sincerely,

Kenneth Ramos, MD, PhD Executive Director Institute of Biosciences and Technology

PROGRAM FACULTY

Institute of Biosciences and Technology 2121 W. Holcombe Blvd. Houston, TX 77030



Dr. Kenneth S. Ramos Executive Director, IBT



Jennifer Cain

Associate Director of Administration, IBT



Dr. Stefan Siwko

Director, IBT Ph.D. Program



Dr. Kristen Neill

Assistant Director of Student Affairs, IBT Ph.D. Program



CENTER FOR EPIGENETICS



Dr. Roderick Dashwood CEDP Center Director



Maryn Cavalier

2nd Y Ph.D. Student Dr. Yun Nancy Huang



Kajol Harsh

3rd Y Ph.D. Student Dr. Yun Nancy Huang



Carolyn Nguyen

1st Y Ph.D. Student Dr. Kurt Zhang



Jorge Perez

5th Y Ph.D. Candidate Dr. Roderick Dashwood



Logan Rivera

1st Y MD/Ph.D. Student Dr. Yun Nancy Huang

- Faculty:
- Dr. Lei Guo
- Dr. Yun Nancy Huang
- Dr. Praveen Rajendran
- **Dr. Kurt Zhang**

AND DISEASE PREVENTION



Minsun Stacey Jeon

4th Y Ph.D. Candidate Dr. Kurt Zhang



Dr. Nivedhitha Mohan

Defense Completed Dr. Roderick Dashwood



Dr. Ahmed Muhsin

4th Y Ph.D. Candidate Dr. Roderick Dashwood



Ashley Suris

2nd Y Ph.D. Student Dr. Yun Nancy Huang



Jimmy Wengler

1st Y MD/Ph.D. Student Dr. Yun Nancy Huang



Dr. Yuhan Yang

Defense Completed Dr. Yun Nancy Huang

Administration:

Wan-Mohaiza Dashwood (Laboratory Manager) Yang Liu (Laboratory Manager) Alma Ramirez, MBA, MS (Administrative Coordinator I)

Staff:

Tingting Hong (Research Associate)

- Sabeeta Kapoor (Research Associate)
 - Shahed Muhsin (Research Associate)
 - **Kunjal Rathod (Research Associate)**
 - **Xianciang Ye (Research Associate)**
- Yan Zhang (Senior Research Scientist)

CENTER FOR INFECTIOUS AND



Dr. Julian Hurdle CIID Center Director



Guadalupe Calderon

1st Y Ph.D. Student Dr. Yi Xu



Amy Gomez

4th Y Ph.D. Candidate Dr. Magnus Höök

<u>Faculty:</u>

Dr. Magnus Höök

Dr. Xiaotong Song

Dr. Yi Xu

Dr. Dekai Zhang

INFLAMMATORY DISEASES



Ann McKelvey

4th Y Ph.D. Candidate Dr. Julian Hurdle



Hannah Reeves

2nd Y Ph.D. Student Dr. Julian Hurdle



Jacob Rutherford

5th Y Ph.D. Candidate Dr. Julian Hurdle

Administration

Olivia Cabrera (Administrative Coordinator I)

Staff:

- Yue Hu (Research Associate)
- Wen Liu (Research Assistant)
- **Anjail Nagarajan (Research Assistant)**
 - Azul Silveyra (Research Assistant)
 - Sarah Woodfin (Research Assistant)

CENTER FOR TRANSLATIONAL



Dr. Peter J.A. Davies CTCR Center Director



Vicky Fan

2nd Y Ph.D. Student Dr. Jason T. George



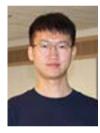
Zahra Ghoreyshi

2nd Y Ph.D. Student Dr. Jason T. George



Xiaoxuan Liu

3rd Y Ph.D. Candidate Dr. Yubin Zhou



Ziying Liu

5th Y Ph.D. Candidate Dr. Fen Wang Dr. Yubin Zhou



Tatsuki Nonomura

1st Y Ph.D. Student Dr. Yubin Zhou

Faculty:

- Dr. Margie Moczygemba
- **Dr. Reid Powell**
- Dr. David J. Reiner
- Dr. Clifford Stephan
- Dr. Robert Tsai
- **Dr. Fen Wang**
- Dr. Guo Dong Zhou
- Dr. Yubin Zhou

CANCER RESEARCH



Linh Huynh

4th Y Ph.D. Candidate Dr. David J. Reiner



Dr. Yi-Tsang Lee

Defense Completed Dr. Yubin Zhou



Siyao Liu

3rd Y Ph.D. Candidate Dr. Yubin Zhou



Javier Villela-Castrejon

2nd Y Ph.D. Student Dr. Jason T. George



You Wu

6th Y Ph.D. Candidate Dr. David J. Reiner



Zihan Zhang

2nd Y Ph.D. Student Dr. Wenshe Liu

Joint Appointments:

Dr. Tanmay Lele Dr. Wenshe Liu Dr. Andrew Robbins Dr. Jun Wang

<u>Administration:</u> Denelle Orellana (Sr. Administratice Coordinator II)

Staff:

Syed Sher Ali Bukhari (Project Scientist) Rui Wang (Research Associate)

CENTER FOR GENOMIC



Dr. Kenneth S. Ramos CGPM Center Director



Bettina Hoden

3rd Y Ph.D. Candidate Dr. Kenneth S. Ramos Dr. Dekai Zhang



Dr. Garrett Jensen

Defense Completed Dr. Jiang Chang



Sokviseth Moeng

1st Y Ph.D. Student Dr. Kenneth S. Ramos



Karthik Mouli

2nd Y MD/Ph.D. Student Dr. Thomas A. Kent



Elias Perli

4th Y MD Student Dr. Thomas A. Kent



Yingshan Wang

3rd Y Ph.D. Candidate Dr. Kenneth S. Ramos <u>Faculty:</u> Dr. Jiang Chang Dr. Paul J. Derry Dr. Thomas A. Kent Dr. Weija Luo Dr. Tej Pandita Dr. Rick Silva Dr. Stefan Siwko

AND PRECISION MEDICINE



Uffaf Khan

3rd Y Ph.D. Candidate Dr. Thomas A. Kent



Jacob Kuempel

1st Y MD/Ph.D. Student Dr. Jiang Chang



Isla Mata

1st Y Ph.D. Student Dr. Kenneth S. Ramos



Nesha Rubin

1st Y Ph.D. Student Dr. Kenneth S. Ramos



Anh Vo

5th Y Ph.D. Candidate Dr. Thomas A. Kent



Xinjie Wang

3rd Y Ph.D. Student Dr. Jiang Chang

Administration:

Andrew Chansamouth, BBA (Senior Administrative Coordinator I) Linda Sáenz (Senior Administrative Coordinator II)

<u>Staff:</u>

De Lona Bacote (Research Specialist V) Hai Chen (Senior Research Assistant) Yanping Chen (Senior Research Assistant)) Abeer Hassanin (Visiting Scholar) Qiang He (Research Data Scientist, MS, MSPH) Marco Tavera-Garcia (Laboratory Manager) Dr. Anton Liopo (Laboratory Manager) Wei Yu (Laboratory Manager)

POSTDOCTORAL ASSOCIATION



Dr. Julian Hurdle Program Director, PDA



Dr. Chetna Dureja Co-president



Dr. Razan Fakieh Co-president

OUR IBT POSTDOCS:

Dr. Rudra Prasanna Banerjee Dr. Xiaoli Cai Dr. Chetna Dureja Dr. Razan Fakieh Dr. Shaohai Fang Dr. Zachary Zhi Geng Dr. Junhua Huang Dr. Yuepeng Ke Dr. Tien Hung Lan Dr. Jing Li Dr. Sultan Neja Dr. Sultan Neja Dr. Andres Chamorro Parejo Dr. Isaac Prah Dr. Pujan Shrestha Dr. Tianlu Wang

HOME LAB:

Dr. David J. Reiner Dr. Yun Nancy Huang Dr. Julian Hurdle Dr. Kenneth S. Ramos Dr. Yun Nancy Huang Dr. Wenshe Liu Dr. Yun Nancy Huang Dr. Yubin Zhou Dr. Yubin Zhou Dr. Kurt Zhang Dr. Roderick H. Dashwood Dr. Kenneth S. Ramos Dr. Julian Hurdle Dr. Jason T. George Dr. Yubin Zhou





ANTIBODY AND BIOPHARMACEUTICAL Dr. Praveen Rajendran

ADVANCED TECHNOLOGY CORES

CENTER FOR ADVANCED IMAGING Dr. Michael Mancini Dr. Leoncio Vergara

HIGH THROUGHPUT FLOW CYTOMETRY ANALYSIS AND CELL SORTING Dr. Margie Mocyzgemba

HIGH THROUGHPUT RESEARCH AND SCREENING Dr. Clifford Stephan

MICROPHYSIOLOGICAL LEAD OPTIMIZATION SCREENING Dr. Clifford Stephan



PRECLINICAL IMAGING Dr. Jiang Chang

PROTEIN PRODUCTION, CHARACTERIZATION, AND MOLECULAR INTERACTION Dr. Magnus Höök

RIGOR AND REPRODUCIBILITY Dr. Kurt Zhang

TEXAS A&M CLINICOGENOMICS Dr. Rick Silva

STUDENT PUBLICATIONS

Avoid equipment graveyards: rigorous process to improve identification and procurement of effective, affordable, and usable newborn devices in low-resource hospital settings

Asma, E., Heenan, M., Banda, G., Kirby, R.P., Mangwiro, L., Acemyan, C.Z., Palamountain, K.M., Kortum, P., Kawaza, K., Oden, Z.M., Richards-Kortum, R., Technical Collaborative Authorship Group (Wang, Y.J., et al.) BMC Pediatrics (2023)

Influence of material parameter variability on the predicted coronary artery biomechanical environment via uncertainty quantification

Berggren, C.C.*, Jiang, D.*, Wang, Y.J.*, Bergquist, J.A., Rupp, L.C., Liu, Z., MacLeoad, Rob., Narayan, A., Timmins, L.H.

Biomech Model Mechanobiol (2024)

Long Interspersed Nuclear Element-1 Analytes in Extracellular Vesicles as Tools for Molecular Diagnostics of Non-Small Cell Lung Cancer.

Bowers, E. C., Cavalcante, A. M., Nguyen, K., Li, C., Wang, Y., El-Zein, R., Chen, S. H., Kim, M. P., McKay, B. S., Ramos, K. S.

International journal of molecular sciences (2024)

Oxidation of Hydrogen Sulfide to Polysulfide and Thiosulfate by a Carbon Nanozyme: Therapeutic Implications with an Emphasis on Down Syndrome

Derry, P. J., Liopo, A. V., Mouli, K., McHugh, E. A., Vo, A. T. T., McKelvey, A., Suva, L. J., Wu, G., Gao, Y., Olson, K. R., Tour, J. M., & Kent, T. A. Advanced materials (2023)

Optogenetic engineering of STING signaling allows remote immunomodulation to enhance cancer immunotherapy

Dou Y., Chen R., Liu S., Lee Y.T., Jing J., Liu X., Ke Y., Wang R., Zhou Y., Huang Y. Nat Communications (2023)

Aziridination-Assisted Mass Spectrometry of Nonpolar Sterol Lipids with Isomeric Resolution

Hirtzel E., Edwards M., Freitas D., Liu Z., Wang F., Yan X. J Am Soc Mass Spectrom (2023)

Updates on Toll-like Receptors in Cancer Immunity and Immunotherapy

Hoden B., Nagai Y., Schuettpelz S., Zhang D. Editorial: Frontiers in Immunology (2023)

TET2 modulates spatial relocalization of heterochromatin in aged hematopoietic stem and progenitor cells

Hong T., Li J., Guo L., Cavalier M., Wang T., Dou Y., DeLaFuente A., Fang S., Guzman A., Wohlan K., Kapadia C., Rosas C., Yang Y., Yin C., Li S., You J., Cheng X., Goodell M., Zhou Y., Huang Y.

Nature Aging (2023)

Integration of Febio as an Instructional Tool in the Undergraduate Biomechanics Curriculum

Jiang D., Grainger D.W., Weiss J.A., Timmins L.H. Journal of Biomechanical Engineering (2024)

AND ACHIEVMENTS

Light activated macromolecular phase separation modulates gene transcription by reconfiguring chromatin interactions

Kim Y.J.*, Jing J.*, Lee M.*, Lee Y.T.*, He L., Botten G.A., Lyu J., Zhang Y., Zhou Y., and Xu J.

Science Advances (2023)

Delineating the Role of Toll-like Receptors in Inflammatory Bowel Disease Liang H., Zhang L., Hoden B., Qu B., DeRubeis D., Song X., Zhang D. Methods in Molecular Biology (2023)

Upregulation of TLR5 indicates a favorable prognosis in prostate cancer Liang H., Zhang L., Liu Z., Hoden B., DeRubeis D., Zhang Y., Wang F., Zhang D. Prostate (2023)

A–Z of Epigenetic Readers: Targeting Alternative Splicing and Histone Modification Variants in Cancer

Mohan N., Dashwood R.H., Rajendran P. Cancers (2024)

Innovative strategies to study epigenetic regulation and advance precision medicine Suris A., Zhou Y., Huang Y. Comprehensive Precision Medicine (2024)

Matrix stiffness drives drop-like nuclear deformation and lamin A/C-dependent YAP nuclear translocation

Wang T.C., Abolghasemzade S., McKee B., Singh I., Pendyala K., Patel H., Shaji A., Kersey A., Harsh K., Kaur S., Dubell C., Chukkapalli S., Lele P., Gaharwar A., Dickinson R., Lele T.

RAL-1 signaling regulates lipid composition in C. elegans Wu Y., Lee M., Mutlu A.S., Wang M., Reiner D.J. MicroPublication Biology (2024)

Single-Cell mRNA Sequencing in Precision Medicine: Promise and Challenges Zhang K.K., Li J., Jeon M., Ramos K.S. Comprehensive Precision Medicine (2024)

Ashley Suris - F31 Fellowship Application Submission (April 5, 2024)

Maryn Cavalier - F31 Fellowship Application Submission (April 5, 2024)

Uffaf Khan - Accepted to NIH-funded SHIFT Program

Anh Vo - Cover Art Published in Nanozyme issue of Advanced Materials Received GCC IDDD Scholarship for ADMET Symposium

Uffaf Khan and Anh Vo - Secured the Golden Ticket from Johnson & Johnson lab in Texas Medical Center and Genentech JDEI award (\$1000) for Nucleate

2023-2024 GSO SOCIAL



BACK TO SCHOOL PARTY



GSO Pizza & Mindfulness







EVENTS AND MEMORIES







The first 3 players to get all marked squares call out "SCIBINGO" and win a prize.



MaxCyte	Jackson Lab	Cytiva	GenScript
Azenta	Thermo Fisher	Millipore Sigma	Stemcell Technologies
Sycamore Life Sciences	VWR	Proteintech	What's cardiomyocytes' favorite color?
What's Hippo's favorite number?	MedChemExpress	Metware Biotechnology	GenScript ProBio

Judge initial: _____

- 1. Visit the vendor booth for an engaging conversation and a daub-off.
- 2.GRAND PRIZE: The first 3 players, who mark all the squares on their Bingo card and shout "SciBingo", win grand prizes. <u>Find Anh Vo to verify.</u>

Grand Prizes:

3. The game ends at 4 pm or when all prizes are claimed.



Portable Arcade





Lava Lamp

\$25 Giftcard

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Thermo Fisher



























THANK YOU!