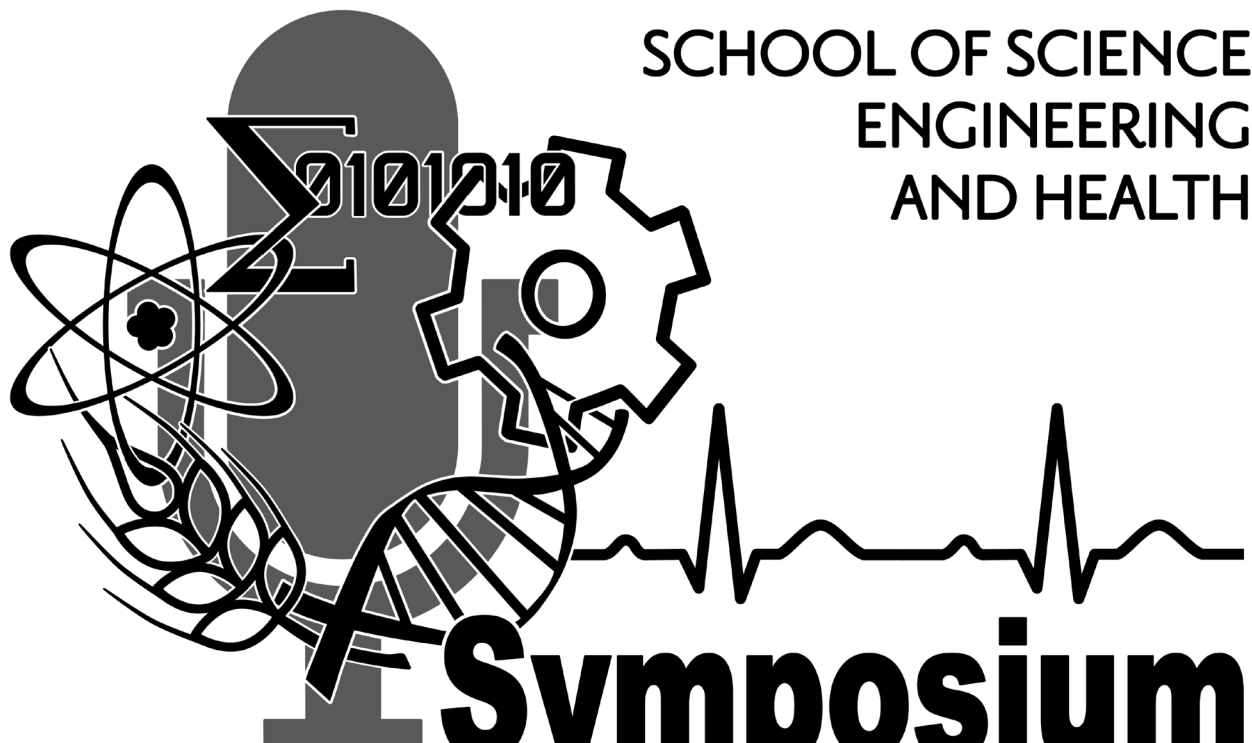


FRIDAY, MAY 2, 2025

**MESSIAH
UNIVERSITY**



**SCHOOL OF SCIENCE
ENGINEERING
AND HEALTH**

Symposium
twenty-second annual

PROGRAM

A Word from the Dean

We in the School of Science, Engineering and Health at Messiah University welcome you to our 22nd Annual Symposium.

Please celebrate with our students, staff, and faculty as you hear and see professional presentations that showcase our students' basic and applied research in science and health fields.

The outcomes of scientific research expand intellectual understanding and have tremendous impact on quality of life, environmental health, and human flourishing.

We warmly welcome you as guests for the day.

Angela C. Hare, Ph.D.

Associate Provost

Dean of the School of Science, Engineering and Health

Professor of Mathematics

Special thanks to...

Rachael Rose, Administrative Assistant to the Dean of the School of Science, Engineering and Health, for coordination of room reservations, advertising, catering, and hospitality.

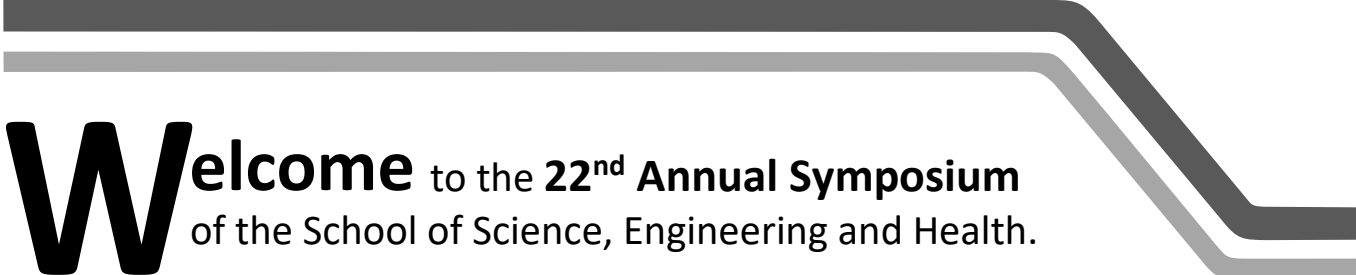
John Harms, Ph.D., Department of Biological Sciences, for management of Symposium communication, layout and scheduling of the Symposium, and program design.

Timothy Van Dyke, Ph.D., Department of Engineering, for coordination of Engineering submissions, and development and maintenance of the web-based Symposium site.

Scott Weaver, D.P.S., for development of the Symposium Project Registration and Management system (SymPRM) used to collect and organize submissions to the Symposium.



Visit https://huggs.messiah.edu/seh_symposium
to view abstracts accompanying each presentation

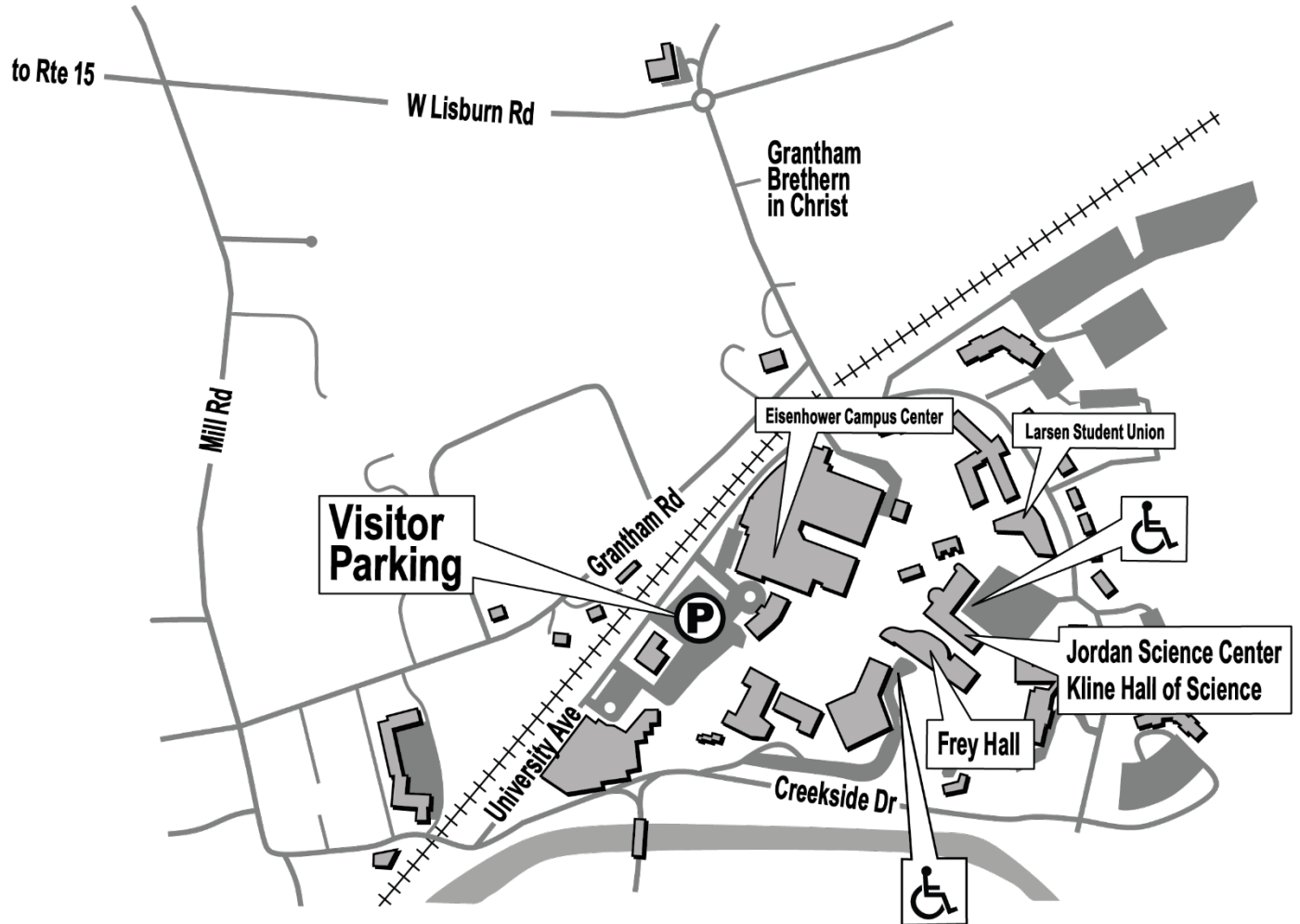


Welcome to the 22nd Annual Symposium of the School of Science, Engineering and Health.

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Messiah University



Welcome to Messiah University!

Visitor Parking: Parking is provided in the main Visitor Parking lot (VV) accessed from University Avenue, between Old Main and the Eisenhower Campus Center. Parking tags are not required during the Symposium. While designated handicapped parking is distributed throughout campus, spots closest to Symposium venues are available in the employee parking lots behind the Jordan Science Center (WW) and in the circle at the heart of campus (YY).

Dining facilities: The Lottie Nelson Dining Hall (upper level) and The Falcon (lower level; soup, paninis, salads) are located in the Eisenhower Campus Center. The Union Café (pizza, grill, wraps, salads) is located in the Larsen Student Union.

Using this Booklet

This **Program and Abstract booklet** provides times, locations and titles for all presentations in the Symposium. A consolidated “**Schedule at a Glance**” (page 4) summarizes the schedule of all Oral Presentations and Poster Presentations.

Presentation Number: Each presentation has been assigned a unique Presentation Number. This number is used throughout the booklet to facilitate cross-referencing.

Authorship: All contributing co-authors and mentors are listed in this program. The name of each **presenting author** is in **bold font**. An **Index of Authors** at the end of the booklet (page 25) lists the names of all authors alphabetically with the number(s) of each presentation on which each is included.

Program & Symbols: Presentations are organized in discipline-specific sessions. Throughout the program and “**Schedule at a Glance**,” unique icons (see box at right) indicate the discipline of each presentation.

Abstracts: Abstracts for each oral and poster presentation in the Symposium are provided on our accompanying website:











https://huggs.messiah.edu/seh_symposium

Acknowledgments: All faculty mentors, external mentors and collaborators, and nursing professionals are recognized. Sources of financial and material support are also listed (page 20) with corresponding presentation numbers.





Authorship Legend:

- bold** Presenting author
- + Research or project mentor
- ‡ Off-campus contributor

Discipline Categories:

-  Biopsychology
-  Cellular & Molecular Biology
-  Chemistry & Biochemistry
-  Computer & Information Science
-  Engineering
-  Exercise Science
-  Mathematics
-  Nursing
-  Organismal & Ecological Biology
-  Physics

Additional Symbols:

-  This oral presentation is accompanied by a poster
-  This poster is accompanied by an Oral Presentation
-  This project was supported by the Steinbrecher Undergraduate Summer Research Program
-  This project was supported by the Collaboratory for Strategic Partnerships and Applied Research

SCHEDULE AT A GLANCE



Engineering I

Alexander Auditorium
Frey 110

- 12:30** Collaboratory
Lightning Showcase
- 1:00** 1 Meals, Parks
- 1:20** 2 Nitschke-Love,
Cottrell
- 1:40** 3 Ferrin, Hilton
- 2:00** 4 McIntire, Steele
- 2:20** 5 Geiger, Hicks
- 2:40** 6 Wong, Bingaman,
Leitzel

Engineering II

Frey 150

- 7 Pettitt, Alunni, Javier
- 8 Chan, LaRoche
- 9 Collyer, Frederick,
Johnston
- 10 Levan, Van Der Ploog
- 11 Pryor, Henry, McAtee
- 12 Petrovich, Brackman,
Slayton

Mathematics & Physics

Frey 145

- 13 Gillis
- 14 Gagliardo
- 15 Bolin, Kelly
- 16 Lyter
- 17 Lippert



Poster Session
3:00-4:00

Engineering — Hollinger Atrium & Hollinger Lounge

- | | | |
|--|---|-----------------------------|
| 40 Bell, Dykes, Heller | 46 Gilbert, Lutz, Mazak | 52 Armstrong, Gillette |
| 41 Coakley, Davis, Kovalcik,
Walls, Yost | 47 Kagarise, Moyo | 53 Behrens, Crawford, Hege |
| 42 Yoho, Blagbrough | 48 Crane, Lamberton, Zook | 54 Cruzan, Doan, Ekstrom |
| 43 Rice, Myers, Redcay | 49 Schied, Schrim | 55 Fan, Penchansky, Rivera |
| 44 Baxter, Pinto | 50 Bahr, DeArville, Gaigler,
Kreider, Martin, Quinn | 56 King, Shatney, Walker |
| 45 Hoskins, Sakore | 51 Haney, Renner | 57 Jo, Rivas |

Evidence-Based Nursing Care — Hollinger Lounge

- | | | |
|---|---|---|
| 58 Anderson, Buffington,
Corbitt, Cottrill, Garvey,
Gillisse, Hocker, Stoner | 60 Burch, Saunders, Tlumach,
Sudlow, Beers, Yang, Russell | 62 Mellinger, Eberly, Wagner,
Weaver, Hershey, Martin,
Leo |
| 59 Rodriguez, Barlett,
Chebeleu, Garbanzos,
Graybill, Miele, Stolyarov | 61 Nicols, Kell, Medidor, Byrd,
Shenk, Keister, Gerbes | |



Engineering III

Alexander Auditorium
Frey 110

- 4:00** 72 Haney, Friedmann,
Griffith, Lau
- 4:30** 73 Derstine, Martin,
Willoughby
- 4:50** 74 Regula, Bucher,
Cronauer, Sobek

Engineering IV

Frey 150

- 75 Foester, Jean, Kekic,
Wages
- 76 Rouland, Fasnacht
- 77 Kramer, Frazho, Kratz,
Pizzuti, Siegrist

Computing

Frey 145

- 4:00** 78 Wiegel, Miller, Gohn
- 4:20** 79 Rice, Sun, Van Dyke,
Merlo
- 4:40** 80 Barrall, Hamm,
Keeports



Organismal Biology

Genetics & Exercise

Chemistry & Biochemistry I

Cell & Molecular Biology I

Kline 120

Kline 113

Jordan 159

Jordan 161

- 1:00 18 Bartley
- 1:20 19 Stults
- 1:40 20 Kumi
- 2:00 21 Perera
- 2:20 22 Teisen
- 2:40

- 23 Gordon
- 24 Kittlitz, Pagano
- 25 Heckman
- 26 Chong, Miller
- 27 Keator, Ong

- 28 Hutchinson
- 29 Heisey
- 30 Alunni
- 31 Webb
- 32 Hosler
- 33 Estes

- 34 Zerebilov
- 35 Ambrosino
- 36 Kersten
- 37 Azar
- 38 Undieh
- 39 Fitz



Poster Session
3:00-4:00

Natural Sciences — Oakes Museum & Jordan Science Center

- 15 Bolin, Kelly
- 18 Bartley
- 22 Teisen
- 25 Heckman
- 29 Heisey
- 32 Hosler
- 35 Ambrosino
- 36 Kersten

- 38 Undieh
- 39 Fitz
- 63 Grant
- 64 Stults
- 65 Call
- 66 Gray-Baublitz
- 67 Blakeslee, Rodriguez
- 68 Riddell, Rosario

- 69 Schad, Cook
- 70 Silvis
- 71 Boudman
- 81 Weldon
- 82 Franchina
- 83 Kuehner
- 85 Barnes
- 86 Wendling

SCHEDULE AT A GLANCE



Cell & Molecular Biology II

Chemistry & Biochemistry II

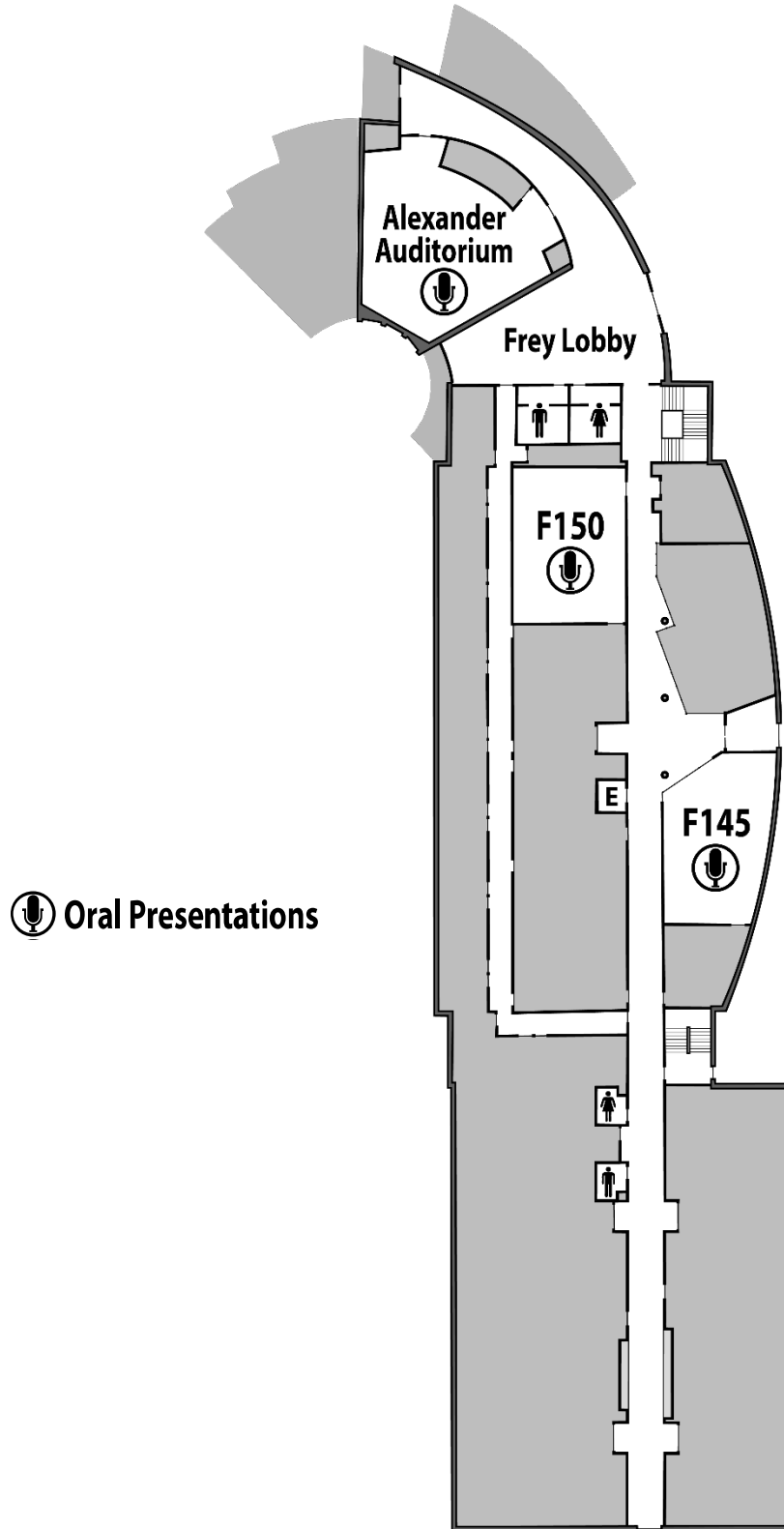
Kline 120

Jordan 159

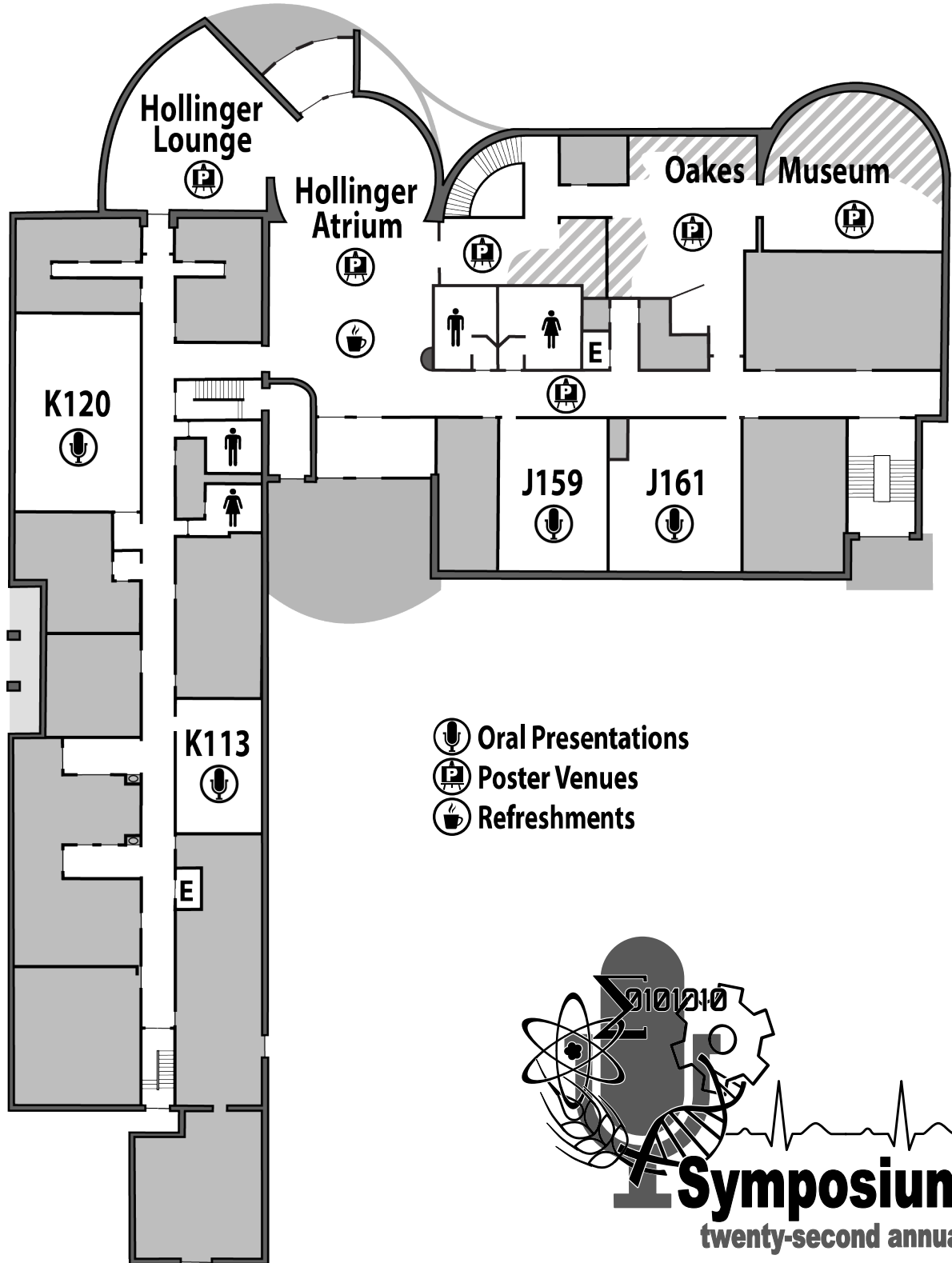
- 4:00 81 Weldon
- 4:20 82 Franchina
- 4:40 83 Kuehner

- 84 Humpert
- 85 Barnes
- 86 Wendling

Frey Hall



Jordan Science Center - Kline Hall of Science



Oral Presentations (Early Afternoon)



















Collaboratory Lightning Showcase

Alexander Auditorium (Frey 110); 12:30 – 1:00

“18 Innovations in 18 Minutes.”

Engineering I


















Alexander Auditorium (Frey 110); 1:00 – 3:00

- | | | | |
|---|------|--|---|
| 1 | 1:00 |  <i>Building Community: Providing and Ensuring Clean Water for Cuban Churches</i>
Regan Meals, Brayden Parks , Candace Bell, Tali Bunch, Micah Cotton, Sam Dykes, Caiden Heller, Lee Knoll, Cole Myers, Derek Weber, Ray Knepper ⁺⁺ , Michelle Lockwood ⁺ |  
40 |
| 2 | 1:20 |  <i>From Classroom To Sand: A Locally Manufacturable Wheelchair For Sikalongo, Zambia</i>
PJ Nitschke-Love, Samuel Cottrell , Gabe Coakley, Jed Davis, Nathan Kovalcik, Emma Walls, Noah Yost, Timothy Van Dyke ⁺ |  
41 |
| 3 | 1:40 |  <i>Vocational School Land Development in Kenya</i>
Anna Ferrin, Caleb Hilton , Alexa Blagbrough, Elizabeth Yoho, J Scott Heisey ⁺ , Michelle Lockwood ⁺ , Steve Lockwood ⁺⁺ |  
42 |
| 4 | 2:00 |  <i>Engineering Hope: A Bridge to Opportunity</i>
Zachary McIntire, John Steele , Levi Beamer, Luke Grannas, Cole Myers, Mason Preston, Luke Redcay, Emma Rice, Benjamin Wenger, Lillian Wertz, Steven Marquiss ⁺ , Brian Swartz ⁺ |  
43 |
| 5 | 2:20 |  <i>Accessible Fluency: Developing an Affordable Digital Auditory Masking Device</i>
Noah Geiger, John Hicks , Sean Baxter, Benjamin Pinto, Harold Underwood ⁺ |  
44 |
| 6 | 2:40 |  <i>An Eye-Triggered Alarm for Late-Stage ALS Patients</i>
Steven Carpenter, Collin Binford , David Vader ⁺ |  
45 |



Engineering II





Frey 150; 1:00 – 3:00

- | | | | |
|----|------|--|---|
| 7 | 1:00 |  <i>A Modular Stance Control Orthosis for Gait Rehabilitation</i>
Laurel Pettitt, David Alunni, Emily Javier , Sarah Gilbert, Kaitlyn Lutz, Alyssa Mazak, Ryan Farris [†] |  
46 |
| 8 | 1:20 |  <i>Embedded Circuit Development for Functional Electrical Stimulation</i>
Adriel Chan, Jacob LaRoche , Ruth LeuamChampassak, June Miller, Noah Richert, Nathaniel Zarate, Ryan Farris [†] |  |
| 9 | 1:40 |  <i>Developing molecular methods to detect genes conferring bacterial antibiotic resistance</i>
Michael Collyer, Laura Frederick, Reese Johnston , Addie Kagarise, Ester Moyo, Lawrence Mylin [†] |  
47 |
| 10 | 2:00 |  <i>Durability and Longevity: A Comparative Analysis of the Cunningham and Steenbeek Clubfoot Braces</i>
Hailey Levan, Trent Van Der Ploog , Chaelee Crane, Gavin Kinch, Josiah Lambertson, Morwamotshe Maserumule, Jack Mohr, Levi Zook, Camilo Giraldo [†] |  
48 |
| 11 | 2:20 |  <i>Design and Testing of Handpump Technology for Reliable Water Access</i>
Aidan Pryor, Gabe Henry, Connor McAtee , Kayra DeVries, Rory Iwaneczko, Evan Sarkett, Ryan Schied, Collin Schrim, Tim Burdett [†] |  
49 |
| 12 | 2:40 |  <i>Prototyping and Analysis of a Locally Manufacturable Standing Wheelchair for Nepal</i>
Jacob Petrovich, Trey Brackman, Ryder Slayton , Ryan Bahr, Maximus DeArville, Leah Gaigler, Caleb Kreider, Brody Martin, Will Quinn, Timothy Van Dyke [†] |  
50 |



Mathematics & Physics










Frey 145; 1:00 – 3:00

- | | | | |
|----|------|---|---|
| 13 | 1:00 |  <i>Dimensionality Reduction: Principle Component Analysis Methodology and Application</i>
Dathan Gillis | |
| 14 | 1:20 |  <i>Using Fibonacci Retracement Levels and Stochastics for Technical Analysis</i>
Justin Gagliardo | |
| 15 | 1:40 |  <i>Searching for Dark Matter with Snipe Hunt Experiment</i>
Ethan Bolin, Franklin Kelly , Abaz Kryemadhi [†] |  |

- 16 2:00 Σ *Mersenne Primes*
Luke Lyter
- 17 2:20 Σ *Alpha Beta Patterns on the First Diagonal in Staircase Tableaux*
Grace Lippert







Organismal Biology

Kline 120; 1:00 – 2:40

- 18 1:00  *Legacy of Charcoal Hearths: Impact on Oak Forest Composition and Succession in Pennsylvania* 
Gracie Bartley, David Foster[†]
- 19 1:20  *Agronomic Evaluation and Oil Analysis of Flax Varieties (*Linum usitatissimum* L.) in South-Central Pennsylvania* 
Isabelle Stults, Roseann Sachs[†], Janet Barroga Matanguihan[†]
- 20 1:40  *Aquaponic Solutions for Cassava (*Manihot esculenta*) Growth*
Kwesi Kumi, David Foster[†]
- 21 2:00  *Anthropogenic Influence on the Health of First-Order Limestone Streams* 
Asia Perera, Jeff Erikson[†]
- 22 2:20  *Documenting Fishers (*Pekania pennanti*) in Northern York County, Pennsylvania* 
Rachel Teisen, David Foster[†]

Genetics & Exercise

Kline 113; 1:00 – 2:40

- 23 1:00  *Exploring the Genotypes that Affect the Ergogenicity of Caffeine in Athletes*
Jarrett Gordon, Owen Walker, H. Scott Kieffer[†], Michael Shin[†]
- 24 1:20  *Reframing Success: Holistic Approach*
Kayla Kittlitz, Kayla Pagano, Kris Hansen-Kieffer[†], Nate Nester
- 25 1:40  *Impact of Caffeine on Anaerobic Capacity and the Influence of Genes linked to Caffeine Signaling and Processing* 
Bella Heckman, H. Scott Kieffer[†], Michael Shin[†]
- 26 2:00  *Inclusive Exercise Programming Platform for Diverse Populations*
Leanne Chong, Shae Miller, Nate Nester, Kris Hansen-Kieffer
- 27 2:20  *Individualizing Group Exercise*
Harrison Keator, Elizabeth Ong, Kris Hansen-Kieffer, Nate Nester

Chemistry & Biochemistry I

Jordan 159; 1:00 – 3:00

- 28 1:00  *Effects of Ultrasonication on Honey Quality*
Alexander Hutchinson, Richard Schaeffer[†]
- 29 1:20  *Synthesis of Hydroxy-substituted Stilbene Analogs for Inhibition of PTP1B*  
Brendan Heisey, Anne Reeve[†]
- 30 1:40  *Preparation of Apocytochrome c as a Substrate for Nonferrous Heme Attachment*
Mary Alunni, Jesse Kleingardner[†]
- 31 2:00  *Synthesis and Characterization of Transition Metal Hydroxy Carbonates*
Jared Webb, Richard Schaeffer[†]
- 32 2:20  *Synthesis of Substituted Stilbenes as Potential PTP1B Inhibitors*  
Maggie Hosler, Anne Reeve[†]
- 33 2:40  *The Effect of Mutations in Holocytochrome c Synthase on Non-ferrous Heme Attachment in *E. coli* Cells*
Jenna Estes, Jesse Kleingardner[†]

Cell & Molecular Biology I




























Jordan 161; 1:00 – 3:00



















- 34 1:00  *Comparison of Ethanol and Acetaldehyde Exposure on Developing Zebrafish*
Rozalia Zerebilov, Jennifer Ness-Myers[†]
- 35 1:20  *Quantifying Primary Tumor Fibrosis in a Metastatic Model of Murine Pancreatic Cancer* 
Marian Ambrosino, John Harms[†]
- 36 1:40  *Characterization of a Chemical Hypoxia Model in Developing Zebrafish* 
Elise Kersten, Jennifer Ness-Myers[†]
- 37 2:00  *Inhibiting Pancreatic Tumor Fibrosis: Proglumide Upregulates Several Collagen Degradation Enzymes*
Michael Azar, John Harms[†]
- 38 2:20  *Nickel Response of irt1 Mutants in *Arabidopsis thaliana** 
Akon Undieh, Michael Shin[†]
- 39 2:40  *Determining the Efficacy of Anti-fibrotic Treatment in Advanced Pancreatic Cancer Using Whole-slide Imaging* 
Faith Fitz, John Harms[†]

Poster Presentations

Engineering

Hollinger Atrium & Hollinger Lounge; 3:00 – 4:00



- | | | | |
|----|---|--|--|
| 40 |  | <i>Building Community: Providing and Ensuring Clean Water for Cuban Churches</i>
Candace Bell, Sam Dykes, Caiden Heller , Tali Bunch, Micah Cotton, Lee Knoll, Regan Meals, Cole Myers, Brayden Parks, Derek Weber, Ray Knepper ⁺⁺ , Michelle Lockwood ⁺ | 

1 |
| 41 |  | <i>Designing a Locally Manufacturable, All-terrain Wheelchair for Zambian Students</i>
Gabe Coakley, Jed Davis, Nathan Kovalcik, Emma Walls, Noah Yost , Samuel Cottrell, PJ Nitschke-Love, Timothy Van Dyke ⁺ | 

2 |
| 42 |  | <i>Vocational School Land Development in Kenya</i>
Elizabeth Yoho, Alexa Blagbrough , Anna Ferrin, Caleb Hilton, J Scott Heisey ⁺ , Michelle Lockwood ⁺ , Steve Lockwood ⁺ | 

3 |
| 43 |  | <i>Engineering Hope: A Bridge to Opportunity</i>
Emma Rice, Cole Myers, Luke Redcay , Levi Beamer, Luke Grannas, Zachary McIntire, Mason Preston, John Steele, Benjamin Wenger, Lillian Wertz, Steven Marquiss ⁺ , Brian Swartz ⁺ | 

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| 44 |  | <i>Accessible Fluency: Developing an Affordable Digital Auditory Masking Device</i>
Sean Baxter, Benjamin Pinto , Noah Geiger, John Hicks, Harold Underwood ⁺ | 

5 |
| 45 |  | <i>An Eye-Triggered Alarm for Late-Stage ALS Patients</i>
Alexander Hoskins, Jasmine Sakore , Joshua Bingaman, Carolina Hatch, Stefan Leitzel, Jacob Wong, Philip Graybill ⁺ | 

6 |
| 46 |  | <i>A Modular Stance Control Orthosis for Gait Rehabilitation</i>
Sarah Gilbert, Kaitlyn Lutz, Alyssa Mazak , David Alunni, Emily Javier, Laurel Pettitt, Ryan Farris ⁺ | 

7 |
| 47 |  | <i>Developing molecular methods to detect genes conferring bacterial antibiotic resistance</i>
Addie Kagarise, Ester Moyo , Michael Collyer, Laura Frederick, Reese Johnston, Lawrence Mylin ⁺ | 

9 |
| 48 |  | <i>Performance and Lifespan: Comparing the Cunningham and Steenbeek Clubfoot Braces</i>
Chaelee Crane, Josiah Lamberton, Levi Zook , Gavin Kinch, Hailey Levan, Morwamotshe Maserumule, Jack Mohr, Trent Van Der Ploog, Camilo Giraldo ⁺ | 

10 |




- 49  *Design and Testing of Handpump Technology for Reliable Water Access*  11
Ryan Schied, Collin Schrim, Kayra DeVries, Gabe Henry, Rory Iwaneczko, Connor McAtee, Aidan Pryor, Evan Sarkett, Tim Burdett[†]
- 50  *Prototyping a Locally Manufacturable Standing Wheelchair for Nepal*  12
Ryan Bahr, Maximus DeArville, Leah Gaigler, Caleb Kreider, Brody Martin, Will Quinn, Trey Brackman, Jacob Petrovich, Ryder Slayton, Timothy Van Dyke[†]
- 51  *An Assistive Technology for Pressing a Piano Sustain Pedal*  72
Sawyer Haney, Caitlin Renner, Kenneth Friedmann, Kierra Griffith, Sean Lau, Philip Graybill[†], Dereck Plante[†]
- 52  *Solar Photovoltaic Design for Hope Academy in Guatemala*  73
Gibson Armstrong, Dean Gillette, Autumn Derstine, Jady Martin, Cooper Willoughby, Dereck Plante[†], Harold Underwood[†]
- 53  *Development of a Reliable, Low-Cost Wind Turbine Monitoring System*  74
Jonathan Behrens, Eliza Crawford, Noah Hege, Justin Bucher, Phillip Cronauer, Ethan Jo, Ethan Regula, Carlos Rivas, Sage Sobek, Tim Burdett[†]
- 54  *Modular Mobility: Serving New and Ongoing Clients*  75
Jacob Cruzan, Caleb Doan, John Ekstrom, Eli Foester, Daniel Jean, Turner Kekic, Colin Wages, John Meyer[†], David Vader[†]
- 55  *New Wastewater System Design for a Girls' Home in Kenya*  76
Joseph Fan, Walker Penchansky, Christopher Rivera, Amy Fasnacht, Gus Rouland, Thomas Soerens[†]
- 56  *Empowering Zambian Farmers: A Locally Produced Manual Seeder*  77
Daniel King, Tim Shatney, Ryan Walker, Chloe Crane, Joshua Frazho, Max Kramer, Dylan Kratz, Simon Kyllonen, Caleb Naylor, Dominic Pizzuti, Jonathan Seeburger, Matthew Siegrist, Camilo Giraldo[†]
- 57  *Improving Battery Longevity for Off-Grid Wind Power Systems* 
Ethan Jo, Carlos Rivas, Tim Burdett[†]



Evidence-Based Nursing Care

Hollinger Lounge; 3:00 – 4:00






- 58  *The Use of Mobile Applications to Manage PTSD Symptoms in Veterans*
Kelly Anderson, Rebecca Buffington, Christine Corbitt, Sam Cottrill, Grace Garvey, Regan Gillisse, Katrina Hocker, Abby Stoner, Brenda Elliott[†]
- 59  *Help! Trauma-Informed Care and De-Escalation Training for Emergency Department Nurses*
Isa Rodriguez, Chloe Barlett, Sofia Chebeleu, Monique Garbanzos, Emma Graybill, Elizabeth Miele, Evelina Stolyarov, Bella Ouellette, Rebekkah Stanko[†]

- 60  *Effect of Cognitive Behavioral Intervention for Trauma in Schools (CBITS) on Trauma-Related Child and Adolescent Wellbeing*
Kiersten Burch, Kailey Saunders, Benjamin Tlumach, Maria Sudlow, Allison Beers, Rou-Hua Yang, Kayla Russell, Wanda Thuma-McDermond[†]
- 61  *Skin-to-Skin Effect on Mother Satisfaction Post-Cesarean Section*
Jami Nicols, Ravyn Kell, Gaelle Medidor, Aamirah Byrd, Emma Shenk, Alanna Keister, Macy Gerbes, Nancy Frank[†]
- 62  *Impact of Post-Critical Incident Stress Debriefing on Pediatric Healthcare Providers*
Olivia Mellinger, Alyssa Eberly, Ali Wagner, Lexi Weaver, Grace Hershey, Julia Martin, Julia Leo, Kaci Wood[†]









Natural Sciences

Oakes Museum & Jordan Science Center; 3:00 – 4:00

- 15  *Searching for Dark Matter with Snipe Hunt Experiment* 
Ethan Bolin, Franklin Kelly, Abaz Kryemadhi[†]
- 18  *Legacy of Charcoal Hearths: Impact on Oak Forest Composition and Succession in Pennsylvania* 
Gracie Bartley, David Foster[†]
- 22  *Documenting Fishers (*Pekania pennanti*) in Northern York County, Pennsylvania* 
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- 25  *Impact of Caffeine on Anaerobic Capacity and the Influence of Genes Linked to Caffeine Signaling and Processing* 
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- 29  *Synthesis of Hydroxy-substituted Stilbene Analogs for Inhibition of PTP1B* 
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- 32  *Synthesis of Substituted Stilbenes as Potential PTP1B Inhibitors* 
Maggie Hosler, Anne Reeve[†]
- 35  *Quantifying Primary Tumor Fibrosis in a Metastatic Model of Murine Pancreatic Cancer* 
Marian Ambrosino, John Harms[†]
- 36  *Characterization of a Chemical Hypoxia Model in Developing Zebrafish* 
Elise Kersten, Jennifer Ness-Myers[†]
- 38  *Nickel Response of *irt1* Mutants in *Arabidopsis thaliana** 
Akon Undieh, Michael Shin[†]










- 39  *Determining the Efficacy of Anti-fibrotic Treatment in Advanced Pancreatic Cancer Using Whole-slide Imaging* 
Faith Fitz, John Harms[†]
- 63  *Screening of Flax Varieties for Genes Associated with Seed Oil Production*
Jillian Grant, Janet Barroga Matanguihan[†]
- 64  *Fatty Acid Analysis of Flaxseed Oil from Flax Grown in South-Central Pennsylvania* 
Isabelle Stults, Janet Barroga Matanguihan[†], Roseann Sachs[†]
- 65  *Synthesis and Characterization of Mineral-Related Metal Mixed-Anion Phases* 
Olivia Call, Richard Schaeffer[†]
- 66  *The Influence Val66Met Polymorphism on Serum BDNF Following Moderate Exercise in an Adult Population*
Sophia Gray-Baublitz, Liliana Greer, Sarah Rathert, Anna Koenig, Ben Van Deusen, Jennifer Thomson[†], Michael Shin[†], H. Scott Kieffer[†]
- 67  *Cupping vs. Dry Needling in Treating Myofascial Pain Syndrome in Athletes: A Critically Appraised Topic*
Helen Blakeslee, **Mina Rodriguez**, Matthew Lewis[†]
- 68  *The Effect of Exercise on Endometriosis Related Pain: A Critically Appraised Topic*
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- 82  *Determining the Effect of a Gastrin/CCK Antagonist on Post-Translational Processing of Collagen in Pancreatic Cancer* 
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- 83  *Establishing a Model System to Study Inflammatory Signaling in Human Macrophages* 
Laura Kuehner, Isis Rivera-Walsh[†]

- 85  *Optimizing Fluorescence and Ultraviolet Assays to Test the Effectiveness of Stilbenes as PTP1B Inhibitors*  
Abigail Barnes, Anne Reeve[†], Jesse Kleingardner[†]
- 86  *Controlling the Kinetics of Silver Nanoparticle Growth on Graphene Oxide*  
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Computing







Frey 145; 4:00 – 5:00

- 78 4:00  *FlightMU - College Friend Finder*
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- 79 4:20  *SHARC: Student Happenings And Recommendations for Clubs*
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- 80 4:40  *Falcon RecZone*
Noah Barrall, Jacob Hamm, Michael Keepports



Cell & Molecular Biology II








Kline 120; 4:00 – 5:00

- 81 4:00  *Investigating the Role of Microglial Activation in Zebrafish Multiple Sclerosis Model* 
Anna Weldon, Jennifer Ness-Myers[†]
- 82 4:20  *Determining the Effect of a Gastrin/CCK Antagonist on Post-Translational Processing of Collagen in Pancreatic Cancer* 
Abigail Franchina, Courtney Williams, John Harms[†]
- 83 4:40  *Establishing a Model System to Study Inflammatory Signaling in Human Macrophages* 
Laura Kuehner, Isis Rivera-Walsh[†]



Chemistry & Biochemistry II

Jordan 159; 4:00 – 5:00

- 84 4:00  *In Vitro Analysis of Wild-Type and Mutant Yeast Holocytochrome c Synthase Capacities for Ligation of Nonferrous Hemes to Apocytochrome c*
Ben Humpert, Jesse Kleingardner[†]
- 85 4:20  *Optimizing Fluorescence and Ultraviolet Assays to Test the Effectiveness of Stilbenes as PTP1B Inhibitors*  
Abigail Barnes, Anne Reeve[†], Jesse Kleingardner[†]
- 86 4:40  *Controlling the Kinetics of Silver Nanoparticle Growth on Graphene Oxide*  
Shelby Wendling, Seth Burkert[†]



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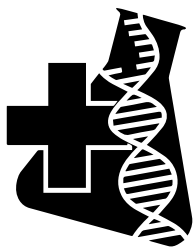
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Steinbrecher Undergraduate Summer Research Program

The **Steinbrecher Endowment for Research in the Health and Life Sciences** was established at Messiah University in 2003 by Dr. Leroy and Mrs. Eunice Steinbrecher to support collaborative experimental research between students and faculty. Dr. Steinbrecher (Class of 1955) was a physician and longtime supporter of Messiah University. Eunice (Class of 1958) has served on the Board of Trustees at Messiah University continuously since 1987 and as chairperson of the board for 10 years (2000–2010).

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Dr. Gerald D. Hess Research Fund for the Natural Sciences

The **Dr. Gerald D. Hess Research Fund for the Natural Sciences** supports undergraduate student research in the Biological Sciences, Chemistry & Biochemistry, and Physics at Messiah University. Established in 2019 to honor the legacy of Dr. Gerald D. Hess, Professor Emeritus of Biology, 100% of gifts to the Hess Fund directly fund research equipment, reagents, supplies, and conference travel for undergraduates.

A graduate of Messiah University, Dr. Hess received his Ph.D. in Animal Physiology from Michigan State University in 1970. Returning to Messiah, he taught courses in Physiology, Cell Biology, Electron Microscopy, and Natural Sciences Capstone for nearly forty years, served as department chair, and retired in 2009 as Interim Dean of the School of Health and Natural Sciences. Throughout his distinguished career, Dr. Hess strove to build a strong program for undergraduate research in biology and in chemistry. His work opened the door to others, an enduring legacy evidenced by this Symposium.



Financial and Material Support

We gratefully acknowledge the following sources of funding and support.

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Dr. Ray Crist Scholarship	33
Daniel Vicario (G&G Technical)	51, 72
Dr. Gerald D. Hess Research Fund for the Natural Sciences	35, 39
Friends of the Murray Library Research Grant	37
Glenview Alliance Church in York County, PA	54, 75
James Redmond (G&G Technical)	51, 72
Kieffer Undergraduate Research Endowment	66
Len Puccio (Bostech Inc.)	51, 72
NSF through the Penn State Center for Nanoscale Science, Materials Research Science and Engineering Center [DMR-2011839]	86
Pennsylvania Academy of Science Undergraduate Research Grant	37, 39
SEPSACS Travel Grant	86
Steinbrecher Undergraduate Summer Research Program	19, 21, 29, 32, 64, 65, 85, 86
Eunice F. Steinbrecher	66

Collaboratory Educators, Collaborators & Partners

We gratefully acknowledge the oversight and training provided by Messiah University faculty and external collaborators.

Project Partners

AlignedWorks
ALS United Mid-Atlantic
Cunningham Prosthetic Care
CURE International
Design Outreach
Ed and Kathy Barlow
Forward Edge International
Glenview Alliance Church in York County, PA
Hope Walks
International Nepal Fellowship
Living Love Ministries
Macha Research Trust in Zambia
Mission Lazarus
MM Ortho Solutions
Physiofunction, U.K.
Rural Water Supply Network
Tree 4 Hope: Hope Academy
WindAid Institute, Peru

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Jason Gregg

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We graciously acknowledge the oversight and training provided by faculty from the following academic departments.

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