



**MINNESOTA  
ACADEMY  
OF SCIENCE**

# **44<sup>th</sup> Winchell Undergraduate Research Symposium**

*Celebrating Excellence in Undergraduate Research since 1981*

April 13, 2024

at

Saint Mary's University of Minnesota, Winona, MN



**Saint Mary's  
University**  
*of* MINNESOTA

## 2024 Winchell Symposium Planning Committee

Dr. Debra Martin (Chair)  
*Saint Mary's University of  
Minnesota*

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*Minnesota Academy of  
Science*

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Dr. Ben Pauli, *Saint Mary's  
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Dr. Robyn Wangberg, *Saint  
Mary's University of  
Minnesota*

### About the Winchell Undergraduate Research Symposium

The Winchell Symposium provides a forum for undergraduate students to present original STEM research, learn from professionals in fields they aspire to enter, and receive recognition for their accomplishments. Founded in 1981 by the Minnesota Academy of Science, the symposium includes a keynote lecture, student presentations, and breakout sessions. More than 125 students, research advisors, MAS members, faculty, and interested members of the community attend the symposium each year.

## Thank You to 2024 Winchell Symposium Sponsors

**American Chemical Society, Minnesota Section | American Heart Association | BBB (TriBeta) National Biological Honor Society | Bethel University, College of Arts and Sciences | Carleton College, Department of Chemistry | College of St. Benedict and St. John's University, Department of Chemistry | Concordia University - St. Paul, Science Department | Hamline University, Departments of Chemistry and Physics | Macalester College, Department of Physics & Astronomy | Michael H. Baker Family Foundation | Rochester Community and Technical College, Sciences and Health Professions | Saint Mary's University of Minnesota | University of Minnesota - Duluth, Department of Pharmacy Practice & Pharmaceutical Sciences | University of Minnesota-Twin Cities, College of Biological Sciences, Department of Psychology, and Department of Chemistry's Dwight C. Legler Memorial Fund**

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## Schedule of Events – April 13, 2024

**8:45-9:15 am Check-in at welcome tables and refreshments** (*Aquinas Hall main entrance*). **Posters may be set up in Aquinas Hall, first floor.**

**9:15-10:15 am Welcome and Keynote Address** (*Aquinas Hall room 200*)  
Dr. Debra Martin, Winchell Symposium Chair, Saint Mary's University of Minnesota

**“From Green Infrastructure to Traditional Ecological Knowledge: Observations on the Nationwide Grassroots Response to Climate Warming”**

Andy Robertson, RPFT, Executive Director, GeoSpatial Services, Saint Mary's University of Minnesota

**10:15-10:30 am Break**

**10:30-11:15 am Breakout Session 1** and **11:30 am-12:15 pm Breakout Session 2** (see panelist information on p. 6)

- **Panel of STEM Graduate & Professional Students** (*Aquinas Hall room 208*)
- **Panel of STEM Industry Professionals** (*Aquinas Hall room 200*)
- **Panel: Perspectives on AI for Faculty** (*Aquinas Hall room 210*)
- **Wildlife capture/animal handling** (*Ticketed event—attendees who chose this option were sent the details by email*)

**12:15-1:15 pm Box Lunch** (*Aquinas Hall, second floor lobby*)

Pick up your lunch, then find a comfortable spot and/or join an optional interest-group discussion:

- *GSS Climate Change discussion (Aquinas Hall room 310)*
- *AI discussion with panelists (Aquinas Hall room 210)*
- *Industry discussion with panelists (Aquinas Hall room 306)*
- *Grad/professional/med school discussion with panelists (Aquinas Hall room 208)*
- *Multidisciplinary undergraduate research approaches: environmental science from a psychology perspective (Aquinas Hall room 308)*

**1:15-1:30 pm Set up for Oral Presentations & put up Posters** (if needed)

**1:30-2:30 pm Oral Presentations (see presenters/titles on pp. 7-9)**

- Session A: Organismal/Physiological Science (*Aquinas Hall room 310*)
- Session B: Chemistry and Biochemistry (*Aquinas Hall room 308*)
- Session C: Cellular/Molecular Biology (*Aquinas Hall room 306*)
- Session D: Cellular/Molecular Biology (*Aquinas Hall room 210*)
- Session E: Cellular/Molecular Biology (*Aquinas Hall room 208*)

**2:40-3:20 pm Poster Session F (*Aquinas Hall, first floor*)**

- **Odd numbered posters (see presenters/titles on pp. 9-11)**

**3:20-4:00 pm Poster Session G (*Aquinas Hall, first floor*)**

- **Even numbered posters (see presenters/titles on pp. 12-14)**

**4:00-4:20 pm Poster Take-Down and Refreshments (*Aquinas Hall, second floor lobby*)**

**4:20-4:45 pm Closing Remarks and Awards (*Aquinas Hall room 200*)**

Keesha Mason, National Marrow Donor Program

Jennifer Hadley, Operations Director, Minnesota Academy of Science

Dr. Debra Martin, Winchell Symposium Chair, Saint Mary's University of Minnesota

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**Keynote Speaker**

**Andy Robertson, RPFT**

*Executive Director, GeoSpatial Services  
Saint Mary's University of Minnesota*



As a professional forester, geographer, and wetland ecologist, I have been involved in adaptive environmental management for almost 40 years. In my current position as Executive Director of GeoSpatial Services at Saint Mary's University, I lead projects nationwide that are focused on resource inventory, monitoring and decision support. Over the past twenty years this work has taken me from coast to coast and into the high Arctic where I have witnessed the impacts of a warming climate first hand. In this talk I will share some of my observations and the creativity that is being brought to bear on this critical issue by federal agencies, state governments, indigenous communities, nonprofits and stakeholders. Scientific inquiry is driving innovation and positive action all around us!

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## WIFI ACCESS

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## Special Thanks to our Judges

**Roda Aden PhD**, Minneapolis College  
**Eric Baack PhD**, Luther College  
**Jennifer Biederman PhD**,  
 Minnesota Trout Unlimited  
**Madalyn Bollig MS**, Saint Mary's  
 University of Minnesota  
**William Boyle PhD**, Anoka-Ramsey  
 Community College  
**Scott Carnahan PhD**, Saint Mary's  
 University of Minnesota  
**Heidi Dahlmann PhD**, Saint Mary's  
 University of Minnesota  
**Randy Faustino PhD**, University of  
 South Dakota  
**Rod Feddersen PhD**, retired scientist  
**Megan Girtman PhD**, Saint Mary's  
 University of Minnesota  
**Takashi Maie PhD**, St. Olaf College  
**Debra Martin PhD**, Saint Mary's  
 University of Minnesota  
**Betsy Martinez-Vaz PhD**, Hamline  
 University  
**Molly McNicoll PhD**, Luther College

**Ben Pauli PhD**, Saint Mary's  
 University of Minnesota  
**Katie Pierpont PhD**, Saint Mary's  
 University of Minnesota  
**Claudia Preston PhD**, Saint Mary's  
 University of Minnesota  
**Matt Rowley PhD**, Saint Mary's  
 University of Minnesota  
**John Schmidt PhD**, Medtronic  
**Heather Sklenicka PhD**, Rochester  
 Community and Technical College  
**Jennifer Sweatman PhD**, Concordia  
 College - Moorhead  
**Aeisha Thomas PhD**, Crown College  
**Elena Tonc PhD**, Macalester College  
**Jackie Towner PhD**, Bethel  
 University  
**Robyn Wangberg PhD**, Saint Mary's  
 University of Minnesota  
**Joe Whittaker PhD**, Concordia  
 College - Moorhead  
**Graeme Wyllie PhD**, Concordia  
 College - Moorhead

## **Breakout Session 1 (10:30 – 11:15 am) and Breakout Session 2 (11:30 am – 12:15 pm)**

### **Panel of STEM Graduate & Professional Students** (*Aquinas Hall room 208*)

Moderator: **Robyn Wangberg PhD**, Associate Professor of Physics, Saint Mary's University of Minnesota

Panelists: **Elise Amerongen**, Dentistry student, University of Iowa  
**Madalyn Bollig MS**, GIS Analyst, Saint Mary's University of Minnesota  
**Anna Carnahan PA-C**, Physician Assistant, Gundersen Health Dermatology  
**Larkin Clem**, Cancer Biology PhD program, University of Wisconsin  
**Gloria Kitange**, Medical School student, University of Minnesota - Twin Cities  
**Ben Preusser PhD**, Scientist, Los Alamos National Lab

### **Panel of STEM Industry Professionals** (*Aquinas Hall room 200*)

Moderator: **Debra Martin PhD**, Professor of Biology, Saint Mary's University of Minnesota

Panelists: **Matt Bilski, MSMOT**, Lead Chemist, Food & Beverage North America, Ecolab  
**Caitlin Preusser BA**, Research Technologist, Mayo Clinic  
**Tom Walker MS** Geographic Information Systems, Facilities Management Systems Coordinator, Mayo Clinic  
**Nicholas Wojtynek PhD**, Associate Director, Medical Affairs, Verastem Oncology

### **Panel: Perspectives on AI for Faculty** (*Aquinas Hall room 210*)

Moderator: **Scott Carnahan PhD**, Assistant Professor of Chemistry, Saint Mary's University of Minnesota

Panelists: **Chris Adamson PhD**, Director of Faculty Development, Center for Excellence in Learning and Teaching, Saint Mary's University of Minnesota  
**Ken Graetz PhD**, Director of Teaching, Learning & Technology Services, Interim Associate Vice President for Academic Affairs and Interim Dean of the Library, Winona State University  
**Emily F. Ruff PhD**, Associate Professor of Biochemistry, Winona State University

**Wildlife capture/animal handling** (*Ticketed event—registered attendees were sent the details by email*)

# Oral Presentation Sessions (1:30-2:30 pm)

*[Student presenters are shown in **bold**.]*

## **Oral Presentation Session A: Organismal/Physiological Science** (Aquinas Hall room 310)

### **A.1 TOWARDS PHYSIOLOGICALLY RELEVANT VASCULARIZATION TESTING: INNOVATIVE HEK293 CELL IMPLANTATION ON THE CHORIOALLANTOIC MEMBRANE**

**Makenna Berger**, Carson Krefft, Ryan Lee, Rachel Novak, and Mong-Lin Yang (Advisor)

*Department of Science, Concordia University - St. Paul, St. Paul, MN*

### **A.2 DETERMINING THE IMPACT OF EXERCISE ON WOMEN'S BRAIN FOG** **Natalie A. Mathews** and Aaron Aslakson (Advisor)

*Department of Biological & Health Sciences, Crown College, St. Bonifacius, MN*

### **A.3 ATRAZINE AND THE CIRCADIAN RHYTHM HAVE NO EFFECT ON INSULIN LEVELS IN MICE**

**Hanna C. Widdes** and Debra Martin (Advisor)

*Department of Biology, St. Mary's University of Minnesota, Winona, MN*

### **A.4 SOUTHEASTERN MINNESOTA BAT RESPONSE TO AQUATIC INSECT EMERGENCES**

**Zachary T. Ryan** and Benjamin Pauli (Advisor)

*Department of Biology, St. Mary's University of Minnesota, Winona, MN*

## **Oral Presentation Session B: Chemistry and Biochemistry** (Aquinas Hall room 308)

### **B.1 OPTIMIZING LAB FOR BEST LAB PROCEDURE AND RESULTS FOR A LIBERAL ARTS SCIENCE COURSE**

**Sophie A. Hastings, Ikran I. Adan**, and Heather Sklenicka (Advisor)

*Department of Chemistry, Rochester Community & Technical College, Rochester, MN*

### **B.2 SYNTHESIS OF PHOSPHORAMIDE AS AN ORGANOCATALYST FOR THE CARBONYL-OLEFIN METATHESIS REACTION**

**Alyssa K. Jones** and Heidi A. Dahlmann (Advisor)

*Department of Chemistry, St. Mary's University of Minnesota, Winona, MN*

### **B.3 THE INFLUENCE OF MEDIA COMPOSITION ON PLASMID COPY NUMBER AND FOLD INDUCTION IN *Escherichia coli* DH5a**

**Catherine Sothy** and Thomas C. Marsh (Advisor)

*Department of Chemistry, University of St. Thomas, St. Paul, MN*

**Oral Presentation Sessions (1:30-2:30 pm)** (continued)

**B.4 IDENTIFICATION AND CHARACTERIZATION OF NOVEL SECONDARY METABOLITES FROM WASTEWATER BACTERIA USING COMPARATIVE GENOMICS**

**Alena C. Wadzinske**, Justin J. Donato (Advisor), and Cassandra McCorison (Advisor)  
*Department of Biology, University of St. Thomas, St. Paul, MN*

**Oral Presentation Session C: Cellular/Molecular Biology** (Aquinas Hall room 306)

**C.1 ANALYSIS OF sGLT-1 EXPRESSION IN DUODENUM TISSUES IN MICE EXPOSED CHRONICALLY TO ATRAZINE**

**Samuel J. Frick**, Michelle Doering, and Debra Martin (Advisor)  
*Department of Biology, St. Mary's University of Minnesota, Winona, MN*

**C.2 REPEAT METHYLISOTHIAZOLINONE EXPOSURE ALTERS THE INFLAMMATORY POTENTIAL OF MURINE SKIN FIBROBLASTS**

**Oliver G. Lagasse** and Elena Tonc (Advisor)  
*Department of Biology, Macalester College, St. Paul, MN*

**C.3 TBX2 SENSITIZATION EFFECTS OF ZR 75.1 CELLS IN RESPONSE TO CISPLATIN**

**Ella L. Wagner** and Matthew A. Rowley (Advisor)  
*Department of Biology, St. Mary's University of Minnesota, Winona, MN*

**Oral Presentation Session D: Cellular/Molecular Biology**  
(Aquinas Hall room 210)

**D.1 METHYLISOTHIAZOLINONE INDUCES CELL DEATH IN PRIMARY AND IMMORTALIZED MAST CELLS**

**Jo-Hsuan Chen**, Ahlaam A. Abdulwali, Eunice Y. Lim, and Elena Tonc (Advisor)  
*Department of Biology, Macalester College, St. Paul, MN*

**D.2 OVEREXPRESSION OF TBX2 INDUCES INVASION OF MCF10A MAMMARY EPITHELIAL CELLS INDEPENDENTLY OF EPIREGULIN**

**Katherine M. Perkins** and Matthew A. Rowley (Advisor)  
*Department of Biology, St. Mary's University of Minnesota, Winona, MN*

**D.3 ASSESSMENT OF GENE EXPRESSION PROFILING AND FUNCTIONAL PRIORITIZATION OF NUCLEAR ENVELOPE GENES IN ALZHEIMER'S DISEASE**

**Emma S. Schuster** and Claudia C. Preston (Advisor)  
*Department of Biology, St. Mary's University of Minnesota, Winona, MN*



**Oral Presentation Sessions (1:30-2:30 pm)** (continued)

**Oral Presentation Session E: Cellular/Molecular Biology** (Aquinas Hall room 208)

**E.1 GENE EXPRESSION PROFILING OF EPIGENETIC REGULATED GENES IN FEMALE MONOZYGOTIC TWINS WITH DISCORDANT DIAGNOSIS OF BREAST CANCER**

**Haley M. Wangen** and Claudia C. Preston (Advisor)

*Department of Biology, St. Mary's University of Minnesota, Winona, MN*

**E.2 INHIBITION OF COLIPHAGE T4rIIAB REPLICATION USING *Moringa oleifera* SEED EXTRACT**

**Megan Drayna** and Jeanne Minnerath (Advisor)

*Department of Biology, St. Mary's University of Minnesota, Winona, MN*

**E.3 METHYLISOTHIAZOLINONE INDUCES APOPTOTIC CELL DEATH IN PRIMARY SKIN FIBROBLASTS**

**Eunice Lim**, Oliver Lagasse, Devavani Chatterjea (Advisor), and Elena Tonc (Advisor)

*Department of Biology, Macalester College, St. Paul, MN*

**Poster Sessions** (*Aquinas Hall, first floor*)

[Student presenters are shown in **bold**.]

**Poster Session F (2:40-3:20 pm)** (Aquinas Hall, first floor)

F.01 Cellular / Molecular Biology **A PUTATIVE YESMN TWO-COMPONENT SYSTEM ORTHOLOG IN *Streptococcus Gordonii* IMPACTS BIOFILM FORMATION IN A ZINC-DEPENDENT MANNER**

**Georgi A. Aus**<sup>1</sup>, Bruno P. Lima<sup>2</sup>, and Brittany L. Nairn<sup>1</sup> (Advisor)

<sup>1</sup>*Department of Biological Sciences, Bethel University, St. Paul, MN*

<sup>2</sup>*Department of Biological and Diagnostic Sciences, University of Minnesota, Minneapolis, MN*

F.03 Cellular / Molecular Biology **CHARACTERIZING *Staphylococcus Aureus* ON CONCORDIA'S CAMPUS**

**Eliot B. Sands**, **Nay H. Paw**, **Isabelle R. Boudreau**, Amanda Brosnahan (Advisor), and Taylor Mach (Advisor)

*Department of Science, Concordia University - St. Paul, St. Paul, MN*

**Poster Session F (2:40-3:20 pm) (continued)**

**F.05 Biochemistry COMPARATIVE ANALYSIS OF GLUTAMINASE 1 ISOTYPE EXPRESSION IN FIBROLAMELLAR HEPATOCELLULAR CARCINOMA TUMORS VERSUS NORMAL LIVER TISSUE SAMPLES**

**Joseph C. Tsukahara, Maya C. Lavendusky, Stephanie Yang,** and Mong-Lin Yang (Advisor)

*Department of Science, Concordia University - St. Paul, St. Paul, MN*

**F.07 Biochemistry CATALOGING NOVEL QUORUM SENSING GENES FROM WASTEWATER SAMPLES**

**Alexander M. Drake,** Justin J. Donato (Advisor), and Cassandra McCorison (Advisor)

*Department of Biology, University of St. Thomas, St. Paul, MN*

**F.11 Cellular / Molecular Biology REIMAGINING A BETTER VESSEL FOR EX-OVO CHORIOALLANTOIC MEMBRANE CHICK EMBRYO ASSAYS**

**Abby Lewerenz,** Makenna Berger, Jarrid Pizel, Julian Yang, and Mong-Lin Yang (Advisor)

*Department of Science, Concordia University - St. Paul, St. Paul, MN*

**F.13 Biochemistry EFFECTS OF MUTATION P126E AND P126R IN WATERMELON GLYOXYSOMAL MALATE DEHYDROGENASE (WGMDH)**

**Lois J. Campbell, Mirnesa Delic,** Finn J. Melchior, and Betsy Martinez-Vaz (Advisor)

*Department of Biology and Biochemistry Program, Hamline University, St. Paul, MN*

**F.15 Biochemistry IDENTIFYING CANDIDATE DRUGS TO TREAT RARE TYPES OF MUSCULAR DYSTROPHY**

**Brenna A. Powers<sup>1</sup>,** Nathaniel P. Mohar<sup>2</sup>, Benjamin E. Hinz<sup>1,3</sup>, Hailey McCoy-Munger<sup>3</sup>, and Lori L. Wallrath<sup>1,2</sup> (Advisor)

<sup>1</sup>*Department of Biochemistry and Molecular Biology/Carver College of Medicine*

<sup>2</sup>*Interdisciplinary Graduate Program in Genetics*

<sup>3</sup>*Department of Biomedical Engineering*

*University of Iowa, Iowa City, IA*

**F.17 Ecology / Environmental Science THE EFFECT OF GARLIC MUSTARD CONDITIONED SOIL ON GARLIC MUSTARD, MYCORRHIZAL FUNGI, AND NATIVE PLANTS**

**Alfred Cobbinah, Olivia Gustafson,** and Eric Baack (Advisor)

*Department of Biology, Luther College, Decorah, IA*

**F.19 Ecology / Environmental Science COMPARING BIODIVERSITY OF SMALL MAMMAL SPECIES IN REMNANT AND RESTORED PRAIRIE HABITATS**

**Katie P. Waugh** and Joseph C Whittaker (Advisor)

*Department of Biology, Concordia College – Moorhead, Moorhead, MN*

**Poster Session F (2:40-3:20 pm)** (continued)

F.21 Epidemiology **PREVALENCE OF NEWBORN SCREENING CONDITIONS IN THE ALL OF US DATABASE**

**Sierra E. Kicker** and Aeisha Thomas (Advisor)

*Department of Biological & Health Sciences, Crown College, St. Bonifacius, MN*

F.23 Neuroscience **CORRELATES BETWEEN SEASONAL HORMONES, SOCIALLY APPROPRIATE BEHAVIOR AND ANDROGEN/OPIOID/DOPAMINE GENE EXPRESSION IN EUROPEAN STARLINGS, *Sturnus Vulgaris***

**Misgana D. Mamo**, Emily Schmidt, Elizabeth Johnson, Joanna Trinkle, and Melissa Cordes (Advisor)

*Department of Biological Sciences, Bethel University, St. Paul, MN*

F.25 Ecology / Environmental Science **GOOD GALL-Y! FIELD PREVALENCE OF GALL-FORMING INSECTS IN CARVER COUNTY, MINNESOTA**

**Joel W. Swanberg** and Trevor Vannatta (Advisor)

*Department of Biological & Health Sciences, Crown College, St. Bonifacius, MN*

F.27 Chemistry, Biomaterials **EXPLORING THE IMPACT OF MYCELIAL BINDING TYPE ON ABSORBENT CRYOGEL-LIKE FIBROUS MATERIALS**

**Grace M. Harper, Leyla F. Sengul, Katelynn R. Stariha, Phatee Yang,** and William S. Boyle (Advisor)

*Department of Chemistry, Anoka-Ramsey Community College, Coon Rapids, MN*

F.29 Cellular / Molecular Biology **ISOLATION AND CHARACTERIZATION OF TETRACYCLINE RESISTANT BACTERIA FROM AQUATIC ENVIRONMENTS IN MINNESOTA**

**Eva Skipwith** and Renu Kumar (Advisor)

*Department of Biology, Minneapolis College, Minneapolis, MN*

F.31 Ecology / Environmental Science **12 YEARS OF A PRAIRIE RESTORATION IN NORTHEAST IOWA: PLANT COMMUNITY SHIFTS, BURN REGIMES, AND MANAGEMENT RECOMMENDATIONS**

**Josephine Meyer**<sup>1</sup> and Molly McNicoll<sup>2</sup> (Advisor)

<sup>1</sup>*Environmental Studies Program, Luther College, Decorah, IA*

<sup>2</sup>*Department of Biology, Luther College, Decorah, IA*

**Poster Session G (3:20-4:00 pm)** (Aquinas Hall, first floor)

G.02 Biochemistry, Chemistry **PROTEIN ENGINEERING OF A FLOURESCENT WATERMELON MALATE DEHYDROGENASE**

**William Yu** and Lisa Gentile (Advisor)

*Department of Chemistry, College of St. Benedict & St. John's University, St. Joseph and Collegeville, MN*

G.04 Biochemistry **BIOCHEMICAL CHARACTERIZATION OF LINC00896, A NON-PROTEIN CODING RNA, WHICH, WHEN EXPRESSED, CONTRIBUTES TO THE DEVELOPMENT OF AUTISM**

**Micalyn Trihus**, Trevor Rohder, Maycee Britz, Jacob Hanson, Andrew Rizea, Dylan Cleveland, Isabella Vannavong, Ashley Jensen, Emma Olson, Swedes Klogber, Ashley Stusse, Robert Mangiamele, Ridge Flatness, Donovan Floyd, and Rachel A. Hellmann Whitaker (Advisor)

*Department of Chemistry, Bemidji State University, Bemidji, MN*

G.06 Cellular / Molecular Biology **DYNAMIC RECIPROCITY BETWEEN FIBROBLASTS AND EXTRACELLULAR MATRIX IN CARDIOMYOPATHY**

**Eric M. Puumala**<sup>1</sup>, Callie Knapp<sup>1</sup>, Jackie Towner<sup>1</sup> (Advisor), Rachelle Crosbie<sup>2</sup> (Advisor), and Kirk Hansen<sup>3</sup> (Advisor)

<sup>1</sup>*Department of Biological Sciences, Bethel University, St. Paul, MN*

<sup>2</sup>*Department of Integrated Biology and Physiology, University of California Los Angeles, Los Angeles, CA*

<sup>3</sup>*Department of Biochemistry and Molecular Genetics, University of Colorado School of Medicine, Aurora, CO*

G.08 Cellular / Molecular Biology **EFFECT OF ARID3B ON INTRACELLULAR IRON AND ANTIOXIDANTS ASSOCIATED WITH FERROPTOSIS**

**Brendon N. Raabolle**<sup>1</sup>, Karen Cowden Dahl<sup>2</sup> (Advisor), and Matthew Rowley<sup>1</sup> (Advisor)

<sup>1</sup>*Department of Biology, Saint Mary's University of Minnesota, Winona, MN*

<sup>2</sup>*Kabara Cancer Research Institute, Gundersen Health, La Crosse, WI*

G.10 Ecology / Environmental Science **QUANTITATIVE AND QUALITATIVE ANALYSIS OF DENTAL ANOMALIES AND PATHOLOGY IN WHITE-TAILED DEER (*Odocoileus Virginicus*)**

**Tessa B. Danielson**, Sophia R. Tobin, and Joseph C. Whittaker (Advisor)

*Department of Biology, Concordia College – Moorhead, Moorhead, MN*

G.12 Cellular / Molecular Biology **STANDARDIZING THE EX OVO CAM PLATFORM: IMPROVING VIABILITY WITH NOVEL VESSEL DESIGN AND WATER SUPPLEMENTATION**

Makenna Berger, **Carson Krefft**, **Ryan Lee**, Rachel Novak, and Mong-Lin Yang (Advisor)

*Department of Science, Concordia University - St. Paul, St. Paul, MN*

**Poster Session G (3:20-4:00 pm) (continued)**

G.14 Biochemistry, Cellular / Molecular Biology      **EFFECTS OF MUTATIONS  
D32R AND C171R ON THE CATALYTIC ACTIVITY OF GUANYLUREA  
HYDROLASE**

**Fran Zyla**, Aubrey Chavarria, Katie Beaudette, and Betsy Martinez-Vaz (Advisor)  
*Department of Biology and Biochemistry Program, Hamline University, St. Paul, MN*

G.16 Biochemistry      **VEGF AND NRP-1 NEURAL EXPRESSION IN CD-1 MICE  
EXPOSED IN UTERO TO ATRAZINE**

**Elle Petersen, Nina Langley**, and Debra Martin (Advisor)  
*Department of Biology, St. Mary's University of Minnesota, Winona, MN*

G.18 Ecology / Environmental Science      **ASSESSING MICROPLASTIC  
CONCENTRATIONS IN THE GASTROINTESTINAL TRACTS AND FECAL  
MATTER OF TREE AND GROUND SQUIRRELS (SCIURIDAE) FOUND IN  
URBAN AND RURAL HABITATS**

**Yuden Dorji, Sharon Mac-George Nwabia, Favziya Rasulova, Fatima  
Mohammed, Mubina Rasul**, and Joseph Whittaker (Advisor)  
*Department of Biology, Concordia College – Moorhead, Moorhead, MN*

G.20 Cellular / Molecular Biology, Organismal / Physiological Sciences  
**CORRELATION BETWEEN MORPHOLOGY AND ENVIRONMENT IN  
EURASIAN PERCH, *Perca Fluviatilis*, AND YELLOW PERCH, *Perca  
Flavescens (Pisces: Percidae)***

**Briella Schmidt, Alyssa Snider, James Le, Sophie Higgs**, and Takashi Maie  
(advisor)  
*Department of Biology, St. Olaf College, Northfield, MN*

G.22 Organismal / Physiological Sciences      **ADHESIVE PERFORMANCE OF  
THE PELVIC SUCKER DURING CLIMBING WATERFALLS IN A JAPANESE  
STREAM GOBY, *Rhinogobius Fluviatilis***

**Dylan Pakizegi, Erin Benson**, and Takashi Maie (advisor)  
*Department of Biology, St. Olaf College, Northfield, MN*

G.24 Ecology / Environmental Science      **ECOSYSTEM RESPONSE TO  
INCREASING HURRICANE DISTURBANCE: COMPARING NUTRIENT  
CYCLING DYNAMICS ASSOCIATED WITH EARLY- AND  
LATE-SUCCESSIONAL TREE SPECIES IN A WET TROPICAL FOREST**

**Miriam L. Kleit**<sup>1</sup> and Christine S. O'Connell<sup>2</sup> (Advisor)  
<sup>1</sup>*Department of Biology, Macalester College, St. Paul, MN*  
<sup>2</sup>*Department of Environmental Studies, Macalester College, St. Paul, MN*

**Poster Session G (3:20-4:00 pm) (continued)**

G.26 Cellular / Molecular Biology, Ecology / Environmental Science

**IDENTIFICATION OF MINNESOTA NATIVE HEMLOCK TREES FOR EX SITU CONSERVATION WORK**

**Jasmine M. Faue**<sup>1</sup>, David Remucal<sup>2</sup> (Advisor), and Aeisha Thomas<sup>1</sup> (Advisor)

<sup>1</sup>*Department of Biological & Health Sciences, Crown College, St. Bonifacius, MN*

<sup>2</sup>*Department of Horticultural Science, University of Minnesota - Twin Cities, Minneapolis-St. Paul, MN*

G.28 Chemistry, Nutrition **PROTEIN CONCENTRATION IN RICE PRODUCTS**

**Hoang Trung Doan, Ying Liu**, and Heather Sklenicka (Advisor)

*Department of Chemistry, Rochester Community & Technical College, Rochester, MN*

G.30 Epidemiology **CHARACTERIZING THE CORRELATION BETWEEN CANCER TREATMENTS AND CARDIOVASCULAR DISEASE IN ALL OF US DATABASE PARTICIPANTS**

**Christella Baluta** and Aeisha Thomas (Advisor)

*Department of Biological & Health Sciences, Crown College, St. Bonifacius, MN*

## Student Oral/Poster Presentations by Last Name

**Adan, Ikran**, Oral Session B: B.1  
**Aus, Georgi**, Poster Session F.01  
**Baluta, Christella**, Poster Session G.30  
**Benson, Erin**, Poster Session G.22  
**Berger, Makenna**, Oral Session A: A.1  
**Boudreau, Isabelle**, Poster Session F.03  
**Campbell, Lois**, Poster Session F.13  
**Chen, Jo-Hsuan (Mady)**, Oral Session D: D.1  
**Cobbinah, Alfred**, Poster Session F.17  
**Danielson, Tessa**, Poster Session G.10  
**Delic, Mirnesa**, Poster Session F.13  
**Doan, Hoang Trung**, Poster Session G.28  
**Dorji, Yuden**, Poster Session G.18  
**Drake, Alexander**, Poster Session F.07  
**Drayna, Megan**, Oral Session E: E.2  
**Faue, Jasmine**, Poster Session G.26  
**Frick, Samuel**, Oral Session C: C.1  
**Gustafson, Olivia**, Poster Session F.17  
**Harper, Grace**, Poster Session F.27  
**Hastings, Sophie**, Oral Session B: B.1  
**Higgs, Sophie**, Poster Session G.20  
**Jones, Alyssa**, Oral Session B: B.2  
**Kicker, Sierra**, Poster Session F.21  
**Kleit, Miriam**, Poster Session G.24  
**Kreffft, Carson**, Poster Session G.12  
**Lagasse, Oliver**, Oral Session C: C.2  
**Langley, Nina**, Poster Session G.16  
**Lavendusky, Maya**, Poster Session F.05  
**Le, James**, Poster Session G.20  
**Lee, Ryan**, Poster Session G.12  
**Lewerenz, Abby**, Poster Session F.11  
**Lim, Eunice**, Oral Session E: E.3  
**Liu, Ying**, Poster Session G.28  
**Mamo, Misgana**, Poster Session F.23  
**Mathews, Natalie**, Oral Session A: A.2  
**Meyer, Josie**, Poster Session F.31  
**Mohammed, Fatima**, Poster Session G.18  
**Pakizegi, Dylan**, Poster Session G.22  
**Paw, Nay**, Poster Session F.03  
**Perkins, Katherine**, Oral Session D: D.2  
**Petersen, Elle**, Poster Session G.16  
**Powers, Brenna**, Poster Session F.15  
**Puumala, Eric**, Poster Session G.06  
**Raabolle, Brendon**, Poster Session G.08  
**Rasul, Mubina**, Poster Session G.18  
**Rasulova, Favziya**, Poster Session G.18  
**Ryan, Zachary**, Oral Session A: A.4  
**Sands, Eliot**, Poster Session F.03  
**Schmidt, Briella**, Poster Session G.20  
**Schuster, Emma**, Oral Session D: D.3  
**Sengul, Leyla**, Poster Session F.27  
**Skipwith, Eva**, Poster Session F.29  
**Snider, Alyssa**, Poster Session G.20  
**Sothy, Catherine**, Oral Session B: B.3  
**Stariha, Katelynn**, Poster Session F.27  
**Swanberg, Joel**, Poster Session F.25  
**Trihus, Micalyn**, Poster Session G.04  
**Tsukahara, Joseph**, Poster Session F.05  
**Wadzinske, Alena**, Oral Session B: B.4  
**Wagner, Ella**, Oral Session C: C.3  
**Wangen, Haley**, Oral Session E: E.1  
**Waugh, Katie**, Poster Session F.19  
**Widdes, Hanna**, Oral Session A: A.3  
**Yang, Stephanie**, Poster Session F.05  
**Yang, Phatee**, Poster Session F.27  
**Yu, William**, Poster Session G.02  
**Zyla, Fran**, Poster Session G.14

## Student Oral/Poster Presentations by Category

**Biochemistry:** Presentations B.3, B.4, F.05, F.07, F.13, F.15, G.02, G.04, G.14, G.16

**Cellular/Molecular Biology:** Presentations C.1, C.2, C.3, D.1, D.2, E.1, E.2, E.3, F.01, F.03, F.11, F.29, G.06, G.08, G.12, G.14, G.20, G.26

**Chemistry:** Presentations B.1, B.2, F.27, G.02, G.28

**Ecology/Environmental Science:** Presentations A.4, F.17, F.19, F.25, F.31, G.10, G.18, G.20, G.24, G.26

**Epidemiology:** Presentations F.21, G.30

**Exercise Science:** Presentation A.2

**Neuroscience:** Presentations D.3, F.23

**Organismal/Physiological Sciences:** Presentations A.1, A.3, G.20, G.22

**Full abstracts may be found in the**  
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