

3-6-2023

16th Annual Research in the Capitol [Program], March 6, 2023

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The background of the entire image is a photograph of the interior of the Iowa State House Rotunda. The view is from a low angle looking up at the ornate, golden ceiling. The ceiling features a central circular skylight with a blue sky and white clouds, an American flag, and the years 1846 and 1882. The ceiling is decorated with a repeating pattern of small, golden stars. The architecture is highly detailed with gold leaf accents and classical motifs.

Iowa Regent Universities present the

16th Annual Research in the Capitol

Monday, March 6, 2023

11:30am - 1:30pm

**Iowa State House, Rotunda
Des Moines, Iowa**



Welcome



Welcome to our sixteenth annual Research in the Capitol. In the last decade, over 500 undergraduates from our three Regent's Universities have come to the Iowa Statehouse to present their work to legislators, members of the Board of Regents, and the public. These students have gone on to contribute to our state as doctors, educators, engineers, lawyers, nurses, and professionals in various disciplines. The opportunity for our students to share their knowledge and exuberance with legislators, Regents, and guests in the Iowa Capitol is a special honor that has stayed with them across the years.

Research involvement plays a central role in undergraduate education. Students who take part in research are more successful academically, are more developed in their career and professional preparation, and are more satisfied with their college experience. Research engagement provides the conditions for collaborative learning and critical thinking that benefit our students as they move into the workforce or on to graduate or professional training. The presentations before you today required countless hours of effort on the part of the students and their mentors outside of the classroom and represent the shared commitment our students, staff, and faculty place on the undergraduate experience.

As you speak with these outstanding students, you will learn first hand the impact research involvement has on Iowa's students and the impact those students have on the research conducted at our outstanding Iowa Public Universities.

Robert Kirby

Director, Iowa Center for Research by Undergraduates

Schedule

11:30am Opening Remarks

- Bob Kirby - Director, Iowa Center for Research by Undergraduates
- Student Speaker - Mackenzie Wisneski, University of Northern Iowa

11:45am-1:30pm

- Student Poster Presentations

Iowa Regents Universities Undergrad Research Contacts

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Presenters

1. Winfred Afeaneku (UNI)

SocioApp: Detecting Your Sociability Status with Your Smartphone

Hometown – Moline, IL

Major – Computer Science

Mentor – Dheryta Jaisinghani

2. Morgan Aitchison (UNI)

New Policy Opens Trade with India for Pork Producers in the US

Hometown – Elk Run Heights, IA

Major – Accounting/Finance: Financial Management

Mentor – Christine Schrage

3. Emily Allen (ISU)

Forgery Detection Using Statistical Analysis

Hometown – Ankeny, IA

Major – Statistics

Mentor – Danica Ommen

4. Andrew Behrens (UofI)

Assessment of Metatarsal Joint Structure in Patients With Bunion Deformity

Hometown – Polk City, Iowa

Major – Biomedical Engineering

Mentor – Cesar Netto

5. Lydia Berns-Schweingruber (UNI)

The Effect of K-12 Public Education Spending on Student Academic Achievement in Iowa

Hometown – Ames, IA

Major – Elementary Education/Sociology

Mentor – Kristin Mack & Marybeth Stalp

6. Kelly Biscoglia (UNI)

Analysis of Cytokinin Response Factors in Artemisia tridentata

Hometown – Waukee, IA

Major – Biochemistry/Env Science: Env Earth Science

Mentor – William Harwood & Anthony Melton

7. Josie Bliss (UofI)

Sanibel Captiva Ecology

Hometown – Ely, IA

Major – Integrative Biology

8. Hannah Blumhoefer (ISU)

An Analysis of Variable-Shape Wave Energy Converter Modifications

Hometown – New Ulm, MN

Major – Aerospace Engineering

Mentor – Ossama Abdelkhalik

9. Denisse Camarena (ISU)

Taking a Closer Look at the Hair of a Bumble Bee

Hometown – Le Mars, IA

Major – Animal Ecology

Mentor – Amy Toth

10. Alison Carr (ISU)

Risks and Fear of Falling in Older Adults

Hometown – Ames, IA

Major – Kinesiology and Health

Mentor – Gregory Welk

11. Karlee Colby (UNI)

Her Story, Her Right: Narrative as a Basic Human Right

Hometown – Cedar Rapids, IA

Major – English/Philosophy

Mentor – Yasemin Sari

12. Emmet Cummings (UNI)

Underground lowans

Hometown – Center Point, IA

Major – History

Mentor – Thomas Connors

13. Anthony David (ISU)

Fabricating Biosensor Platforms for Real-Time Biothreat Detection

Hometown – Maple Grove, MN

Major – Mechanical Engineering

Mentors – Pranav Shrotriya and Todd Kingston

14. Makayla Dove, Mckenzie Sanden (ISU)

Gene Editing of Human Cells for Alzheimer’s Disease Research

Hometown – Carol Stream, IL, Plymouth, MN

Major – Bioinformatics, Genetics

Mentor – Qian Wang

15. Hugh Duffy (ISU)

Lowering Carbon Footprint with 3D Printed Concrete Buildings

Hometown – Cedar Rapids, IA

Major – Architecture

Mentor – Chengde Wu

16. Harper Dunne (Uofl)

We Looked at 6,795 Articles So You Didn’t Have To: A Scoping Review of Studies Investigating MSS (Multisensory Sensitivity) in Pain Populations

Hometown – Fort Worth, Texas

Major – Spanish, Global Health Studies

Mentor – Laura Frey Law

17. William Fettkether (ISU)

Using Glass to Develop the Next Generation of Solid-State Batteries

Hometown – Dunkerton, IA
Major – Materials Engineering
Mentor – Steve Martin

18. Daniel Fu – (Uofl)

RGS6 mediates exercise-induced rescue of impaired cognition and hippocampal neurogenesis in mice with Alzheimer's disease

Hometown – Johnston, Iowa
Major – Biomedical Sciences
Mentor – Rory Fisher

19. Noah Gilkes (Uofl)

Traumatic brain injury is associated with neurological deficits and leads to activation of the type I interferon pathway

Hometown – Robins, Iowa
Major – Neuroscience, Philosophy
Mentor – Elizabeth Newell

20. Grace Hagedorn (ISU)

Creating effective G418 antibiotic plates for yeast transformation

Hometown – Ankeny, IA
Major – Biology
Mentor – Mohan Gupta

21. Jenna Heinen (UNI)

Spectroscopic Characterization of Wind Cave National Park

Hometown – Algona, IA
Major – Biochemistry/Physics: Data Science
Mentor – Joshua Sebree

22. Dela Houssou, Erik Dralle (ISU)

Resiliency of Electric Power Network under Wind Event

Hometown – Iowa City, IA, Oswego, IL

Major – Civil Engineering

Mentor – Alice Alipour

23. Karly Jans (ISU)

Mental Health Issues within Iowa Veterinary Clinics

Hometown – Clutier, IA

Major – Biology and Animal Ecology

Mentor – Mike Rentz

24. Vesha Jayswal (UNI)

The Power of Homeownership

Hometown – Independence, IA

Major – Accounting/Economics: Business Economics

Mentor – Joe Ugrin

25. Elle Jones (UNI)

Government and Institutional Changes regarding Human Rights that affect Citizen Involvement

Hometown – Burlington, IA

Major – Political Science/Pre-Prof: Law

Mentor – Yasemin Sari

26. Emmeline Kraus (UofI)

Seasonal effects of the fungal pathogen Tubakia iowensis (bur oak blight) on the photosynthetic capacity of infected Quercus macrocarpa (bur oak).

Hometown – Iowa City, IA

Major – Environmental Sciences; Geography

Mentors - Matt Dannenberg and Susan Meerdink

27. Victoria Kyveryga (ISU)

Structure and Energy-Related Properties of Novel Barium-Arsenide Materials

Hometown – Ames, IA

Major – Chemical Engineering and Chemistry

Mentor – Kirill Kovnir

28. Trevor Larkin (UofI)

Preparation and Evaluation of Lanthanide Catalysts for Oxygen Reduction

Hometown – Dubuque, Iowa

Major – Chemistry

Mentor – Johna Leddy

29. Priscilla Lee (ISU)

Differences in Working Memory Between Monolingual and Bilingual Learners

Hometown – Schaumburg, IL

Major – Kinesiology

Mentor – Ji-Young Choi

30. Haley Lightfoot (UofI)

Novel Green Solventless Synthesis of Uranium Metal Organic Frameworks via Temperature Dependent Flux Reactions

Hometown – Lake Zurich, IL

Major – Chemistry

Mentor – Tori Forbes

31. Kobie Long (UofI)

Identifying Areas of Groundwater-Surface Water Exchange along Camp Cardinal Creek at Ashton Prairie Living Laboratory

Hometown – Des Moines, IA

Major – Environmental Science

Mentor – Ben Swanson

32. Julie Matta (UNI)

Hidden in Plain Sight: The Influence of Indigenous and Latin Theatre

Hometown – Marshalltown, IA

Major – Theatre: Performance/ Theatre: Theatre Yth Community

Mentor – Katherine Hahn

33. Rowan McCarthy (UNI)

Development of a Water Quality Index Calculation Tool using Excel

Hometown – Windsor Heights, IA

Major – The Study of Religion/ Env Science: Env Earth Science

Mentor – Mohammad Iqbal

34. Tamara McConnell, Mia Riddley (ISU)

Biological and Geochemical Controls on Iron Deposition in an Intermittent Stream

Hometown – Kansas City, KS, Byram, MS

Major – Geology, Environmental Engineering

Mentor – Elizabeth Swanner

35. James McMillan (UofI)

Impact of Violence over the Life Course

Hometown – Iowa City, IA

Major – Public Health, Ethics and Public Policy

Mentor – Stephanie DiPietro

36. Jesse Miller (UofI)

"License to do Evil in the Name of Good": Political Radicalization and Rhetorical Adaptation During the Wilmington Coup

Hometown—Solon Iowa

Major—History, Social Studies Education

Mentor—Alyssa Park and Nick Yablon

37. Aracely Miron-Ocampo (UofI)

Searching for Novel Antifungal Treatments and Regulatory Pathways via the Characterization of a Fluphenazine Derivative Against C. albicans

Hometown – Des Moines, IA

Major – Microbiology, Global Health Studies Certificate

Mentor – Damian Krysan and Sarah Beattie

38. Ryleigh Mulcahey (UofI)

Sanibel Capitva Ecology

Hometown – North Liberty, IA

Major – Chemistry, Environmental Science

39. Diana Mulder (ISU)

Verification of a qPCR Assay for Detection of Phialophora gregata in varied Soybean Tissue and Brown stem rot suspect samples

Hometown – Parkersburg, IA

Major – Microbiology, International Agriculture

Mentor – Leonor Leandro

40. Stephanie Orellana (UofI)

We are listening: Educator experiences during COVID-19

Hometown – Muscatine, Iowa

Major – Psychology

Mentor – Emily Thomas

41. Zach Palmer (UofI)

Captive Labor Market: Addressing Iowa's school-to-prison pipeline

Hometown – Huxley, IA

Major – English & Creative Writing

Mentor – Heather Erwin

42. Jacob Parker (UNI)

Using an Aminimide Functional Group to Selectively Uptake Lithium

Hometown – Bettendorf, IA

Major – Biochemistry/ Psychology

Mentor – Martin Chin

43. Jeanetta Plotzke (ISU)

Drainage District Main Improvements in Iowa

Hometown – Osage, IA

Major – Environmental Science and Global Resource Systems,

Mentor – Matthew Helmer

44. Olivia Poppen, Tatum Englund, Madison Bemis (ISU)

Ergonomic Assessments via Virtual Reality: Is it Possible?

Hometown – West Branch, Marshalltown, Fairfield, IA

Major – Industrial Engineering, Industrial Engineering

Mentors – Kathryn Lieffrig, Stephen Gilbert

45. Tristen Prouse (UNI)

How to Not Save the World From COVID-19: The Dire Consequences of Giving Away the Vaccine Formula

Hometown – Buckingham, IA

Major – Economics: General Economics/Pre-Prof:Law

Mentor – Lisa Jepsen

46. Tanzeel Ur Rehman (UNI)

IoT in the Air: Thread-enabled Flying IoT Network for Indoor Environments

Hometown – Lahore, Pakistan

Major – Computer Science

Mentor – Dheryta Jaisinghani

47. Matthew Shafer (ISU)

Creating Curriculum to Inspire Young Scientists

Hometown – Solon, IA

Major – Biology

Mentor – Jeanne Serb

48. Megan Smith (ISU)

Structural Analysis of a Tyrosine Kinase-Substrate Complex - a Target of Cancer Drugs

Hometown – Cedar Falls, IA

Major – Biochemistry

Mentor – Amy Andreotti

49. Grayson Talaski (UofI)

The Impact of 3D Foot Alignment on Detection of Distal Tibiofibular Syndesmotom Widening after Injury using Comparative Contralateral Distance Mapping

Hometown – Bloomington, IL

Major – Biomedical Engineering

Mentor – Cesar de Cesar Netto

50. Eric Thomas (UofI)

Comparison of Intentionally Planted Species to Observed Population: Survey of plant biodiversity at Ashton Prairie Living Laboratory Prairie Restoration

Hometown – Iowa City, IA

Major – Environmental Sciences

Mentor – Benjamin Swanson

51. Abigail Tibben, Megan McGuire (ISU)

Producing Mock Crime Scene Footwear Impressions Dataset

Hometown – Marshalltown, Ankeny, IA

Major – Genetics, Criminal Justice

Mentor – Stacy Renfro

52. Zach Vig (UofI)

Detecting Iowa's CO₂ in the Stratosphere using the High Altitude Near Infrared Spectroscopy Experiment (HANICSE)

Hometown – Mount Vernon, IA

Major – Geoscience, Physics

Mentor – David Miles

53. Morgan Wickman (UNI)

Secondary Traumatic Stress: Therapists' Past Trauma and Workplace Intervention

Hometown – Winterset, IA

Major – Psychology

Mentor – Elizabeth Lefler

54. Raquel Wilhelm (UNI)

Investigation of Unexpected Purple Substance Extracted from Newsprint Paper

Hometown – Cedar Rapids, IA

Major – Chemistry

Mentor – Shoshanna Coon

55. Mackenzie Wisneski (UNI)

Using Color with Care: An Exploration of the Application of Psychological Color Theory within Language Classrooms

Hometown – Le Claire, IA

Major – Tchg Eng to Spkr of Othr Lang

Mentor – Hilal Ergül



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