

## 2021 Summer Undergraduate Poster Session Abstracts

### University of North Dakota

#### **Effects of Arsenic exposure on KRT5, ZPF3611 and DSG3 genes in UROtsa cell line**

Yeabtsega Abraham, Matthew Kalonick, Peter Knutson, Seema Somji, Aaron Mehus  
Department of Pathology, University of North Dakota

#### **Use of a Forced Restraint Mice Model to Study $\alpha_{1A}$ -adrenergic Receptor Activation in Major Depressive Disorder**

Sophia Barber<sup>1</sup>, Melemoala Tuifua<sup>2</sup>, Alexis Rodriguez<sup>3</sup>, Jason Power<sup>4</sup>, Van Doze<sup>4</sup>

<sup>1</sup>Division of Biological Sciences, University of California, San Diego, San Diego CA; <sup>2</sup>Division of Natural Sciences, El Camino College, Torrance, CA; <sup>3</sup> Division of Biological Sciences, University of North Dakota, Grand Forks, ND; <sup>4</sup>Department of Biomedical Sciences, University of North Dakota School of Medicine and Health Sciences, Grand Forks, ND

#### **Differential Longevity Identified in Long-term $\alpha_{1A}$ and $\alpha_{1B}$ Adrenergic Receptor Activation**

Sophia Barber<sup>1</sup>, Melemoala Tuifua<sup>2</sup>, Alexis Rodriguez<sup>3</sup>, Jason Power<sup>4</sup>, Joseph Biggane<sup>5</sup>, Dianne Perez<sup>6</sup>, Van Doze<sup>4</sup>

<sup>1</sup> Division of Biological Sciences, University of California, San Diego; <sup>2</sup> Division of Natural Sciences, El Camino College; <sup>3</sup> Division of Biological Sciences, University of North Dakota; <sup>4</sup> Department of Biomedical Sciences, University of North Dakota School of Medicine and Health Sciences; <sup>5</sup> Department of Biology, University of Mary <sup>6</sup> Department of Molecular Cardiology, Lerner Research Institute, Cleveland Clinic Foundation

#### **$\alpha_{1A}$ Adrenergic Receptor Activation Increases Seizure Threshold**

Sophia Barber<sup>1</sup>, Melemoala Tuifua<sup>2</sup>, Alexis Rodriguez<sup>3</sup>, Jason Power<sup>4</sup>, Joseph Biggane<sup>5</sup>, Dianne Perez<sup>6</sup>, Van Doze<sup>4</sup>

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#### **Let's talk about Sex...Determination: Investigating the Effect of Foxl2 Overexpression on Male-determining Genes Amh, Dmrt1 and Sox9 in Common Snapping Turtle Embryos (*Chelydra serpentina*)**

Tatyana Bazile<sup>1</sup>, Melanie Borysewicz<sup>2</sup>, Autumn Joy<sup>3</sup>, Aerica Nagornyuk<sup>3</sup>, Turk Rhen<sup>3</sup>

<sup>1</sup>Rensselaer Polytechnic Institute, <sup>2</sup>Concordia College, <sup>3</sup>Biology Department, University of North Dakota

#### **CD24, CD133, ALDH1A1, and CD44 Expression in Glucose Exposed CD24+/CD133+ and CD24+ Proximal Tubule Epithelial Cells**

Katie Bierstedt, Matthew Kalonick, Peter Knutson, Swojani Shrestha, Scott H. Garrett

Department of Pathology, University of North Dakota School of Medicine and Health Sciences, Grand Forks, ND

#### **EMT Marker Expression and Localization in Acute Glucose Exposed HRTPT and HREC24T Cells**

Kaitlyn Berwald, Matthew Kalonick, Peter Knutson, Swojani Shrestha, Scott Garrett, Donald Sens

University of North Dakota School of Medicine and Health Sciences

### **Effects of Acetylcholine Agonist Carbachol on Dopamine Transporter Palmitoylation**

Aaron Blackwell, Isaiah Germolus, and James D. Foster

*Department of Biomedical Sciences, University of North Dakota, School of Medicine and Health Sciences, Grand Forks, ND*

### **Don't Let a Tick Make You Sick**

Nicholas Boe, Tyler J. Achatz, Lynda LaFond, Dawn Cleveland, Staci Dreyer, Jakson Martens, Catherine Brissette, and Jefferson Vaughan

*University of North Dakota, Department of Biology*

### **Wnt11b, Mapk13, and Rspo1 Are Not Regulated by FoxL2 During Sex Determination, but Show Strong Response to Cell Density**

Melanie Borysewicz<sup>1</sup>, Tatyana Bazile<sup>2</sup>, Autumn Joy<sup>3</sup>, Aerica Nagornyyuk<sup>3</sup>, and Turk Rhen<sup>3</sup>, Ph.D.

*Concordia College*<sup>1</sup>, *Rensselaer Polytechnic Institute*<sup>2</sup>, *Biology Department, University of North Dakota*<sup>3</sup>

### **Genes Expression in CD133-CD24+ and CD133+CD24+ Cell lines under high concentrations of glucose: CLCN7, LIPA, RRAGC**

Boudnoma C. Convolbo<sup>2</sup>, Swojani Shrestha<sup>1</sup>, Brent Voels<sup>3</sup>, Matthew J. Kalonick<sup>1</sup>, Peter Knutson<sup>1</sup>, Scott H. Garrett<sup>1</sup>, Seema Somji<sup>1</sup>, Donald A Sens<sup>1</sup>

<sup>1</sup>*Department of Pathology, University of North Dakota School of Medicine & Health Sciences, Grand Forks, ND*

<sup>2</sup>*Department of Chemistry DNIMAS, Norfolk State University, Norfolk, VA*

*Cankdeska Cikana Community College, Fort Totten, ND*

### **Expression of IG2FR, MCOLN1, SQSTM1 Lysosomal Markers in CD/133+/CD24+ Cells and CD133-/CD24+ Cells Exposed to Elevated Glucose Concentrations.**

Emile Dargbeh, Swojani Shrestha, Matthew Kalonick, Peter Knutson, Scott Garrett

*Department of Pathology, University of North Dakota School of Medicine & Health Sciences, Grand Forks, ND*

### **Expression of TFAP2A, NFKBIA, and PI3 in Arsenite-Exposed Urothelial Cells**

J.Delorme, Matthew Kalonick, Peter Knutson, Swojani Shrestha, Aaron Mehus, Seema Somji

*Department of Pathology, University of North Dakota, Grand Forks, ND*

### **EGFR, EP300, and CREBBP Expression in Arsenic-Exposed UROtsa Bladder Cells**

Devin Evavold, Peter Knutson, Matthew Kalonick, Aaron Mehus, Swojani Shrestha, Seema Somji

*Department of Pathology, University of North Dakota School of Medicine & Health Sciences*

### **Genome-Wide Analysis of Methylome in the Mouse Brain using Long-Read Sequencing Technology**

Zachary Even, He Huang, Ramkumar Mathur, and Xusheng Wang

*Department of Biology, University of North Dakota*

### **Optimizing Soil Respiration Methods**

Mary (Fynn) Gagnon, Brian Darby

*Department of Biology, University of North Dakota*

**Glucocorticoid Receptor Agonist Prednisolone Increases Dopamine Transporter Palmitoylation**

Jaron C. Harmon<sup>1</sup>, Isaiah Germolus, Tess Sether, Christopher Brown, James D. Foster

*Department of Biomedical Sciences, University of North Dakota, School of Medicine and Health Sciences, Grand Forks, ND; <sup>1</sup>Department of Biology, College of Agriculture and Life Sciences, Brigham Young University – Idaho*

**mTOR and associated genes expression in glucose exposed CD24+/CD133+ and CD24+/Cd133- cell lines**

Devon Headdress, Matthew Kalonick, Shrestha Swojani, Peter Knutson, Scott Garrett

*Department of Pathology, University of North Dakota School of Medicine & Health Sciences*

**Expression of tight junctional markers - Claudins, Cadherins, and Integrins - in glucose treated CD133+/CD24+ and CD133-/CD24+ cell lines**

Zachary Jorgenson, Swojani Shrestha, Matthew Kalonick, Peter Knutson, Scott H. Garrett

*Department of Pathology, University of North Dakota School of Medicine & Health Sciences, Grand Forks, ND*

**Eggs-cellent Development; Cell density increases impact of Foxl2 overexpression on three key genes in ovarian development.**

Autumn R Joy<sup>1</sup>, Tatyana Bazile<sup>2</sup>, Melanie Borysewicz<sup>3</sup>, Aerica Nagornyuk<sup>1</sup>, Turk Rhen<sup>1</sup>

*<sup>1</sup>Biology Department, University of North Dakota, <sup>2</sup>Rensselaer Polytechnic Institute, <sup>3</sup>Concordia College*

**KRT6A, KRT6B, and KRT6C expression in Arsenite Exposed UROtsa Cell Line**

Josaphina Juarez, Aaron Mehus, Matthew Kalonick, Peter Knutson, Scott Garrett, Seema Somji

*Department of Pathology, University of North Dakota School of Medicine & Health Sciences*

**P63, TRIM29, and PPL Expression in Arsenite Exposed UROtsa Cell Line**

Kaija Kinnunen, Matthew Kalonick, Peter Knutson, Swojani Shrestha, Aaron Mehus, Seema Somji

*Department of Pathology, University of North Dakota, Grand Forks, ND*

**Stable chromatin binding is required for GATA3-induced breast cancer cell reprogramming**

<sup>1</sup>Gwyneth Knott, <sup>2</sup>Hayden May, <sup>2</sup>Mika Saotome, and <sup>2</sup>Motoki Takaku

*<sup>1</sup>Colorado State University; <sup>2</sup>Department of Biomedical Sciences, University of North Dakota School of Medicine & Health Sciences*

**Metallothionein Gene Expression in HRTPT and HREC24T Cell Lines**

Julia L. Kochanowski, Swojani Shrestha, Gazal Kalyan, Scott H. Garrett

*Department of Pathology, University of North Dakota School of Medicine and Health Sciences, Grand Forks, ND*

**Profiling the chromatin accessibility of Cebpa in PUER cells using ATAC-Seq**

Frances Kujawski<sup>1</sup>, Trevor Long<sup>2</sup>, Rockford Copiskey<sup>2</sup>, and Manu<sup>2</sup>

*<sup>1</sup>Cedar Crest College and the <sup>2</sup>Department of Biology, University of North Dakota*

**Importance of Focal Adhesions in Epithelial to Mesenchymal Transition**

Anna Lambertz<sup>1</sup>, Aaron Vanyo<sup>1</sup>, and Amanda Haage<sup>1</sup>

*<sup>1</sup>Department of Biomedical Sciences, University of North Dakota School of Medicine and Health Sciences*

**KRT1, STAT3, AND IVL expression in Arsenic exposed UROsta cell line**

Briley LaRocque, Aaron Mehus, Scott Garrett, Peter Knutson, Matthew Kalinick, Seema Somji  
Department of Pathology, University of North Dakota School of Medicine & Health Sciences, Grand Forks, ND

**KRT14 & CLDN1 Expression in Chronically Exposed UROtsa Cell Line With 1  $\mu$ M As<sup>3+</sup>**

Becker Lindner, Matthew Kalonick, Peter Knutson, Swojani Shrestha, Seema Somji, Aaron Mehus  
Department of Pathology, University of North Dakota, Grand Forks, ND

**Differential expression of COL4A3, COL4A4, ITGA6, and CLDN10 in CD133-/CD24+, CD133+/CD24+, and TERT cell lines**

Alexis Lohnes<sup>1</sup>, Shealynn Wells<sup>1</sup>, and Brent Voels<sup>1</sup>  
<sup>1</sup>Cankdeska Cikana Community College, 214 First Ave Fort Totten, ND

**Cell cycle arrest as a function of progesterone regulated micro-RNA in breast cancer.**

Edward Looker<sup>1</sup>, Annika Price<sup>2</sup>, Motoki Takaku<sup>2</sup>  
<sup>1</sup>School of Natural Sciences, Hampshire College  
<sup>2</sup>Department of Biomedical Sciences, University of North Dakota School of Medicine

**Inorganic arsenite upregulates expression of GRHL1, ESRP1, and RXRA in urothelial cells**

Sofia Lutz, Peter Knutson, Matthew J. Kalonick, Aaron A. Mehus, and Seema Somji  
Department of Pathology, University of North Dakota School of Medicine and Health Sciences, Grand Forks, ND

**Expression of LAMP1, NEU1, & NPC2 in HREC24T & HRTPT Cells at Various Glucose Concentrations**

Kaha Mohamud, Matthew Kalonick, Swojani Shrestha, Scott Garrett, Donald Sens  
Department of Pathology, University of North Dakota School of Medicine & Health Sciences

**Bacterial Transmission Between Male and Female Bees**

<sup>1</sup>Makaila Martin, <sup>2</sup>Krista Riensche, <sup>3</sup>Hayley Qualley, <sup>3</sup>Jona Pederson, <sup>4</sup>Shea McGuinness, <sup>1</sup>Bryann Rainbow, <sup>5</sup>Sabra Poitra, <sup>6</sup>Jecelle Fetzer, and <sup>3</sup>Rebecca Simmons  
<sup>1</sup>Nueta Hidatsa Sahnish College, North Dakota; <sup>2</sup>Northwestern College; <sup>3</sup>Department of Biology, University of North Dakota; <sup>4</sup>Montana State University; <sup>5</sup>Cankdeska Cikana Community College; <sup>6</sup>Northeastern Junior College

**Residues V324 and I330 in the Human Dopamine Transporter are Involved in High-Affinity Binding of Methylphenidate**

Nicole Matter<sup>1</sup>, Madhur Shetty<sup>2</sup>, Haley Melikian<sup>3</sup>, and L. Keith Henry<sup>2</sup>,  
<sup>1</sup>South Dakota State University Department of Biology and Microbiology, <sup>2</sup>University of North Dakota Department of Biomedical Sciences, and <sup>3</sup>Department of Psychiatry, University of Massachusetts Medical School.

**Biodiversity of Solitary Bees in Northwestern Montana**

Shea McGuinness<sup>1</sup>, Krista Riensche<sup>2</sup>, Jecelle Fetzer<sup>3</sup>, Makaila Martin<sup>4</sup>, Jona Pedersen<sup>5</sup>, Sabra Poitra<sup>6</sup>, Hayley Qualley<sup>5</sup>, Bryann Rainbow<sup>4</sup>, Rebecca Simmons<sup>5</sup>, Michael Ivie<sup>1</sup>  
<sup>1</sup>Montana State University, <sup>2</sup>Northwestern College, <sup>3</sup>Northeastern Junior College, <sup>4</sup>Nueta Hidatsa Sahnish College, <sup>5</sup>University of North Dakota, <sup>6</sup>Cankdeska Cikana Community College

**Hyperglycemic Conditions Affect RAPTOR, RICTOR, and eIF4EBP1 Expression in HREC24T and HRTPT Cells**

Merrick M. McMahon, Matthew J. Kalonick, Swojani Shrestha, Donald A. Sens, Scott H. Garrett  
Department of Pathology, University of North Dakota School of Medicine & Health Sciences

**Diversity of Cercariae in Snails of the Red River Valley, with Emphasis on Swimmer's Itch Agents**

Roiya Meyer<sup>1</sup>, Karalyn Altendorf<sup>2</sup>, Taylor Chermak<sup>2</sup>, Caleb Foertsch<sup>2</sup>, Nicholas Boe<sup>2</sup> and Vasyl Tkach<sup>2</sup>  
<sup>1</sup>Department of Biology, University of Wisconsin, Stevens Point  
<sup>2</sup>Department of Biology, University of North Dakota, Grand Forks

**Identification of Molecular Determinates Involved in High Affinity Binding of Methylphenidate to the Human Dopamine Transporter**

Yuliet Monatukwa<sup>1</sup>, Madhur Shetty<sup>1</sup>, Haley Melikian<sup>2</sup> and L. Keith Henry<sup>1</sup>  
<sup>1</sup>Department of Biomedical Sciences, University of North Dakota and <sup>2</sup>Department of Psychiatry, University of Massachusetts Medical School

**Palmitoylation of the Dopamine Transporter when treated with the glucocorticoid agonist Dexamethasone.**

Erin Morin, Isaiah Germolus, and James D. Foster  
Dept. of Biomedical Sciences, University of North Dakota School of Medicine and Sciences, Grand Forks, ND

**Overexpression of Foxl2 on StAR, Cyp11a1, Cyp17a1, and Cyp19a1 in *Chelydra serpentina* are Affected by Cell Density**

Aerica Nagornyuk<sup>1</sup>, Tatyana Bazile<sup>2</sup>, Melanie Borysewicz<sup>3</sup>, Autumn Joy<sup>1</sup>, and Turk Rhen<sup>1</sup>  
<sup>1</sup>Biology Department, University of North Dakota, <sup>2</sup>Rensselaer Polytechnic Institute, <sup>3</sup>Concordia College

**Mosquito Population Dynamics of Traill County, North Dakota**

Taylor R. Painter, Laura A. Jacobson, Lily K. Pyle, Austin E. de Laroque, Joseph O. Mehus  
Department of Biology, Mayville State University

**Native Pollinators and Conservation efforts in The Greenway of Grand Forks, ND and East Grand Forks, MN**

Hayley Qualley<sup>2</sup>, Krista Riensche<sup>3</sup>, Jecelle Fetzer<sup>4</sup>, Makaila Martin<sup>5</sup>, Shea McGuinness<sup>4</sup>; <sup>1</sup>Jona Pedersen, <sup>6</sup>Sabra Poitra, <sup>4</sup>Bryann Rainbow, <sup>1</sup>Rebecca Simmons  
<sup>1</sup>University of North Dakota; <sup>2</sup>Northwestern College; <sup>3</sup>Northeastern Junior College; <sup>4</sup>Neuta Hidatsa Sahnish College; <sup>5</sup>Montana State University; <sup>6</sup>Cankdeska Cikana Community College

**Western Honey Bees in North Dakota**

Bryann Rainbow<sup>1</sup>, Krista Riensche<sup>2</sup>, Makaila Martin<sup>1</sup>, Hayley Qualley<sup>3</sup>, Rebecca Simmons<sup>3</sup>  
<sup>1</sup>Neuta Hidatsa Sahnish College, North Dakota; <sup>2</sup>Northwestern College; <sup>3</sup>Department of Biology, University of North Dakota

**Solitary Bee and Hoverfly Community Structure in Western North Dakota and Eastern Minnesota.**

Krista Riensche<sup>1</sup>, Jecelle Fetzer<sup>2</sup>, Makaila Martin<sup>3</sup>, Shea McGuinness<sup>4</sup>, Jona Pedersen<sup>5</sup>, Sabra Poitra<sup>6</sup>, Hayley Qualley, Bryann Rainbow<sup>3</sup>, Rebecca Simmons<sup>5</sup>  
<sup>1</sup>Northwestern College, <sup>2</sup>Northeastern Junior College, <sup>3</sup>Neuta Hidatsa Sahnish College, <sup>4</sup>Montana State University, <sup>5</sup>University of North Dakota, <sup>6</sup>Cankdeska Cikana Community College

### **Restraint Model Leads to the Study of Neurogenesis and Psychiatric Treatments**

*Alexis Rodriguez<sup>1</sup>, Jason Power<sup>1</sup>, Sophia Barber<sup>2</sup>, Melemoala Tuifua<sup>3</sup>, Van Doze<sup>1</sup>*

*<sup>1</sup>Department of Biomedical Sciences, University of North Dakota School of Medicine & Health Sciences, Grand Forks, ND; <sup>2</sup>University of California San Diego, San Diego, CA; <sup>3</sup>El Camino College, Torrance, CA*

### **Building the Path to Early Alzheimer's Prediction Using Machine Learning**

*Kincaid Rowbotham, Ling Li, Xusheng Wang*

*Department of Biology, University of North Dakota*

### **Mutation of Inner Loop Residue T276 of the Serotonin Transporter Does Not Alter MDMA Substrate Recognition Properties of Outer Gate Residue E493 Arguing Against Domain Cooperativity**

*Khondker Salim<sup>†</sup>, Grace Rerick<sup>‡</sup>, Madhur Shetty<sup>‡</sup>, Evan Walter<sup>‡</sup>, and Keith Henry<sup>‡</sup>*

*<sup>†</sup>Department of Biosciences, Rice University, Houston, TX*

*<sup>‡</sup>Department of Biomedical Sciences, University of North Dakota School of Medicine and Health Sciences*

### **Analysis of KRT16, PRDM1, AND PERP Gene Expression During Long-Term Arsenite-Transformation of the UROtsa Cell Line**

*Paige Sannes, Aaron Mehus, Matthew Kalonick, Peter Knutson, Swojani Shrestha, Seema Somji, Scott Garrett*

*Department of Pathology, University of North Dakota School of Medicine and Health Sciences, Grand Forks, ND*

### **Myoepithelial and EMT marker expression in HRPRT cells in the presence of Arsenite**

*Tyrell J. Schloesser, Matthew J. Kalonick, Donald A. Sens, Scott H. Garrett, Seema Somji, Swojani Shrestha*

*Department of Pathology, University of North Dakota School of Medicine & Health Sciences*

### **Effect of Chronic Arsenite Exposure to SOX2, CDH1, and CNFN**

*Evan Szczepanski, Peter Knutson, Matthew Kalonick, Aaron Mehus, Seema Somji*

*Department of Pathology, University of North Dakota School of Medicine & Health Sciences, Grand Forks, ND*

### **Agent Based Model Visualizing the Spread of CWD among Deer Ppopulations.**

*<sup>1</sup>John Sullivan, <sup>2</sup>Brian Darby,*

*<sup>1</sup>Williston State College; <sup>2</sup>Department of Biology, University of North Dakota*

### **Using a forced restraint mouse model to study the role of $\alpha_{1A}$ -adrenergic receptors in major depression**

*Melemoala Tuifua<sup>1</sup>, Sophia Barber<sup>2</sup>, Alexis Rodriguez<sup>3</sup>, Jason Power<sup>4</sup>, Van Doze<sup>4</sup>*

*<sup>1</sup>Division of Natural Sciences, El Camino College, Torrance, CA <sup>2</sup>Division of Biological Sciences, University of California, San Diego, San Diego, CA <sup>3</sup>Division of Biological Sciences, University of North Dakota, Grand Forks, ND <sup>4</sup>Department of Biomedical Sciences, University of North Dakota School of Medicine and Health Sciences, Grand Forks, ND*

### **Epithelial Mesenchymal Transition Marker Expression and Localization in Chronic Glucose Exposed Cells**

*Erin Walcker, Peter Knutson, Matthew Kalonick, Swojani Shrestha, Scott Garrett, Donald Sens*

*Department of Pathology, University of North Dakota School of Medicine and Health Sciences*

**P53, CDKN1A, STEAP3, CASP10 Gene expressions at basal level in CD133<sup>+</sup>/CD24<sup>+</sup> and CD133<sup>-</sup>/CD24<sup>+</sup> from the RPTEC/TERT1 cell line**

*Shealynn Wells<sup>1</sup>, Matthew Kalonick<sup>1</sup>, Peter Knutson<sup>1</sup>, Swojani Shrestha<sup>1</sup>, Aaron Mehus<sup>1</sup>, Brent Voels<sup>2</sup>, Seema Somji<sup>1</sup>, Scott Garrett<sup>1</sup>*

*<sup>1</sup>Department of Pathology, University of North Dakota School of Medicine & Health Sciences; <sup>2</sup>Candesksa Cikana Community College*

**Genetic Analysis of Chronic Wasting Disease in North Dakota Deer**

*<sup>1</sup>Theresa Wood, <sup>2</sup>Laura Young, <sup>2</sup>Brian Darby*

*<sup>1</sup>Benedictine College, Kansas; <sup>2</sup>Department of Biology, University of North Dakota*

**North Dakota State University**

**Evaluating heart rate variability for identifying and mitigating poor welfare outcomes in group-housed sows**

*Makenzie Melby<sup>1</sup>, Chris Byrd<sup>2</sup>*

*<sup>1</sup>University of California, Davis; <sup>2</sup>Animal Sciences, North Dakota State University*

**Blood Parasites in Red-Winged Blackbird nestlings: Can its presence influence nestling growth?**

*Miliann Mojica Algaran<sup>1</sup>, Time Greives<sup>2</sup>*

*<sup>1</sup>Interamerican University of Puerto Rico, Metropolitan Campus; <sup>2</sup>Biological Sciences, North Dakota State University*

**Investigating perivascular cell phenotype changing under the influence of cancer cells**

*Maryam Al-Kaabi, Isabel Kallmeyer, Jiha Kim*

*Biological Sciences, North Dakota State University*

**Synthesis and characterization of nanoclay based scaffolds for bone tissue regeneration**

*Audrey Moffat<sup>1</sup>, Mikaelah Brinkerhoff<sup>1</sup>, Dinesh Katti<sup>2</sup>*

*<sup>1</sup>University of Michigan, Dearborn; <sup>2</sup>Biomedical Engineering, North Dakota State University*

**Synthesis of All-Carbon Quaternary Chiral Centers via Michael- Initiated Cyclopropanation**

*Norbert Weijenberg<sup>1</sup>, Mukund Sibi<sup>2</sup>*

*<sup>1</sup>Nebraska Wesleyan University; <sup>2</sup>Chemistry and Biochemistry, North Dakota State University*

**Gene Editing using CRISPR-Cas9 to Study Gene Function**

*Joshua Weiss<sup>1</sup>, Haring Stuart<sup>2</sup>*

*<sup>1</sup>Saint Michael's College; <sup>2</sup>Chemistry and Biochemistry, North Dakota State University*

**3-D Anatomical Reconstruction of Human Heart Using Patient-specific Data**

*Hailey Pratt<sup>1</sup>, Trung Le<sup>2</sup>*

*<sup>1</sup>Colorado Mesa University; <sup>2</sup>Biomedical Engineering, North Dakota State University*

**Identification of a plant-based compound to inhibit breast cancer progression at bone metastasis**

*Tram Huynh<sup>1</sup>, Ambarish Rao<sup>2</sup>, Kalpana Katti<sup>3</sup>*

*<sup>1</sup>University of Miami; <sup>2</sup>Michigan Technological University; <sup>3</sup>Biomedical Engineering, North Dakota State University*

### **Smart “PIG” (robotics) for Detecting Internal Damage and Environment Inside Pipes**

*Philip Senat<sup>1</sup>, An Khanh Tran<sup>2</sup>, Ying Huang<sup>3</sup>*

<sup>1</sup>Norwalk Community College; <sup>2</sup>Illinois Wesleyan University; <sup>3</sup>Civil and Environmental Engineering, North Dakota State University

### **Effects of Nano-Sheet Orientation and Morphology on the Thermo-mechanical Behaviors of Polymer Nanocomposites for Engineered Tissue Scaffold**

*Katherine Liberman<sup>1</sup>, Oriana Molares<sup>2</sup>, Wenjie Xia<sup>3</sup>, Dali Sun<sup>3</sup>*

<sup>1</sup>Michigan Technological University; <sup>2</sup>University of Florida; <sup>3</sup>Biomedical Engineering, North Dakota State University

### **Mapping Slope Failures in North Dakota**

*Mohammed Mohammed<sup>1</sup>, Ty Johnson<sup>2</sup>, Beena Ajmera<sup>1</sup>, Aaron Daigh<sup>1</sup>*

<sup>1</sup>Civil Engineering and Soil Science, North Dakota State University; <sup>2</sup>University of Illinois Urbana-Champaign

### **Classification of Breast Cancer RNA-Sequence Data Set using Machine Learning and Evolutionary Computation Methods**

*Mitchell Borders, Simone Ludwig*

Department of Computer Science, North Dakota State University

### **Analysis of Gene Expression Cancer Data Set using Machine Learning Methods**

*Yusaku Nitta<sup>1</sup>, Simone Ludwig<sup>2</sup>*

<sup>1</sup>Soka University of America; <sup>2</sup>Department of Computer Science, North Dakota State University

### **Authentication in cross-device interaction**

*Jake Leight<sup>1</sup>, Jun Kong<sup>2</sup>*

<sup>1</sup>Briar Cliff University; <sup>2</sup>Department of Computer Science, North Dakota State University

### **IoT device for the monitoring and diagnosis of Obstructive Sleep Apnea in Cancer Patients under Treatment**

*Noah Jackson<sup>1</sup>, Adeoye Olomodosi<sup>2</sup>, Trung Le<sup>1</sup>*

<sup>1</sup>Biomedical Engineering, North Dakota State University; <sup>2</sup>Alcorn State University

### **Grow Your Own Home**

*Devin Elliott<sup>1</sup>, Matthew Doll<sup>2</sup>, Amiri Ali<sup>1</sup>, Chad Ulven<sup>1</sup>*

<sup>1</sup>Department of Mechanical Engineering, North Dakota State University; <sup>2</sup>University of Michigan-Dearborn

### **Nanomechanical Characterization of Linin Flax Fibers**

*Antonio Maldonado<sup>1</sup>, Xinnan Wang<sup>2</sup>*

<sup>1</sup>Dordt University; <sup>2</sup>Department of Mechanical Engineering, North Dakota State University

### **Agricultural Microbiomes of North Dakota: linking microbial communities to soil health and crop production**

*Aiden Moser<sup>1</sup>, Luis Pastoriza<sup>2</sup>, Samiran Banerjee<sup>3</sup>, John McEvoy<sup>3</sup>, Abbey Wick<sup>3</sup>*

<sup>1</sup>University of New Hampshire; <sup>2</sup>University of Puerto Rico-Arecibo, <sup>3</sup>Microbiological Sciences, North Dakota State University



**Engineering microbiomes through broad range conjugation**

Yumi Cho<sup>1</sup>, Marisa Bennett<sup>2</sup>, Glenn Dorsam<sup>3</sup>, Barney Geddes<sup>3</sup>

<sup>1</sup>New York University; <sup>2</sup>Arizona State University, <sup>3</sup>Microbiological Sciences, North Dakota State University

**Biotechnological intervention to augment the regeneration potential of the kidney**

Grace Geffre<sup>1</sup>, Emerson Woodbury<sup>2</sup>, Sean Kelleher<sup>3</sup>, Sijo Mathew<sup>4</sup>

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**Biotechnological production and characterization of full-size anti-RAGE IgG antibodies and fluorescent labeled anti-mouse nanobodies**

Madison King<sup>1</sup>, Audrey Hayes<sup>2</sup>, Estelle Leclerc<sup>1</sup>, Stefan Vetter<sup>1</sup>

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**Role of Estrogen and its Metabolites in Asthma**

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**Apelin Receptor Expression in Human Airway Smooth Muscle Cells**

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**Reversal of Aging-Associated Myelopoietic Bias by Angiotensin-(1-7)**

Hope Weyrick<sup>1</sup>, Yagna P Jarajapu<sup>2</sup>

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**Altered Renin Angiotensin System in the Aging Mouse Gut**

Swedha Rajaram, Yagna P Jarajapu<sup>2</sup>

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**Genotyping Alarmins in the Aging Bone Marrow Mononuclear Cells: Effect of Angiotensin-(1-7)**

Bailey Winkle<sup>1</sup>, Yagna P Jarajapu<sup>2</sup>

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**Changes in Crop Residue Morphology During Decomposition**

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**Effects of Low Soil pH on Soybean Root Morphology**

Hannah Zantow<sup>1</sup>, Larry Cihace<sup>2</sup>

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**Detecting the Hidden: Using High Throughput Sequencing and Metabarcoding to Characterize the Fungi that Live in Coffee and Its Relatives**

Leah Farmer<sup>1</sup>, Laura Aldrich-Wolfe<sup>2</sup>

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**Electrical and Computer Engineering: Emerging Memory Circuit and System Analysis**  
*Christopher Parks, Sumitha George*  
*Electrical and Computer Engineering, North Dakota State University*