

Future Interdisciplinary Research Explorations (FIRE)
College of ACES Office of Research - Seed Grant Awards

Title	Principle Investigator(s)	Collaborators	Funding Cycle
More than the sum of its parts: Diversifying Midwest agriculture systems by developing Intercropping Breeding Strategies to improve forage quality in grass-legume mixtures	Juan Arbelaez Assistant Professor, CPSC	Daniel Shike, ANSCI Carmen Ugarte, NRES Milcah Kigoni, CPSC Raysa Gevartosky, CPSC Lucas Munaro, CPSC Timothy Miles, UIUC Energy Farm	FY2024-2025: \$60,000
Elucidating the Spatial Regulation of Glucose Metabolism in the Uterine Decidua	Matthew Dean Assistant Professor, ANSCI	Indrani Bagchi, VetMed Zeynep Madak-Erdogan, FSHN David Zhao, Statistics	FY2024-2025: \$60,000
Sperm Binding to Glycans in the Storage Reservoir as a Mechanism of Reproductive Isolation	David Miller, Professor, ANSCI	Mark Hauber, SIB Al Roca, ANSCI Gustavo Caetano-Anolles, CPSC Jason Herrick, Omaha Henry Doorly Zoo and Aquarium Carlo Unverzagt, Univ. of Bayreuth	FY2024-2025: \$60,000
Efficacy of DNA-clamp nanostructure to inhibit influenza A virus infection	Andrew Steelman Associate Professor, ANSCI	Xing Wang, Bioengineering	FY2024-2025: \$60,000

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Multiscale Modeling and Experimental Validation for Improved Flavor Generation and Retention During Baking of Foods	Pawan Takar Professor, FSHN		FY2024-2025: \$60,000
Targeting humanitarian assistance for forcibly displaced populations: New frontier methods using machine learning and geospatial analysis	Angela Lyons Associate Professor, ACE	Josephine Kass-Hanna, St. Joseph University of Beirut, Lebanon Aiman Soliman, NCSA Yifang Zhang, NCSA Alejandro Montoya Castano, PhD Student, ACE	FY2023-2024: \$60,000
Proteomic analysis of tame and aggressive behavior during aging	Anna Kukekova Associate Professor, ANSCI	Jeffrey N. Savas, Assistant Professor Neurology, Medicine, and Pharmacology, Feinberg School of Medicine, Northwestern University	FY2023-2024: \$60,000
Development and characterization of a mouse model to study HIV-mediated cardiovascular disease	Jaime Amengual Assistant Professor, FSHN	Joan W Berman, Professor, Albert Einstein School of Medicine David J Volsky, Professor, Icahn School of Medicine Amparo Blanco, PhD Student, DNS	FY2023-2024: \$60,000
Invasion of Services: Impacts of fire and grass invasions on forest ecosystem services	Jennifer Fraterrigo Professor, NRES	Mark Lara, Assistant Professor, Department of Plant Biology Andrew Margenot, Assistant Professor, CPSC	FY2023-2024: \$59,962

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Building a Community-Based Approach to Understanding and Improving the Food Practices of People who Live Alone	Merin Oleschuk Assistant Professor, FSHN	Melissa Pflugh Prescott, Assistant Professor, FSHN Melissa Ocepek, Assistant Professor, ISI Brenna Ellison, Associate Professor, Purdue	FY2023-2024: \$59,847
Early detection of chicken egg fertility in ovo using optical sensing and machine learning	Mohammed Kamruzzaman Assistant Professor, ABE	Jason Emmert, Professor, ANSCI Ryan Dilger, Professor, ANSCI Girish Chowdhary, Associate Professor, ABE	FY2023-2024: \$60,000
A novel, non-invasive method to identify biomarkers of ovarian cancer	Romana Nowak Professor, ANSCI	Brian Cunningham, Professor, ECE	FY2023-2024: \$57,141
Targeting Tumor Metabolic Heterogeneity Using Dietary Interventions to Improve Therapy Response in Metastatic Breast Tumor	Zeynep Madak-Erdogan, Associate Professor, FSHN	Rohit Bhargava, Professor, Bioengineering	FY2022-2023: \$60,000
Using Food Waste-derived Products to Fabricate Triboelectric Devices for Energy Harvesting and Biomechanical Monitoring	Yi-Cheng Wang, Assistant Professor, FSHN	Wei Zheng, Principal Research Scientist, ISTC; Manuel Enrique Hernandez, Assistant Professor, AHS	FY2022-2023: \$60,000
I-SEEDS: Illinois System for Electronic Estrus Detection and Stimulation	Isabella Cardoso Ferreira S Condotta, Assistant Professor, ANSCI	Robert V. Knox, Professor, ANSCI; Matthew Caesar, Associate Professor, CS	FY2022-2023: \$60,000

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Demand for Genetic Traits on US Dairy Farms and their Implications for Profitability and Sustainability	Jared Hutchins , Assistant Professor, ACE	Derek Nolan, Teaching Assistant Professor and Extension Faculty Specialist, ANSCI; Phil Cardoso, Associate Professor, ANSCI; Courtney Hayes, AACUP Veterinarian, AACUP UIUC	FY2022-2023: \$60,000
Integrating Narratives of Engagement Between People and Birds to Support Environmental Stewardship	Carena Van Riper , Associate Professor, NRES	Mark Hauber, Professor, Evolution, Ecology, and Behavior; Riley Andrade, Post-doctoral Research Associate, NRES; Susannah Lerman, Research Ecologist, USFS; Devin Goodson, MS student, NRES	FY2022-2023: \$59,977
Genetically Constrained Deep Reinforcement, GenCoR Learning and Multi-trait Analysis to Reveal Genotype-to-phenotype Relationships from High-throughput Phenotyping without Training Data	Alex Lipka , Assistant Professor, CPSC	Mohammed El-Kebir, CS; Oluwasanmi O. Koyejo, CS; Andrew Leakey, Plant Biology, CPSC	FY2021-2022: \$59,848
Predicting Cooperative Degradation of Complex Substrates in Synthetic Rumen Communities	Josh McCann , Assistant Professor, ANSCI	Tin Lu, Bioengineering; Roderick Mackie, ANSC; Christopher Fields, High Performance Computing in Biology	FY2021-2022: \$60,000
Tailoring Intervention Strategies to Support College-Going in Rural Illinois High School Contexts	Jasmine Collins , Assistant Professor, ALEC	Marci Rockey, CCRR; Matt Giani, UT Austin	FY2021-2022: \$49,488

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Hydroponic production of safe lettuce using treated wastewater	Paul Davidson , Associate Professor, ABE	Yuanhui Zhang, ABE; Andrew Margenot, CPSC; Michael Stablein, ABE	FY2021-2022: \$60,000
Advancing Sustainable Agriculture: An Integrative Airborne-satellite Framework to Monitor Crop Nitrogen Status in the U.S. Corn Belt	Kaiyu Guan , Assistant Professor, NRES	Elizabeth Ainsworth, Plant Biology, CPSC; Sheng Wang, iSEE; Alexander Schwing, ECE; Christopher Harbourt, ABE	FY2021-2022: \$60,000
Probabilistic assessment of adequacy and development of nutrient load reduction goals under a changing climate	Rabin Bhattarai , Assistant Professor, ABE	Trent Ford, ISWS; Momcilo Markus, ISWS; Elia Getahun, ISWS; Laura Keefer, ISWS	FY2021-2022: \$59,685
Lifestyle strategies to reduce disease pathogenesis of SARS-CoV	Andrew Steelman , Assistant Professor, ANSCI	Jeff Woods, AHS	FY2021-2022: \$60,000
The Role of Bradyrhizobium in N Cycling and Sustainability of Miscanthus	Angela Kent , Professor, NRES	Di Lang, IGB; Wendy Yang, Plant Biology; Zhongjie Yu, NRES	FY2021-2022: \$59,620
Fighting fire with FIRE: Exploiting Corn Rootworm Attraction to Manipulate Pest Behavior	Nicholas Seiter , Assistant Professor, CPSC	Esther Ngumbi, Entomology; Sarah Hind, CPSC; Joseph Spencer, INHS	FY2021-2022: \$58,057
Machine Learning Methods for Conservation Policy	Kathy Baylis , Associate Professor, ACE	Daniel Miller, NRES; Robert Brunner, Physics; Jana Diesner, iSchool	FY2020-21: \$59,971
Signals in the Soils and Signals Through the Soils	Andrew Margenot , Assistant Professor, CPSC	Andrew Singer, COE; Chowdhary, ABE; Tugce Baser, CEE; Youssef Hashash, CEE	FY2020-21: \$60,000
Cholesterol Metabolism and Systemic Inflammatory Responses	Daniel McKim , Assistant Professor, ANSCI	Andrew Steelman, ANSC; Gee Lau, VetMed; Aditi Das, VetMed	FY2020-21: \$60,000

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The Microbial and Metabolic Impact of Walnut Consumption in Adults with Obesity	Hannah Holscher , Assistant Professor, FSHN	Nicholas Burd, AHS; Jason Ridlon, ANSC; Sharon Thompson, DNS	FY2020-21: \$60,000
Utilization of the Gnotobiotic Porcine Model to Settle an Endocrine Controversy: Are Gut Bugs a Major Source of 11-oxy-androgens?	Jason Ridlon , Assistant Professor, ANSCI	Sharon Donovan, FSHN; Andrew Steelman, ANSC	FY2020-21: \$60,000
Machine Learning Approaches to Characterizing Normative Variation in Early Caregiving Processes and Links to Toddler Brain Development	Nancy McElwain , Assistant Professor, HDFS	Mark Hasegawa-Johnson, ECE; Romit Roy Choudhury, ECE; David Hyde, Psychology	FY2020-21: \$59,946
Examining the impact of parental leave decisions on parents' career and family outcomes: A mixed-method, cross-cultural study	Karen Kramer , Assistant Professor, HDFS	Eunmi Mun, Sociology; Teresa Cardador, School of Labor and Employment Relations	FY2019-20: \$60,000
Relating soil copper accumulation to copper resistant pathogens in high-value Illinois agriculture	Sarah Refi Hind , Assistant Professor, CPSC	Andrew Margenot, CPSC; Mohammad Babadoost, CPSC; Elizabeth Wahle, U of I Extension; Catherine J. Murphy, Chemistry	FY2019-20: \$60,000
Genetic and epigenetic contributions to child health outcomes in the STRONG Kids 2 cohort	Margarita Terán García , Assistant Research Professor, HDFS	Sharon Donovan, FSHN; Naiman Kahn, Kinesiology and Community Health, DNS; Kelly Bost, HDFS; Barbara Fiese, HDFS, Family Resiliency Center; Salma Musaad, Interdisciplinary Health Sciences Initiative, Family Resiliency Center; Yuan-Xiang Pan, FSHN, DNS	FY2019-20: \$60,000

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Geospatial toxicology to understand and reduce rural liver cancer disparities	Zeynep Madak-Erdogan , Associate Professor, FSHN	Luidmila Sergeevna Mainzer, NCSA; Jong Sung Lee, NCSA; Nohra Mateus-Pinilla, INHS; Hongbo Shao (ISGS); Martin Pentrak, ISGS	FY2019-20: \$60,000
Comparative connectome of the soybean cyst nematode and establishment of an online anatomical atlas	Nathan Schroeder , Assistant Professor, CPSC	Lav Varshney, Electrical and Computer Engineering; David Hall, Albert Einstein College of Med.	FY2019-20: \$60,000
Comparative transcriptomic approach to identify genes involved in sperm storage and fertility in females	David Miller , Professor, ANSCI	Derek Wildman, IGB; Gene Robinson, IGB	FY2019-20: \$60,000
Advancing methods to identify behavioral signatures of relationship health in older adult couples	Brian Ogolsky , Associate Professor, HDFS	Shannon Mejía, Kinesiology and Community Health; Alexandra Chronopoulou, Industrial and Enterprise Systems Engineering; Helmut Strey, Stony Brook Univ., NY	FY2019-20: \$60,000
Biosecurity, environmental and agronomic assessment of biochar use in animal mortality composting	Neslihan Akdeniz Onuki , Clinical Assistant Professor, ABE	Paul Curtis Davidson, ABE; Maria Bonita Villamil, CPSC	FY2019-20: \$60,000
Enhancing agro-ecosystem services using integrated hydro-ecologic and socio-cultural analytics	Maria Chu , Assistant Professor, ABE	Carena van Riper, NRES	FY2018-19: \$60,000
Identifying Agriculturally Relevant Climate Shocks and Their Effect on Civil Conflict	Benjamin Crost , Assistant Professor, ACE	Kathy Baylis, ACE; Kaiyu Guan, NRES	FY2018-19: \$50,400

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Obesity-induced epigenetic modification of stem cells and abnormal tissue function in pigs	Megan Dailey , Assistant Professor, ANSCI	Larry Schook, ANSC; Brendan Harley, Chemical & Biomolecular Engineering	FY2018-19: \$60,000
Global Virtual Water Trade: Unraveling complexity in the international food-water nexus, identifying impacts of climate change, and evaluating opportunities to save domestic water resources	Sandy Dall'Erba , Associate Professor, ACE	Francina Dominguez, Atmospheric Sciences; Megan Konar, Civil & Environmental Engineering	FY2018-19: \$60,000
A bioengineered host-microbe platform and multi-omic approach to define microbial metabolic pathways that generate genotoxic hydrogen sulfide from sulfur amino acids	Rex Gaskins , Professor, ANSCI	Paul Kenis, Chemical & Biomolecular Engineering; Jason Ridlon, ANSC	FY2018-19: \$60,000
Fate, transport, and prevalence of <i>Cyclospora</i> in a natural environment	Paul Davidson , Assistant Professor, ABE	Michelle Green, ANSC, Illinois Natural History Survey; William Witola, Pathobiology, VetMed	FY2017-18: \$58,800
Soybean hulls as a sustainable, functional, and economical ingredient in monogastric feeding systems: A comparative approach	Maria de Godoy , Assistant Professor, ANSCI	Hans Stein, ANSC; Carl Parsons, ANSC; Peter Goldsmith, ACE; Sajid Alavi, Kansas State Univ.	FY2017-18: \$60,000
Whole exome sequencing of uterine leiomyomas	Matthew Hudson , Professor, CPSC	Romana Nowak, ANSC	FY2017-18: \$57,700
Understanding cancer disparities using integrative -omics approaches	Zeynep Madak-Erdogan , Assistant Professor, FSHN	Jodi Flaws, Comparative Biosciences, VetMed; Rebecca Smith, Pathobiology, VetMed	FY2017-18: \$60,000

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Maternal Speech Prosody and the Development of Young Children's Stress Regulation across Brain, Body, and Behavior	Nancy McElwain , Associate Professor, HDFS	Jennifer S. Cole, Linguistics, LAS; Daniel Berry, Educational Psychology, College of Education; Brad Sutton, Bioengineering; Ryan Larsen, Biomedical Imaging Center, Beckman	FY2017-18: \$60,000
The role of <i>Clostridium paraputrificum</i> in antibiotic-induced inactivation of oral contraceptives	Jason Ridlon , Assistant Professor, ANSCI	Derek Wildman, Molecular & Integrative Physiology; Michael Miller, FSHN	FY2017-18: \$57,600
Novel bioengineering approaches for defining pathological mechanisms underlying renal fibrosis	Rex Gaskins , Professor, ANSCI	Hyunjoon, Joon Kong, Chemical & Biomolecular Engineering; Amelia Bartholomew, UIUC	FY2015-16: \$50,000
Sodium reduction in snack foods via optimized microstructural design of sodium delivery system	Youngsoo Lee , Assistant Professor, FSHN	Pawan Takhar, FSHN; Scott Robinson, Beckman Institute; Jan Ilavsky, Argonne National Laboratory; Soo-Yeun Lee, FSHN	FY2015-16: \$49,500
Restoring for the future: Expected outcomes of wetland restoration in the context of regional precipitation change scenarios	Jeffrey Matthews , Assistant Professor, NRES	Rabin Bhattarai, ABE; Geoffrey Pociask, Illinois State Geological Survey	FY2015-16: \$33,000
The Impact of Access to Marriage on the Daily Lives of Same-Sex Couples	Brian Ogolsky , Assistant Professor, HDFS	Robin Fretwell Wilson, College of Law; Ramona Faith Oswald, HDFS	FY2015-16: \$45,600
Discovering Dietary Predictors of Success in Fecal Microbiota Transplant, FMT Patients	Kelly Swanson , Professor, ANSCI	Hannah Holscher, ANSC; John Farrell, College of Medicine at Peoria	FY2015-16: \$50,000

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Personality and Financial Behavior	Yilan Xu , Assistant Professor, ACE	Brent Roberts, Psychology; Jeffrey Brown, Finance	FY2015-16: \$34,500
Development of a high throughput analysis platform to enable virulence evolution studies in field populations of virus---infected soybean cyst nematodes	Kaustabh Bhalerao , Associate Professor,	Kris Lambert, CPSC	FY2014-15: \$50,000
A model system for the disruption of one carbon metabolism and the subsequent effects of creatine deficiency on skeletal muscle strength and cognitive function	Timothy Garrow , Professor, FSHN	Kenneth Wilund, Department of Kinesiology and Community Health, College of Applied Health Sciences; Joshua Gulley, Psychology	FY2014-15: \$50,000
Developing a methodology for a participatory plant selection and breeding program for sustainable urban agriculture	Sarah Taylor Lovell , Assistant Professor, CPSC	John Taylor, CPSC; Jack Juvik, CPSC; Robin Jarrett, HDFS; Sam Wortman, CPSC	FY2014-15: \$50,000
The Role of Maternal Prosody in Young Children’s Physiological and Behavioral Regulation Under Low- and High-Stress Conditions	Nancy McElwain , Associate Professor, HDFS	Jennifer S. Cole, Linguistics, LAS; Daniel Berry, Educational Psychology, College of Education	FY2014-15: \$48,122
Zein nanofabricated structures for entrapment and retrieval of circulating cancer cells	Graciela Padua , Research Professor, FSHN	Logan Liu, Electrical and Computer Engineering	FY2014-15: \$49,853
The role of genetic polymorphisms of toll- like receptor genes in dairy goat mastitis	Alfred Roca , Associate Professor, ANSCI	Gila Kahila Bar-Gal, HUJ, Israel; Phil Cardoso, ANSC; Juan Loor, ANSC; Nikolas Nikolaidis, Calif. State University at Fullerton	FY2014-15: \$50,000

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From worm to rat: investigating the role of proprotein convertases in visceral afferent neuroplasticity	Nathan Schroeder , Assistant Professor, CPSC; Megan Dailey , Assistant Professor, ANSCI	Terry Powley, Purdue University	FY2014-15: \$50,000
Efficacy of nutritional labeling and its contributions to sensory acceptability and food choice	Soo-Yeun Lee , Associate Professor, FSHN	Brenna Ellison, ACE; Youngsoo Lee, FSHN; Brittany Duff, Advertising- College of Media; Alejandro Lleras, Psychology	FY2014-15: \$40,000
The effect of maternal stress on the immune system and the gastrointestinal microbiome for idiopathic preterm labor.	Brian Ogolsky , Assistant Professor, HDFS	Andrea Braundmeier-Fleming, ANSC; Bryan White, ANSC; Alan Peaceman, Northwestern University	FY2014: \$30,000
Targeted Delivery of Anti-Inflammatory Prodrugs to Adipose Macrophages for Preventative Treatment of Obesity- Induced Insulin Resistance	Kelly Swanson , Associate Professor, ANSCI	Andrew Smith, Bioengineering; Matthew Wallig, VetMed	FY2014-15: \$40,000
Using On-farm Experimentation with Precision Agriculture Technology to Improve Fertilization	David Bullock , Professor, ACE	Donald Bullock, CPSC; Tony Grift, ABE; Luis Rodriguez, ABE	FY2013-14: \$40,000
High throughput crop phenotyping through remote sensing	Brian Diers , Professor, CPSC	Lei Tian, ABE; Fred Kolb, CPSC; Jack Juvik, CPSC; Randy Nelson, CPSC, USDA-ARS	FY2013-14: \$27,732
Foreclosure as a natural experiment to quantify effects of residual landscape on carbon storage and identify controls on the outcome of potential urban sustainability initiatives	Jennifer Fraterrigo , Assistant Professor, NRES	Bethany Cutts, NRES; Jonathan Greenberg, Geography and Geographic Information Science	FY2013-14: \$31,451

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Phenotyping Technology to Accelerate Crop Cultivar Development	Tony Grift , Associate Professor, ABE	Martin Bohn, CPSC; Pat Brown, CPSC; Erik Sacks, CPSC; Geir Dullerud, Mechanical Sciences & Engineering; David Forsyth, Computer Science	FY2013: \$14,940
Forest Fragmentation, Wildlife Habitat Use, and the Geographic Expansion of Lyme Disease	James R. Miller , Associate Professor, NRES	Brian F. Allan, Entomology	FY2013-14: \$38,973
Illinois-Building Research Interactions to Distinguish Genetic and Environmental Factors	Margarita Teran-Garcia , Assistant Professor, FSHN; Angela Wiley , Associate Professor, HDFS	Marcela Raffaelli, HDFS; Flavia Andrade, Kinesiology & Community Health; Celia Aradillas-Garcia, UASLP, Mexico; Omar Sanchez-Armass, UASLP, Mexico	FY2013-14: \$40,000

ABE = Agricultural and Bioengineering; ACE = Agricultural and Consumer Economics; ALEC = Agricultural Leadership, Education, and Communications; ANSCI = Animal Sciences; CPSC = Crop Sciences; FSHN = Food Science and Human Nutrition; HDFS = Human Development and Family Studies; NRES = Natural Resources and Environmental Sciences