

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

Title	Principle Investigator(s)	Collaborators	Funding Cycle
Nanotechnology-enabled delivery of fungicide to control red crown rot of soybeans	<b>Boris Camiletti, CPSC</b>	Catherine Murphy, Chemistry; Andrew Margenot, CPSC	FY2025-2026; \$60,000
Unearthing Health Inequalities: An Interdisciplinary Exploration of Urban Soil Microbiome Virulence and Antibiotic Resistance in Chicago, Illinois	<b>Angela Kent, NRES</b>	Andrew Margenot, CPSC; Marynia Kolak, School of Earth, Society, and Environment; Pamela Martinez, Microbiology; Cierra Raglin, IGB	FY2025-2026; \$60,000
Developing machine learning-assisted triboelectric sensors for liquids	<b>Yi-Cheng Wang, FSHN</b>	Shirui Luo, NCSA	FY2025-2026; \$60,000
Enhancing Soybean Nutritional Quality: Genetic Diversity and Environmental Modeling for Optimizing Amino Acid Profiles in Soybean Breeding Lines	<b>Eliana Monteverde Dominguez, CPSC</b>	Nicolas Martin, CPSC; Amit Rai, CPSC, Claudia Asensio, FSHN	FY2025-2026; \$59,816
More than the sum of its parts: Diversifying Midwest agriculture systems by developing Intercropping Breeding Strategies to improve forage quality in grass-legume mixtures	<b>Juan Arbelaez, CPSC</b>	Daniel Shike, ANSCI; Carmen Ugarte, NRES; Milcah Kigoni, CPSC; Raysa Gevartosky, CPSC, Lucas Munaro, CPSC; Timothy Miles, UIUC Energy Farm	FY2024-2025: \$60,000

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Elucidating the Spatial Regulation of Glucose Metabolism in the Uterine Decidua	<b>Matthew Dean, ANSCI</b>	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	<b>David Miller, ANSCI</b>	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	<b>Andrew Steelman, ANSCI</b>	Xing Wang, Bioengineering	FY2024-2025: \$60,000
Multiscale Modeling and Experimental Validation for Improved Flavor Generation and Retention During Baking of Foods	<b>Pawan Takar, FSHN</b>	Keith Cadwallader, FSHN; Yuxiang Lui; Worcester Polytechnic Institute	FY2024-2025: \$60,000
Targeting humanitarian assistance for forcibly displaced populations: New frontier methods using machine learning and geospatial analysis	<b>Angela Lyons, ACE</b>	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	<b>Anna Kukekova, ANSCI</b>	Jeffrey N. Savas, Assistant Professor Neurology, Medicine, and Pharmacology, Feinberg School of Medicine, Northwestern University	FY2023-2024: \$60,000

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Development and characterization of a mouse model to study HIV-mediated cardiovascular disease	<b>Jaime Amengual, FSHN</b>	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	<b>Jennifer Fraterrigo, NRES</b>	Mark Lara, Plant Biology; Andrew Margenot, CPSC	FY2023-2024: \$59,962
Building a Community-Based Approach to Understanding and Improving the Food Practices of People who Live Alone	<b>Merin Oleschuk, HDFS</b>	Melissa Pflugh Prescott, FSHN; Melissa Ocepek, ISI; Brenna Ellison, Purdue	FY2023-2024: \$59,847
Early detection of chicken egg fertility in ovo using optical sensing and machine learning	<b>Mohammed Kamruzzaman, ABE</b>	Jason Emmert, ANSCI; Ryan Dilger, ANSCI; Girish Chowdhary, ABE	FY2023-2024: \$60,000
A novel, non-invasive method to identify biomarkers of ovarian cancer	<b>Romana Nowak, ANSCI</b>	Brian Cunningham, ECE	FY2023-2024: \$57,141
Targeting Tumor Metabolic Heterogeneity Using Dietary Interventions to Improve Therapy Response in Metastatic Breast Tumor	<b>Zeynep Madak-Erdogan, FSHN</b>	Rohit Bhargava, Bioengineering	FY2022-2023: \$60,000

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Using Food Waste-derived Products to Fabricate Triboelectric Devices for Energy Harvesting and Biomechanical Monitoring	<b>Yi-Cheng Wang, FSHN</b>	Wei Zheng, ISTC; Manuel Enrique Hernandez, AHS	FY2022-2023: \$60,000
I-SEEDS: Illinois System for Electronic Estrus Detection and Stimulation	<b>Isabella Cardoso Ferreira S Condotta ANSCI</b>	Robert Knox, ANSCI; Matthew Caesar, CS	FY2022-2023: \$60,000
Demand for Genetic Traits on US Dairy Farms and their Implications for Profitability and Sustainability	<b>Jared Hutchins, ACE</b>	Derek Nolan, ANSCI; Phil Cardoso, ANSCI; Courtney Hayes, AACUP UIUC	FY2022-2023: \$60,000
Integrating Narratives of Engagement Between People and Birds to Support Environmental Stewardship	<b>Carena Van Riper, NRES</b>	Mark Hauber, Evolution, Ecology, and Behavior; Riley Andrade, NRES; Susannah Lerman, USFS; Devin Goodson, 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	<b>Alex Lipka, CPSC</b>	Mohammed El-Kebir, CS; Oluwasanmi O. Koyejo, CS; Andrew Leakey, Plant Biology, CPSC	FY2021-2022: \$59,848

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Predicting Cooperative Degradation of Complex Substrates in Synthetic Rumen Communities	<b>Josh McCann, ANSCI</b>	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	<b>Jasmine Collins, ALEC</b>	Marci Rockey, CCRR; Matt Giani, UT Austin	FY2021-2022: \$49,488
Hydroponic production of safe lettuce using treated wastewater	<b>Paul Davidson, ABE</b>	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	<b>Kaiyu Guan, NRES</b>	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	<b>Rabin Bhattarai, ABE</b>	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	<b>Andrew Steelman, ANSCI</b>	Jeff Woods, AHS	FY2021-2022: \$60,000
The Role of Bradyrhizobium in N Cycling and Sustainability of Miscanthus	<b>Angela Kent, NRES</b>	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	<b>Nicholas Seiter, CPSC</b>	Esther Ngumbi, Entomology; Sarah Hind, CPSC; Joseph Spencer, INHS	FY2021-2022: \$58,057

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Machine Learning Methods for Conservation Policy	<b>Kathy Baylis, ACE</b>	Daniel Miller, NRES; Robert Brunner, Physics; Jana Diesner, iSchool	FY2020-21: \$59,971
Signals in the Soils and Signals Through the Soils	<b>Andrew Margenot, CPSC</b>	Andrew Singer, COE; Chowdhary, ABE; Tugce Baser, CEE; Youssef Hashash, CEE	FY2020-21: \$60,000
Cholesterol Metabolism and Systemic Inflammatory Responses	<b>Daniel McKim, ANSCI</b>	Andrew Steelman, ANSC; Gee Lau, VetMed; Aditi Das, VetMed	FY2020-21: \$60,000
The Microbial and Metabolic Impact of Walnut Consumption in Adults with Obesity	<b>Hannah Holscher, FSHN</b>	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?	<b>Jason Ridlon, ANSCI</b>	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	<b>Nancy McElwain, HDFS</b>	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	<b>Karen Kramer, HDFS</b>	Eunmi Mun, Sociology; Teresa Cardador, School of Labor and Employment Relations	FY2019-20: \$60,000

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Relating soil copper accumulation to copper resistant pathogens in high-value Illinois agriculture	<b>Sarah Refi Hind, CPSC</b>	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	<b>Margarita Terán García, HDFS</b>	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
Geospatial toxicology to understand and reduce rural liver cancer disparities	<b>Zeynep Madak-Erdogan, FSHN</b>	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	<b>Nathan Schroeder, CPSC</b>	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	<b>David Miller, ANSCI</b>	Derek Wildman, IGB; Gene Robinson, IGB	FY2019-20: \$60,000

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Advancing methods to identify behavioral signatures of relationship health in older adult couples	<b>Brian Ogolsky, HDFS</b>	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	<b>Neslihan Akdeniz Onuki, ABE</b>	Paul Curtis Davidson, ABE; Maria Bonita Villamil, CPSC	FY2019-20: \$60,000
Enhancing agro-ecosystem services using integrated hydro-ecologic and socio-cultural analytics	<b>Maria Chu, ABE</b>	Carena van Riper, NRES	FY2018-19: \$60,000
Identifying Agriculturally Relevant Climate Shocks and Their Effect on Civil Conflict	<b>Benjamin Crost, ACE</b>	Kathy Baylis, ACE; Kaiyu Guan, NRES	FY2018-19: \$50,400
Obesity-induced epigenetic modification of stem cells and abnormal tissue function in pigs	<b>Megan Dailey, ANSCI</b>	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	<b>Sandy Dall'Erba, ACE</b>	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	<b>Rex Gaskins, ANSCI</b>	Paul Kenis, Chemical & Biomolecular Engineering; Jason Ridlon, ANSC	FY2018-19: \$60,000



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Fate, transport, and prevalence of <i>Cyclospora</i> in a natural environment	<b>Paul Davidson, ABE</b>	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	<b>Maria de Godoy, ANSCI</b>	Hans Stein, ANSC; Carl Parsons, ANSC; Peter Goldsmith, ACE; Sajid Alavi, Kansas State Univ.	FY2017-18: \$60,000
Whole exome sequencing of uterine leiomyomas	<b>Matthew Hudson, CPSC</b>	Romana Nowak, ANSC	FY2017-18: \$57,700
Understanding cancer disparities using integrative -omics approaches	<b>Zeynep Madak-Erdogan, FSHN</b>	Jodi Flaws, Comparative Biosciences, VetMed; Rebecca Smith, Pathobiology, VetMed	FY2017-18: \$60,000
Maternal Speech Prosody and the Development of Young Children's Stress Regulation across Brain, Body, and Behavior	<b>Nancy McElwain, HDFS</b>	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	<b>Jason Ridlon, ANSCI</b>	Derek Wildman, Molecular & Integrative Physiology; Michael Miller, FSHN	FY2017-18: \$57,600
Novel bioengineering approaches for defining pathological mechanisms underlying renal fibrosis	<b>Rex Gaskins, ANSCI</b>	Hyunjoon, Joon Kong, Chemical & Biomolecular Engineering; Amelia Bartholomew, UIUC	FY2015-16: \$50,000

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Sodium reduction in snack foods via optimized microstructural design of sodium delivery system	<b>Youngsoo Lee, FSHN</b>	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	<b>Jeffrey Matthews, NRES</b>	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	<b>Brian Ogolsky, HDFS</b>	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	<b>Kelly Swanson, ANSCI</b>	Hannah Holscher, ANSC; John Farrell, College of Medicine at Peoria	FY2015-16: \$50,000
Personality and Financial Behavior	<b>Yilan Xu, ACE</b>	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	<b>Kaustabh Bhalerao, ABE</b>	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	<b>Timothy Garrow, FSHN</b>	Kenneth Wilund, Department of Kinesiology and Community Health, College of Applied Health Sciences; Joshua Gulley, Psychology	FY2014-15: \$50,000

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Developing a methodology for a participatory plant selection and breeding program for sustainable urban agriculture	<b>Sarah Taylor Lovell, CPSC</b>	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	<b>Nancy McElwain, HDFS</b>	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	<b>Graciela Padua, FSHN</b>	Logan Liu, Electrical and Computer Engineering	FY2014-15: \$49,853
The role of genetic polymorphisms of toll- like receptor genes in dairy goat mastitis	<b>Alfred Roca, ANSCI</b>	Gila Kahila Bar-Gal, HUJ, Israel; Phil Cardoso, ANSC; Juan Llor, ANSC; Nikolas Nikolaidis, Calif. State University at Fullerton	FY2014-15: \$50,000
From worm to rat: investigating the role of proprotein convertases in visceral afferent neuroplasticity	<b>Nathan Schroeder, CPSC; Megan Dailey, ANSCI</b>	Terry Powley, Purdue University	FY2014-15: \$50,000
Efficacy of nutritional labeling and its contributions to sensory acceptability and food choice	<b>Soo-Yeun Lee, FSHN</b>	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.	<b>Brian Ogolsky, HDFS</b>	Andrea Braundmeier-Fleming, ANSC; Bryan White, ANSC; Alan Peaceman, Northwestern University	FY2014: \$30,000

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Targeted Delivery of Anti-Inflammatory Prodrugs to Adipose Macrophages for Preventative Treatment of Obesity- Induced Insulin Resistance	<b>Kelly Swanson, ANSCI</b>	Andrew Smith, Bioengineering; Matthew Wallig, VetMed	FY2014-15: \$40,000
Using On-farm Experimentation with Precision Agriculture Technology to Improve Fertilization	<b>David Bullock, ACE</b>	Donald Bullock, CPSC; Tony Grift, ABE; Luis Rodriguez, ABE	FY2013-14: \$40,000
High throughput crop phenotyping through remote sensing	<b>Brian Diers, CPSC</b>	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	<b>Jennifer Fraterrigo, NRES</b>	Bethany Cutts, NRES; Jonathan Greenberg, Geography and Geographic Information Science	FY2013-14: \$31,451
Phenotyping Technology to Accelerate Crop Cultivar Development	<b>Tony Grift, ABE</b>	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	<b>James R. Miller, NRES</b>	Brian F. Allan, Entomology	FY2013-14: \$38,973

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Illinois-Building Research Interactions to Distinguish Genetic and Environmental Factors	<b>Margarita Teran-Garcia, FSHN; Angela Wiley, HDFS</b>	Marcela Raffaelli, HDFS; Flavia Andrade, Kinesiology & Community Health; Celia Aradillas-Garcia, UASLP, Mexico; Omar Sanchez-Armass, UASLP, Mexico	FY2013-14: \$40,000
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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