NDSU OFFICE OF RESEARCH AND CREATIVE ACTIVITY

RCA UPDATE

June 17, 2019

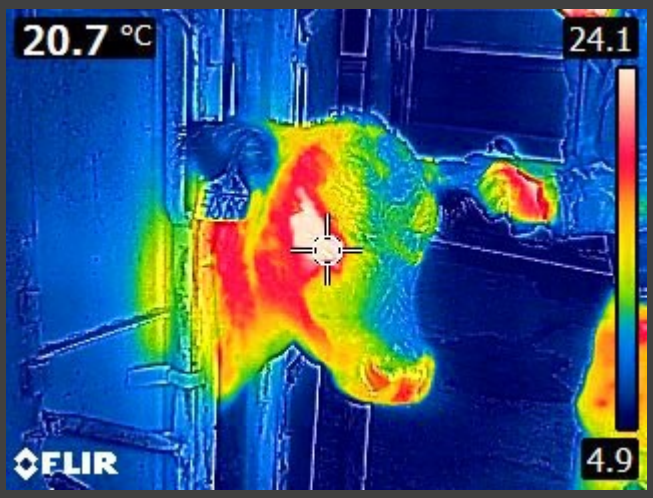
Solving Agriculture Problems, One at a Time

Xin “Rex” Sun, an assistant professor in the NDSU Agricultural and Biosystems Engineering (ABEN) department, believes that the future of agriculture is being created through precision agriculture technology. With an overall goal to improve producers’ ability to feed the world through a series of small steps, Rex’s work consists of research projects that continually move towards that goal.

This philosophy has led Rex to search out the problems facing local agriculture professionals. After a meeting at a bison processing plant in New Rockford, ND, Rex and his graduate student had a conversation with one of the managers. They discovered that bovine respiratory disease (BRD), a general term for respiratory cattle diseases including pneumonia and bronchitis, has historically proven to be a limiter in quality of the herds. The condition is the major cause of mortality in herds and can affect an individual’s ability to survive subsequent illnesses or harsh environmental conditions. Prevention is the primary method to avoid widespread outbreaks but it involves closely monitoring individuals for increased temperatures, which is a time intensive job.

After the tour, Rex spent the entire trip home thinking about a method for cattle ranchers to monitor the health of their herds by identifying and isolating ill individuals. After review of current studies, he wrote a proposal and his idea was funded.

A key to Rex's solution is monitoring temperature of individual members of a herd without any physical contact. His system utilizes a thermal imaging camera developed by FLIR (a longtime leader in thermal photography) to determine which individual members of the herd are ill or in discomfort due to increased temperatures.



"I try to put myself in the perspective of a rancher who doesn't have the time to go and measure each individual cow's temperature via a rectal thermometer," commented Rex. "With my system, they can simply point a handheld device at each cow and record their statistics thus saving a lot of time and effort."

Now that he's got this first step completed, he's been working on incorporating the system onto a UAS which would allow ranchers the ability to monitor their herds regardless of their location in the sky.

Ideas such as the thermal monitoring system would not have been possible without a feedback loop. Rex engages with his ABEN students in much the same way. Given that it's a new program at NDSU, Rex wants to ensure that his students are fully engaged. "The students are my target clients. They pay tuition and they deserve to get the most value from their

investment. Their feedback makes sure I get it right. I ask each of them, ‘what do you want to learn and how can you best learn it?’ and then I can modify my approach accordingly.”

This approach has proven true. In a class review, one student commented, “Thanks for being a great teacher and also for learning along with us.” Another added, “Dr. Sun just wants us to succeed and get as much information as possible. I think it is awesome to have such a motivated teacher like him.”

Rex also believes that ongoing research must be a major component of his curriculum and all his students participate in it. He instills how even small discoveries move towards the overall goals of precision agriculture technology. “Our approach is simple,” he says. “We solve one problem at a time.”

EXPORT CONTROLS

International Travel and Export Controls

When you leave the United States, everything you take with you is an export, including devices, software, and data. Most items are subject to the Export Administration Regulations (EAR).

- Personal items: clothes, toiletries, articles of adornment, medicine, their containers, etc.
- Personal electronic devices: laptop, tablet, PDA, flash drive, smartphone and software on them such as Windows, Adobe, etc.

- Information: documents, drawings, data, software and software on laptops
- Tangible research items and materials: Research items, such as equipment, may appear ‘more interesting’ and are more likely to draw attention from Customs or security officials.

Document your items, origin, ownership and value: If you take a personal item of value to avoid duty upon your return to the U.S. Customs and Border Protection (CBP) form CBP 4457 (available in the Export Control office) can help. It needs to be signed by CBP before you depart.

Device inspection: US Customs officials (and Customs in other countries) are authorized to search and retain electronic devices including digital cameras, cell phones, media players, disk drives and others even without probable cause to look for violations of export controls as well as other laws and regulations. To prepare for this:

- Don’t carry data you don’t want others to see,
- Don’t carry the only copy of anything you cannot afford to lose,
- Have a Plan B, and
- Consider taking a clean laptop furnished by NDSU IT.

If you have questions, please contact the NDSU Export Control Office at ndsu.exportcontrols@ndsu.edu for more information and assistance.

Upcoming Limited Submission Program Deadlines

Limited submission grant programs are those that indicate a limit on the number of proposals that may be submitted by an institution for a particular deadline. A selection process becomes necessary if more

applicants express interest in applying than NDSU is allowed to submit to the grant program.

- NEH Summer Stipends Program
  Pre-Proposal Deadline: July 26, 2019
- NSF Major Research Instrumentation (MRI)
  Notification Deadline: September 5, 2019
- NSF Research Traineeship (NRT)
  Notification Deadline: September 9, 2019
- NIH Collaborative Program for Multidisciplinary Teams (RM1)
  Notification Deadline: September 9, 2019

New IACUC Guiding Principle: Animal Procurement

In May, the NDSU Institutional Animal Care and Use Committee (IACUC) approved the Animal Procurement Guiding Principle. NDSU faculty, staff, or students acquiring live vertebrate animals for research, teaching, testing, demonstration, or production must complete the Animal Acquisition Form before bringing animals to NDSU.

For questions regarding Animal Procurement requirements, please contact Dr. Neil Dyer [neil.dyer@ndsu.edu] or Josie Hayden [josie.hayden@ndsu.edu].

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FUNDING OPPORTUNITIES

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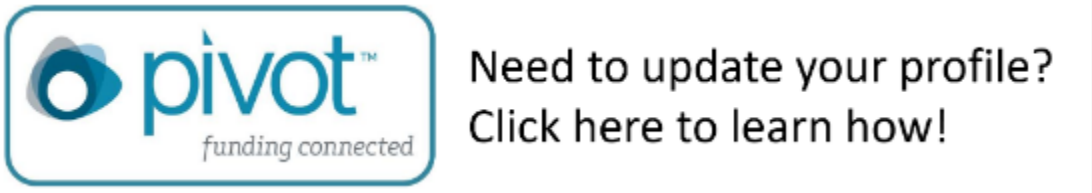

Burroughs Wellcome Fund - Investigators in the Pathogenesis of Infectious Disease (PATH)

The Investigators in the Pathogenesis of Infectious Disease (PATH) award provides $500,000 over five years to support accomplished investigators at the assistant professor level to study pathogenesis, with a focus on the interplay between human and microbial biology, shedding light on how human and microbial systems are affected by their encounters. The PATH program provides opportunities for assistant professors to bring multidisciplinary approaches to the study of human infectious diseases. The goal of the program is to provide opportunities for accomplished investigators still early in their careers to study what happens at the points where the systems of humans and potentially infectious agents connect. The program supports research that sheds light on the fundamentals that affect the outcomes of these encounters: how colonization, infection, commensalism, and other relationships play out at levels ranging from molecular interactions to systemic ones.

Pre-proposal Deadline: July 15, 2019; 11AM CT

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Forecasted Opportunity: Defense Established Program to Stimulate Competitive Research (DEPSCoR)

In the FY2018 National Defense Authorization Act (NDAA), Congress reauthorized a restructured version of DEPSCoR. The program received $12M in FY2019 appropriations.

The DEPSCoR competition intends to encourage collaborations on basic

research projects of interest to the Department of Defense (DoD). The program is structured to form a 2-person team between:

1. an investigator with prior funding from the DoD (within the past seven years), and
2. a researcher who has not previously received funding from the DoD.

The Defense Technical Information Center website contains a non-comprehensive repository of government-funded scientific, technical, and engineering information for the DoD. Researchers new to DoD (Applicant) are encouraged to visit the site as a *starting point* for identifying past and present DoD-funded researchers.

The program is sponsored and managed by the Basic Research Office, Office of the Under Secretary of Defense for Research and Engineering and administered through the Air Force Office of Scientific Research.

A pre-solicitation notice for this DEPSCoR-exclusive competition is available at grants.gov.

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High Plains Intermountain Center for Agricultural Health and Safety

The High Plains Intermountain Center for Agricultural Health and Safety (HICAHS) Pilot Grants program funds innovative research projects that promote worker health and safety in the agriculture, forestry, or fishing industries. Extra consideration is given to projects that directly impact the HICAHS region which includes Colorado, Montana, Utah, Wyoming, North Dakota, and South Dakota. Applications are encouraged from student investigators, junior faculty, and researchers new to occupational health and safety research.

This program has been highly successful, leading to the generation of federally-

funded R01 grants, the development of new educational materials and intervention techniques, the training of student and junior investigators, and publication of peer-reviewed journal articles and conference presentations. The request for applications is solicited every summer with a maximum award amount of $25K (including up to 8% indirect costs).

Application Deadline: July 31, 2019

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NEH: Summer Stipends - Limited Submission Program

Limited submission grant programs are those that indicate a limit on the number of proposals that may be submitted by an institution for a particular deadline. A selection process becomes necessary if more applicants express interest in applying than NDSU is allowed to submit to the grant program.

NEH Summer Stipends: The internal NDSU deadline for pre-proposals is 4pm on July 26, 2019. Contact Christina Weber for the pre-proposal requirements.

NEH Summer Stipends support individuals pursuing advanced research that is of value to humanities scholars, general audiences, or both. Eligible projects usually result in articles, monographs, books, digital materials and publications, archaeological site reports, translations, or editions. Projects must not result solely in the collection of data; instead they must also incorporate analysis and interpretation. Summer Stipends support continuous full-time work on a humanities project for a period of two consecutive months. Summer Stipends support projects at any stage of development. Up to two applicants may be nominated by their institution.

Application deadline: September 25, 2019 (for projects beginning May 2020)

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NIH Collaborative Program Grant for Multidisciplinary Teams (RM1) – Limited Submission Program

Limited submission grant programs are those that indicate a limit on the number of proposals that may be submitted by an institution for a particular deadline. A selection process becomes necessary if more applicants express interest in applying than NDSU is allowed to submit to the grant program.

NIH RM1: Notify RCA by 9/9/2019, 5:00 p.m. if you intend to apply.

This National Institutes of Health (NIH) funding opportunity announcement (FOA / PAR-17-340) is designed to support highly integrated research teams of three to six PD/PIs to address ambitious and challenging research questions that are important for the mission of the National Institute of General Medical Sciences (NIGMS) and are beyond the scope of one or two investigators. Collaborative program teams are expected to accomplish goals that require considerable synergy and managed team interactions. Project goals should not be achievable with a collection of individual efforts or projects. Teams are encouraged to consider far-reaching objectives that will produce major advances in their fields. Applications that are mainly focused on the creation, expansion, and/or maintenance of community resources, creation of new technologies or infrastructure development are not appropriate for this FOA.

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NIH Research to Understand and Inform Interventions that Promote the Research Careers of Individuals in the Biomedical Sciences (R01)

This Funding Opportunity Announcement (FOA / PAR-19-295) encourages applications that propose research designed to test training, mentoring, and networking interventions intended to enhance research-oriented individuals' interest, motivation, persistence and preparedness for careers in the biomedical

research workforce. Funded projects are expected to produce research findings that will guide the design and implementation of interventions in a variety of academic settings and career levels to enhance the diversity of the biomedical research workforce.

NIGMS encourages the use of evidence-based practices and recognizes that there is need for more hypothesis-driven research to test biomedical training, mentoring and networking interventions for efficacy and replicability across career stages and at a range of institution types and to provide insights into the factors contributing to success. Through this funding announcement, NIGMS intends to enhance the evidence base for effective, high-impact, scalable interventions, and to improve understanding of the factors contributing to success, including the social and behavioral factors involved in the advancement of individuals pursuing independent academic biomedical research careers.

Standard submission deadlines apply.

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NSF Major Research Instrumentation (MRI) – Limited Submission Program

Limited submission grant programs are those that indicate a limit on the number of proposals that may be submitted by an institution for a particular deadline. A selection process becomes necessary if more applicants express interest in applying than NDSU is allowed to submit to the grant program.

NSF MRI: Notify RCA by 9/5/2019, 5:00 p.m. if you intend to apply.

The National Science Foundation Major Research Instrumentation (MRI) Program [NSF 18-513] serves to increase access to multi-user scientific and engineering instrumentation for research and research training in our Nation's institutions of higher education and not-for-profit scientific/engineering research organizations. An MRI award supports the acquisition or development of a

multi-user research instrument that is, in general, too costly and/or not appropriate for support through other NSF programs. **Cost sharing of precisely 30% of the total project cost is required.**

An MRI proposal may request support for either the acquisition or development of a research instrument.

- Track 1: Track 1 MRI proposals are those that request funds from NSF greater than or equal to $100,000 and less than $1,000,000. Two proposal submissions are allowed per organization.
- Track 2: Track 2 MRI proposals are those that request funds from NSF greater than or equal to $1,000,000 up to and including $4,000,000. One proposal submission is allowed per organization.

LIMITED SUBMISSION: The MRI program requires that an MRI-eligible organization may, as a performing organization, submit or be included as a significantly funded subawardee in *no more than three MRI proposals*. Each performing organization is limited to a maximum of three proposals in *the* "Tracks" as defined above, with no more than two submissions in Track 1 and no more than one submission in Track 2.

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NSF Research Traineeship Program (NRT) – Limited Submission Program

Limited submission grant programs are those that indicate a limit on the number of proposals that may be submitted by an institution for a particular deadline. A selection process becomes necessary if more applicants express interest in applying than NDSU is allowed to submit to the grant program.

NSF NRT: Notify RCA by 9/9/2019, 5:00 p.m. if you intend to apply.

The National Science Foundation (NSF) Research Traineeship (NRT) program

[NSF 19-522] is designed to encourage the development and implementation of bold, new, and potentially transformative models for STEM graduate education training. The NRT program seeks proposals that explore ways for graduate students in research-based masters and doctoral degree programs to develop the skills, knowledge, and competencies needed to pursue a range of STEM careers. The program is dedicated to effective training of STEM graduate students in high priority interdisciplinary research areas, through the use of a comprehensive traineeship model that is innovative, evidence-based, and aligned with changing workforce and research needs. The NRT program addresses workforce development, emphasizing broad participation, and institutional capacity building needs in graduate education. Strategic collaborations with the private sector, non-governmental organizations (NGOs), government agencies, national laboratories, field stations, teaching and learning centers, informal science centers, and academic partners are encouraged.

The NRT Program has announced the program's priority areas for FY2019 and FY2020. For FY2019 and FY2020, the NRT Program requests *proposals in any interdisciplinary research theme of national priority*, with special emphasis on the six NSF Research Big Ideas. The NSF Research Big Ideas are Harnessing the Data Revolution (HDR), The Future of Work at the Human-Technology Frontier (HTF), Navigating the New Arctic (NNA), Windows on the Universe: The Era of Multi-Messenger Astrophysics (WOU), The Quantum Leap: Leading the Next Quantum Revolution (QL), and Understanding the Rules of Life: Predicting Phenotype (ROL).

LIMITED SUBMISSION: An eligible organization may participate in *two proposals* per competition. **Participation includes serving as a lead organization, non-lead organization, or subawardee on any proposal.** Organizations participating solely as evaluators on projects are excluded from this limitation.

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Russell Sage Foundation Research Grants: Behavioral Economics

The Russell Sage Foundation (RSF) program on Behavioral Economics supports novel research that uses insights and methods from psychology, economics, sociology, political science and other social sciences to examine and improve social and living conditions in the United States. Investigator-initiated research proposals are sought that will broaden understanding of the social, economic and political consequences of actual behaviors and decisions.

RSF is especially interested in research at the intersection of behavioral economics and behavioral sciences and its other programs--Future of Work; Race, Ethnicity and Immigration; Social Inequality. Priority will be given to field experiments, as opposed to lab experiments. Projects that can contribute to a more unified theory of human behavior to eventually eliminate the distinction between behavioral economics and the rest of economics are also of interest.

The following examples illustrate, but do not exhaust, the topics and types of research RSF would be interested in supporting:

- Choice Architecture
- Time Preferences
- Poverty, Inequality and Mobility
- Labor Markets
- Racial and Ethnic Bias
- Public Finance

Letter of Inquiry Deadline: August 21, 2019; 1pm CT

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Russell Sage Foundation Research Grants: Decision Making and Human Behavior in Context

The Russell Sage Foundation (RSF) is launching a new special initiative on Decision Making and Human Behavior in Context that will support innovative research on decision making across the social sciences that examines causes, consequences, processes, or context from a behavioral or alternative perspective. The RSF seeks to support a wide range of research on decision-making in context by scholars in psychology, political science, sociology, and other social science fields who are pursuing questions consistent with the aims of the Foundation.

This initiative will support research proposals from multiple methodological perspectives that will further our understanding of decision making processes and human behavior in the contexts of work, race, ethnicity, immigration, and social inequality, broadly conceived, in the U.S. Priority will be given to research related to our core programs and other special initiatives. Limited consideration will be given to projects that test well-established behavioral effects without examining the overarching context or the underlying mechanisms.

Letter of Inquiry Deadline: August 21, 2019; 1pm CT

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Have questions, ideas, or suggestions for the RCA Update?

Contact Us

The Office of Research and Creative Activity (RCA) sends weekly emails to NDSU faculty and staff to provide current information on various topics including funding opportunities, grant program changes, research resources, deadlines, notices, and training.

You are receiving this notification through the NDSU official employee listserv or sub-list. The official listserv refreshes after each pay period.

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