

ANNUAL REPORT FY2023



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FROM THE VPR



Fitzgerald visits Ryan McGrath's NDSU Healthy Living ND lab

**COLLEEN
FITZGERALD, PHD**
NDSU Vice President for
Research and Creative Activity

Congratulations to all of our successful researchers for their contributions to a strong year for NDSU research. Those contributions are part of the essential activity needed to maintain NDSU's Carnegie R1 status, a distinction that ranks the university among the top 146 institutions nationwide and serves as one of President Cook's top priorities.

FY 2023 was a strong year for NDSU research, with research expenditures climbing to \$174.9 million—a 6.6% increase from the previous year.

The amount represents a fifth year of increased expenditures across a variety of disciplines across NDSU's research focus areas of FY23 was also the second year of NDSU's R1 classification as a "Doctoral University - Very High Research Activity " from the Carnegie Classification of Institutions of Higher Education, a distinction that ranked the university among the top 146 institutions nationwide.

Throughout the year we focused on strategic priorities directed at both research and pathways into innovation:

- Increase overall annual rates of growth in research expenditures
- Grow federal funding to closer to one-third of the overall expenditures
- Strategically leverage state funding from federal opportunities, to maintain a balanced portfolio across campus
- Leverage federal innovation opportunities from existing assets, and the legislation that eventually became the CHIPS and Science Act.

The academic year got off to an exciting start when NDSU was named the lead institution for a \$14m National Science Foundation (NSF) I-Corps Hub. The institution will lead six other partner programs across the upper Midwest. The Great Plains I-Corps Hub will provide training that is experiential and immersive and helps to develop the inventors and entrepreneurs of tomorrow and accelerate the economic and societal benefits of NSF-funded research projects.

Later in the summer, work began on the National Science Foundation (NSF) Engines. This program is aimed to empower all regions of the country, including the Midwest, to capitalize on their strengths and a regional collaborative partnership known as FARMS (Northern Plains AgTech Engine for Food systems Adapted for Resiliency and Maximized Security) reached the final stages of a nationwide competition that will provide winning teams with \$160 million funding over 10 years. As one of only sixteen projects selected as finalists, FARMS seeks to build upon North Dakota's reputation as a leader in AgTech and will deliver market-driven innovative research, education, workforce development, and DEIA (diversity, equity, inclusion, and accessibility) programs.

The year saw organizational changes as well. Oversight of the ND EPSCoR office was moved to RCA, which provided a closer connection between the team's work across the state and RCA's goals. My time at NSF provided me with experience with the various research initiatives driven by the EPSCoR program in addition to collaboration with both Tribal Communities and Universities. Sheridan McNeil was hired as Director of Tribal Partnerships. From this role, Sheridan will lead strategic engagement opportunities, special projects and other initiatives with the state's tribal nations and Tribal Colleges and Universities as part of statewide efforts to foster competitive research on behalf of the state of North Dakota.

With a vision set for the future, the North Dakota Legislature provided NDSU with two years of funding via HB 1003 for the Economic Diversification Research (EDRF) Fund. Targeted at supporting research, the program aims to ensure that the state economy generates additional revenue streams to stimulate

economic growth in the state by innovating new technology, ideas and products; promote job creation and career and wage growth; enhance health care outcomes; address loss of revenue and jobs in communities with economies that depend primarily on the fossil fuel industry; and provide experiential learning opportunities for students. NDSU will receive \$2.5M through the EDRF to support research endeavors and will target the funds on research with significance to partners and the economic, societal and well-being of North Dakota citizens.

An important milestone for FY23 was the establishment of our inaugural Faculty Research Council, a group who made a set of recommendations to President Cook, including:

- more significant investments into foundational types of resources
- support for faculty researchers including reassigned time and seed and pilot grants
- enhancement of the diversity of campus researchers, including through the needed cross-cultural knowledge and infrastructure to strengthen our collective ability to advance nation to nation ethical research collaborations with sovereign tribal nations
- adequate administration and accountability for reassigned time for research and reward structures that recognize and incentivize grant activity, among others.

The development of these programs and initiatives resulted in FY23 being a year of strategic growth in the implementation of the research enterprise at NDSU. I am confident that the plans we have implemented will yield even greater results in the coming years.

Colleen M. Fitzgerald, PH.D.
Vice President
NDSU Research and Creative Activity

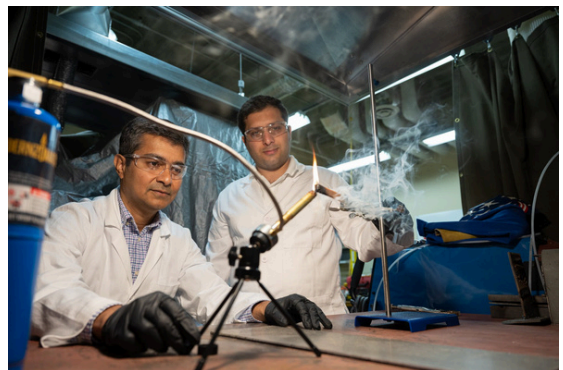
RESEARCH EXPENDITURES

For the fourth year in a row, North Dakota State University has reached a new all-time high in research expenditures and leads all North Dakota higher education institutions in terms of overall research expenditures.

In FY22 (the most recently reported fiscal year), NDSU reached a milestone with \$174.9 million in research expenditures, surpassing totals of \$164 million in FY21 and \$155.6 million in FY20.

The FY22 amount places NDSU among the top 100 public research universities according to the National Science Foundation's Higher Education Research and Development Survey (HERD).

For FY22, NDSU ranks 99 out of 410 public institutions. NDSU leads all North Dakota higher education institutions in research expenditures for USDA, USDOT, NSF, and DOD.



FY22 EXPENDITURES

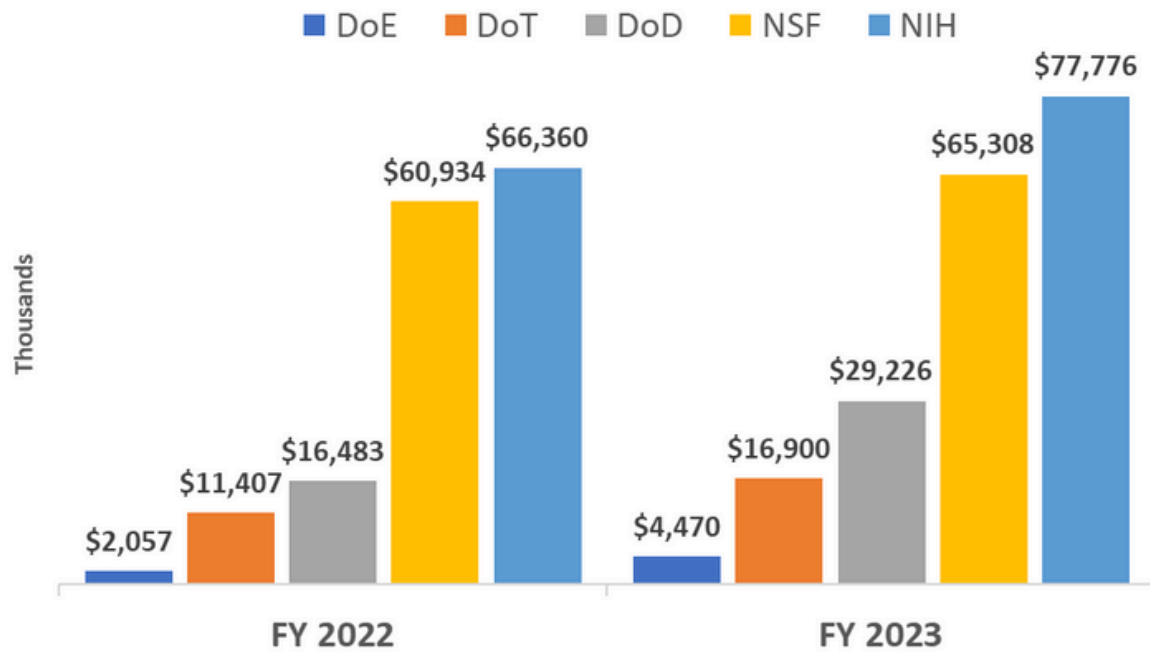
\$174M

FY23 AWARDS

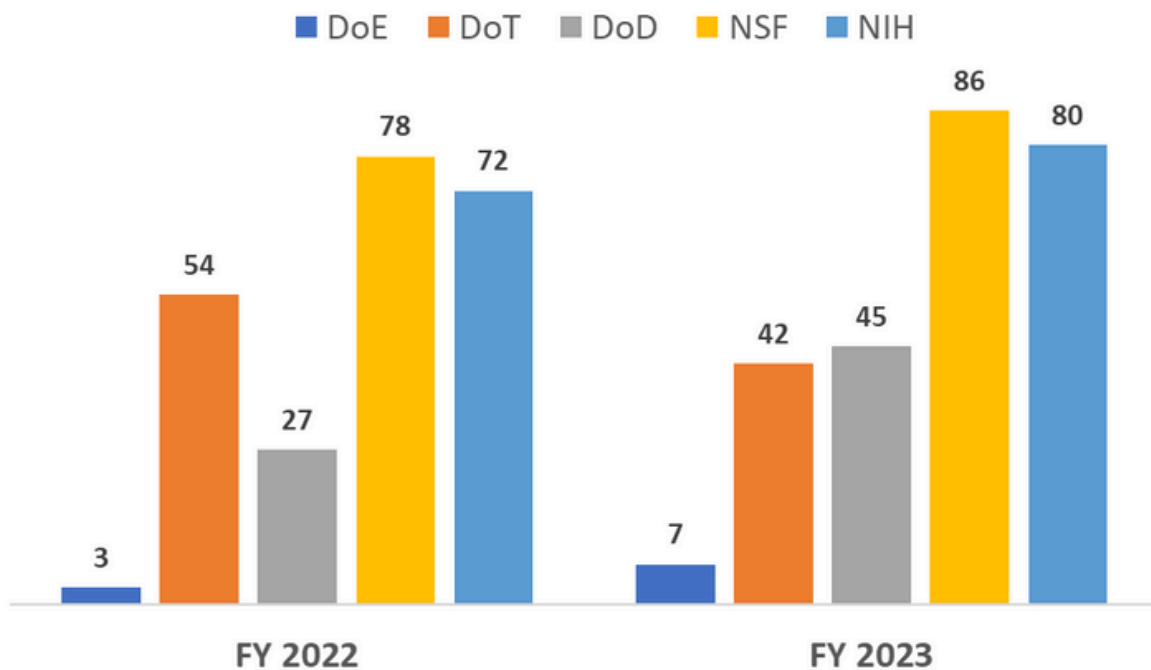
\$81M

FEDERAL FUNDING

TOTAL DOLLARS REQUESTED, BY FEDERAL AGENCY



NUMBERS OF SUBMISSION REQUESTED, BY FEDERAL AGENCY



RCA FY23 BUDGET

RCA Business Units

Sponsored Programs	\$	10,927
Research Development	\$	133,666
Innovation & Economic Development	\$	12,427
Research Integrity	\$	21,282
General RCA Operating	\$	43,567
Total business unit operations	\$	221,869

Campus Support

Research Core Operations		
EML Operating	\$	136,283
MERC and R2 Operating	\$	8,213
UAS Operating	\$	3,070
Other campus support	\$	79,233
Travel/Resources Awards	\$	58,857
Equipment Match/Repair/Purchases	\$	84,627
Total campus support	\$	370,283

Salaries

Salaries RCA	\$	2,213,136
Salaries EML	\$	171,811
Total salaries	\$	2,384,947

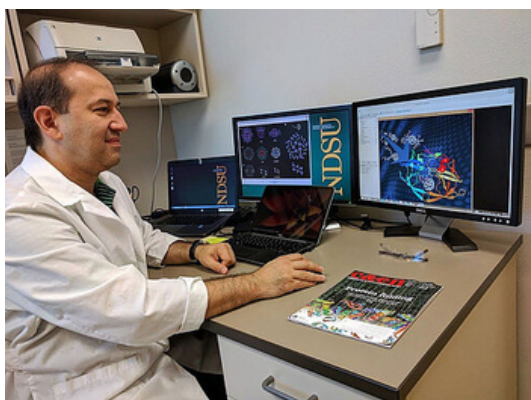
Total	\$	2,977,099
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RESEARCH SUCCESS



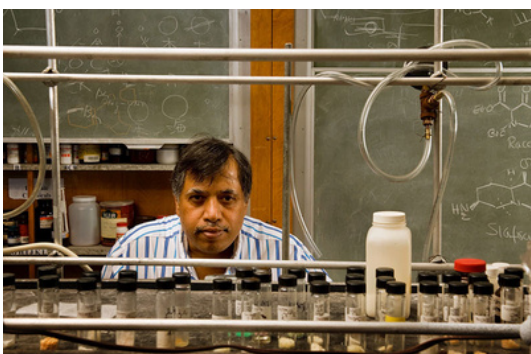
NSF I-CORPS GREAT PLAINS HUB ESTABLISHED

The NSF I-Corps Great Plains Hub provides immersive, entrepreneurial training for scientists, researchers and engineers in the Great Plains states. By propelling research ideas into the marketplace and empowering entrepreneurs, the Hub drives transformative change and catalyzes the growth and success of startups in the region.



NDSU RESEARCHER AIMS TO CREATE NEW AI MODEL TO PREDICT MICROPLASTIC TOXICITY

A new study by Bakhtiyor Rasulev, NDSU associate professor of coatings and polymeric materials, aims to create a new AI model to determine the toxicity of various types of microplastics found in our environment. Rasulev's research is supported by a National Science Foundation (NSF) EPSCoR RII Track-4: EPSCoR Research Fellows award.



A CAREER GUIDED BY SERENDIPITY AND KINDNESS

How has the concept of "kindness" driven NDSU's biomedical research enterprise at NDSU for the past four decades? Mukund Sibi, university distinguished professor of chemistry and biochemistry joined NDSU as an assistant professor in 1987 and in 2021, was among an exclusive group of only 564 researchers in the world named as an American Association for the Advancement of Science (AAAS) fellow in 2021.

RESEARCH FOUNDATION

NDSU

RESEARCH FOUNDATION

INVENTION DISCLOSURES

- 1 horticulture
- 6 agricultural varieties
- 28 technologies

Agreements signed

- 3 Confidentiality/Nondisclosure agreements
- 13 Material Transfer/Data Use agreements

US patents issued

- Biobased, Non-Isocyanate, 2K Polyurethane Coatings Produced from Polycarbamate and Dialdehyde Crosslinking
- Low Cost Diabetes Breath Analyzer Based on Nanostructured K2W7022 Material

- Use of Amphiphilic Surface Modifying Additives to Improve Performance of Siloxane-Polyurethane Fouling-Release Coatings
- Block-Scaffolds for Bone Regeneration Using Nano-clay Polymer Scaffolds
- Biofilm Inhibitor and Method of Inhibiting Biofilm

Foreign patents

- Total Ankle Replacement

SPONSORED PROGRAMS

Breakdown of external awards and federal formula funds:

	FY2023
External Awards	\$ 80,906,655
<i>Total External Awards</i>	\$ 80,906,655
Hatch/McIntire-Stennis Funds	\$ 3,356,889
Extension Service Smith-Lever Formula Funds	\$ 4,188,224
Student Financial Aid	\$ 10,220,225
<i>Total Federal Formula Funds</i>	\$17,765,338
Grand Total	\$98,671,993

College/Unit*	Proposals Processed through Sponsored Programs Administration	Total Dollars Requested from External Funding Sources	Total Dollars Awarded from External Funding Sources**
Agriculture Experiment Station & Extension Service	563	\$88,181,755	\$28,583,762
Agriculture, Food Systems & Natural Resources	65	\$5,043,692	\$943,201
Arts & Sciences	166	\$70,795,117	\$17,992,807
Business	6	\$108,983	\$55,265
Engineering	149	\$44,077,663	\$13,863,801
Graduate School	3	\$81,558	\$91,520
Health & Human Sciences	114	\$64,295,511	\$9,223,975
Information Technology	0	0	0
Miscellaneous Offices	31	\$7,960,264	\$6,168,669
Upper Great Plains Transportation Institute	50	\$13,484,964	\$3,983,655
TOTAL	1,147	\$294,029,507	\$80,906,655

*College/unit categories are determined by the principal investigator's department only; co-PI's departments are not reflected.

**Federal formula funds and state appropriated dollars are not included

NSF Higher Education Research and Development (HERD) Survey: NDSU reported expenditures of \$190,331,786 ***

***Tentative number; Not considered final until formally published by NSF in November 2024.

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