

RESEARCH & SCHOLARSHIP



ANNUAL REPORT

FY 2022



DR. CORINNE LENGSFELD

Senior Vice Provost for
Research & Graduate
Education



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a year in review

WHERE WE ARE NOW

August 15, 2022

Each year as I write this letter, I'm gifted the opportunity to reflect on the past year and our collective accomplishments. It's no secret the last three years have been a challenge – though one we have not only survived, but thrived within.

Because of this constant dedication, we have managed to accomplish something I'm not sure anyone believed was possible – our reclassification as a Doctoral/Very High Research university (or “R1”) by the Carnegie Classification of Institutions of Higher Education.

Our path to R1 was unlike the other eight institutions that made the transition. We had no university-wide strategic plan that called for this goal; no doubling of faculty; no infusion from a large donor to finance labs, endow chairs, or doctoral fellowships. We didn't buy new areas of excellence; instead, we unleashed what was already here. We built it never sacrificing our brand and grew it from the ground up.

Simultaneously, DU's research and scholarship shone brightly. Our research expenditures topped \$43 million in FY 22 – the highest value our institution has ever achieved. Our dedicated faculty received 120 new awards totaling nearly \$26 million. The backlog of unexpended awards has continued to grow, fueled by new awards, to \$50 million.

Faculty and their research drove revenue of \$14 million in earned media. Courses solely focused on research collected \$6 million. And another \$6 million in facilities and administration fees provided critical revenue supporting infrastructure, the now #1 ranked library according to The Princeton Review, grant administration personnel, and so much more.

Our transition to R1 is a phenomenal collective achievement and our attention must turn to creating supports to faculty and staff in research aligned to our new designation. In January, the University made immediate and substantial investments recognizing the rapid growth in research has out paced our infrastructure. You can read more about this in this annual report.

The University does not achieve such growth and recognition without total engagement of our employees. Research does not progress without our



librarians. We struggle to keep afloat and in-line without our grant administrators. Headway is not made if problems aren't being solved efficiently and creatively in the middle of the night. Money is not spent and talented employees are not hired without Deans offices, ORSP, HRIC, and Shared Services. These are the people that make things happen.

Our students are the work engine and our fuel. Their endless energy and passion drives us when we need it most. DU hosted the annual Research & Scholarship Showcase online via Zoom, where 70 undergraduate students participated. DU also awarded 387 doctoral degrees, 2,808 master's degrees, 35 undergraduate summer research grants, and 23 Undergraduate Partners in Scholarship (PINS) grants in FY 22.

Contrary to some common perceptions, research doesn't cost money – we drive revenue, visibility, and rank and we create long lasting impact. We are no longer a diamond in the rough – we are unstoppable and here to stay. Now, we rewrite what R1 can look like – together.

Corinne Lengsfeld
Senior Vice Provost for
Research & Graduate Education

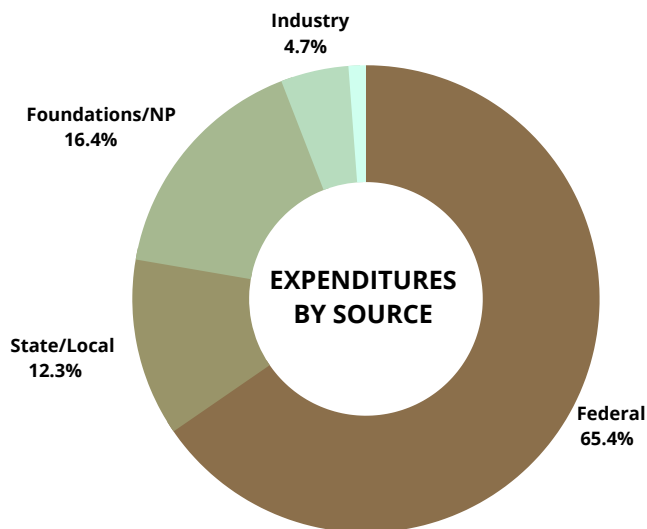
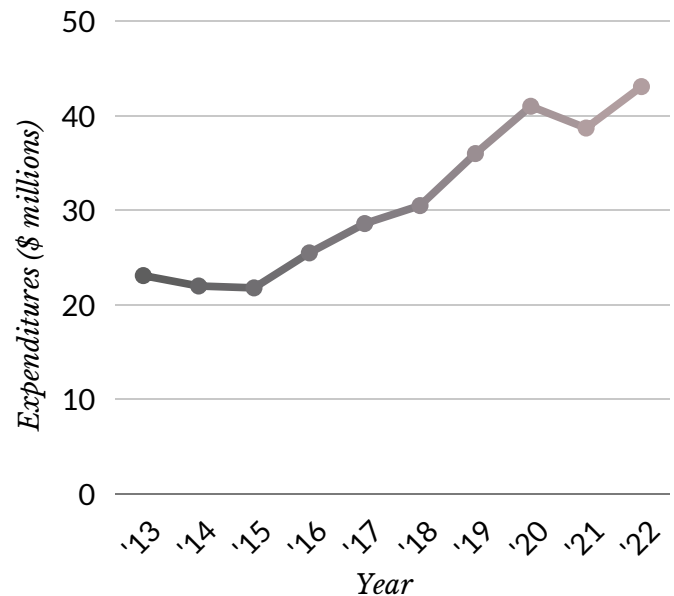
RESEARCH OVERVIEW

Despite the impact of COVID-19, FY 2022 was a record-breaking year with over \$43 million in expenditures.

\$43M

RESEARCH EXPENDITURES

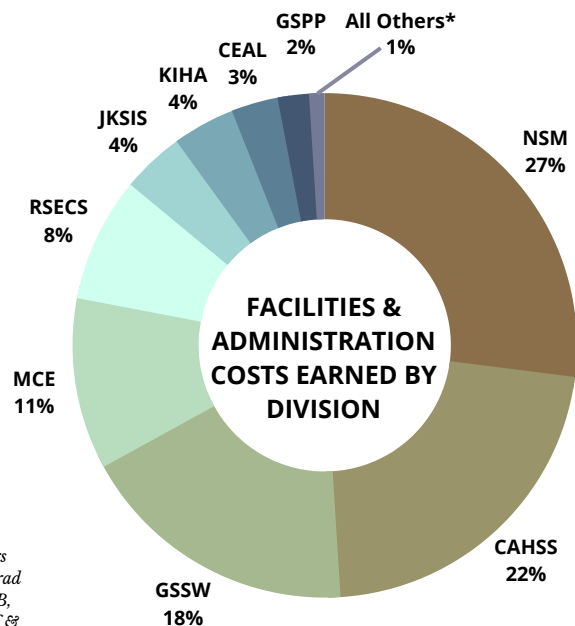
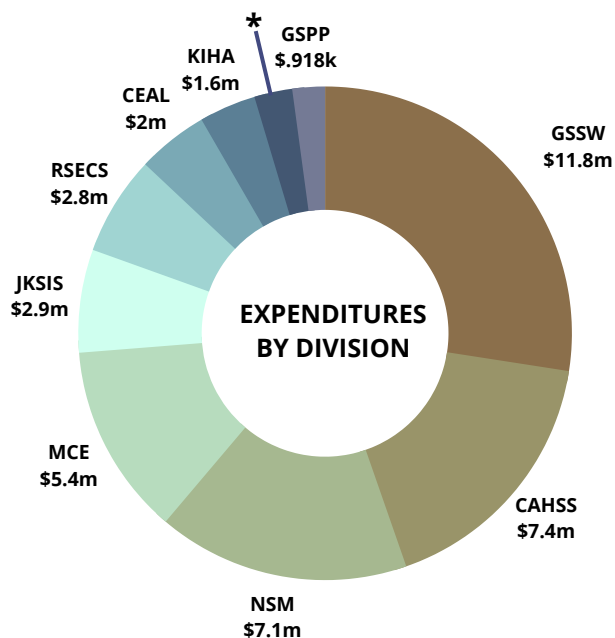
In FY 2022, research expenditures continued its incline after a slight decrease in FY 2021. Over the past 10 years, expenditures have increased 123%.



\$6M

FACILITIES & ADMINISTRATION COST REIMBURSEMENT

DU collected \$6 million in F&A cost reimbursement, of which \$1.5 million was returned to divisions.



*Note: All Others includes SCOL, Grad Tax, UCOL, DCB, Grad Studies, Iliff & OTL (<1% each).

NEW GRANT AWARDS

Even with the continued disruption of COVID-19, DU's principal investigators did not let it deter them from securing new grant funding.

120

NEW GRANT AGREEMENTS

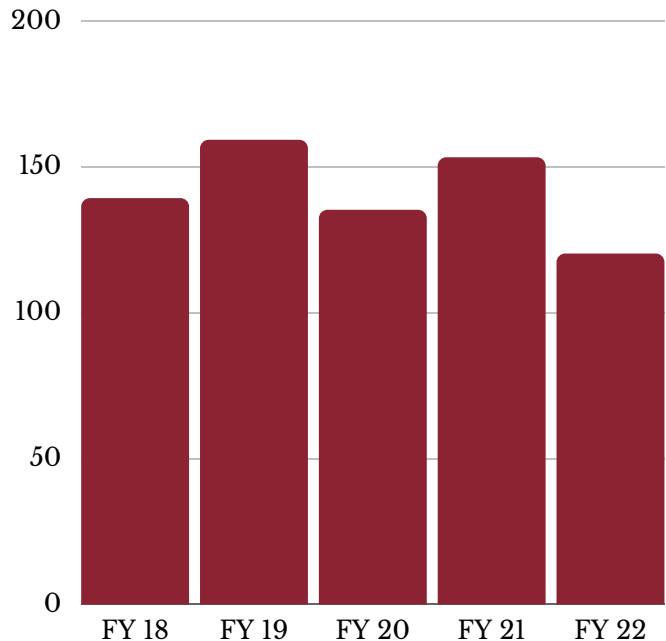
Of the 120 new grant agreements awarded in FY 2022, 14 were funded at more than \$500k.

\$25.9M

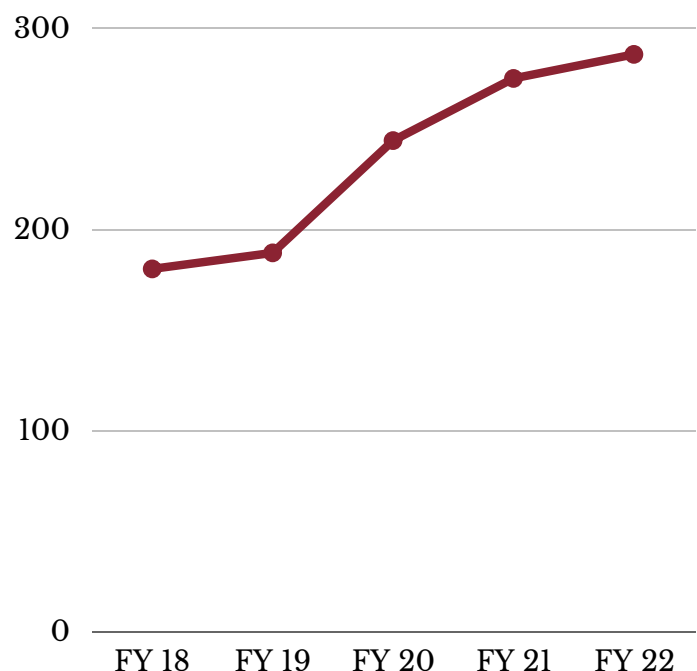
NEW AWARD FUNDING

Throughout FY 22, DU received \$25.9 million in new award funding.

New Awards (#)



Active Principle Investigators (#)



DU R1 RESEARCH INVESTMENTS

In FY 22, DU was one of only nine universities recognized as a new Doctoral/Very High Research university (or “R1”) by the Carnegie Classification of Institutions of Higher Education, joining the ranks of 137 universities currently recognized as engaging in highest research activity.

To continue to support our teacher-scholars across the university, DU announced the following new multi-year investments in research.



Pre-Award Unit

Creation of a pre-award unit serving faculty for prospecting, proposal preparation, and training of new PIs and division grant managers. Staffing for multi-disciplinary large proposal writing and coordination also included.



PI Support

Expanded support for principal investigators to focus on their research by streamlining the accounting and management of awards



Post-Doc Support

- Expanded support for post-docs to work with our faculty researchers
- Post-doc salary matching program (10 in the first year) plus training: \$150k plus \$30k = \$180k



Applicant Fee Waiver

Expanded fee waiver for graduate applicants



PROF Funding

Increased PROF funds from \$20k per award to \$27k per award -- total increase in PROF award funding to \$625k



Facilities

\$150k investment in research facilities and space to support research growth



GRA Stipends

Increased grant-funded GRA stipends 6%, mirroring GTA/GSA increase



Technology

- Technology improvements: \$65k
- Human subject research (IRBNet): \$30k
 - COI module (InfoEd): \$35k

CAMPAIGNS & INITIATIVES

STAT CONFERENCE



PURPOSE

Held in January 2022, this virtual [event](#) was hosted for the second time to explore the ways in which institutions, researchers, and academics have pivoted in real time to respond to the unprecedented challenges of the day. Focusing on lessons from COVID-19, panelists explored the impacts of COVID-19 on all aspects of life.



CONFERENCE

- Virtual via Zoom, Facebook Live & [YouTube](#)
- 14 speakers from 9 colleges, universities, and private organizations
- 1100+ viewers via Zoom, Facebook Live & YouTube



CONFERENCE SUMMARY

- Media
 - Solid engagement through website and ads
 - Targeted emails/display advertising with *Inside Higher Ed*: 99,981 impressions & 281 clicks
 - Social media: 63k impressions; 2k engagements
 - Website (www.du.edu/stat): 1,763 views
- Next STAT Conference will be held January 2023

PUBLIC IMPACT FELLOWS



PURPOSE

In FY 2019, in collaboration with Marketing & Communications and the Office of the Provost, DU created the Public Impact Fellows program. This program was designed to increase faculty reach and impact of the University's faculty thought leaders.

'22

2022 PIFS

- Anamika Barman Adhikari, GSSW
- Naazneen Barma, JKSS
- Ryan Elmore, DCB
- Michael Gibson-Light, CAHSS
- Kerstin Haring, RSECS
- Travis Heath, GSPP
- Jennifer Hoffman, NSM
- Cecilia Orphan, MCE
- Sarah Schindler, SCOL
- Christopher Whitt, ODEI



FY 2022 SUMMARY

- 28 individual fellows featured from all 4 cohorts
- 98 total mentions in elite, national, and local media
- Most hits: Govind Persad (SCOL) & Alex Huffman (NSM)
- 13 op-eds; all published in elite/national outlets (The Washington Post, The Hill, Bloomberg and The Boston Globe)

USNWR CAMPAIGN



GOAL & STRATEGY

Currently listed as number 97 in "National Universities" by U.S. News & World Report (USNWR), the purpose and goal of this campaign is to increase top-of-mind awareness and perception of DU's unique value propositions and relevance. It utilizes a multi-channel marketing campaign, combining targeted email communications with robust paid, earned and owned media touchpoints.



CAMPAIGN

- Quarterly newsletter sent with a 20% open rate
- Paid Advertising: Inside Higher Ed, Chronicle of Higher Education, LinkedIn & Facebook
- Owned Content: RadioEd podcast & video series
- Good exposure & high engagement throughout campaign



CAMPAIGN RESULTS

- Inside Higher Ed impressions: 150,113
- Chronicle of Higher Education metrics
 - Newsletter ad clicks: 1,212
 - Digital display: 55,300 impressions
 - Email blast: 34.9% open rate (25% average)
- Social Media (LinkedIn & Facebook)
 - LinkedIn impressions: 285,248
 - Facebook boosted post engagements: 2879

FACULTY REPORT



**287 PRINCIPAL
INVESTIGATORS**

funded for FY 2022

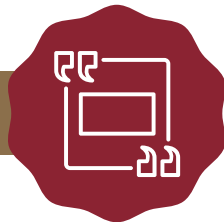
**39 PRINCIPAL
INVESTIGATORS**

with \$350k + in research expenditures



**509 FACULTY
AUTHORS**

**36,686 FACULTY
CITATIONS**



**822 ARCHIVAL
PUBLICATIONS**

**858 MEDIA
PLACEMENTS**

local (612) & national (246) media during FY 2022



TOP PRINCIPAL INVESTIGATORS

*BASED ON FY22
EXPENDITURES*

\$4,000,000 +
Nancy Lucero, Butler

\$2,000,000 +
Jonathan Moyer, JKSS

\$1,000,000 +
Douglas Clements &
Julie Sarama, MCE
Galena Rhoades, CAHSS
Robin Leake, Butler
Phillip Strain, MCE
Elysia Davis, CAHSS
Amy Roberts, Butler

\$500,000 +
Elaine Belansky, MCE
Michele Hanna, GSSW
Kristin Klopfenstein, CEAL
Paul Rullkoetter, RSECS
Ashley Hamilton, CAHSS
Elysia Clemens, CEAL
Pilyoung Kim, CAHSS
Lena Lundgren, GSSW
Kevin Shelburne, RSECS
Norma Hafenstein, MCE
Amin Khodaei, RSECS

\$350,000 +
Kevin Morris, GSSW
Charmaine Brittain, Butler
Schuyler Van Engelenburg, NSM
Meredith Silverstein, Butler
Carole Wilcox, Butler
Gareth Eaton &
Sandra Eaton, NSM
Daniel Paredes, KIHA
Sarah Watamura, CAHSS
James Blankenship &
Dinah Loerke, NSM
Eric Kushner, NSM
Robin Hibbs, NSM
John Latham, NSM
Scott Horowitz, NSM
Kingshuk Ghosh, NSM
Yan Qin, NSM
Kimberly Gorgens, GSPP
Daniel Linseman, NSM

FACULTY PUBLICATIONS

FACULTY-AUTHORED BOOKS

Rashida Banerjee, MCE
Advances in Family-School-Community Partnering: A Practical Guide for School Mental Health Professionals and Educators

Jenn Bellamy, GSSW
Practitioner's Guide to Using Research for Evidence-Informed Practice

Douglas Clements, MCE
Science and Engineering in Preschool Through Elementary Grades: The Brilliance of Children and the Strengths of Educators

Roberto Corrada, SCOL
Labor Law in the Contemporary Workplace 2021 Update

Administrative Law: A Casebook

Colorado Employment Law and Practice

Brette Garner, MCE
Teacher Learning of Ambitious and Equitable Mathematics Instruction: A Sociocultural Approach

Alan Gilbert, JKIS
Plato's Severed Lovers: Sokrates and Alkibiades

Steven Hartley, DCB
Marketing

Rafael Ioris, CAHSS
A Amazonia no Séclo XXI: Trajetórias, Dilemas e Perspectivas

Haider Khan, JKIS
When the Earth Trembled: Towards a Theory and People's History of the Bangladesh Liberation Movement and Lessons for Today

Mark Levine & Libbi Segev Levine, DCB
Real Estate Transactions, Tax Planning

Moustapha Ly, CAHSS
Le Nouvel Édouard Glissant: De L'opacité Poétique à la Limpidité Politique

Thomas Nail, CAHSS
Theory of the Object

Lucretius III: A History of Motion

Lisa Pasko, CAHSS
Latinas in the Criminal Justice System: Victims, Targets, and Offenders

Scott Phillips, CAHSS
Geometrical Justice: The Death Penalty in America

Artur Poczwadowski & Mark W. Aoyagi, GSPP
Expert Approaches to Sport Psychology: Applied Theories of Performance Excellence

Chip Reichardt, CAHSS
The Method of Multiple Hypotheses: A Guide for Professional and Academic Researchers

Jayson Richardson, MCE
Leadership for Deeper Learning: Facilitating School Innovation and Transformation

A Guide to Teaching in International Schools

Anna Sher, NSM
An Introduction to Conservation Biology

Ecology: Concepts and Applications

Derigan Silver, CAHSS
Mass Media Law

Phillip Strain, MCE
Prevent-Teach-Reinforce for Young Children: The Early Childhood Model of Individualized Positive Behavior Support

Jing Sun, CAHSS
Red Chamber, World Dream: Actors, Audience, and Agendas in Chinese Foreign Policy and Beyond

Javier Torre, CAHSS
Forjado en la Frontera. Vida y Obra del Explorador, Cartógrafo y Artista don Bernardo de Miera y Pacheco en el Gran Norte de México

HIGHLY-CITED PAPERS

Jenalee Doom, CAHSS
Differential Associations of Parental Harshness and Parental Disengagement with Overall Cortisol Output at 15 years: Implications for Adolescent Mental Health

Denis Dumas & Peter Organisciak, MCE
Measuring Divergent Thinking Originality With Human Raters and Text-Mining Models: A Psychometric Comparison of Methods

David Gao, RSECS
A Distributed Double-Newton Descent Algorithm for Cooperative Energy Management of Multiple Energy Bodies in Energy Internet

Elysia Davis, CAHSS
A Predictable Home Environment May Protect Child Mental Health During the COVID-19 Pandemic

Zhihui Zhu, RSECS
Error-Tolerant Deep Learning for Remote Sensing Image Scene Classification

Angela Narayan, CAHSS
Intergenerational Transmission and Prevention of Adverse Childhood Experiences (ACEs)

Brian O'Neill, JKIS
Climate Model Projections from the Scenario Model Intercomparison Project (ScenarioMIP) of CMIP6

Achievements and Needs for the Climate Change Scenario Framework

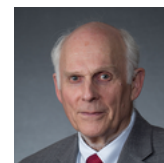
Erika Manczak & Jenalee Doom, CAHSS
"I Hate This": A Qualitative Analysis of Adolescents' Self-Reported Challenges During the COVID-19 Pandemic

Paul Horn, NSM
Random Walks on Simplicial Complexes and the Normalized Hodge 1-Laplacian

AWARD ABSTRACTS

LARGE GRANTS/CONTRACTS

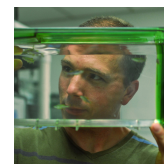
GARETH EATON, NSM



***Preclinical Electron Paramagnetic
Resonance Tumor Imager***
National Institutes of Health, \$2.67m

Revolutionary methods of acquiring electron paramagnetic resonance (EPR) spectra of free radicals create a paradigm shift in application of EPR to understanding the role of radicals in cancer and in other diseases. Lung damage, stroke, myocardial infarction, brain injury, wound healing, other trauma, and peripheral vascular limitations may similarly benefit from EPR imaging of redox status. This project will test the imager in applications to redox equilibria in mouse tumors, reactive oxygen species related to cancer in mice, and acute lung injury.

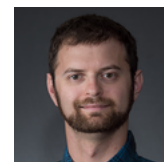
ERICH KUSHNER, NSM



Polarized Protein Trafficking and Angiogenesis
National Institutes of Health, \$1.8m

During angiogenic development, endothelial cells create a hollow cavity called a lumen. The mechanisms underpinning the morphodynamic changes in endothelial architecture and signaling leading to vascular lumen formation, or tubulogenesis, are incompletely understood. In this proposal we will investigate a protein called synaptotagmin-like protein 2 (sytl2) that we believe is responsible for defining the luminal surface by directing protein transport to the apical membrane during blood vessel development.

SCOTT HOROWITZ, NSM



Targeting Quadruplex Binding in ALS
National Institutes of Health, \$1.8m

Many of the proteins that have been implicated in ALS aggregation are nucleic acid binding proteins, and even more specifically, bind a particular structure of nucleic acid called a G-quadruplex. G-quadruplexes can form from RNA and DNA in the cell. Our laboratory recently found that G-quadruplexes are particularly efficient at modulating protein oligomerization and aggregation. We will therefore exploit this facet of G-quadruplex biology to develop treatments targeting protein aggregation in ALS.

AWARD ABSTRACTS

LARGE GRANTS/CONTRACTS

**DANIEL LINSEMAN;
BRADLEY DAVIDSON
& KIM GORGENS**



*Exosome Biology in Alzheimer's
Disease and Concussion
National Institutes of Health, \$1.5m*

Concussion or mild traumatic brain injury (mTBI) is a leading cause of disability in older adults, military service personnel, and athletes. Repeated concussions may lead to increased risk for dementia, but biomarkers which are both diagnostic of mTBI and prognostic for AD have not been identified. The current project is focused on identifying targets for drug development and novel biomarkers for this condition.

**TODD BLANKENSHIP
& DINAH LOERKE**



*Control of Cell Ratcheting During
Epithelial Morphogenesis
National Institutes of Health, \$1.18m*

The pulsed nature of cytoskeletal forces implies that there must be cellular processes to extract unidirectional changes that drive processive transformations in cell shape. In the proposed studies, we will examine the upstream signals that engage ratcheting and direct Sbf/Rab35 compartmental behaviors to contracting interfaces or cell apices, and identify the fundamental changes in oscillatory durations, amplitudes, frequencies, and/or directionality that lead to contractile processivity.

**MARY CLARK, ANNA
SHER; CORINNE
LENGSFELD; KRISTIN
DEAL & DEB ORTEGA**



*Adaptation: DU MERISTEM - Mobilizing
Equity to Raise Inclusivity in STEM
National Science Foundation, \$990k*

This program will implement systemic change to promote equity in hiring, promotion, and retention of Historically Excluded Faculty (HEF) in the STEM fields. The work to rectify both poor representation and marginalization of HEF at DU will be supported by transdisciplinary research and analyses concerning issues of inclusion and exclusion in institutions of higher education.

AWARD ABSTRACTS

LARGE GRANTS/CONTRACTS

KATY BARS, GSPP

*The Strengthening Bridges of Care Project
Caring for Denver Foundation, \$750k*



The Sturm Center and CUB Clinic see a need to integrate services, training, and outreach across populations served. Strengthening Bridges of Care is timely due to negative impacts of COVID-19 Pandemic, events in Afghanistan, and overall unrest negatively affecting our clients.

ERIC CHESS, KIHA

*SilverBills: A Financial and Legal
Tech Tool for Caregivers
SilverBills, \$662k*



This project will address the lack of financial management and legal support for caregivers of PwD by building features on our SilverBills product that simplify financial management, provide a supportive communication tool and a vault for critical legal documents. Using proprietary technology, SilverBills receives, scrutinizes, stores, and pays bills on behalf of clients. SilverBills intends to use the NIH grant to further develop its technology and tailor capabilities to specifically address the needs of Caregivers.

NICHOLAS PERRY, CAHSS

*Evaluation of Responding to Relationships
Washington Park Research & Evaluation, \$615k*



The Research Scientists and Project Coordinators will support WPRE's independent evaluation of Responding to Relationships to assess program performance, and provide a final, summative evaluative judgement that synthesizes our findings into a final report.

MARTIN MARGITTAI, NSM

*Tau Pathology in Down Syndrome
and Alzheimer's
National Institutes of Health, \$538k*



Down syndrome (DS) is a genetic condition that occurs in 1 out of 700 births with more than 350,000 Americans affected. Although Alzheimer's disease (AD) occurs with high penetrance in DS, few treatment options are available. The current project is focused on discovery-based research of the tau protein, a major component of Alzheimer pathology and associated dementia seen in DS

STUDENT RESEARCH & SCHOLARSHIP

Even through the continued COVID-19 pandemic, the University of Denver supported a large number of graduate and undergraduate students through funding for research and scholarship. DU contributed grant funding, supporting 647 students and resulting in 20.8% of all students paid on campus being supported by grants. Additionally, the number of graduate assistantships are on the rise, more than doubling from FY 2010 to present.

While no international travel grants or graduate student conference travel grants were awarded in FY 2022, DU students still shined brightly. 2,808 Master's degrees and 387 Doctoral degrees were awarded to graduate students. The Graduate Research Fellowships Program (GRFP) awarded 2 DU graduate students in FY 2022 and 35 undergraduates received Undergraduate Summer Research Grants.

In its second year, the [Undergraduate Research Journal](#) published two complete issues, featuring 17 articles, biographies, and interviews, all authored and peer reviewed by DU undergraduate students.



647

*students were supported
by \$3.3 million
in grant funding
in FY 2022*



172

*graduate research
assistantships were supported
by grant funding during
FY 2022*



20.8%

*of all students paid on campus
were supported by grants for
FY 2022*

8

UNDERGRADUATE SCHOLAR TRAVEL FUND GRANTS

AWARDED IN
FY 2022
TOTALING
\$6,636

35

UNDERGRADUATE SUMMER RESEARCH GRANTS

AWARDED IN FY 2022
TOTALING \$117,116

2,808

MASTER'S DEGREES

AWARDED IN
FY 2022

2

GRFP AWARDS

AWARD RECIPIENTS:

DEBORAH HAN

NATHALIE DIEUJUSTE

23

UNDERGRADUATE PARTNERS IN SCHOLARSHIP (PINS) GRANTS

AWARDED IN
FY 2022
TOTALING
\$32,400

387

DOCTORAL DEGREES

AWARDED IN
FY 2022

RESEARCH & SCHOLARSHIP SHOWCASE

Going Virtual

For the third year, the DU Research & Scholarship Showcase was hosted on an online platform, allowing presenters to showcase their work, even in the midst of a pandemic.

—
70

students

participated in the 2022
Research & Scholarship Showcase

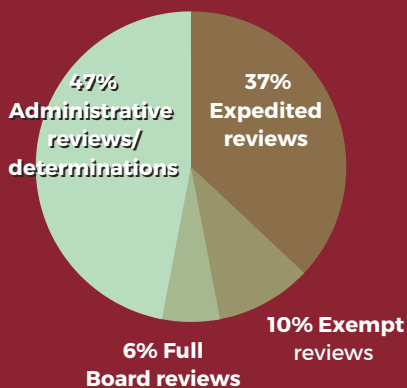
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The University of Denver's Research & Scholarship showcase welcomes DU community members to join in admiration of the exemplary scholarship of our graduate and undergraduate students. With the COVID-19 pandemic ongoing, the annual [showcase](#) was held as a Zoom conference. Presenters crafted engaging visual presentations, sharing their research and findings. Event attendees were able to view presentations, ask questions, and leave comments for presenters during the sessions. All research presentations are available upon request via e-mail at uap-researchshowcase@du.edu.

OFFICE OF RESEARCH INTEGRITY & EDUCATION

IRB Submissions



The Office of Research Integrity & Education (ORIE) continued to expand its presence to investigators by introducing a new website format, a research blog, and online training videos. To support our ongoing commitment to research integrity and compliance, Post Approval Monitoring (PAM) programs are integrated into human subjects protection, animal welfare, and biosafety research, with our team conducting 42 PAM reviews with investigators. The DU Animal Welfare Program was recognized as an exceptional program by AAALAC during the recent accreditation visit this spring. Obtaining this type of accreditation confirmed DU's strong commitment to the responsible care and use of animals in science.

When DU was classified as an R1 university in December 2021, DU was recognized as a very high research-focused university. The number of submissions increased from our faculty, staff, and student investigators from an average of 77 monthly submissions in FY21 to 183 monthly submissions in FY22.

1000+

active
IRB
protocols

2200

FY 22
submissions
to IRB

42%

of IRB protocols
are by student
investigators

11

active
IACUC
protocols

32

active
IBC
protocols



INTELLECTUAL PROPERTY & TECHNOLOGY TRANSFER

The research and technology transfer enterprise at the University of Denver has continued to break records in FY 22. The Office of Intellectual Property & Technology Transfer (OIPTT) has managed an unprecedented number of active agreements, continuing a growth trend evidenced over the past four years that demonstrates the determination and resiliency of the DU research community. This year, OIPTT oversaw property rights protection activities associated with nine active US patent applications and one foreign patent application, 24 issued patents currently in maintenance, and a variety of activities related to trademark, copyright, trade secrets, and other IP rights. The office has continued to provide on-demand service to researchers and units across the campus regarding IP, tech transfer, commercialization, and partnership questions and needs.

As administrative, legal, and operational demands increase with DU's achievement of R1 status, OIPTT has begun to actively partner with individual faculty, divisional and university-wide groups, and external partners to drive efforts to streamline processes, scale operations, and identify growth opportunities.

35

Material Transfer
Agreements

6

Non-Disclosure
Agreements (NDA) /
Confidentiality
Agreements (CDA)

29

Data Use Agreements (DUA) /
Data Share Agreements

1

Active
Technology
Licenses

2

Invention
Disclosures

3

New US Patents
Filed

15

Other agreements which
implicate DU's intellectual
property

