

**Technology Transfer Office
University of Wyoming
Report on FY 23 Performance and Future Actions**

The Technology Transfer Office (TTO) has been in the process of restructuring since April 2023. Since that time, several items have been addressed that will create a strong foundation for the TTO and anticipated growth of the research enterprise as the University achieves R1 status. Major accomplishments include:

1. Accelerating Research Translation proposal to the National Science Foundation

The University applied for and received a grant from the National Science Foundation (NSF) to accelerate research translation for \$6M over four years. The focus of this grant will be to:

- a) Develop the Translational Research Accelerator as a unifying force, a program designed to synchronize translational research activities and build a cohesive, university-wide culture of translational research and innovation.
- b) Create a market-driven, I-Corps™-style translational research engine that leverages innovation and entrepreneurship education and mentoring to create “market pull.”
- c) Re-structure technology transfer to be more proactive in identifying commercialization and startup opportunities.

This grant will enable the University to address key culture and infrastructure aspects of technology transfer and translational research. This will be accomplished through funding key strategic research translation projects (STRPs) and training and mentoring university faculty, pos-doctoral fellows, and graduate students. The primary impact of the grant is:

- a) Enabling the restructuring of the TTO to be more pro-active.
- b) Staffing of the office with the appropriate personnel for commercialization, licensing, and market research to create a core-competencies in those areas.
- c) Providing funds to advance selected STRPs to achieve culture changes and impact. The selected STRPS have the potential to result in significant impact through licensing and startups.
- d) Initiating a culture change that demonstrates the value of parallel pursuit of research excellence and research translation.

2. Staffing

The TTO has developed and posted job descriptions for the following positions to be filled in FY24 Q3:

- a) Licensing/Commercialization Manager: Two position one in life science and the second in engineering/physical sciences
- b) Operations/Fiscal/Compliance Manager (TTO and ART grant)
- c) Database specialist

Position descriptions for the following will be created and posted in FY24 Q3

- a) Business Development Manager (joint with Industry and Strategic Partnerships)
- b) Market Research Specialist
- c) Interns – business, technical, and legal

3. TTO Metrics

The Technology Transfer Office (TTO) metrics below reflect the activities of the office in fiscal year 2023. The year has been complicated with departure of key TTO staff and the subsequent engagement and on-boarding of an interim-director to manage the office through APIOiX.

Fiscal Year	2017	2018	2019	2020	2021	2022*	2023
TTO Metrics							
Invention Disclosures	53	37	30	45	21	27	40
U.S. Patent Applications Filed	53	58	32	34	18	27	33
U.S. Patents Granted	15	7	11	10	14	13	17
Total Licenses and Options Executed	3	0	1	2	0	1	0
New Startups Formed	1	0	0	2	0		1
Industry Sponsored Research Agreements Facilitated							5
CDAs Executed	89	65	92	37	11	2	56
MTAs Executed	38	40	36	10	0	0	~70

**Due to significant staff turnover in FY22 and FY23, TTO records were not updated and maintained consistently. Therefore, the data for FY22 is incomplete, but is in the process of being audited and updated.*

4. Income metrics

Licensing income received to date: \$4.05M. FY23 licensing income: \$511,096.

Total dividends received to date: \$111,448. FY23 dividends: \$58,816.

FY23 patent expenses: \$1.36M.

As of August 2023, the University is using an updated license agreement template that was approved by the Office of General Counsel and reviewed by external counsel.

5. Intellectual Property

Between January 1, 2020, and December 31, 2023, the University of Wyoming received 40 issued US patents (Exhibit A).

In addition, The University of Wyoming has been ranked 91st on "Top 100 U.S. Universities Granted Utility Patents in 2022," a list published by the National Academy of Inventors. (Exhibit B).

6. License agreement negotiations

The TTO has initiated license negotiations with several companies (some are University startups) for intellectual property developed at the University.

- a) Magnesium Corporation*: Water treatment technology developed by Dr. Brandt.
- b) PJKT72 Inc.: Technology for conversion of coal to graphite developed by Dr. Te Yu.
- c) Asimica, LLC*: Bacteriophage technology developed by Drs. Grant Bowman and Mushnikov.
- d) Acadian Research and Development*: Technology to convert coal to graphene oxide developed by Dr. Paul Johnson.
- e) Susteon holdings, Inc.: Direct carbon capture technology developed by Dr. Maohong Fan.

*University Startups

7. List Active Startups (alphabetical)

- a) CellDrop Biosciences, Inc.
- b) Blue Sky Group Inc.
- c) ENWYO LLC
- d) Glycobac LLC
- e) MKS Technology LLC
- f) Piri Tech Inc.
- g) PlankTOMICS Algae Bioservices*
- h) Plenty Inc.
- i) SoftRay, Inc. (Acquired by Veolia, Inc. in January 2023)

8. Database migration and cleanup

Migration of the database to servers hosted by Inteum. This will enable automation of key aspects of operations such as automated invoice processing (for patent expenses) and processing non-disclosure agreements. During the migration, the TTO also conducted a database audit. The audit determined that there was critical data missing, and the TTO is engaged in addressing these issues in the following areas:

- a) Licensing: Data has been inconsistently entered especially with respect to licenses executed. Currently there are licensees that are out of compliance with respect to payment of minimum annual payments, royalty reports, and due diligence reports. TTO is in the process of a comprehensive review of the data and reaching out to companies that have an active license to ensure payment and compliance.
- b) Patent docket: The patent information in the database is significantly out of date. The TTO has collected the information that needs to be updated and is working with Bormann & Co., and external patent docketing services, to update records in the database.
- c) Other Agreements: The database is lacking information regarding the number of non-disclosure, materials transfer, and industry sponsored research agreements. This will be the focus of cleanup after critical licensing and patent docketing data has been updated.

9. Collaboration with REDD units.

TTO is working collaboratively, primarily with IMPACT307, Industry and Strategic Collaborations, and Research Services to proactively address entrepreneurship and industry collaborations.

IMPACT307:

- a) Submission of an EDA grant for startup challenges
- b) Development of a plan to re-deploy the Fisher Launchpad

- c) Development of internal processes and procedures for working with SPARK and the NSF GreatPlains I-Corps hub
- d) Developing a joint proposal to fund seed projects through ASCEND TWO (The University is part of ASCEND TWO as part of an NIGMS initiative to assist universities in the INBRE cohort to commercialize health related technologies).

Industry and Strategic Partnerships (and UW Foundation):

- a) Coordination of activities to reach out and work with companies on strategic long-term relationships. This includes interactions with Genesis Alkali, Hess, Dow, BWXT, and Nvidia
- b) Creation of a monthly group meeting to coordinate efforts between the TTO, Research Services, and Industry and Strategic Collaborations.
- c) Development of a process between the different units to streamline interactions.

Research Services:

- a) Assistance with negotiation of agreements – specifically intellectual property, confidentiality, and publication clauses.
- b) Review of agreements with state and other agencies – specifically negotiations with WYDOT that have resulted in the creation of standard language that is more in-line with University policies and Federal regulations.

10. Outreach

The TTO is proactively reaching out to departments, colleges, and research centers. Over the last 6 months the TTO has held a two-day “open house” at the SI building where it met with several faculty members; held 10 one-on-one meetings with faculty; established contact and developed collaborative efforts with the College of Business, NSF I-Corps Node and SPARK; and, established a working relationship with research centers such as COIFPM, CCCC, and WYSAC.

Future Outreach Efforts

As the TTO increases its staff over the course of the year and starts to implement the strategies for the ART grant, the office will engage in active outreach to the University community. Activities include:

- a) Campus-wide launch event to inform the faculty, students, and staff about the ART grant and funding opportunities.
- b) Presentations on commercial utilization of research at department meetings.
- c) Meetings with deans and center directors to discuss technology transfer opportunities.
- d) One-on-one meetings with faculty and lab groups.

Exhibit A

Patents Issued in 2020 – 2023 (Calendar Years)		
Patent Number	Title	Inventors
US 10549265 B2	Diethyl oxalate catalysts	Maohong Fan Erlei Jin
US 10602674 B2	Greenwall cladding	Nathaniel R. Storey
US 10617075 B2	Hydroponic produce display apparatus	Nathaniel R. Storey
US 10631481 B2	Modular hydroponic rack system for crop cultivation and transport	Nathaniel R. Storey
US 10638677 B2	Vertical hydroponic plant production apparatus	Nathaniel R. Storey
US 10703981 B2	Enzymatic depolymerization and solubilization of chemically pretreated coal and coal-derived constituents	Michael A. Urynowicz Zaixing Huang
US 10724809 B2	Radiative cooling structures and systems	Ronggui Yang; Xiaobo Yin Ganf Tan Dongliang Zhao Yanguang Ma Yao Zhai
US 10758559 B1	Targeting cathepsin K to facilitate wound healing	Sreejayan Nair
US 10792612 B2	Methods and compositions for the removal of mercury from gases	Robert C. Corcoran Kaspars Krutkramelis Rodolfo A. Monterroso
US 10800987 B2	Composite iron-sodium catalyst for coal gasification	Maohong Fan Rodolfo Monterroso
US 10810495 B2	Methods for data encoding in DNA and genetically modified organism authentication	Don Roth Siguna Mueller Farhad Jafari
US 10818933 B2	Methods, catalysts, and supports for electrochemical devices	Dongmei Li Shibely Saha Brian Leonard
US 10844274 B2	Organic acid-based enhanced waterflooding	Vladimir Alvarado Teresa Reilly Kelly Meyers
US 10871439 B2	Enhancement of sensitivity of fountain flow cytometry by background attenuation	Paul E. Johnson
US 10888054 B2	Vertical hydroponic tower array fixture system	Nathaniel R. Storey
US 10944123 B2	Electrical energy generation in fluidic channels and membranes using spontaneous capillary flow	Debashis Dutta
US 11026378 B2	Vertical hydroponic plant production apparatus	Nathaniel R. Storey
US 11077443 B2	Apparatus for temperature modulation of samples	Kennan Oyen Michael Dillon
US 11136558 B2	Compositions and methods for reducing fucosylation of glycoproteins in insect cells and methods of use thereof for production of recombinant glycoproteins	Hideaki Mabashi-Asazuma Donald L. Jarvis

US 11191609 B2	Augmented reality based real-time ultrasonography image rendering for surgical assistance	Joseph Mcginley Suresh Muknahallipatna Bradley Riotto John Mcinroy
US 11205565 B2	Non-intrusive laser-based technique for monitor and control of protein denaturation on surfaces	Erica Belmont Franco Basile James Rundel Andrew Goodenough
US D952183 S	Filtration rack	Jessica Kern
US D954989 S	Filtration rack	Jessica Kern
US 11376219 B2	Localized immunosuppression of allografts for peripheral nerve repair	Jared Bushman
US 11393109 B2	Motion tracking synchronization in virtual reality spaces	Russell N. Todd Qin Zhu Derek T. Smith
US 11402376 B2	Methods and devices for detection of biological materials using electric field assisted rapid analyte capture	Debashis Dutta Michael Taylor Ravichander Rao Peesara
US 11464858 B2	Magnetic nanoparticle delivery system for pain therapy	Baskaran Thyagarajan Padmamalini Baskaran
US 11473004 B2	Microemulsions and uses thereof to displace oil in heterogeneous porous media	Lamia Goual Tianzhu Qin Gina Javanbakht Mohammad Piri
US 11478747 B2	Ultrafast catalytic CO.SUB.2 .capture catalyzed by a novel ultrasound-treated ionic liquid	Maohong Fan Xiaowen Zhang Yangyan Gao Armistead G. Russell Xin He
US 11499928 B2	Methods and systems for isochoric measurements using differential scanning calorimetry	Hertanto Adidharma Sugata P. Tan Morteza Dejam Xingdong Qiu
US 11525117 B2	Microbial stem cell technology	Grant Bowman Nikolai Mushnikov Mark Gomelsky
US 11573125 B2	Optical detector	William D. Rice Subash Kattel Joseph R. Murphy
US 11642642 B2	Exploiting oxygen inhibited photopolymerization within emulsion droplets for the fabrication of microparticles with customizable properties	John Oakey Katie Dongmei Li-Oakey Daniel Debroy Carl Frick Rajib Shaha
US 11707437 B2	Topical formulations with resiniferatoxin nanoparticles and methods	Louis Premkumar Baskaran Thyagarajan

US 11731875 B2	Methods for production of graphene oxide	Patrick Johnson Ana Paula Martins Leandro
US 11749083 B2	Method and apparatus for optical ice detection	William D. Rice
US 11761058 B2	Materials derived from coal using environmentally friendly solvents	Dongmei Li Shuai Tan Chenlin Li Luke Williams
US 11766467 B2	Methods of treating wounds using cathepsin K inhibitors	Sreejayan Nair
US 11814299 B2	Method for separation of rare earth elements from coal ash using supercritical carbon dioxide	Mauhong Fan Zaixing Huang
US 11820662 B2	Process and apparatus for carbon nanotube formation	William D. Rice Jeffrey A. Fagan Joshua S. Walker

Exhibit B

UW Ranks Among Top 100 US Universities Granted Patents in 2022

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The University of Wyoming has been ranked 91st on "Top 100 U.S. Universities Granted Utility Patents in 2022," a list published by the National Academy of Inventors ([NAI](#)).

The new list was created to highlight and celebrate American innovation and to showcase the universities that play a large role in advancing the innovation ecosystem within the U.S. and beyond.

"As a U.S.-based national academy, it is important to us not only to showcase innovation happening on the broader world stage, but here at home as well. Invention has been part of the American experience since the country's inception, with intellectual property (IP) being protected in the Constitution," says Jamie Renee, executive director of NAI. "Innovation has always been at the heart of U.S. culture, and the Top 100 U.S. Universities list allows us to recognize and celebrate the commitment these universities have to the American tradition of invention and protection of IP."

With 15 utility patents granted in 2022, UW tied with George Mason University and the City University of New York, according to the list. That's close behind schools that include Oregon State University (19 patents), Clemson University (19) and Wake Forest University (16) and ahead of schools that include the University of Miami (13), Auburn University (12) and the University of Toledo (11).

A utility patent covers the creation of a new or improved -- and useful -- product, process or machine. Utility patents granted to UW in 2022 included technology and devices for controlled environment agriculture; methods for dealing with foodborne bacteria; technology for nervous tissue repair, stem cells and pain therapy; and technology for oil and gas recovery as well as carbon capture.

Parag Chitnis, UW's vice president for research and economic development, credits UW's Technology Transfer Office, as well as the Office of General Counsel, for helping UW researchers obtain patents.

"Helping turn discoveries by UW researchers into intellectual property that can be commercialized to help diversify Wyoming's economy is a top priority for the university," Chitnis says. "While we are striving to increase our performance and become a Carnegie R1 research university, it is nice to be recognized as a top-100 university in the nation for patent production."

UW's Technology Transfer Office also obtains international patents, plant patents and design patents. Other types of IP protection include trademarks and copyrights.

NAI says the [Top 100 U.S. Universities](#) list is meant to provide a more focused view of the national innovation landscape and the contributions made by U.S. academic institutions. The list was created using calendar year data provided by the U.S. Patent and Trademark Office. Top 100 placement includes all named assignees listed on the patent. To see the full list, go [here](#).