

RESEARCH + INNOVATION

POWERHOUSE

A Report on UofL's Impressive FY2021 Research Impact

Office of Research and Innovation
uofl.edu/research

UNIVERSITY OF
LOUISVILLE[®]

BREAKING *BOUNDARIES*

The University of Louisville was awarded more than \$200 million for groundbreaking research in FY2021, a more than \$30 million increase over the previous record set the year before. At \$26.7 million, our innovation income was no-less impressive, nearly tripling our previous high.

This funding supported work in UofL's three Grand Challenge areas: to empower our communities, advance our health and engineer our future economy.

\$201.5M

in competitive research funding - a more than \$30 million increase over our previous high in FY2020.

80

new patents awarded - nearly double the previous year's total.

\$26.7M

in innovation income - nearly triple the previous record set in FY2020

482

agreements (license, option, material transfer, NDA).

OUR 'GRAND CHALLENGES'

As part of its Strategic Plan, UofL has selected three 'Grand Challenges' to guide its research priorities. These are big, global challenges UofL is helping to solve through its existing and growing research infrastructure, talent and strength.

- **EMPOWERING OUR COMMUNITIES:** UofL will empower communities — promoting equity, eliminating disparities and strengthening the ability of all individuals and communities to achieve well-being and prosperity.
- **ADVANCING OUR HEALTH:** UofL will advance human health, leading a transformative shift in how we understand, promote and recover wellbeing through all stages of life.
- **ENGINEERING OUR FUTURE ECONOMY:** UofL will engineer a future economy made possible by cutting-edge technology and ideas in the world of work.

EMPOWERING OUR COMMUNITIES

THE RESILIENCE JUSTICE PROJECT + S.W. LOUISVILLE

- **Mill Creek Watershed Planning:** Apply environmental justice & resilience justice frameworks:
 - Collaboration with Louisville Metro & environmental & community groups;
 - U.S. EPA Clean Water Act grant;
 - Anti-racist;
 - Community-engaged;
 - Tony Arnold & Resilience Justice Fellows: 3 law students of color;
 - Uses Arnold's "field-defining" frameworks (e.g., Los Angeles, Chicago, Brazil, Pakistan).
- **Intended Impacts:**
 - **Transform** the inequitable environmental conditions of the watershed & improve community resilience & equity;
 - **Empower** community residents, especially low-income people of color;
 - **Prevent** green gentrification & displacement.

ADVANCING OUR HEALTH**GENOMICS SERVICE CENTER**

Launched UofL Sequencing Technology Service Center, first run of PacBio Sequel IIe system in November 2020.

- Only instrument in KY or surrounding states (WV, TN, VA, OH, IN) and established as Certified Service Provider, operating at ~90% capacity;
- Broad and growing network of internal, external academic, and industrial customers and key collaborators;
- Statewide collaborative network for NIH-funded SARS-CoV-2 genomic surveillance - 7000 viral genomes will be sequenced by end of Q1 2022.
- Custom targeted methods development resulting in new experimental strategies with direct impact on personalized medicine, cancer biology, and HIV Cure research.
- Immune system response highly population/individual specific. Personalized immune/antibody response (e.g. for coronavirus vaccines or cancer therapies).
- Where have THE MOST long-read, PacBio-enabled sequences been generated for SARS-COV-2 in the world? Boston? San Francisco? The Mayo Clinic?

Right here at UofL by Melissa Smith and Corey Watson and their staff.



ENGINEERING OUR FUTURE ECONOMY

LOUISVILLE AUTOMATION AND ROBOTICS RESEARCH INSTITUTE (LARRI)

- New 10,000-square-foot space dedicated to research, education and collaboration in automation and robotics;
- 12 dedicated faculty members, postdoctoral staff, affiliated faculty and more than 50 student researchers;
- Areas of investigation include:
 - Human-robot interaction;
 - Automation and robotics for industry;
 - Networked robots and autonomous vehicles;
 - Planning and control for mechatronic systems, etc.

THRIVING INNOVATION ECOSYSTEM

- **Strong technologies and IP**, with areas of focus that include small molecule therapeutics for cancer, renewable energy/battery storage, advanced materials and social innovation.
- **UofL New Ventures**, a new office dedicated to the launch and growth of research-backed startups.
- **LaunchIt**, UofL's whirlwind 10-week startup and corporate innovation bootcamp. Lessons cover Steve Blank's lean launchpad methodology, with the goal of driving product development.
- The **Superfecta**, UofL's suite of five prestigious grant-backed programs, totaling nearly \$14 million, aimed at translating research for market. UofL is one of only a handful of universities to have each, and the only one to have them all.
- **Entrepreneurs in Residence**, seasoned founders hired to help foster entrepreneurship at UofL and shepherd university-born technologies to market.

COMMERCIALIZATION SUCCESES

- **Several products on the market, including:**
 - **ANSYS Inc.**, a global public firm, which is marketing and selling UofL-born modeling software that helps manufacturers optimize and improve efficiency. ANSYS acquired UofL startup 3D SIM;
- **Launched several startups, including acquisitions and IPOs:**
 - **Talaris Therapeutics**, launched by an endowed UofL researcher and commercializing her university-born cell therapy technology, completed a \$150 million IPO in early 2021 (NASDAQ: TALS). The IPO came on the heels of two funding raises worth a collective \$215 million.

IMPRESSIVE FOLLOW-ON **FUNDING**

UofL companies and licensees have a history of success in receiving follow-on funding to further develop university-born technologies.

This may include venture capital, federal or state development grants, and funding from Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR).

UofL supports companies pursuing this funding, including through its established relationships with venture capital firms.

\$365M

The amount of funding raised by UofL startup Talaris in two years' time, this number includes series A and B investment rounds (each being one of, if not *the*, largest raises in the state in their respective years) and a fully-funded IPO.

\$32M

The amount of SBIR/STTR funding secured by UofL licensees and partners in the past four fiscal years (2017-2020). This number out-paces our peers and make UofL possibly *the best* university partner for SBIR/STTR in the state.

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