

Research News

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OFFICE of RESEARCH and SPONSORED PROGRAMS

October 2013

A WINNING YEAR

Dear Researchers,

WFU Reynolda Campus research had an excellent year. For FY13, total external support for projects exceeded \$9.8 million, the second highest amount in campus history, and not including 5 fellowships for scholarship in the arts, humanities, and social sciences. The total is even more remarkable when you consider that \$8.4 million, approximately 86%, comes from federal sources limited by sequestration budget cuts.

FY13 saw 22 departments and centers receive sponsored research funding, and nearly all increased their total over FY12's. The Department of Health and Exercise Science received the most, with the Physics Department running a close second.

Faculty and staff in 32 departments and centers submitted external proposals for a total of 152, requesting over \$38 million. The Chemistry Department submitted the most proposals and requested the most funding.

We would like to recognize two of our former CRADLE program participants, Oana Jurchescu and Timo Thonhauser, both in Physics, who received prestigious CAREER awards from the National Science Foundation. WFU has received 5 such awards to date, and Oana and Timo join Patricia Dos Santos and Rebecca Alexander in Chemistry and Dave Anderson in Biology in that distinction.

Another graduate of the CRADLE program, Assistant Professor of Chemistry Lindsay Comstock-Ferguson, received her first independent federal funding. The following faculty and staff also received their first individual external grants at WFU:

Steve Folmar, Anthropology
Rebecca Powell, Biology; Center for Energy,
Environment, & Sustainability
Alessandra Beasley Von Burg, Communication
Ronald Von Burg, Communication
Sam Cho, Computer Science and Physics
John Senior, Divinity
David Taylor, International Studies
Sarah Raynor, Mathematics
Megan Mulder, ZSR Library

This year saw the first Cross-Campus Collaborative Research Fund competition, and we plan another in spring 2014. We overhauled our other internal grant programs to create WFU Pilot Research Grants (PRG), which replace the Science and Social, Behavioral, and Economic Science Research Funds. The PRG will be open to researchers in all disciplines who meet the eligibility criteria. We look forward to receiving strong applications for these new funds and working with recipients on the external proposals that result.

We entered Phase II of the Triad Interuniversity Project Planning Grants (TIPP) and congratulate Richard Williams and David Carroll, both in Physics, Abdou Lachgar, Chemistry, Keerthi Senevirathne, Center for Energy, Environment, and Sustainability, and their collaborators at Winston-Salem State University, University of North Carolina at Greensboro, and North Carolina A&T State University. This team received \$100K to continue their research on solar energy.

With a new Provost and Associate Provost for Research, we knew that FY13 would mark a transition for the university as well as our office. We are pleased to see how everyone's efforts achieved such success.

Sincerely, *Lori Messer*, Director

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WAKE FOREST
UNIVERSITY

CELEBRATING CAMPUS RESEARCH

Julie Edelson

On 2 October, ORSP held a reception recognizing all those who contributed to sponsored research activity. Provost Kersh applauded the scholarly achievements of our teacher-scholar model: despite sequestration, Wake Forest faculty won almost \$10M in external awards, second only to the stimulus year, which, he joked, doesn't count. A record number of individuals and departments submitted proposals, and the Institutional Review Board (IRB) handled applications at a record pace. All in all, Wake Forest ideally matches talented seekers with expert services.

Associate Provost for Research S. Bruce King, Professor of Chemistry, said that our faculty's success in these hard times reflects diligence, creativity, and work of the highest quality. He thanked the IRB, center and institute directors, the Research Advisory Council (RAC), Financial and Accounting Services, and ORSP, especially Director Lori Messer, for sustaining and advancing the research effort. Internal support mechanisms will continue to help faculty amass pilot data to support competitive external proposals, and another cross-campus program with the Medical School is under discussion.

STAFF ACCOMPLISHMENTS

Susan Edwards was elected to the WFU Staff Advisory Council for a 3-year term.

Amy Comer is a member of the program committee for the North Carolina Society of Research Administrators (NCSRA) annual meeting, which will be held 3-5 March 2014 at the Pinehurst Resort.

Lori Messer became Secretary of the Research Administrators Certification Council Board of Directors. She has been a board member for the past 2 years.

NEW BUSINESS MANAGER SERVES 3 DEPARTMENTS

Stephen Williams

ORSP welcomes Ms. Crystal Reid, who will serve as business manager for Computer Science, Math, and Psychology. We are fortunate to have the assistance of four other departmental business managers (Biology, Chemistry, Physics, and Health and Exercise Science), but Crystal is the first to cover three departments. Their increased sponsored research activity and success call for a dedicated administrator.

We could not have found a better match. Crystal worked for 10 years in the Medical School's Office of Research in several capacities. She has pre- and postaward expertise and extensive experience in presenting statistical data reports and research projections. She is also warm, responsive, a great listener, and a detail-oriented problem-solver. Married, with a child in college, she is an invaluable addition to the university.

NIH NEWS

Amy Comer

Naming Senior/Key Personnel. PIs should use discretion in identifying senior/key personnel other than the PD and PIs in NIH grant applications. Changing the status of senior/key personnel named in the Notice of Grant Award requires prior written approval from NIH. These are individuals whom the PI considers critical to the project, and their absence would affect the approved scope. Consultants are not generally considered senior/key personnel, but if they substantively and measurably contribute to the scientific development or execution of the project, they should be designated as such and included in the Senior/Key Person Profile component.

Required use of updated electronic grant application forms. NIH periodically updates its electronic grant application forms to remain current with the most recent form sets available through Grants.gov and approved by the Office of Management and Budget. Please remember that all NIH applications must be submitted in response to a Funding Opportunity Announcement. Use the most current *Parent Announcements* for *unsolicited* or *investigator-initiated* applications. The current updated forms must be used for NIH applications submitted after 25 September 2013.

Form updates can be confusing for applicants: old application packages are removed from announcements and replaced with new packages that include the updated forms; some new announcements are posted without any application packages for a period of time; and timelines can vary by grant program. ORSP monitors these changes closely to assure that your NIH application is submitted using the correct forms.

WAKESPACE: PUBLIC ACCESS TO RESEARCH RESULTS

Molly Keener
Scholarly Communication Librarian
Z. Smith Reynolds Library

Support for public access to taxpayer-funded research results is rising. The National Institutes of Health (NIH) Public Access Policy, the first in the United States, became required for all award recipients in April 2008. Through the PubMed Central (PMC) repository, all peer-reviewed scholarly articles stemming from research funded in whole or in part by NIH must be made publically accessible within 12 months of publication. In January 2011, the National Science Foundation (NSF) required that all proposals include a Data Management Plan of up to 2 pages that specifies how data will be preserved for future access. The NSF Directorates determine field-specific data-archiving allowances and practices.

In February 2013, the White House Office of Science and Technology Policy (OSTP) issued a memorandum requiring all federal agencies with annual research and development budgets in excess of \$100 million to submit plans detailing how they will provide public access to research publications and data. The 6-month deadline for these plans passed in late August, and while they have not been shared publically, the word circulating among interest groups is that several agencies are considering either archiving in PMC, as NIH offered, or launching similar repositories; currently, no cross-agency federal repository exists. One agency is reportedly looking into a partnership with a coalition of publishers to ensure access via journal websites.

Also in February, the bi-partisan Fair Access to Science and Technology Research (FASTR) bill was introduced in both the House and Senate. It builds on the success of the NIH Public Access Policy and complements OSTP plans, notably through legislative enforcement. In September, Provost Rogan Kersh signed the "Open Letter to the Higher Education Community" (<http://www.sparc.arl.org/blog/opportunity-your-campus-support-open-access-encourage-your-provosts-sign-open-letter-support>), supporting FASTR on behalf of Wake Forest University.

In FY13, ~86% of WFU's external research dollars came from federal agencies, and compliance with the NIH Public Access Policy is routine among funded researchers. Many publishers facilitate compliance by automatically depositing articles based on NIH-funded research on behalf of authors.

However, the NSF Data Management Plan recently prompted one WFU researcher to alter his data-archiving practices. To fulfill requirements for an NSF renewal application over

the summer, Biology Professor Dave Anderson worked with me to archive data sets in WakeSpace (<http://wakespace.lib.wfu.edu>), the university's institutional repository. WakeSpace is a publicly searchable solution for storing research outputs, providing space for WFU researchers to deposit publications and data. Dr. Anderson confirmed with the NSF program officer that WakeSpace was an acceptable venue for public access, and we deposited his data (see <http://hdl.handle.net/10339/38649>) in advance of deadline.

For information on using WakeSpace to support your research, federally funded or otherwise, contact me at keenerm@wfu.edu or x5829.

OUTSTANDING PROJECT

Julie Edelson

Computer Science Professor **Jennifer Burg** received a 3-year award for *Collaborative Research: Computing in the Arts - A Community-Building Initiative* from the National Science Foundation's Transforming Undergraduate Education in Science, Technology, Engineering, and Mathematics (TUES) program. In partnership with the College of Charleston and UNC Asheville, the project aims to build a strong, diversified community of computer science educators interested in adopting and developing innovative instructional material related to computing in the arts (cita). The team will disseminate the successful cita model implemented at the College of Charleston; synthesize it with complementary approaches at partner institutions; and create new instructional materials and curricular exempla for dissemination at annual faculty development workshops, meetings and special sessions of SIGCSE (Special Interest Group on Computer Science Education), and on a shared website.

Two object lessons from Dr. Burg's success. First, establish a track record. This project follows on two previous NSF-funded projects, awarded concurrently: *Linking Science, Art, and Practice in Digital Sound* and *CPATH: Revitalizing Computer Science Education through the Science of Digital Media*. The first, also a collaboration among Dr. Burg and a digital sound designer at University of North Carolina School of the Arts, created, implemented, and disseminated innovative curricular material integrating the science and art of digital sound design. The second also placed the study of digital media at the center of collaborative explorations to broaden the relevance and excitement of computer science.

Second, establish collaborations. Look at Wake Forest funded awards from March to September: 15 are explicitly collaborative, and most enlist the participation of colleagues and students. Join the team!

IRB TRANSITIONS

Pam Moser

The composition of the Institutional Review Board (IRB) is defined by federal regulation [45CFR46.107] and institutional policy. To continue meeting those requirements, the following changes became effective 1 July 2013.

The IRB benefited from the exemplary service of Professor **Pete Brubaker**, Health and Exercise Science, for two 3-year terms. Pete stayed an additional year as HES representative, while his replacement, Associate Professor **Gary Miller**, was on research leave and Resident Professor in the WFU/Southern Cone Program. Professor **Jack Rejeski** rejoins the board after his sabbatical year for a third term as alternate HES member.

The Department of Psychology was well-represented for two terms (6 years) by alternate member **Eric Stone**, Professor and Director of Graduate Studies. Associate Professor **John Petrocelli** now takes Eric's place.

Psychologist **Alan Cameron**, Associate Director of the University Counseling Center, began his board service in 2008 as the Education Department delegate. When the Visiting International Fellows Program was discontinued in 2012, he graciously agreed to continue on the IRB although no longer affiliated with Education. He now serves as the primary member from the University Counseling Center. **Robert McNamara**, Staff Psychologist, was appointed the alternate. Associate Professor **Adam Friedman** transitioned from alternate to primary board member to fill the Department of Education vacancy.

To foster continuity in leadership, former Vice-chair **Fred Chen**, Associate Professor of Economics, is now Chair, and past Chair **Janine Jennings**, Associate Professor of Psychology, remains on the board as Vice-chair.

Jeffrey Teague, the university's Senior Information Security Analyst, will serve as a specialty reviewer for questions on data confidentiality and security. He is completing training to assist the board in this important area of human subjects protections.

See the 2013-2014 roster on the IRB website.

Human Subjects Protection AND Research Advancement

I knew about HeLa cells but not Henrietta Lacks when science writer Rebecca Skloot delivered a keynote address at the annual Advancing Ethical Research Conference I attended in December 2010. I bought Ms. Skloot's book, *The Immortal Life of Henrietta Lacks*, as soon as I returned to Winston-Salem—it was sold out at the conference book stall—and read it straight away. Recently, the Lacks family returned to the media spotlight because they and the National Institutes of Health reached an understanding about sharing the genomic data derived from their matriarch's cell line.

Henrietta died in 1951 from an aggressive form of cervical cancer after unknowingly donating a tissue sample that researchers at Johns Hopkins University were able to grow in vitro. Successful propagation of the cells was a game-changer, and in the decades that followed, HeLa cells traveled to research labs around the world, enabling lifesaving and lucrative biomedical discoveries.

Eventually, the HeLa cell genome was mapped, and a team at the European Molecular Biology Laboratory published it in March. Ms. Lacks' descendants, concerned for the privacy of their personal medical information, petitioned for withdrawal of the paper. The EMBL rescinded it with apologies, and finally, wheels were set in motion to determine the terms under which Henrietta's genetic information would be shared. The result is the HeLa Genome Data Use Agreement. Note that during the same time period, the Supreme Court ruled that naturally occurring genes could not be patented, taking one of the family's concerns off the table.

From the NIH news release: "The understanding reached with the Lacks family respects their wishes to enable scientific progress while ensuring public acknowledgment of the enormous contribution made by the late Henrietta Lacks. In addition, the understanding gives the Lacks family a seat at the table in reviewing applications for controlled access to Henrietta Lacks' whole genome data."

Sixty-two years after her death, Henrietta's legacy contributes, not only to the advancement of biomedical research, but research ethics as well.

FUNDED FACULTY RESEARCH

March — September 2013

ANTHROPOLOGY

Ellen Miller

- *Paleontological exploration and excavation at Buluk, northern Kenya*, Leakey Foundation, \$19,000
- *Paleontological exploration at Buluk, early Miocene, Kenya*, National Geographic Society, \$24,340

BIOLOGY

Dave Anderson

- *Population size of blue-footed boobies in Galapagos: Evaluation of indications of decline*, Galapagos Conservancy, \$32,853
- *Life history evolution in Galapagos boobies*, Galapagos Conservancy, \$27,000

T. Michael Anderson, *Collaborative research: Mechanisms of tree recruitment limitation across a savanna soil moisture availability gradient*, National Science Foundation (NSF), \$64,746

Bill Conner, *Bats jamming bats: A novel form of intraspecific communication*, NSF, \$400,000

Susan Fahrback, *Allotropic actions on insulin in honey bees*, NSF, \$120,000

Wayne Silver and Susan Fahrback, *Undergraduate neuroscience training cooperative between WSSU and WFU*, National Institutes of Health (NIH), \$86,092

CENTER FOR ENERGY, ENVIRONMENT, & SUSTAINABILITY

Rebecca Powell, **BIOLOGY**, *Collaborative Research: Thermal controls on ecosystem metabolism and function: Scaling from leaves to canopies to regions*, NSF/Oregon State University, \$51,072

Miles Silman, **BIOLOGY**, *Understanding range limits and plant migration in response to climate change in neotropical montane forests*, NSF, \$350,000

Richard T. Williams, **PHYSICS**

- *Collaborative research: ARI-MA: Realizing high-performance inorganic scintillators at low cost*, NSF/Domestic Nuclear Detection Office, \$129,557
- Keerthi Senevirathne, David Carroll, **PHYSICS**, Abdou Lachgar, **CHEMISTRY**, *Four Universities Solar Consortium*, UNC-G, \$25,000

CENTER FOR BIOETHICS, HEALTH, & SOCIETY

Mark Hall, **LAW**, *Data analysis and strategic planning for Forsyth HealthCare access*, Forsyth HealthCare, Inc., \$34,921

CENTER FOR MOLECULAR COMMUNICATION & SIGNALING

S. Bruce King, **CHEMISTRY**, *New reagents for tracking protein oxidation in cells by MS and imaging methods*, NIH/WFBH, \$89,639

CENTER FOR NANOTECHNOLOGY & MOLECULAR MATERIALS

Dave Carroll, **PHYSICS**

- *Organic thermoelectrics: The matrix composite approach*, Air Force Office of Scientific Research (AFOSR)/Texas A & M, \$45,000
- *Power-generating coverings and casings*, National Aeronautics and Space Administration (NASA)/Streamline Automation, \$59,400
- *Gammabrite*, Gammabrite, \$25,000

Oana Jurchescu, **PHYSICS**

- *MRI acquisition of an electron beam evaporator for interdisciplinary research and education*, NSF, \$225,048

CHEMISTRY

Rebecca Alexander, *Dissecting catalytic features of diverse methionyl-tRNA synthetase enzymes*, NSF, \$171,875

Lindsay Comstock-Ferguson, *Investigating N-mustard-based analogs of SAM as probes of biological methylation*, NSF, \$300,000

Angela Glisan King, *Project SEARCH Academy summer program in chemistry*, Northwest AHEC, \$3,949

Patricia Dos Santos, *Target specificity of cysteine desulfurase in Bacillus subtilis*, NSF, \$149,190

COMMUNICATION

Ron Von Burg, Alessandra Beasley Von Burg, and Allen Loudon, *Benjamin Franklin Trans-Atlantic Fellows Institute*, Department of State, \$225,000

COMPUTER SCIENCE

Jennifer Burg, *Collaborative research: Computing in the arts—a community-building initiative*, NSF, \$199,750

FUNDED FACULTY RESEARCH

March — September 2013 (continued)

Victor Paul Pauca, Todd Torgersen, and Robert Plemmons, **MATHEMATICS**, *Implicit geometry and linear and nonlinear tensor-based compression and restructuring of high-dimensional multimodality datasets*, Department of Defense (DoD)/Boeing Company, \$61,599

William Turkett, *Dwight D. Eisenhower Research Fellowship for Eric Li*, Department of Transportation (DoT), \$5,500

DIVINITY SCHOOL

Jill Crainshaw, *Doing theology at the table*, Calvin Institute for Christian Worship, \$12,000

ECONOMICS

Michael Lawlor, *HELP PD II*, NIH/Wake Forest Baptist Health (WFBH), \$21,500

EDUCATION

Adam Friedman, *Creating videos of exemplary social studies instruction*, North Carolina Community College System, \$12,996

GRADUATE SCHOOL OF ARTS & SCIENCES

Bradley Jones, **CHEMISTRY**, *Graduate research fellowship program*, NSF, \$74,000

HEALTH & EXERCISE SCIENCE

Michael Berry

- Standardized rehabilitation for ICU patients with acute respiratory failure, NIH/WFBH, \$88,100
- *Early ICU mobility in the critically injured burn patient*, DoD, WFBH, \$163,494

Peter Brubaker, *Project SEARCH*, NW AHEC, \$3,750

Jeff Katula

- *HELP PD II*, NIH/WFBH, \$22,534
- and Michael Lawlor, **ECONOMICS**, *Maya Angelou Center for Health Project 1*, NIH/WFBH, \$30,000

Steve Messier

- and Shannon Mihalko, *Strength Training and Arthritis Trial (START)*, NIH, \$812,649
- and Shannon Mihalko, *The Runner's And Injury Longitudinal Study (TRAILS): Injury recovery supplement*, DoD, \$441,069
- *Strength training and arthritis trial (BIRT)*, NIH, \$137,703

- *Pain management in osteoarthritis: Clinical benefits and cost effectiveness*, NIH/Brigham and Women's Hospital, \$48,680

Anthony P. Marsh

- Peter Brubaker, and Jack Rejeski, *Cooperative Lifestyle Intervention Project (CLIP II)*, NIH, \$66,253
- *Physical exercise to prevent disability pilot study: LIFE field center*, NIH/WFBH, \$243,063
- *Nutritional status and mobility in geriatric patients predicts postoperative complications*, Anesthesia Patient Safety Foundation, \$4,506
- *Trial of vitamin D supplementation and neuromuscular function in older adults*, NIH/WFBH, \$43,948

Gary Miller

- *Increased plasma nitrite, tissue oxygenation, and functional changes in PAD*, NIH/Duke University, \$2,820
- *Dietary nitrate to augment exercise benefits*, NIH/Duke University, \$2,806

Jack Rejeski

- Peter Brubaker, and Anthony Marsh, *Cooperative Lifestyle Intervention Project (CLIP II)*, NIH, \$66,253
- *LIFE DMAQC (Data Management, Analysis, and Quality -control Center)*, NIH/WFBH, \$143,734.54

HISTORY

Penny Sinanoglou, *Legally subject: Contested nationality and subjecthood in the British Empire, 1870-1950*, American Association of University Women (AAUW) Postdoctoral Research Leave Fellowship

HUMANITIES/HUMANITIES INSTITUTE

David Phillips, *Integrating Humanities Across National Boundaries: The Promise of CHCI*, Mellon Fdn/Duke University, \$50,000

MAGNOLIA SCHOLARS

Timothy French, *Summer bridge*, Department of Education (ED)/NC Independent Colleges and Universities, \$4,750

MATHEMATICS

Jennifer Erway, *Collaborative research: Trust-search methods for inverse problems in imaging*, NSF, \$149,857

FUNDED FACULTY RESEARCH

March—September 2013 (continued)

Miaohua Jiang, *Dwight D. Eisenhower Research Fellowship for Venkat Manne*, DoT, \$5,500

Ellen Kirkman, *Invariant theory of Artin-Schelter regular algebras*, Simons Foundation, \$7,000

PHILOSOPHY

Christian Miller and Will Fleeson, R. Michael Furr, Eranda Jayawickreme, **PSYCHOLOGY**, *The developing character project: Research and dissemination on the existence, nature, and cultivation of character*, Templeton World Charity Foundation, \$968,036

PHYSICS

Paul Anderson, *Studies of particle production, vacuum polarization, and the validity of the semi-classical approximation in gravity*, NSF, \$41,275

Natalie Holzwarth, *First principles simulations of battery materials*, NSF, \$100,000

Oana Jurchescu

- *High-conductivity in binary organic single crystals for electronic applications*, NSF/UNC-CH, \$62,182
- *CAREER: Fundamental limits of charge transport in organic semiconductors*, NSF, \$400,000
- *Acquisition of a glove-box for organic thin-film transistor fabrication*, NSF, \$12,000
- *Infra-red (IR) spectroscopy for electronic structure determination of future electronic devices*, NIST, \$116,463
- *Spintronics for novel device application and metrology advancement*, National Institute of Standards and Technology (NIST), \$119,144

Daniel B. Kim-Shapiro

- *Storage lesions in banked blood due to disrupted NO homeostasis*, NIH/University of Pittsburgh, \$27,775
- *Myoglobin as a nitrate reductase that regulates hypoxic cardiac NO signaling*, NIH/University of Pittsburgh, \$28,175

Fred Salsbury

- *Computational biosciences from the Cancer Center Support Grant*, NIH/WFBH, \$5,138

- *Targeting the MSH2-dependent apoptotic pathway*, NIH, \$161,409

Timo Thonhauser

- *Kinetics and reactivity in metal organic framework materials*, Department of Energy (DoE), \$108,505

Richard T. Williams

- *Physics of scintillator nonproportionality*, DoE/Lawrence Berkeley Laboratory, \$37,500
- *Research on scintillator materials and mechanisms: LaBr₃ with co-doping and other topics*, Saint-Gobain Ceramics & Plastics, Inc., \$90,000

POLITICS AND INTERNATIONAL AFFAIRS

Katy Harriger and Christy Buchanan, **PSYCHOLOGY**, *Follow-up study on the impact of the Democracy Fellows program on alumni*, Kettering Foundation, \$44,620

PSYCHOLOGY

Will Fleeson and R. Michael Furr, *Integrating process and structure in borderline personality disorder*, NIH, \$19,101

R. Michael Furr, *Binge drinking: Individual differences in the capacity to alter drinking patterns*, NIH/University of Texas Health Science Center at San Antonio, \$12,440

Eranda Jayawickreme, *What are the real benefits of hardship? Examining possibilities for behavior growth following adversity*, Templeton Foundation, \$24,805

Janine Jennings, *LIFE DMAQC*, NIH/WFBH, \$9,264.46

SCHOOLS OF BUSINESS

Todd Johnson, *Regenerative medicine: Current concepts and changing trends*, North Carolina Biotechnology Center (NCBC), \$1,800

TRANSLATIONAL SCIENCE CENTER

Daniel B. Kim-Shapiro, **PHYSICS**, and S. Bruce King, **CHEMISTRY**

- *Effects of nitric oxide in sickle cell blood*, NIH, \$355,935
- *Exercise, weight loss, and arterial stiffness in obese older adults*, American Heart Association (AHA)/WFBH, \$16,660

COMPLIANCE HOTLINE

Call 1-877-880-7888 or email www.twinc.com/Reportline/International/ to report suspected violations of laws, regulations, rules, policies, procedures, ethics, or other information anonymously. The operator, who is not a university employee, will report your concerns to the University Compliance Office.



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**Research
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