

## RESEARCH & SCHOLARLY ACTIVITIES



## Research and Scholarly Activities Highlights

### Select awards received, January and February 2021

College	Department	Title	Sponsor	Award Amount	PI and Co-PI(s)
BCAS	Chemistry	Integration of Leukotriene and Prostaglandin Receptor Signaling in Mast Cell Activation and Pulmonary Inflammation during Asthma	National Institute of Allergy and Infect	\$ 380,000	Paruchuri,Sailaja M; Smith, Adam W (Co-PI, Chemistry)
BCAS	Geosciences	Dormitory Wastewater Monitoring of SARS-CoV-2 at Universities and Colleges in the State of Ohio	Ohio Department of Health via Ohio State University	\$ 151,037	Senko,John M
CEPS	Biomedical Engineering	Aptamer-functionalized cardiac patches	National Heart Lung and Blood Institute via Pennsylvania State U.	\$ 150,000	Zhang,Ge
CEPS	Electrical & Comp Engineering	Analysis and Design Solutions for Next Generation technologies used in automotive traction drive systems	Nexteer Automotive	\$ 69,333	Sozer,Yilmaz
CEPS	Mechanical Engineering	Modeling the Crushing Behavior of Polymer Foams in Sandwich Structures Operating in Arctic Region	Office of Naval Research	\$ 100,000	Hoo Fatt,Michelle S
CEPS	Mechanical Engineering	Portable Automated Intravenous Injector	National Science Foundation	\$ 50,000	Nadkarni,Gopal R
CEPS	School of Polymer Sci & Engr	Gradient Amine Sorbents for Low Vacuum Swing CO2 Capture at Ambient Temperature	U.S. Department of Energy	\$ 752,002	Chuang,Steven S
CEPS	School of Polymer Sci & Engr	Myrcene Anionic Polymerization and Functionalization - Phase 2	Lubrizol Corp.	\$ 155,571	Cavicchi, Kevin A
CHHS	Health & Human Sci-Dean's Off	Area Health Education Centers Point of Service Maintenance and Enhancement	Health Resources & Services Administration via NEOMED	\$ 116,363	Lax,Greta A
CHHS	Schl of Social Wrk & Family Sci	University of Akron GLS Campus Suicide Prevention Grant	Substance Abuse & Mental Health Services	\$ 90,519	Ellis,John
CHHS	Schl of Social Wrk & Family Sci	Ohio Child Welfare Training Program State Training	Ohio Department of Job and Family Services via U. of Cincinnati	\$1,382,090	McCarragher,Timothy M
CHHS	Speech-Language Path/Audiology	Preparing Early Intervention Providers for the Opioid Epidemic (PEPOpE)	U.S. Department of Education via U. of Cincinnati	\$ 23,256	Steiger,James
Other: Student Success	Asst VP Student Affairs	OhioCorps Grant - Mentoring Program Consortium	Ohio Department of Higher Education	\$ 274,000	Doehring,Alison E
LAW	School of Law - Dean's Office	City of Akron Expungement Program-2021	City of Akron, Ohio	\$ 25,000	Sahl,Joann Marie

## Technology Transfer and UA Research Foundation Highlights

### UA partners with LTA Research to develop airships in Akron

LTA has entered into an agreement with The Development Finance Authority of Summit County to sublease space at the Akron Airdock to house manufacturing and flight operations. For more than two years, LTA has partnered with UA to design, develop, and test small unpiloted airships and have received certification from the Federal Aviation Administration for previous test flights. The innovative team includes graduate and undergraduate students in the College of Engineering and Polymer Science who are proud to be reviving this legacy of aviation and renewing manufacturing innovation in Akron, where it all started. LTA Research is a company focused on the research and development of 21st century piloted and unpiloted airships. This significant work has the potential to provide multiple benefits, including an innovative approach to delivering humanitarian aid, the reduction of carbon emissions normally associated with aircraft, and growth for local economies.



UA student Tommy Alvarado installs the final structural component on the team's most recent flight vehicle. Courtesy of LTA Research.

### UA researcher named Senior Fellow of National Academy of Inventors



NAI Senior Member  
Dr. George Chase

**Dr. George Chase**, professor of chemical, biomolecular and corrosion engineering, has been named a Senior Member of the National Academy of Inventors (NAI). NAI Senior Members are active faculty, scientists, and administrators from NAI member institutions who have demonstrated remarkable innovation producing technologies that have brought, or aspire to bring, real impact on the welfare of society. Dr. Chase, who has been teaching at UA since 1985, is listed as an inventor on 15 patents, has received several honors and awards from science organizations, and participates in industrial research as director of the Coalescence Filtration Nanofibers Consortium at UA. "Personally, it is gratifying to receive recognition for your work from peers and colleagues," says Dr. Chase. "Being a Senior Member provides opportunities within the entrepreneur community locally and nationally. Most important to me is the message that faculty researchers at UA are recognized for their innovations and entrepreneurial spirit." He is among 61 academic inventors named to the 2021 class of NAI Senior Members.

### UA I-Corps Site trains 300<sup>th</sup> team

UA's I-Corps Site program hit a milestone in early 2021: training its 300<sup>th</sup> team in the "I-Corps method," an iterative process through which teams test their business assumptions by interviewing potential customers. UA was one of the first three locations nationwide selected as an I-Corps Site by the National Science Foundation. Since 2013, the program has trained 318 teams with more than 1,000 faculty members, students and business mentors participating. Graduating teams have gone on to raise R&D funding and start Ohio-based companies.



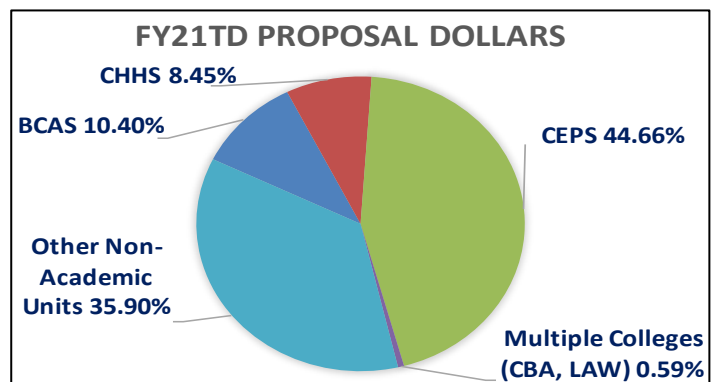
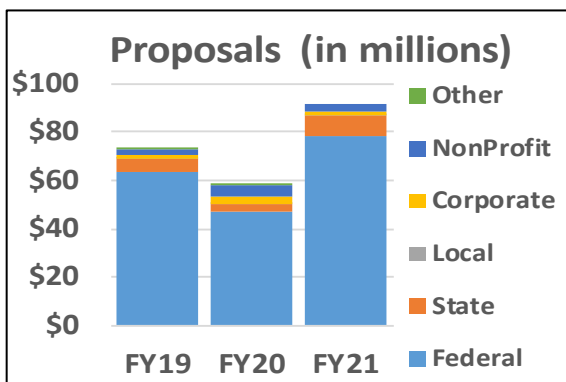


**PROPOSALS (New and Continuing)**

<b>FY19</b>	<b>Count</b>	<b>Total \$</b>	<b>Anticipated IDC \$</b>	<b>Anticipated UA and Non-UA Cost Share \$</b>
Federal	162	\$ 63,296,462	\$ 18,843,866	\$ 1,151,168
State	12	\$ 5,270,638	\$ 144,430	\$ 55,872
Local	3	\$ 90,455	\$ 5,152	\$ -
Corporate	33	\$ 2,188,450	\$ 493,853	\$ -
NonProfit	27	\$ 2,217,275	\$ 209,165	\$ 106,120
Other*	8	\$ 394,301	\$ 100,555	\$ 40,243
<b>Total</b>	<b>245</b>	<b>\$ 73,457,581</b>	<b>\$ 19,797,022</b>	<b>\$ 1,353,403</b>

<b>FY20</b>	<b>Count</b>	<b>Total \$</b>	<b>Anticipated IDC \$</b>	<b>Anticipated UA and Non-UA Cost Share \$</b>
Federal	124	47,125,279	11,757,116	1,082,669
State	13	2,945,931	261,125	522,996
Local	4	68,995	-	-
Corporate	37	3,129,521	489,042	-
NonProfit	45	5,121,827	874,549	2,313,864
Other*	3	339,287	-	-
<b>Total</b>	<b>226</b>	<b>58,730,839</b>	<b>13,381,832</b>	<b>3,919,529</b>

<b>FY21</b>	<b>Count</b>	<b>Total \$</b>	<b>Anticipated IDC \$</b>	<b>Anticipated UA and Non-UA Cost Share \$</b>
Federal	122	\$ 78,368,587	\$ 11,894,915	\$ 2,691,768
State	14	\$ 8,695,202	\$ 1,518,358	\$ 74,222
Local	4	\$ 74,492	\$ -	\$ -
Corporate	26	\$ 1,194,332	\$ 170,142	\$ -
NonProfit	30	\$ 3,209,722	\$ 509,345	\$ 1,490,703
<b>Total</b>	<b>196</b>	<b>\$ 91,542,335</b>	<b>\$ 14,092,760</b>	<b>\$ 4,256,693</b>



\*Other is comprised of sponsor types: individual, non-U.S. government, and other universities.

FY21 federal and state funding includes COVID-19 relief dollars, including funding from the federal CARES Act.

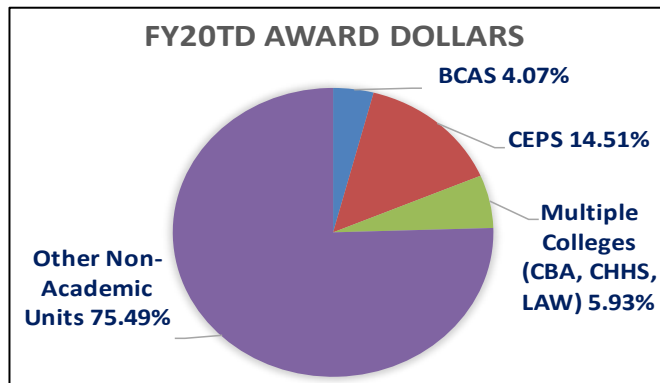
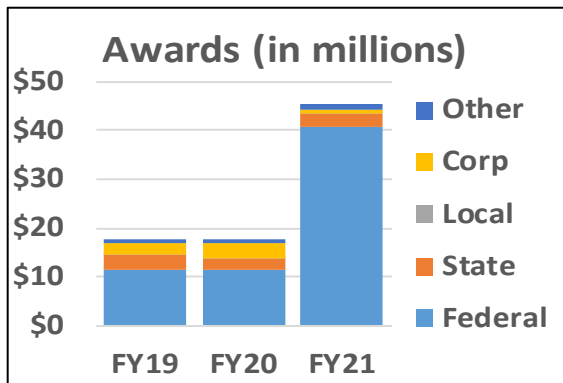
This report may co-report with UA's Development Office.

### AWARDS

FY19	Count	Total \$	Anticipated IDC \$	Anticipated UA and Non-UA Cost Share \$
Federal	85	\$ 11,361,497	\$ 3,050,785	\$ 300,627
State	11	\$ 3,239,904	\$ 130,563	\$ 97,635
Local	3	\$ 96,021	\$ 5,152	\$ -
Corporate	35	\$ 2,091,291	\$ 561,429	\$ -
Other*	20	\$ 996,808	\$ 48,184	\$ 94,347
<b>Total</b>	<b>154</b>	<b>\$ 17,785,521</b>	<b>\$ 3,796,113</b>	<b>\$ 492,609</b>

FY20	Count	Total \$	Anticipated IDC \$	Anticipated UA and Non-UA Cost Share \$
Federal	67	\$ 11,270,095	\$ 2,471,994	\$ 403,477
State	10	\$ 2,508,257	\$ 28,973	\$ 2,210,800
Local	6	\$ 110,566	\$ 3,302	\$ -
Corporate	37	\$ 2,838,106	\$ 716,964	\$ -
Other*	32	\$ 1,105,335	\$ 35,511	\$ 90,702
<b>Total</b>	<b>152</b>	<b>\$ 17,832,358</b>	<b>\$ 3,256,744</b>	<b>\$ 2,704,979</b>

FY21	Count	Total \$	Anticipated IDC \$	Anticipated UA and Non-UA Cost Share \$
Federal	63	\$ 40,774,481	\$ 1,621,254	\$ 320,414
State	11	\$ 2,533,382	\$ 333,206	\$ 240,990
Local	3	\$ 40,926	\$ 3,286	\$ -
Corporate	26	\$ 1,019,170	\$ 216,322	\$ -
Other*	23	\$ 880,707	\$ 79,578	\$ -
<b>Total</b>	<b>126</b>	<b>\$ 45,248,665</b>	<b>\$ 2,253,645</b>	<b>\$ 561,404</b>



\*Other is comprised of sponsor types: foundation/nonprofit, individual, non-U.S. government, and other universities. This report does not include testing agreements. Also, this report may co-report with UA's Development Office.

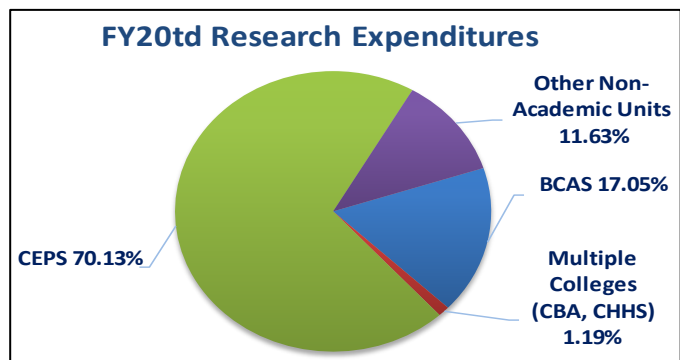
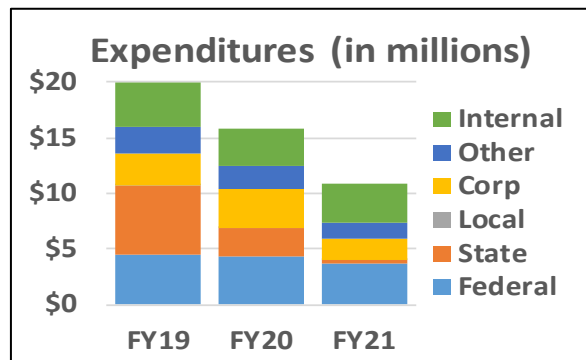
FY21 federal and state funding includes COVID-19 relief dollars, including funding from the federal CARES Act.

RESEARCH EXPENDITURES

FY19	Total \$	Actual IDC \$	Actual Cost Share \$
<b>External</b>	<b>\$ 15,930,257</b>	<b>\$ 2,685,201</b>	<b>\$ 2,629,184</b>
Federal	\$ 4,469,103	\$ 1,303,704	\$ 101,254
State	\$ 6,198,991	\$ 186,816	\$ 2,073,684
Local	\$ 48,631	\$ -	\$ 23,781
Corporate	\$ 2,907,191	\$ 884,814	\$ 78,415
Other*	\$ 2,306,343	\$ 309,868	\$ 352,050
<b>Internal</b>	<b>\$ 3,987,823</b>	<b>\$ -</b>	<b>\$ -</b>
<b>Grand Total</b>	<b>\$ 19,918,080</b>	<b>\$ 2,685,201</b>	<b>\$ 2,629,184</b>

FY20	Total \$	Actual IDC \$	Actual Cost Share \$
<b>External</b>	<b>\$ 12,502,940</b>	<b>\$ 2,629,429</b>	<b>\$ 2,254,660</b>
Federal	\$ 4,368,375	\$ 1,308,887	\$ 57,947
State	\$ 2,470,582	\$ 21,275	\$ 1,908,953
Local	\$ 29,188	\$ -	\$ 18,385
Corporate	\$ 3,483,575	\$ 996,463	\$ 39,219
Other*	\$ 2,151,220	\$ 302,803	\$ 230,156
<b>Internal</b>	<b>\$ 3,408,347</b>	<b>\$ -</b>	<b>\$ -</b>
<b>Grand Total</b>	<b>\$ 15,911,287</b>	<b>\$ 2,629,429</b>	<b>\$ 2,254,660</b>

FY21	Total \$	Actual IDC \$	Actual Cost Share \$
<b>External</b>	<b>\$ 7,362,390</b>	<b>\$ 1,933,588</b>	<b>\$ 215,394</b>
Federal	\$ 3,662,122	\$ 1,142,299	\$ 38,004
State	\$ 348,744	\$ 74,943	\$ 1,081
Local	\$ 6,203	\$ -	\$ -
Corporate	\$ 1,880,410	\$ 478,472	\$ 10,731
Other*	\$ 1,464,910	\$ 237,874	\$ 165,577
<b>Internal</b>	<b>\$ 3,470,655</b>	<b>\$ -</b>	<b>\$ -</b>
<b>Grand Total</b>	<b>\$ 10,833,046</b>	<b>\$ 1,933,588</b>	<b>\$ 215,394</b>

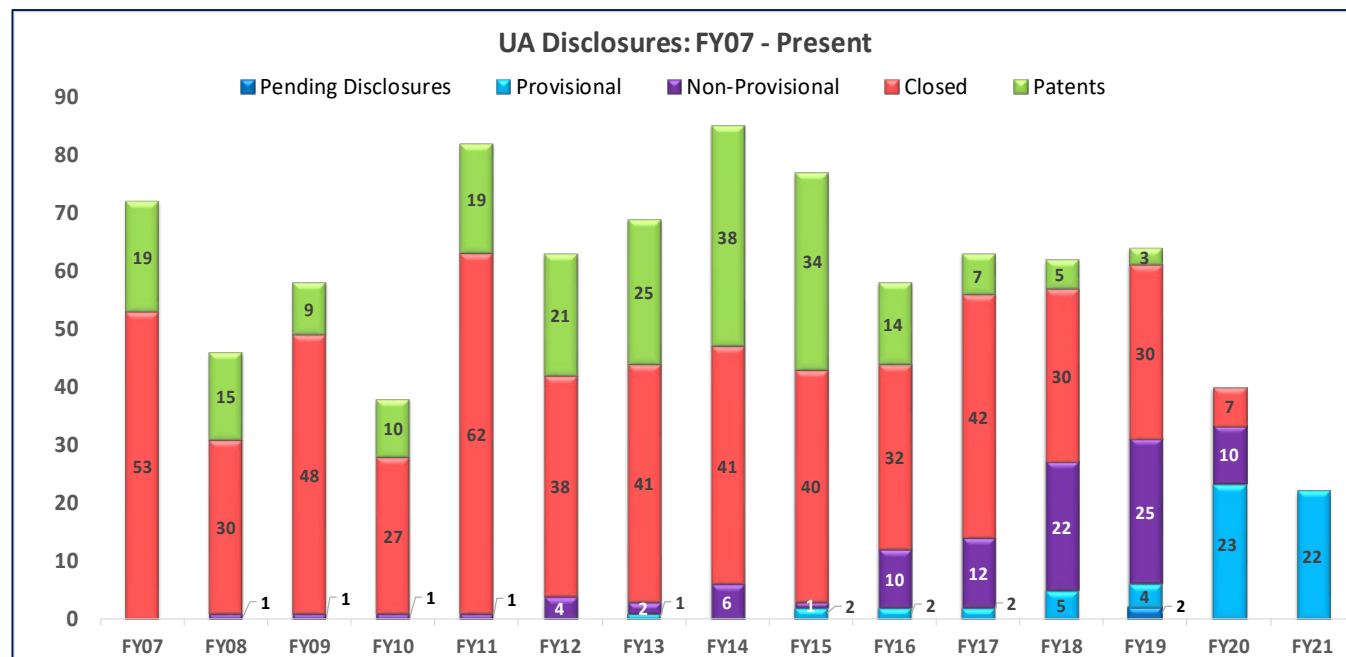
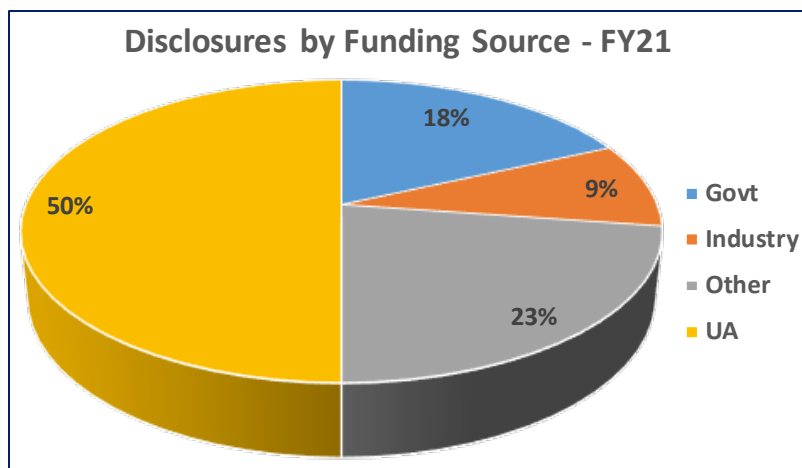
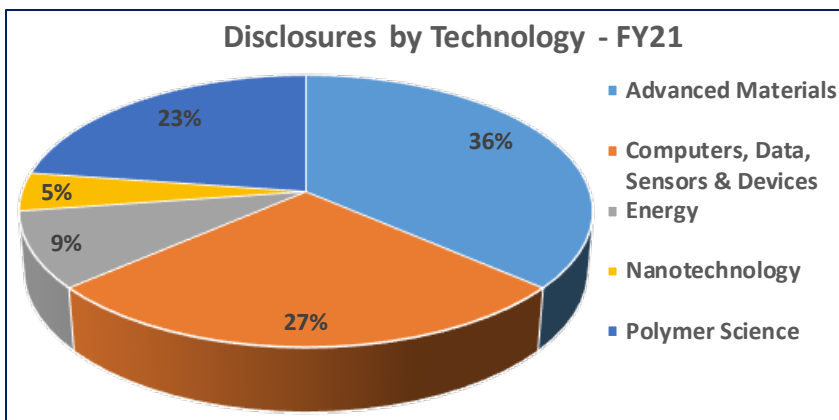


\*External Other sponsor types are foundation/nonprofit, individual, non-U.S. gov't. and other universities. This page reports research expenditures only. Internal research expenditures include research-related accounts, such as startup funding. Expenditure data subject to change due to adjustments, including after-the-fact student tuition and academic year wages.

## Technology Transfer: Invention Disclosures and Patent Activity FY07 to present

Disclosures submitted in FY21 to date continue in a variety of fields, with 63% being in advanced materials and the field of computers, data, sensors and devices. All are being assessed regarding the technology and potential market. A provisional patent application protects an invention for one year. During this time a technology and market assessment is conducted to determine if a non-provisional patent should be filed. Once filed, it takes several years for the claims to be evaluated, revisions to be filed, and a patent to issue.

The funding source of research leading to inventions can affect the ability to commercialize the technology. Industry research agreements usually provide options for exclusive or non-exclusive licenses, with negotiated fees. Agreements often include provision for patent costs to be paid by the research sponsor. Government funding gives the university the right to patent and license, while including government use provisions. Other funding sources typically leave patent rights under university control and responsibility. Regardless of research funding, by Ohio statute any intellectual property created by State employees or by anyone using state funding or facilities is owned by UA.



**U.S. Patents Issued from July 1, 2020 to February 28, 2021**  
**(Sorted by Funding Source & Technology)**

U.S. Patent	Issue Date	Patent Title	Inventors	College	Technology	Funding
10,731,635	8/4/2020	Polymer Electrolyte Membrane Assembly	Dr. Thein Kyu, Camilo Piedrahita and Jinwei Cao	CEPS	Advanced Materials	Govt
10,809,170	10/20/2020	Dynamic Mechanical Analysis System	Dr. Siamak Farhad and Roja Esmaeeli	CEPS	Computers, Data, Sensors & Devices	Govt
10,875,015	12/29/2020	Methods for Making Oxygen Reduction Catalysts Formed of Platinum Alloy Nanoparticles Embedded in Porous Carbon	Dr. Zhenmeng Peng, Li Qin Zhou, Kan Huang, Tomoyuki Nagai, Hongfei Jia, Hisao Kato and Xiaochen Shen	CEPS	Advanced Materials	Industry
10,840,500	11/17/2020	Superionic Conductive Polymer Electrolyte Composites for Lithium Battery	Dr. Yu Zhu	CEPS	Energy	Industry
10,920,346	2/16/2021	Mechanically Strong Super Absorbent Non-woven Mats	Dr. Darrell Reneker and Dr. Daniel Smith	CEPS	Nanotechnology	Industry
10,710,281	7/14/2020	Electric Field "Z" Direction Alignment of Nanoparticles in Polymer Solutions	Dr. Mukerrem Cakmak, Yuanhao Guo and Saurabh Batra	CEPS	Advanced Materials	Other
10,816,415	10/27/2020	Flexible Sensors and Methods for Making the Same	Dr. Jae-Won Choi	CEPS	Advanced Materials	Other
10,870,749	12/22/2020	Thermally Conductive Polymers and Methods for Making	Dr. Jiahua Zhu, Nitin Mehra and Liwen Mu	CEPS	Advanced Materials	Other
10,788,445	9/29/2020	Polymer Electrolyte Membrane Fuel Cell (PEMFC) Sensor	Dr. Siamak Farhad	CEPS	Computers, Data, Sensors & Devices	Other
10,765,748	9/8/2020	Composition and Methods for Tethering Bioactive Peptides to Metal Oxide Surfaces	Dr. Matthew Becker and Wen Tang	CEPS	Medical	Other
10,849,710	12/1/2020	Imaging Display System for Guiding Medical Interventions	Dr. Yang Liu	CEPS	Medical	Other
10,899,885	1/26/2021	Vegetable Oil Based Viscoelastic Polymers that Display Photoresponsive Rheological and Adhesive Properties	Dr. Abraham Joy, Ying Xu, Sudhanva Govindarajan and John Swanson	CEPS	Medical	Other
10,774,185	9/15/2020	Centrally Functionalizable Living Cationic Polymer or Copolymer and Methods Synthesizing the Same	Dr. Joseph Kennedy, Dr. Turgut Nugay, Tejal Deodhar and Dr. Nihan Nugay	CEPS	Polymer Science	Other
10,793,661	10/6/2020	Synthesis of Star Isobutylene-Based Thermoplastic Elastomers	Dr. Kennedy, Dr. Turgut Nugay and Dr. Nihan Nugay	CEPS	Polymer Science	Other
10,889,712	1/12/2021	Styrenic Block Copolymer-Hyperbranched Styrenic Block Copolymer Networks	Dr. Joseph Kennedy, Dr. Turgut Nugay and Dr. Nihan Nugay	CEPS	Polymer Science	Other



**U.S. Patents Issued from July 1, 2020 to February 28, 2021**  
**(Sorted by Funding Source & Technology)**

U.S. Patent	Issue Date	Patent Title	Inventors	College	Technology	Funding
10,899,869	1/26/2021	Glycerol Containing Polyurethanes and Polyurethane Nanocomposites	Dr. Joseph Kennedy, Dr. Turgut Nugayand Dr. Nihan Nugay	CEPS	Polymer Science	Other
10,777,324	9/15/2020	Engineered 3D Lung Airway Tree	Hosseini Tavana	CEPS	Medical	UA