The University of Texas/Texas A&M Investment Management Company

UTIMCO as Your Partner

October 2019

UTIMCO

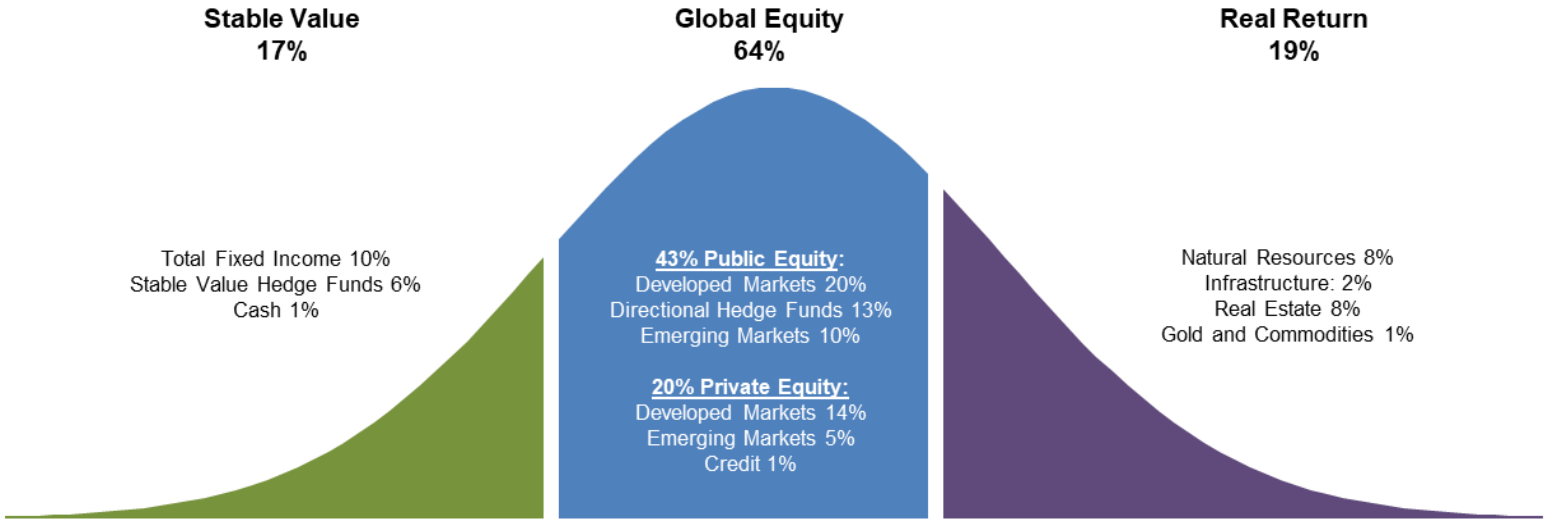
Mission

- We generate superior long-term investment returns to support The University of Texas and Texas A&M University Systems as they provide world-class teaching, push the boundaries of discovery, and achieve excellence in patient healthcare for the people of Texas and beyond.

History & Governance

- Created in March 1996
- Manages the investment assets under the fiduciary care of the U.T. System Board of Regents
- ~$46 billion AUM
- The first external investment corporation formed by a public university system

Asset Allocation



Economic Conditions		
• GDP surprises are negative • Inflation surprisingly low with weak demand • Negative earnings surprises • Out of line valuations • Flight to quality	• Positive GDP surprises • Inflation surprises not dramatic • Positive earnings surprises • Reasonable valuations • Political stability	• Real GDP growth too low • Inflation surprises on the high side • Real earnings too low • Commodity-oriented demand exceeds supply by an above normal margin

UTIMCO Structure

Three Main Funds

Permanent University Fund (PUF) - $22.6 billion*

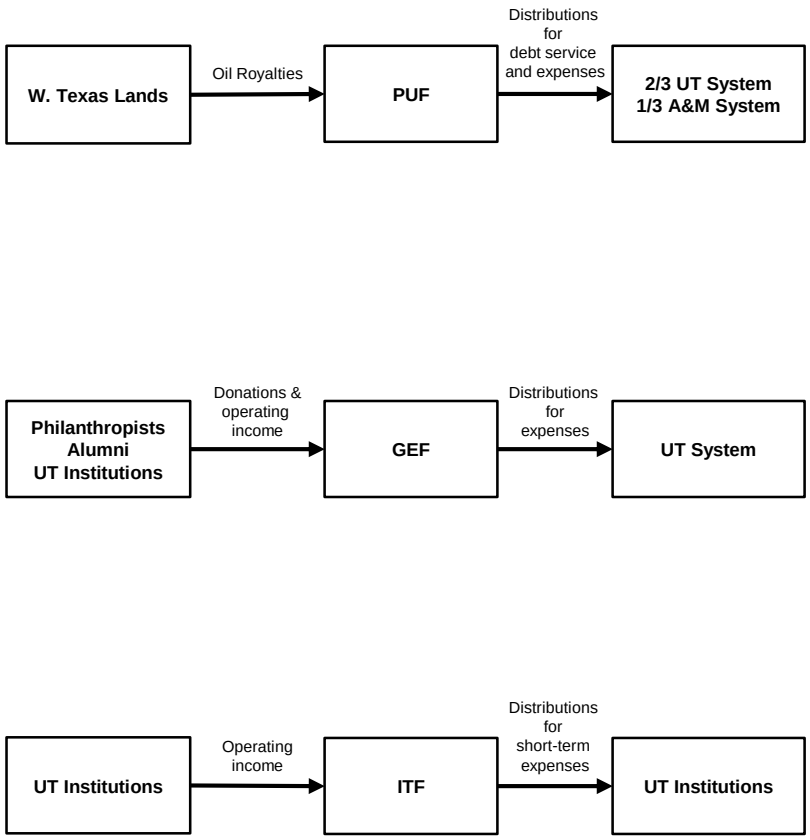
- Established by the Texas Constitution in 1876, through appropriation of land grants previously given to the University of Texas at Austin
- Today, the PUF contains 2.1 million acres of land in the Permian Basin which produces two streams of income:
  - Mineral income—primarily oil and gas royalties (non-distributable, must be invested)
  - Surface income—primarily from surface leases and easements (distributable)

General Endowment Fund (GEF) - $12.7 billion*

- Created in 2001 and is composed of two sub-funds:
  - Permanent Health Fund (PHF)
  - Long Term Fund (LTF)
- Created to allow for greater diversification and cost savings than was possible when the investments of PHF and LTF were managed separately

Intermediate Term Fund (ITF) - $9.2 billion*

- Established in 2006
- Created to improve the efficiency of operating funds management, and to improve investment returns on UT System operating reserves



** As of 6/30/19.*

Supported Institutions

UT System

Academic Institutions & Enrollment

UT Austin	40,804
UT Arlington	28,329
UT Dallas	19,596
UT El Paso	21,456
UT Permian Basin	4,744
UT Rio Grande Valley	24,678
UT San Antonio	27,443
UT Tyler	7,329
Total	**174,379**

Health Institutions & Enrollment

UT MD Anderson	376
UT Southwester Medical Center	2,266
UT Medical Branch at Galveston	3,344
UT Health Science Center at Houston	5,335
UT Health Science Center at San Antonio	3,280
UT Health Science Center at Tyler	44
Total	**14,645**

A&M System

Academic Institutions & Enrollment

Texas A&M	51,586
Prairie View A&M	8,531
Texas A&M Commerce	8,234
Tarleton State University	11,316
West Texas A&M	7,540
Texas A&M Kingsville	6,971
Texas A&M Corpus Christi	9,776
Texas A&M International	6,992
Texas A&M Texarkana	1,695
Texas A&M Central Texas	1,951
Texas A&M San Antonio	5,746
Total	**120,338**

Health Institutions & Enrollment

Texas A&M Health Science Center	673

*Enrollment data as of Fall 2018.

University of Texas System

Education

- No. 8 among Best Value Public Colleges by Kiplinger (2018)
- Top 10 Best Graduate Schools in more than 40 areas, including accounting, information systems, educational psychology, elementary and special education, engineering and pharmacy, *US News & World Report (2018)*

Research

- MD Anderson Chair of Immunology Jim Allison earned the 2018 Nobel Prize in Medicine for his pioneering research on immunotherapy or "checkpoint inhibition," i.e., the use of antibodies to trigger T-cell reactions against cancer. Immunotherapy has produced remarkable results in many cancers including non-Hodgkin lymphoma, acute lymphocytic leukemia, melanoma, and lung cancer.

Society

- First-generation college students
  - Over 9,000 UT students (more than 20% of undergraduates)
- College students from households in bottom US income quintile
  - Over 6% of students are from families with a median income of less than $20,000 per year
- College students receiving financial aid
  - 54% of UT students

Healthcare

- MD Anderson:
  - Founded in 1941; and 1 of 3 original comprehensive cancer centers in the US
  - Ranked No. 1 hospital for cancer care in the US by *US News & World Report (2019)*; has been ranked 1 of top 2 every year since 1990
  - In 2012, launched Moon Shots Program to accelerate the development of scientific discoveries into clinical advances for 20 types of cancer that collectively account for 63% of cancer deaths annually
  - In 2018, cared for ~146,000 patients (45,000 new) and provided more than $170 million in uncompensated care for un- or under-insured Texans
  - More than 1,200 open clinical trials

Texas A&M System

Education

- No. 1 among national public universities for superior education at an affordable cost by *Fiske Guide to Colleges (2018)*
- No. 1 in Most Affordable Public Medical Schools for In-State Students by US News & World Report (2016)
- No. 1 among colleges that combine best outcomes for low-income students with accessible admission rates by Priceonomics.com (2015)

Research

- Texas A&M Professor of Visualization Francis Quek has developed technology for "talking books" that allow the blind to access literature with increased command over their reading experiences.
- Dr. Quek developed the STAAR Description Format (SDF), which converts any portable document format (PDF) to a version the blind can read on an iPad. Users can scan the text with their fingers to hear the words, control the pace of their reading, keep their place on the page, refer to text, highlight important information and take notes, much like the experience enjoyed by those who are sighted.

Society

- First-generation college students
  - Over 13,000 Texas A&M students (25% of undergraduates)
- College students from households in bottom US income quintile
  - Over 4% of students are from families with a median income of less than $20,000 per year
- College students receiving financial aid
  - 72% of Texas A&M students

Healthcare

- Texas A&M Health Science Center:
  - Founded in 1999; educates over 600 students annually across 8 Texas campuses in medicine, nursing, dentistry, pharmacy, and public health
  - Structured as a conduit for community-based research, health education and disease prevention initiatives to improve lives across Texas' 254 counties
  - Launched EMPOWER tele-health program in 2019 to improve healthcare access in rural communities, particularly for chronic or complex conditions such as opioid dependency

Endowment Resource Comparison

The UT and Texas A&M Systems:

- Enroll a much larger number of undergraduates whose family income is in the bottom quintile of U.S. households, compared to universities with similar sized endowments
- Have the second largest endowment in the U.S. by AUM, but endowment value per student of less than $120,000 (the second lowest of the top 20 endowments)
- Have the lowest percentage of undergraduates (31%) whose family income is in the top quintile of U.S. households

						% of Students from [c]		# of Students from [d]
Rank	Institution Name	Endowment Value (in MM) [a]	Undergraduate Students [b]	Endowment Value per Student	Median Household Income of Student's Family [c]	Top 20%	Bottom 20%	Bottom 20%
1	Harvard University	39,200	6,699	5,851,620	168,800	67%	5%	301
2	**University of Texas and Texas A&M Systems***	**32,893**	**290,065**	**113,399**	**79,092**	**31%**	**13%**	**38,635**
3	Yale University	29,400	5,964	4,929,577	192,600	69%	2%	119
4	Stanford University	26,500	7,056	3,755,669	167,500	66%	4%	282
5	Princeton University	25,900	5,260	3,211,947	186,100	72%	2%	105
6	University of California System**	19,600	216,747	90,428	105,800	48%	7%	15,172
7	Massachusetts Institute of Technology	16,400	4,547	3,606,774	137,400	61%	6%	282
8	University of Pennsylvania	13,800	11,716	1,177,876	195,500	72%	2%	234
9	University of Michigan	11,900	29,821	399,048	154,000	66%	4%	1,193
10	Columbia University	10,900	8,868	1,229,138	150,900	62%	5%	443
11	University of Notre Dame	10,700	8,530	1,254,396	191,400	75%	2%	171
12	Duke University (DUMAC, Inc.)	8,500	6,532	1,301,286	186,700	69%	4%	261
13	Northwestern University	8,400	8,181	1,026,769	171,200	66%	4%	327
14	The University of Chicago	7,900	6,306	1,252,775	134,500	58%	6%	378
15	Washington University in St. Louis	7,600	7,579	1,002,771	272,000	84%	1%	76
16	The University of Virginia	7,300	16,777	435,120	155,500	67%	3%	503
17	Cornell University	6,900	14,907	462,870	151,600	64%	4%	596
18	Rice University	6,300	3,970	1,586,902	160,800	64%	5%	199
19	University of Southern California	5,500	18,631	295,207	161,400	63%	5%	932
20	Dartmouth College	5,490	4,417	1,242,925	200,400	69%	3%	115
	Average	**15,054**	**34,129**	**1,711,325**	**166,160**	**65%**	**4%**	**3,016**

(a) Estimated using university annual endowment reports, as of FY 2018.

(b) Many private institutions do not provide historical undergraduate enrollment. Majority of data is for fall 2017 enrollment. If fall 2017 was unavailable, fall 2018 was used.

(c) Data on household income median and quintiles from https://opportunityinsights.org/data/

(d) Estimated using undergraduate enrollment and household income quintile data.

** Excludes operating funds (ITF). Weighted average across all UT and A&M campuses.*

*** Includes foundation figures.*

UT and A&M Systems – Detail by School

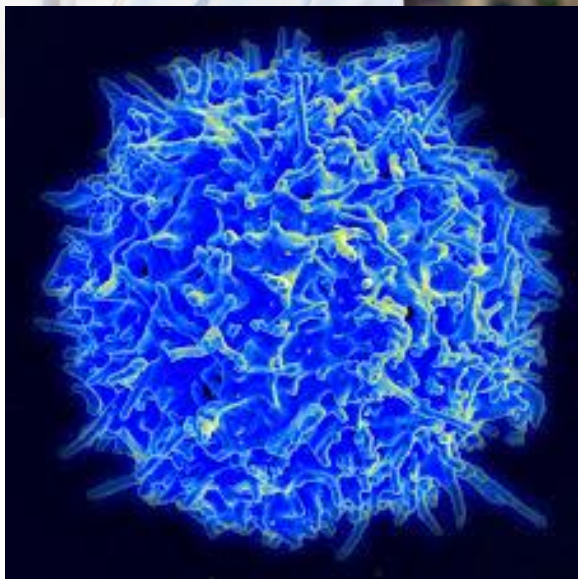
School	Fall 2017 Undergrad Enrollment	Median Income of Student	% of Students from Top 20%	% of Students from Bottom 20%	# of Students from Bottom 20%
University Of Texas At Arlington	27,640	62,700	36%	10%	2,764
University Of Texas At Austin	40,492	123,900	56%	6%	2,430
University Of Texas At Dallas	18,091	89,800	40%	8%	1,447
University Of Texas At El Paso	21,335	37,500	11%	24%	5,120
University Of Texas Of The Permian Basin	6,065	70,300	23%	9%	534
University Of Texas At San Antonio	26,011	73,800	11%	32%	8,324
University Of Texas At Tyler	7,437	82,200	8%	9%	684
University Of Texas Rio Grande Valley	24,220	30,948	8%	29%	7,074
University of Texas System	**171,291**	**75,202**	**29%**	**17%**	**28,377**
Texas A&M University	50,929	130,900	59%	4%	2,037
Praire View A&M	7,986	39,300	11%	18%	1,437
Texas A&M University - Commerce	8,126	56,500	21%	13%	1,056
Tarleton State University	11,288	76,700	28%	7%	734
West Texas A&M University	7,563	71,400	25%	9%	650
Texas A&M University - Kingsville	6,775	47,700	14%	20%	1,355
Texas A&M University - Corpus Christi	10,174	65,400	27%	12%	1,221
Texas A&M International	6,799	33,300	11%	26%	1,768
Texas A&M System	**118,774**	**84,701**	**35%**	**9%**	**10,259**
Total	**290,065**	**79,092**	**31%**	**13%**	**38,635**

Data unavailable for Texas A&M Texarkana, Texas A&M Central Texas, and Texas A&M San Antonio.
Median Income of Student estimated for University of Texas Rio Grande Valley.
Median income figures source: https://opportunityinsights.org/data/

RESEARCH EXAMPLES

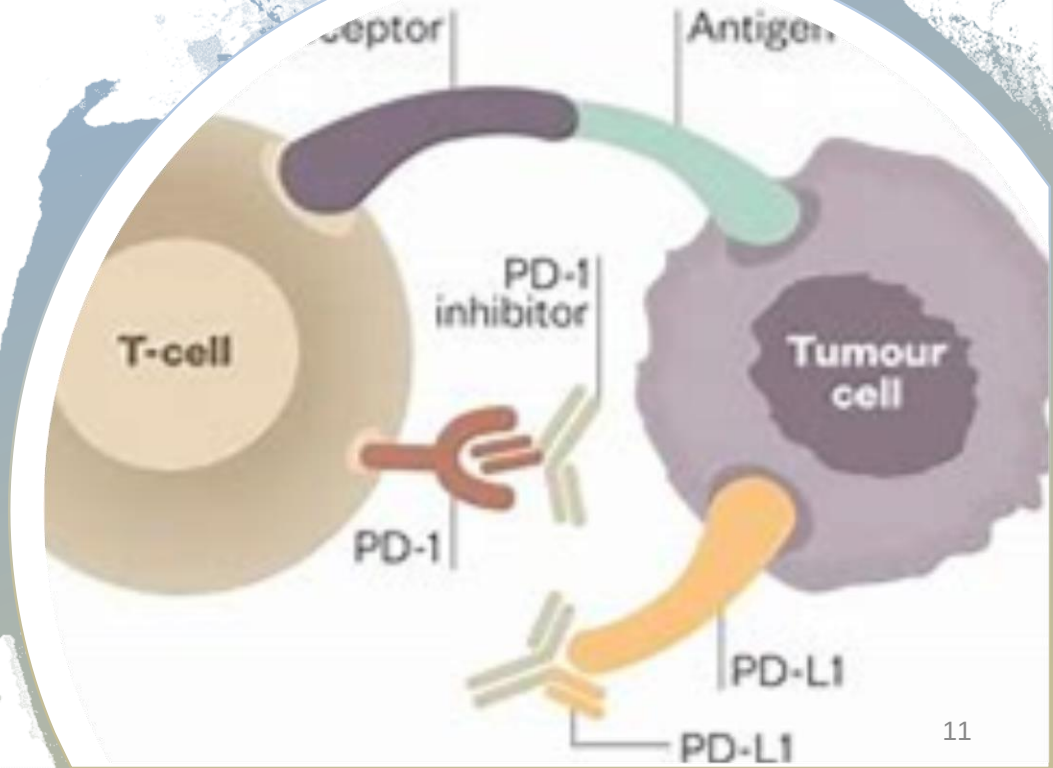
UT MD Anderson Case Study – Dr. James P. Allison Awarded Nobel Prize in Physiology or Medicine

- Dr. Jim Allison earned the Nobel Prize in 2018 for his breakthrough research regarding the biology of T cells—a type of white blood cell that develops in the thymus gland and plays an integral role in the central nervous system.
- Traditional cancer treatments focused on attacking the cancer cells. Dr. Allison's research instead focuses on treating the immune system rather than the cancer cells. Allison's crucial insight was to block a protein on T cells that acts as a brake on their activation, freeing the T cells to attack cancer.
- "Science advances on the efforts of many," Allison said. "A succession of graduate students, postdoctoral fellows and colleagues at MD Anderson, the University of California, Berkeley, and Memorial Sloan Kettering Cancer Center played important roles in this research."
- Dr. Allison is the first scientist at MD Anderson to win the prestigious award.



UT Case Study – National Cancer Institute Awards Curiel Lab $3.3M

- Tyler J. Curiel, M.D., M.P.H., of the Joe R. and Teresa Lozano Long School of Medicine at UT Health San Antonio, has been awarded a five-year, $3.3 million Provocative Questions grant by the National Cancer Institute. Dr. Curiel and his colleagues seek to optimize the effectiveness of immune-checkpoint drugs in treating melanoma and other cancers.
- The work is at the leading frontiers of cancer immunotherapy. It's the second such award for Dr. Curiel. He joined The University of Texas Health Science Center, now called UT Health San Antonio, in 2006.
- Cancer cells express a protein called PD-L1 (programmed death-ligand 1). This protein inhibits anti-tumor T cells, protecting tumors from immune elimination. Immune-checkpoint molecules are an emerging class of drugs that block this inhibition, resulting in successful treatment of many cancers. The drugs include anti-PD-L1 antibodies.

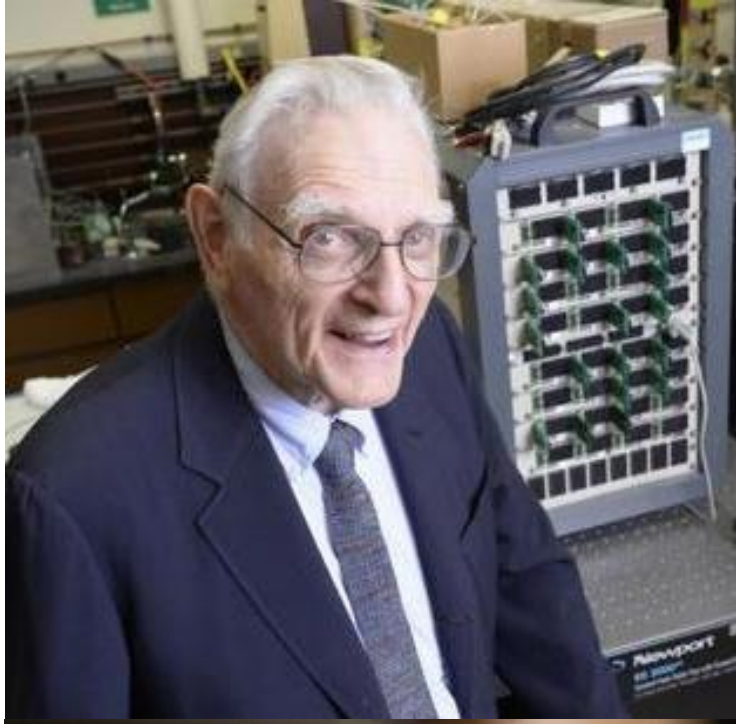


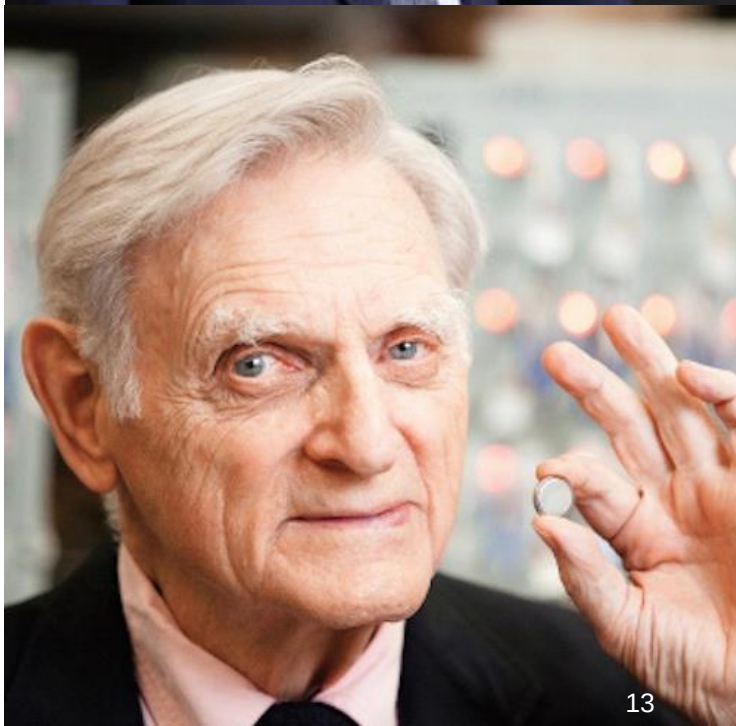
UT Case Study – A Rose Inspires Smart Way to Collect and Purify Water

- A new device for collecting and purifying water, developed at The University of Texas at Austin, was inspired by a rose and, while more engineered than enchanted, is a dramatic improvement on current methods. Each flower-like structure costs less than 2 cents and can produce more than half a gallon of water per hour per square meter.
- “We were searching for more efficient ways to apply the solar-steaming technique for water production by using black filtered paper coated with a special type of polymer, known as polypyrrole,” Fan said.
- The device removes any contamination from heavy metals and bacteria, and it removes salt from seawater, producing clean water that meets drinking standard requirements set by the World Health Organization.

UT Case Study – Lithium-Ion Battery Inventor Wins Nobel Prize for Fast-Charging, Noncombustible Batteries

- A team of engineers led by John Goodenough, professor in the Cockrell School of Engineering at The University of Texas at Austin and co-inventor of the lithium-ion battery, has developed the first all-solid-state battery cells that could lead to safer, faster-charging, longer-lasting rechargeable batteries for handheld mobile devices, electric cars and stationary energy storage.
- Goodenough's latest breakthrough is a low-cost all-solid-state battery that is noncombustible and has a long cycle life (battery life) with a high volumetric energy density and fast rates of charge and discharge.
- The researchers demonstrated that their new battery cells have at least three times as much energy density as today's lithium-ion batteries.
- For his breakthrough research, Dr. Goodenough was awarded the Nobel Prize in 2019. At 97 years old, he became the oldest Nobel laureate in history.





Texas A&M Case Study – Chemists Develop Nanoscale Bioabsorbable Wound Dressing

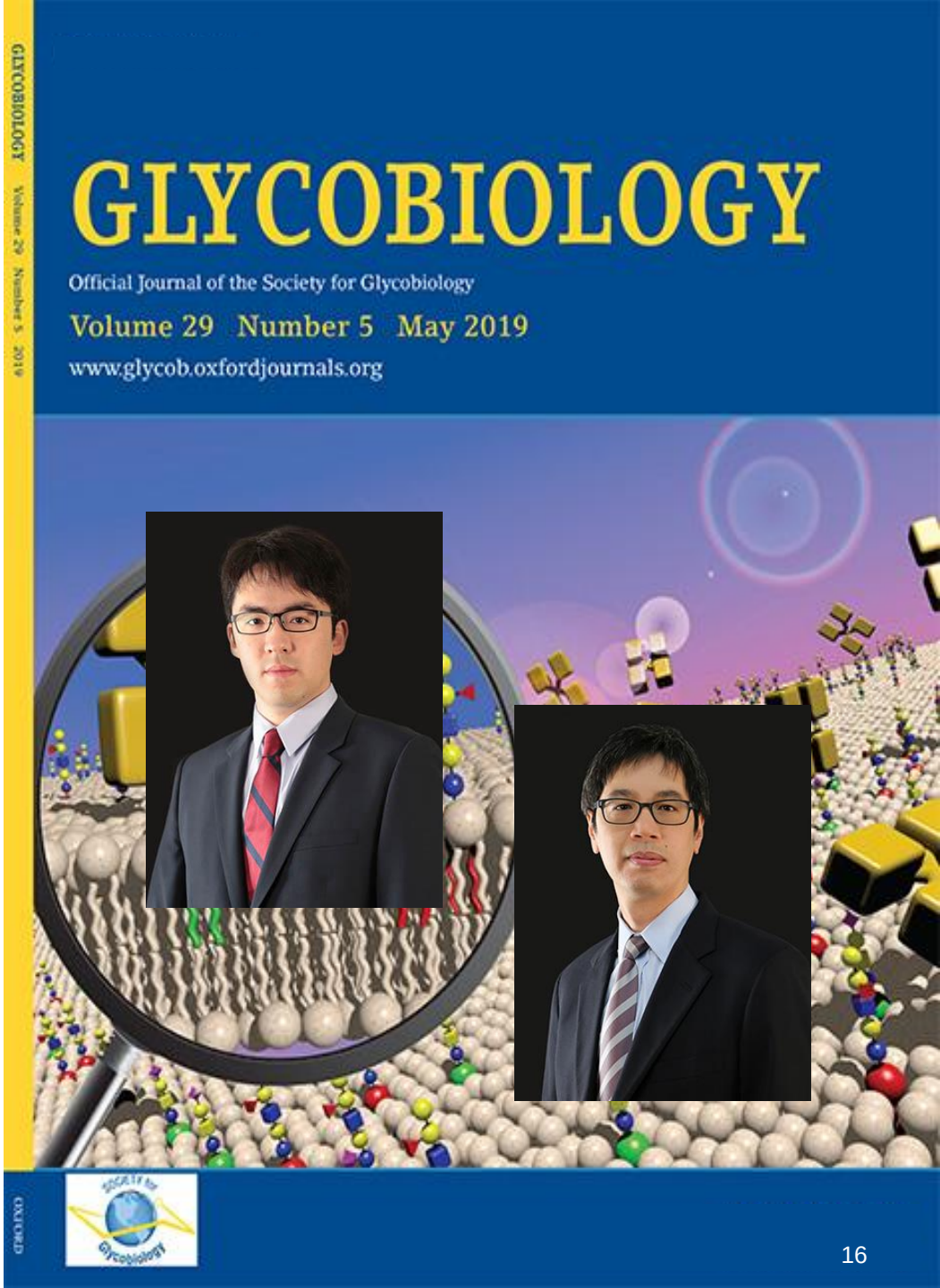
- Scientists at Texas A&M University are harnessing the combined power of organic nanomaterials-based chemistry and a natural product found in crustacean exoskeletons to help bring emergency medicine one step closer to a viable solution for mitigating blood loss.
- Hemorrhage is a leading cause of death in traumatic injuries, ranking fourth in the United States at a total cost of $671 billion in 2013. Karen Wooley's research group has developed a bioabsorbable wound dressing that builds on the already proven blood-flow-staunching properties of chitosan by taking them nanoscale to boost their effectiveness and impact.
- Wooley's team successfully encapsulated highly entangled nanofibers of chitosan within a sugar-based hydrogel that dissolves in as little as seven days, leaving behind a significantly larger available wound-healing surface while eliminating the need for subsequent physical removal.

Texas A&M Case Study – Researchers Develop Injectable Bandage

- A penetrating injury from shrapnel is a serious obstacle in overcoming battlefield wounds that can ultimately lead to death. Given the high mortality rates due to hemorrhaging, there is an unmet need to quickly self-administer materials that prevent fatality due to excessive blood loss.
- An injectable bandage has been developed Akhilesh Gaharwar's Inspired Nanomaterials and Tissue Engineering Laboratory. (Texas A&M University College of Engineering).
- Injectable hydrogels are promising materials for achieving hemostasis in case of internal injuries and bleeding, as these biomaterials can be introduced into a wound site using minimally invasive approaches.

Texas A&M Case Study – New Theory to Predict Pathogen Infection Pathway

- Dr. Hung-Jen Wu & Dr. Joseph Sang-Il Kwon have developed a new method for forecasting possible infection routes. The research is based on the complex interactions between glycans and lectins, two biomolecules found in living systems.
- Lectin-glycan interactions play an important role in a wide variety of physiological and pathological processes, but these interactions have several unique characteristics that make them difficult to characterize or analyze using traditional biomolecular analysis tools. The research team has developed a new glycoarray tool, along with a computational tool, that allow for a deeper understanding and characterization of glycan-lectin interactions and bonds.

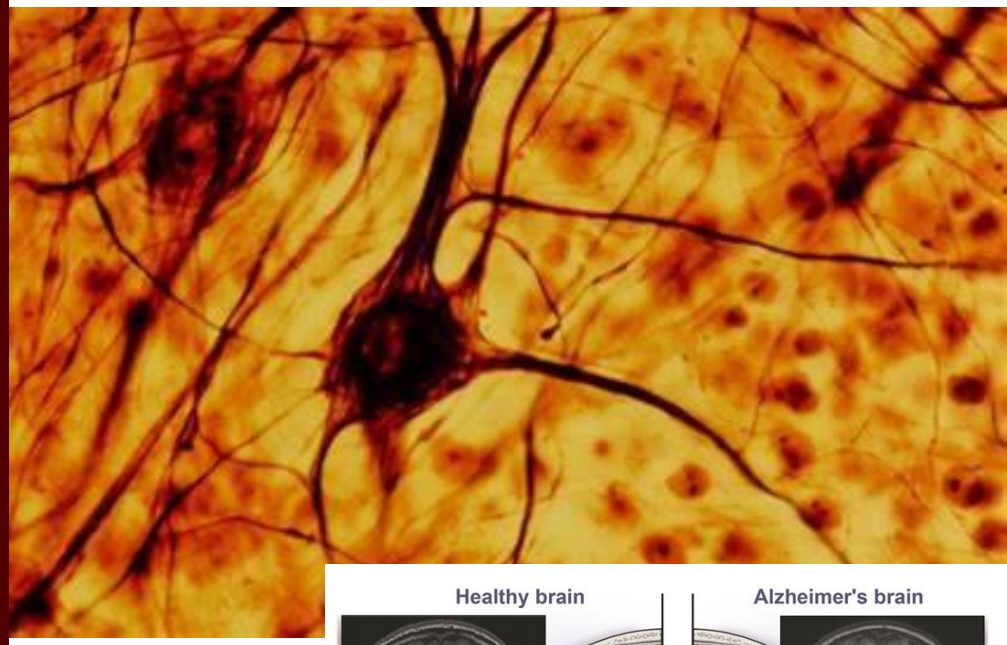


Texas A&M Case Study – Doctoral Student Pursues Life Saving Breast Cancer Detection Technology

- Doctoral Student Elif Kaya is working with Dr. Kamran Entesari on a device to assist with early breast cancer detection in the hope of saving millions of lives.
- “We have demonstrated that the first broadband time domain contact-less CMOS (complementary metal–oxide–semiconductor) homodyne-transceiver works as a complex dielectric spectroscopy with an exceptional accuracy that can characterize the materials such as liquid/solid materials, chemical/biological materials or body tissues,” Kaya said.
- Although there are already some research projects focused on breast cancer detection, Kaya’s team is proposing to make a more cost-effective miniaturized portable device with greater accuracy, ease of use and quick results.

Texas A&M Case Study – Institute For Regenerative Medicine, Celltex Enter Agreement For Alzheimer's Research

- Celltex has acquired an intellectual property license and signed multi-year research study with Texas A&M Health Science Center.
- Houston-based biotechnology company, Celltex, a multi-year research study investigating potential therapies for Alzheimer's disease using autologous mesenchymal stem cell (MSC)-derived exosomes. His team will test the efficiency of these exosomes to reduce brain inflammation and assist in repair of neuronal damage related to Alzheimer's disease.
- There are more than five million Americans living with Alzheimer's. We are hopeful that this research might someday treat the disease effectively by stopping or delaying the neuronal damage. Alternatively, exosomes may rejuvenate the networks of surviving but sick neurons via anti-inflammatory and neuroprotective effects.



MRI scans (gray) and illustrations (color) show the differences between a brain affected by Alzheimer's disease and a normal brain.