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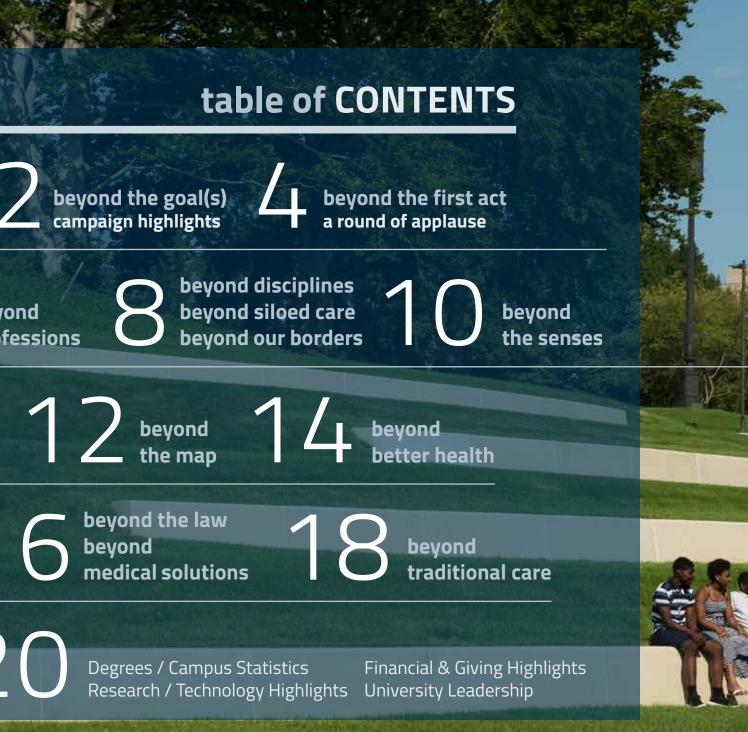
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TOBY'S TERRACE

# from the PRESIDENT

To the Case Western Reserve

I look back on the 2018-2019 academic year with a sense of awe.

From the remarkable generosity of our capital campaign's 60,000 donors... to a Top 10 Medical Breakthrough by a biomedical engineering professor... to the stunning space that is our new Health In short, going beyond what is to Education Campus with Cleveland Clinic... we experienced so many moments that exceeded expectations. As you will read, the results ofto

The pages that follow feature those examples and several more. The common factor among them all? A willingness to try something new.

It could be attempting what others deem impossible. Reaching outside a specific area of expertise. Or perhaps even collaborating with an unexpected partner.

achieve something better.

surpass our greatest imaginingswhich, in turn, inspire us to aim even higher next time.

With great appreciation,

Barbara R. Snyden



#### Beyond the Goal(s)

Case Western Reserve's supporters exceeded all expectations in the university's Forward Thinking campaign—over and over again.

Initial thoughts centered on an effort just three years after the campaign's of about \$850 million—just more than double the total of the previous campaign, which closed in 1994. But

years of accumulated needs, plus growing challenges ahead, demanded a more ambitious target: \$1 billion.

Donors blew past that total in 2014,

So leaders set another goal, this one \$1.5 billion—50 percent higher the

Three years later, alumni and friends took the campaign beyond that mark, too. By the time Forward Thinking closed Dec. 31, 2018, the effort had brought in \$1.8 billion.

"The generosity of alumni, friends and philanthropic organizations is both extraordinary and inspiring," President Barbara R. Snyder said at the time.

"We are honored and humbled by this support, which already has made a significant positive impact on our university."

The Nord Family Greenway expands from the renovated Maltz Performing Arts Center (far left) to the Tinkham Veale University Center (far right)—all projects completed during the Forward Thinking campaign.

**Campaign Highlights:** 

**60,000** donors

34,000

first-time givers

46,000

11 new or fully renovated buildings, alumni contributors thanks to \$393 million in gifts

98 endowed professorships created

\$254 million in scholarship support







# A Round of Applause

Nine months after Green's big announcement, the university's theater department made news of its own: a No. 12 global ranking from *The Hollywood Reporter* for its Master of Fine Arts (MFA) program with Cleveland Play House.

The MFA program—whose alumni include Tony nominee Elizabeth Davis and *Mad Men* star Rich Sommer—made a six-slot jump over the previous year, besting offerings from London, Los Angeles and New York City.



#### **Beyond Professions**

as they will practice.

the creation of the Health Education Campus of Case Western Reserve University and Cleveland Clinic.

In the spring of 2019, faculty, staff and students finally saw the concept become a reality.

With the opening of the 477,000-square-foot Sheila and Eric care is increasingly common—in large Samson Pavilion and 132,000-square- measure because it leads to improved

Health sciences students should learn foot Dental Clinic, the campus is now home to students, faculty and staff of the university's nursing, For five years, this simple idea drove dental, and medical schools, including said Tyler Reimschisel, Case Western an ideal space to meet, work on the Cleveland Clinic Lerner College of Medicine.

> And their space is explicitly designed to encourage interaction—in classes, labs, and even at meals. The physical and academic structures aim to give students a head start on their future careers, where team-based health patient outcomes.

The new campus "makes interprofessional education, like having shared classes, much easier," have met otherwise—and you have Reserve's founding associate provost for interprofessional education, research and collaborative practice. Pointing to the expansive Cosgrove Courtyard at the center of the Samson Pavilion, he added: "And that, right

there, supports collaboration. You get to know people you probably wouldn't

interprofessional projects and build a

unique culture of interdisciplinarity."

"The new campus is amazing ... it's really a launchpad for us to learn from, engage with and work in our community."

> Opened in April, the centerpiece of the Health Education Campus is Samson Pavilion, where nursing, medicine and dental students join together during and in between classes. Across the street, dental students provide high-quality care to the greater Cleveland community in a brand-new clinic.

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#### **Beyond Disciplines**

Reserve more than a decade ago with reality, he and others quickly engaged. an idea: create a virtual lab for speechlanguage pathology students to learn how to observe, assess, diagnose and interact with patients.

With a PhD in communication sciences explained Williams, now an adjunct and disorders. Williams knew what to teach. Her challenge was finding

Enter Marc Buchner, associate professor of electrical engineering and computer science. When Williams The Virtual Immersion Center for sought colleagues to assist with the

Stacy Williams came to Case Western technology needed to make the lab a

"My success [developing computerbased simulations] was due to my ability to collaborate with colleagues in different fields at the university," associate professor specializing in communication sciences. "I relied on someone willing to help with the *how*. subject matter experts like Marc for assistance in developing the inner workings of the technology itself."

Simulation Research proved to be

just the beginning. Williams went on to found Simucase, a global company offering clinical simulations for speech-language pathology, audiology and occupational therapy.

> Its origins and expansion can be found in U.S. patents like those Williams and Buchner received in 2018.\*

"Collaborations like this one are truly rewarding," said Buchner, "and exemplify the type of approach that we are now, in the university's new strategic plan, looking to emphasize and support."

This patent is indicative of a trend at Case Western Reserve: In 2018, the National Academy of Inventors and Intellectual Property Owners Association ranked the university 17th in the "Top 100 Worldwide" Universities Granted U.S. Utility Patents."

\*Williams. S.L. & Buchner, M. (2018) United States Patent Numbers 9911352, 10089895 titled: Situated Simulation for Training, Education and Therapy.

#### Beyond Siloed Care

Patients with more than one disease face myriad battles: Not only do their own bodies have to fight multiple ailments, but their health care providers need to go outside their respective fields to coordinate successful care.

Thanks to a \$3.5 million federal grant, Specifically, they're looking at how School of Medicine and Frances Payne providers think about cardiovascular Bolton School of Nursing faculty have risk, as well as the impact of a nursetaken a strong first step to address the led intervention to help people living latter issue.

In collaboration with colleagues at Duke University, medicine's Chris Longenecker and nursing's Allison Webel are examining interventions to assist patients with HIV and who are at higher risk for cardiovascular disease

with HIV reach cholesterol and blood pressure goals.

HIV care has a strong history of health care professionals from different disciplines joining forces, Webel said. While physicians' core focus may be on the disease, she explained, nurses try to understand the full context surrounding a patient's health.

"And," she added, "that legacy of interdisciplinary work has been incredibly successful."

#### Beyond Our Borders

After leading a successful effort to ensure Case Western Reserve's restrooms offered free menstrual products, undergraduate Geneva Magsino sought a larger challenge.

She found it in Sierra Leone—and then again, in Senegal.

While Magsino's on-campus efforts centered on securing access to resources important to women's

health, her subsequent research revealed that in some places, stigma surrounding menstruation contributed not only to illness, but fundamental inequalities.

In collaboration with classmate Hannah Clarke, Magsino developed an educational program to provide girls in In the summer of 2018, the pair

the taboo subject. With initial support from the Office of Undergraduate Studies and Office for Diversity, Inclusion and Equal Opportunity, their proposal also secured a \$10,000 grant from the Projects for Peace philanthropic organization.

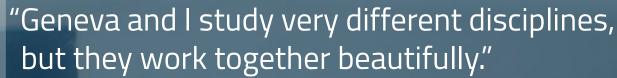
western Africa basic information about spent two months teaching in Sierra

Leone, working alongside Girl Up, a United Nations Foundation initiative committed to advancing gender equality. Then, when both studied abroad in Senegal during the spring semester 2019, they brought the program to a local bilingual school.

Although Magsino graduated in May with a degree in international studies,

she and Clarke, now a junior studying French on the pre-med track, continue to look for opportunities to share Projects for Peace.

As Clarke put it: "Wherever we go, we take our project with us."





# "Students typically learn how to be professionals in 'their lane.' Their value is extremely limited unless they take those blinders off."

The 2018-2019 Annual Report of Case Western Reserve University | case.edu/beyond

#### Beyond the Senses

solve a nagging problem.

For students in the law school's interdisciplinary entrepreneurship program known as Fusion, the irritant was barking dogs.

Their solution? A relaxing scent.

Open to graduate and professional students in law, management, engineering and science, Fusion aims to give students the knowledge and skills needed to evaluate and develop potential commercial ventures based on complex technologies. In the 2018–19 academic year, the program included time in the Larry Sears and Sally Zlotnick Sears think[box], where students could learn technical fundamentals and design prototypes to accompany their pitches.

For the team trying to calm howling hounds, Sears think[box] provided the space and technology necessary to

One key to a successful invention is to turn a popular at-home diffuser into a dual-chamber system with sensors and a microcontroller. Their creation, Lavender Retriever, releases lavender oil, known for reducing stress, and dog-soothing pheromones when its sensors detect barking.

> Just as important as the free access to top tech, team member Rebecca Lindhorst (LAW '18) explained, was the group's disparate expertise, united by the Fusion program.

"Because we all had different backgrounds," she said, "we were able to pick up ideas from disciplines that we wouldn't have thought of before."

As adjunct law faculty and Fusion cofounder Ted Theofrastous explained: "Our hope is that the students take these analytical tools with them and apply them in their careers in the broader ecosystem of innovation and entrepreneurship."

Inside Sears think[box], the university's 50,000-square-foot innovation space, students and the public use technology—from 3D printers to laser cutters and more—to create the next big thing, or simply their next passion.

—Ted Theofrastous Fusion co-founder

"When you look at the data in text form, you suspect there's some sort of pattern."

—Rachel Lovell

Research Assistant Professor at the Jack, Joseph and Morton Mandel School of Applied Social Sciences

#### Beyond the Map

A scholar and a journalist happened to be sitting next to one another, each the school's Begun Center for Violence that Cleveland's redlined areas not with a laptop open to what looked like Prevention Research and Education, identical maps.

tracked entirely different factors: the those that nearly a century earlier had rates, but also low levels of scholar's highlighted sexual assault frequency, while the journalist's looked at child lead poisoning rates.

professor at the Jack, Joseph and Morton Mandel School of Applied Social Sciences, the coincidence became an "aha" moment.

It prompted Lovell, also a member of and center senior research associate Misty Luminais to discover that both But the two greater Cleveland images highlighted areas corresponded to been redlined.

Redlining is a practice in which federal agencies designated residents of For Rachel Lovell, a research assistant certain largely minority areas to be poor credit risks for mortgage loans and other services.

> Working with Case Western Reserve's Freedman Center for Digital

Scholarship, the researchers found only consistently overlapped with neighborhoods that today had high numbers of unsubmitted sexual assault kits and child lead-poisoning internet access.

This connection, Luminais said, "helped us to start thinking about sexual assault in a holistic manner" and better understand how seemingly unrelated problems, and their solutions, ultimately may be connected.

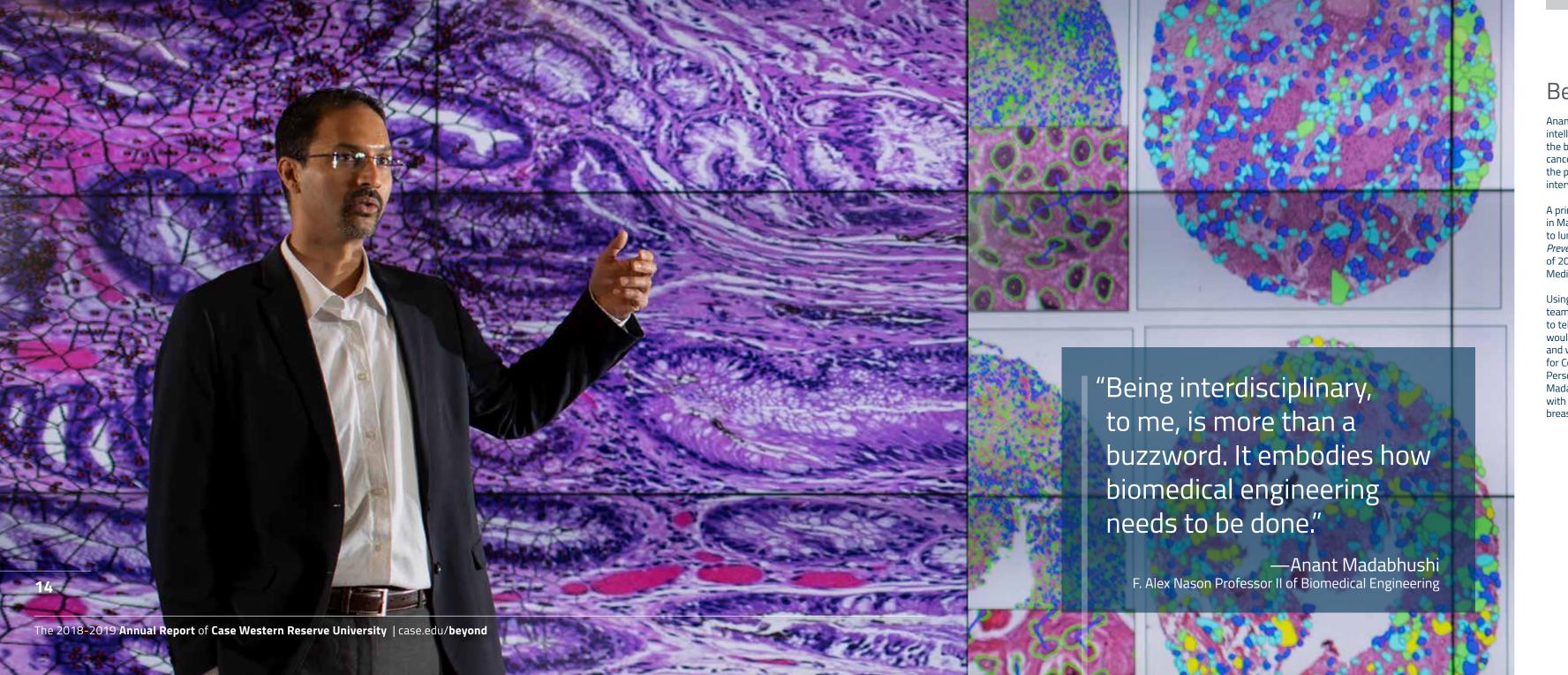
Analyzing banking and lending maps of Cleveland from the 1930s, researchers layered data sets related to sexual assault kits, lead levels and internet access via global information systems (GIS) mapping.

 Aggregation of sexual assault kits by Cuyahoga County census tracts (1992-2014) Percentage of tested children with elevated blood-lead levels (darker colors mark higher percentages) (2015) LAKE ERIE South Euclid Cleveland Lakewood Shaker **Bay Village** Heights Rocky River Westlake Warrensville Heights North Garfield Olmsted Heights Heights Bedford Parma Heights Olmsted Twp Parma

Berea

Euclid

12



#### Beyond Better Health

Anant Madabhushi believes artificial intelligence can quickly determine the best approaches to defeat cancer—and it also can spare patients diagnosis, such results give reason the physical and financial pain of interventions unlikely to help them.

A prime example can be found in Madabhushi's findings relating to lung cancer—work that Prevention magazine deemed one of 2018's "10 Most Incredible Medical Breakthroughs."

Using biopsy images, he and his team trained computers to be able to tell which lung cancer patients would benefit from chemotherapy and which would not. The Center for Computational Imaging and Personalized Diagnostics, led by Madabhushi, has seen similar success with head and neck cancers, as well as breast cancers in their early stages.

With research showing that roughly 40 percent of cancer patients deplete their life savings within two years of for hope across multiple fronts—so much so that Madabhushi has begun conversations with Weatherhead School of Management faculty regarding potential implications for health care costs.

"Being a very curious person, I'm always interested in gaining multiple different perspectives," he said, "and every so often, you have this eureka moment and you're able to really move the needle forward in a way that doesn't just result in another paper, another algorithm. You find something that just might reach that patient who

#### Beyond the Law

Jonathan Adler sees the law as a major lever in addressing today's environmental challenges.

And, as of last spring, he has a new platform to prove his thesis. Adler, the Johan Verheij Memorial Professor Environmental Protection Agency. of Law and prominent environmental Next is a conference on environmental law scholar, is the inaugural director of the Coleman P. Burke Center for Environmental Law. Burke (LAW '70), a prominent environmental conservationist, established the center "Today's environmental problems with a commitment of \$10 million, the require a willingness to work outside largest gift in the school's history.

The center aims to expand students' learning opportunities in environmental law, and also establish the school as an intellectual hub of

interdisciplinary research and thought leadership.

The center's first major event was a symposium marking the 50th anniversary of the founding of the health with the university's Law-Medicine Center—the nation's first centered on health law.

and across disciplinary boundaries," Adler said. "It is our hope that this center will foster productive dialogue and analysis of these issues and prepare a new generation of environmental lawyers."



Fifty years ago, Cleveland's Cuyahoga River fire sparked a focus on pollution in the area and around the country—and the creation of the Environmental Protection Agency.



#### **Beyond Medical Solutions**

Michael Konstan knows the opioid crisis is much more than a medical problem.

So as a leader in a nearly \$350 million federal effort to address it, he has engaged faculty from across the College of Arts and Sciences and the Jack, Joseph and Morton Mandel School of Applied Social Sciences as well as his own colleagues in the School of Medicine.

The federal HEALing\* Communities Study aims to reduce opioid deaths

in four states—Kentucky, Massachusetts, New York and Ohio within three years.

The challenge for Ohio is enormous: In 2017, the most recent year for which statistics are available, the state Successfully combatting the opioid ranked second in the country for opioid crisis, said Konstan, the medical deaths, with a rate 2.5 times higher than the national average.

Konstan is leading a team to work with eight highly impacted northern Ohio counties designated for the

by 40 percent across 67 communities project—including the university's own, Cuyahoga. The \$66 million Ohio grant calls for data-driven approaches across disciplines including health, behavioral health, justice systems and community engagement.

> school's vice dean for translational research, "requires a strong collaborative effort."

#### Beyond Traditional Care

For many, a therapy dog can be calming. But how does the animal's presence actually achieve this effect?

That's the question Aviva Vincent tackled as a doctoral candidate in the Jack, Joseph and Morton Mandel School of Applied Social Sciences. Now a Mandel School instructor and researcher, Vincent found enthusiastic reactions such as changes in levels of their job is behavior management," partners in Case Western Reserve's

School of Dental Medicine and the Irving and Jeanne Tapper Dental Clinic at University Hospitals Rainbow Babies & Children's Hospital.

With support from Salimetrics, a southern California company that analyzes saliva samples for research, Vincent assessed biological "Most dentists say the majority of oxytocin—a hormone associated with said Vincent, explaining how

stress reduction—in 8- to 12-yearolds who had reported fear or anxiety in dental settings. In measures taken at various points before and after interacting with a therapy dog, oxytocin levels were shown to increase.

professors such as Gerald Ferretti, chair of pediatric dentistry at the School of Dental Medicine and chief of pediatric dentistry at UH Rainbow Babies & Children's Hospital, supported her vision. "It's been a really positive experience working with faculty in the dental school to help answer this problem."

"Many children fear going to the dentist. What if we could change that?"

> —Aviva Vincent Instructor in the Jack, Joseph and Morton Mandel School of Applied Social Sciences

Part of the Health Education Campus (see p. 6), the new 132,000-square-foot Dental Clinic expands opportunities for education and research while enhancing the experience for all patients—from children to seniors.



#### DEGREES + CAMPUS **STATISTICS**

JULY 1, 2018 - JUNE 30, 2019

3,536 AWARDED (2018-19)

BACHELOR'S 1,157

MASTER'S 1,682

PHD 207

460 OTHER DOCTORATE (JD, MD, DMD, DNP, DM, DMA, SJD)

CERTIFICATE

#### CAMPUS

3,550 FACULTY (full-time) 3,202 STAFF (full- and part-time)

ENROLLMENT (Fall 2019)

5,383 undergraduate 50 states represented

5,491 GRADUATE + PROFESSIONAL

COUNTRIES REPRESENTED

#### DEGREES BY **SCHOOL**

(Undergraduate, Graduate and Professional)

**713** Case School of Engineering

**658** College of Arts and Sciences

**247** Frances Payne Bolton School of Nursing

**275** Jack, Joseph and Morton Mandel School of Applied Social Sciences

**88** School of Dental Medicine

**261** School of Law

**676** School of Medicine

**618** Weatherhead School of Management

## RESEARCH + TECHNOLOGY **HIGHLIGHTS**

#### COMPETITIVE SPONSORED

RESEARCH PROJECTS*	Projects Awarded	Awarded, in Millions**
National Institutes of Health	<b>369</b>	\$196.9
Department of Defense	27	\$10.6
National Science Foundation		\$7.4
	40	·
Department of Energy	11	\$7.6
NASA	9	\$1.6
Other Federal	101	\$16.4
Industry	102	\$12.7
Nonprofit, Foundations,	582	\$71.1
Associations, Societies		
Other Government	46	\$7.4
Total	1,287	\$331.7

TECHNOLOGY **TRANSFER** 

New Intellectual
Property Deals
with Industry

New Inventions

\$4.16 M
Licensing Revenues

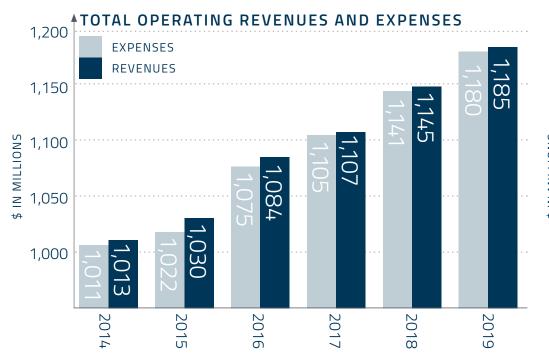
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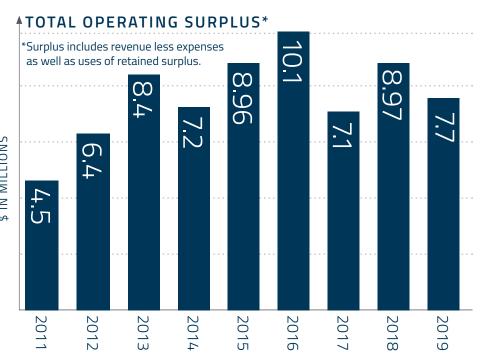
<sup>\*</sup> Does not include awards to Case Western Reserve faculty at Cleveland Clinic Lerner College of Medicine.

<sup>\*\*</sup> Numbers have been rounded.

### FINANCIAL **HIGHLIGHTS**

JULY 1, 2018 - JUNE 30, 2019







#### 2018-19 GIVING **HIGHLIGHTS**

undergraduates receiving scholarship support from gifts

16,849 donors, 14,382 of whom are alumni

raised for scholarships, fellowships and student aid

to the annual fund, which provides immediate student-focused support

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