

**OSU will
transform
the future.**

As Oregon State University begins its next 150 years, our mission as Oregon's statewide university will not change. OSU will continue to provide access to a high-quality education while serving the state's economy and all of its communities.

In IMPACT 2019, we share many meaningful narratives and examples of how Oregon State, its students, faculty and alumni are out there serving our state, the nation and the world.

I guarantee that OSU will build on its legacy of leadership and transformation by advancing solutions to address the world's most pressing issues for the next 150 years.

A handwritten signature in black ink that reads "Edward J. Ray". The signature is fluid and cursive, with a large, sweeping flourish at the end of the name.

Edward J. Ray
President
Oregon State University



32,011

2018 FALL ENROLLMENT

Students have always been Oregon State's most important contribution to society. As Oregon's largest university for the fifth year in a row, OSU continues to make a transformative education accessible for students across Oregon, the nation and the world.

Corvallis

24,290

DOWN 1.9%

OSU-Cascades

1,259

UP 4.6%

Ecampus

6,565

UP 7.9%



5,886

FIRST-GENERATION STUDENTS
22.9% OF ALL UNDERGRADUATES

1,162

U.S. VETERANS
3.6% OF ALL STUDENTS

5,287

GRADUATE STUDENTS
16.5% OF ALL STUDENTS



3,410

INTERNATIONAL STUDENTS
11% OF ALL STUDENTS

7,128

GRADUATES IN THE CLASS OF 2018,
ANOTHER RECORD

7,857

STUDENTS OF COLOR
25% OF ALL STUDENTS

SOURCE: Fall 2018 Enrollment Summary. All comparisons relate to 2017 enrollment. Totals include students who are enrolled at both OSU-Cascades and Ecampus.

Research has a ripple effect. With \$382 million, we're making waves.

That 2018 total — our second-best year ever in competitive research grants and contracts — reflects Oregon State's ability to turn today's research into a brighter tomorrow.

Examples abound. OSU researchers developed a disease-resistant variety of hazelnuts that saved what's now a booming industry. Important breakthroughs in the fight against ALS, Alzheimer's, cancer and other diseases originate in our labs. And the dazzling displays on your smartphone and TV come courtesy of a transparent transistor invented at Oregon State.

We see research as more than a quest for discovery. It is a practical, problem-solving tool that improves lives, protects natural resources and drives economic growth to transform the future for the better.

And the ripples that start here can spread around the world.



2018 research by the numbers



\$382 MILLION

IN RESEARCH GRANTS AND CONTRACTS



\$31 MILLION

IN RESEARCH FUNDING FROM BUSINESS
AND INDUSTRY



78

INVENTION DISCLOSURES



\$4.4 MILLION

IN LICENSING REVENUE
up 10% over 2017



82 COMPANIES

LAUNCHED AND 770 JOBS CREATED THROUGH
THE OSU ADVANTAGE BUSINESS INCUBATOR
SINCE 2013

Research vessel Taani will launch the next generation of ships for science.



Artistic rendering of the research vessel Taani

Now under construction in Louisiana, Oregon State's new research vessel has a name: Taani. Pronounced "tahnee," the word is used by the Siletz people to mean "offshore." It continues the university's tradition of tying the names of research vessels to regional Native American tribes and their languages.

Taani is scheduled for delivery in 2021 and will be fully operational after a year of outfitting and testing. The National Science Foundation (NSF) chose Oregon State to lead the design and construction for as many as three new regional-class research vessels (RCRV) for the nation. So

far, the NSF has awarded OSU grants of \$121.88 million and \$88 million in what could be a \$365 million project overall.

Taani will be 199 feet long, with a cruising speed of 11.5 knots and a range of about 7,000 nautical miles. It will have berths for 16 scientists and 13 crew members and be able to stay out at sea for 21 days before returning to port.

RCRV does not stand for Really Cool Research Vessel. But it could.

DEPLOY AND CONQUER

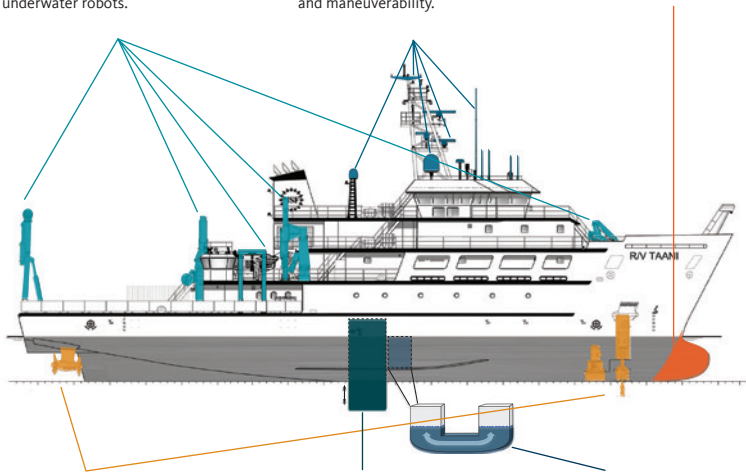
Off its stern, Taani will be equipped with a flexible, multi-jointed A-frame for deployment of nets, buoys and other sampling equipment. Amidships, an advanced robotic arm will be able to deploy sampling and measurement tools without the need for extra safety lines, as well as launch and recover underwater robots.

STEADY AS SHE GOES

Although the ocean is in constant motion, many operations require the ship to remain stationary or follow a survey line very precisely as data is collected. A state-of-the-art dynamic positioning system — featuring two sets of twin thrusters in the bow and stern — will increase Taani's stability and maneuverability.

BULBOUS BOW

Taani's protruding bow has a purpose: better hydrodynamics. The design can reduce drag by up to 15 percent and increase fuel efficiency by up to 6 percent.



SHIP-TO-SHORE IN REAL TIME

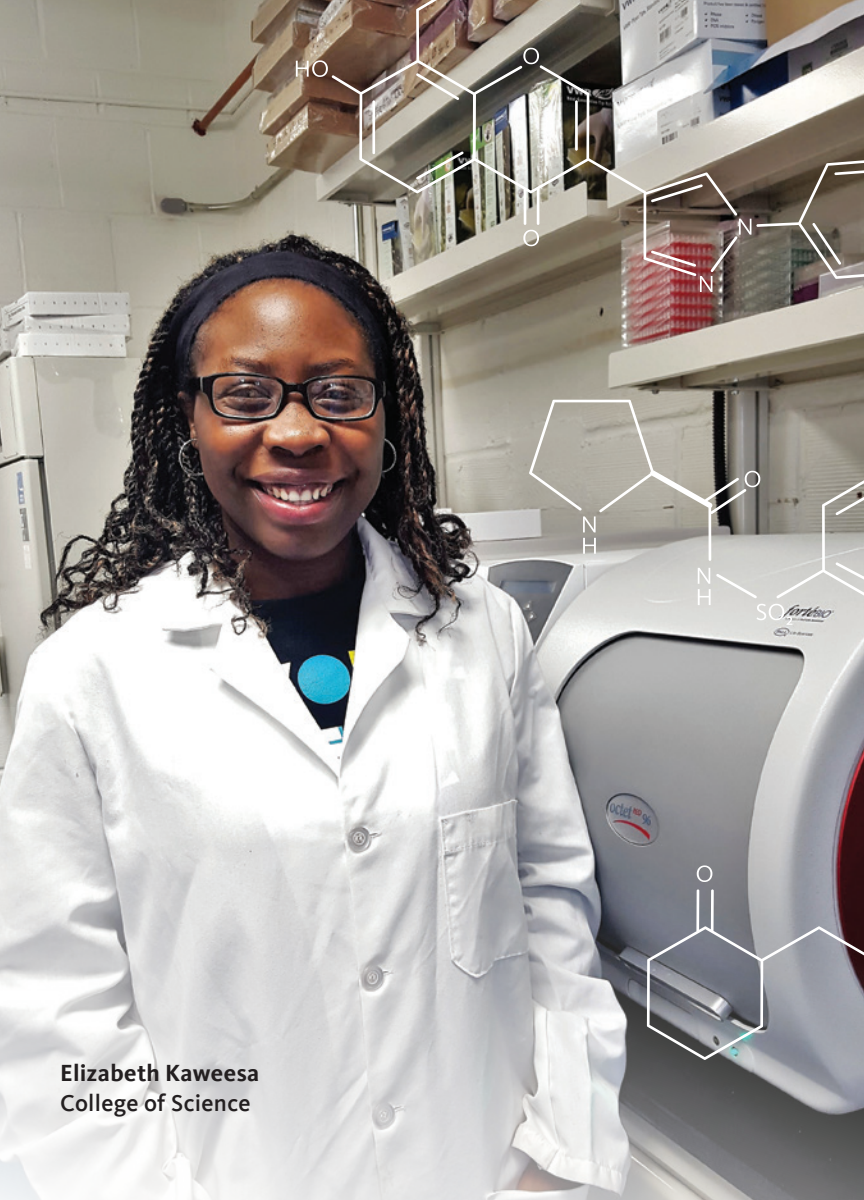
Advanced datapresence technologies will enable constant real time measurements of temperature, salinity, light transmission, dissolved oxygen and other parameters. Scientists on shore will be able to participate in research projects remotely, and teachers can have direct interactions with scientists working at sea.

CENTER OF ATTENTION

A retractable centerboard will provide a versatile platform on which a variety of acoustical sensors can be easily installed and switched out based on specific mission requirements. These could include instruments to identify schools of fish, measure currents, capture seafloor images or communicate with swarms of autonomous underwater vehicles.

THAT'S NOT HOW WE ROLL

A ship's lateral rolling motion can provoke seasickness in even the most stouthearted scientists. Rolling can also make deployment and retrieval of instruments difficult and even dangerous. A large, U-shaped tank within the hull will use gravity to shift water weight and dampen Taani's roll, making operations safer and more comfortable.



Elizabeth Kaweesa
College of Science

Drugs from Dirt? Yes!

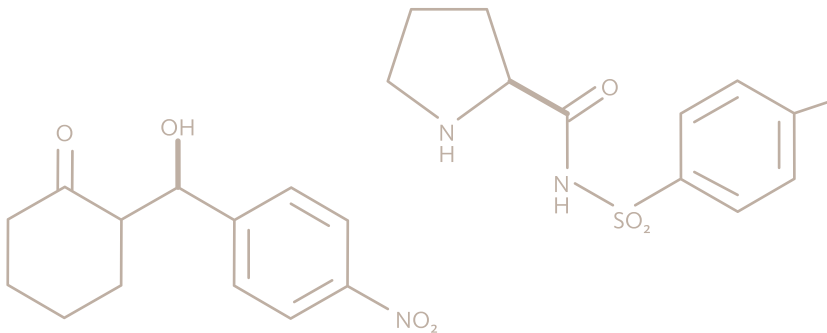
Chemist Sandra Loesgen and her research team have discovered that a soil-dwelling bacterium produces molecules that induce death in melanoma cells.

It's an important breakthrough because few existing therapies effectively manage melanoma, the most dangerous form of skin cancer. In the U.S. alone, there are more than 80,000 new melanoma cases and 9,000 fatalities reported each year.

Loesgen, postdoctoral scholar Birte Plitzko and graduate student Elizabeth Kaweesa found that the molecule — mensacarcin — attacks the mitochondria of melanoma cells. Mitochondria are the part of a cell that produce most of the energy needed for life.

Their findings contribute to a promising area of biomedical research. Mitochondria have emerged as a potential target for therapy because the mitochondria of cancer cells are structurally and functionally different from those of noncancerous cells.

The discovery also gives new meaning to the idea of groundbreaking research.





The new OSU Portland Center occupies the entire second floor of the historic Meier & Frank Building.

We may have opened new doors in 2018, but we've been in Portland for years.



The OSU Portland Center at Pioneer Square is the culmination of decades spent putting down roots across the Portland area. Along with the OSU Food Innovation Center in the Pearl District, multiple OSU Extension Service programs and ongoing partnerships with local

schools and private industry, Oregon State University is now offering innovative bachelor's degree programs in Portland to better meet students' needs where they are located.

New hybrid academic programs combine online coursework from Oregon State's top-ranked Ecampus with in-person sessions in downtown Portland. It's the best of both worlds for students who have work and family obligations that require the flexibility of online learning, but who also crave regular in-person contact with instructors and other students.

And it's the best of both worlds for us, too. OSU gets to serve unmet needs, as well as introduce teaching methods that could change the status quo of higher education — something we love to do and do really well.



Photo by Stephen Ward

Forget water into wine. We're turning whey into vodka.

No miracles — just ingenuity and fermentation science. Distilling whey into vodka and other spirits could transform a waste stream into a revenue stream for the roughly 1,700 artisan creameries in the U.S.

As much as 90 percent of the milk that goes into making cheese comes out as whey. It's expensive to dispose of in a landfill and potentially harmful to the environment.

But not when converted into alcohol.

“Whey ferments and distills beautifully,” says Paul Hughes, who leads Oregon State's burgeoning distilling program. He is analyzing the chemistry and flavor characteristics of different whey types for making vodka and other spirits. Distilling whey could create new products for small, artisan creameries to sell while reducing negative environmental impacts.

Cheers!





Small fish. Big impact.

You might not notice them. Small, seemingly inconsequential fish the size of a minnow, dashing between the reeds of Central Oregon's waterways. But these fish — called stickleback — actually have a lot to say. Like canaries in a coal mine, stickleback signal our potential biological future if we don't halt pollution in its tracks. And soon.

This is the primary concern of eight undergraduate students working on the Stickleback Project, a study directed by OSU-Cascades biology instructor Ann Petersen that examines changes to the fishes' reproductive systems. Data collected by the group will help paint a picture of how the health of Central Oregon's rivers affects local species — research that could inform how to approach industrial land use in the state's fastest-growing region.

“Stickleback may be part of an emerging health crisis around the world,” Petersen says. Fortunately, thanks to this team in Bend, finding answers today may spare us even harder questions tomorrow.



Wildfire is no match for a determined Beaver.



You know your research is good when it causes the U.S. Forest Service to change its tune on wildfire management.

Paleologos Paleologou was studying geography at a Greek university in the summer of 2007 when a series of deadly wildfires erupted throughout his country, scorching more than half a million acres of forest and killing 84 of his fellow citizens.

In the aftermath, Paleologou swore he would do everything in his power to prevent such a catastrophe again.

Equipped with a Ph.D. in wildfire behavior modeling, Paleologou relocated to Oregon, where he joined a team of OSU College of Forestry researchers using the latest computer modeling techniques to determine best practices for foresters.

The data has proven so useful that the U.S. Forest Service is taking a serious look at Paleologou's recommendations to reduce fuel loads and set prescribed burns at a larger, more strategic scale. This shift could finally mean peace of mind for people living in regions at high risk for seasonal wildfires — particularly those still struggling after the disastrous California wildfires of 2018.

“If I can contribute to change, I will have accomplished something,” Paleologou says. Now, with the U.S. Forest Service's ear, he will.

Our champion
baseball team's
secret weapon:
math.





Morgan Pearson struck out no one, caught no fly balls and hit no home runs, but he was instrumental in the Beavers' record-setting season, capped by winning the 2018 College World Series in Omaha, Nebraska.

Pearson used his mastery of mathematics and statistics to analyze the competition — providing vital data about players and tactics that helped Head Coach Pat Casey make game-time decisions about who to play and how to win.

Pearson has played baseball since he was 5 and nearly made it as a walk-on for the Beavers. Instead, Casey offered him a position in baseball operations, the first step toward his goal for a career in baseball analytics. Despite a grueling game schedule and rigorous academic coursework, along with his own mathematical and biostatistics research, Pearson graduated from Oregon State on schedule in 2018. He did have to miss out on Commencement, however. He was on his way to Omaha.

After graduation, Pearson went on to the major leagues, using statistics to identify talent for the Texas Rangers. He believes his example can inspire other students to pursue the variety of career opportunities in math and statistics. “With math, you can go into almost any field,” he says.

That includes the baseball field.



Out there bridging the gap for Portland's most vulnerable.

One hundred patients served. 125 hours of workshops taught. Nonprofit status achieved. All in less than one year. That's what our pharmacy students have been up to in Portland — in addition to their coursework and research.

Bridges Collaborative Care Clinic — a free, pop-up clinic run by students from Oregon State University, Portland State University and Oregon Health & Science University — provides basic medical care, pharmacy and dental services to people experiencing homelessness in the Portland metro area.

It is life-changing assistance for those who are typically barred from vital health care services, due to a lack of insurance or an inability to keep appointments without access to transportation. And it's a fantastic interdisciplinary learning experience for the students involved.

"I am in constant awe of the power that a group of passionate students can have when working together toward a common goal," says Kevin Christy, Bridges co-chair and College of Pharmacy student. "They amaze me every day."

She's a pint-size pioneer in the fight against cancer.

Meet Missy, a four-pound Chihuahua who will stand up to any dog, regardless of size.



Fourth-year student Paige Ganster prepped Missy for surgery, observed the nanoparticles highlighted during the procedure and managed Missy's post-operative care.

Diagnosed with a mammary tumor, Missy was the first patient in a clinical trial to use a glowing nanoparticle developed in Oregon State's College of Pharmacy. The nanoparticle attaches to cancer cells, allowing surgeons to see exactly what tissue needs to be removed. It also heats up under an infrared laser to destroy any remaining tumor cells.

The clinical trials, conducted at the Carlson College of Veterinary Medicine, are critical to assessing the effectiveness and potential side effects of experimental treatments.

As for Missy, she's had no complications. Her owner, Mary Terry, is happy to have contributed to medical progress while giving Missy "her best shot at a long life."

Donor support for the future keeps making history.

After raising \$132.15 million in 2017, the OSU Foundation figured that amount could be reached again last year.

That was an understatement. With exceptional generosity, donors contributed \$151.93 million in 2018, setting yet another record. Among the highlights:

- » A historic \$50 million gift from 1974 alumnus Gary Carlson, Oregon State's largest ever, will greatly expand the teaching, research and service mission of the renamed Carlson College of Veterinary Medicine.
- » Donations pushed OSU-Cascades past its \$10 million goal to match state funding for a second academic building on the Bend campus.
- » The Arts and Education Complex initiative accelerated with a gift from the family of 1968 alumna Lynne Detrick that will fund an acoustically superior concert hall for piano recitals, choir concerts and other performances.

Donors invest for the future. They can be confident in their investments in Oregon State.

Scholarships By The Numbers

Oregon State awards more grant and scholarship dollars than any other university in the state and leads the state in the number of undergraduates receiving grants and scholarships.

\$100 MILLION

RAISED TOWARD THE \$150 MILLION GOAL OF THE STUDENT SUCCESS INITIATIVE

34 PERCENT

OF FIRST-YEAR STUDENTS RECEIVED SCHOLARSHIP SUPPORT IN 2017-18



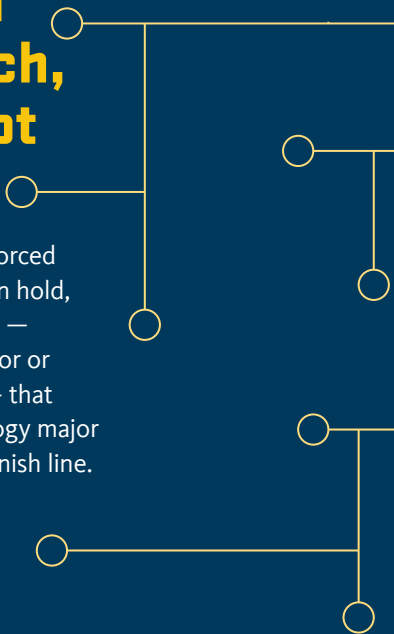
4,000+

STUDENTS RECEIVED
MORE THAN \$11 MILLION
IN DONOR-FUNDED
SCHOLARSHIPS IN THE
2017-18 ACADEMIC YEAR

With graduation just beyond reach, a scholarship got her there.

When an unexpected family tragedy forced Diana Vasquez to put her education on hold, it was an OSU Foundation scholarship — designed to help students in their junior or senior years complete their degrees — that allowed the food science and technology major to resume her studies and reach the finish line.

Diana Vasquez '18
College of Agricultural Sciences





To make a brilliant solution, make sure people will use it.

When Grace Burleson went to a girls' school in Uganda to test a new water purifier, it wasn't just to see if the device worked.

The humanitarian engineering graduate student from Oregon State needed to make sure the water purifier met the needs of those who would use it — the more than 1.2 billion people worldwide who boil water daily over an open fire, often indoors.

Sure, the new device is safer, faster and more efficient than an open fire. It can purify up to 400 liters per hour and uses up to 97 percent less wood. But in observing the school's kitchen staff, Burleson discovered they were suspicious of the water coming out of the device.

It was cold.

Boiling provides an obvious visual cue that the water is safe. But boiling isn't necessary. Instead, the new device heats incoming

water to 160 degrees Fahrenheit for 15 seconds, meeting World Health Organization standards. And to maximize efficiency, a heat exchanger captures waste heat from the outgoing water stream to warm up the incoming water.



As a result of Burleson's observations, the design team modified the device. Now, users can draw off hot water as it exits the heating chamber. Not only does this give them confidence that the device is working properly, they can use the hot water immediately for tea — something Burleson noticed they drink at almost every meal.

Effective. Practical.
Absolutely brilliant.

Grace Burleson '16, '18 wrote her undergraduate Honors College thesis on water treatment technologies in the developing world. Her training in humanitarian engineering incorporated anthropological methods to test and refine a water purifier.



Learning comes naturally when you go out there.

One of the best ways to help students learn is to take them out of the classroom. Oregon State leads programs that do.

The OSU Extension Service is charged with administering Outdoor School programs statewide. Over the 2017-18 school year, Outdoor School gave nearly 31,000 fifth and sixth graders an immersive, hands-on experience across Oregon's spectacular landscapes. In this first year of state funding from voter-approved Measure 99, the program served 385 schools from Oregon's 36 counties.

Oregon State also integrates learning into fun, kid-friendly camp activities. Last summer, OSU-Cascades graduate students in the Master of Arts in Teaching program taught math, science and engineering skills to Central Oregon middle schoolers using traditional camp fare: Popsicle sticks, dry ice and marshmallows. Launched in 2012, the summer STEM camps are a hit with campers, local educators and the future teachers who get practical experience.

Opportunities for discovery in the STEM fields are everywhere. Even over s'mores.



Patric Papabathini '18
College of Business

Ecampus opens doors through browser windows.

Like anyone with a foot on the first rung of the corporate ladder, Patric Papabathini wanted to advance.

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But just four years after moving from India to Seattle to work at Microsoft, his chances to advance had stopped. Why? Papabathini didn't have a college degree.

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Eager to make the leap from administrator to manager, he turned to Oregon State Ecampus. Affordable, accessible and top-ranked in the nation, Ecampus made earning a degree while balancing the commitments of work and family a real possibility. But what sealed the deal was the flexibility of distance learning — Papabathini was able to earn his degree in business administration while back home in India.

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Two years later, Papabathini made the long journey back to the United States to proudly participate in Oregon State's Commencement ceremony. "I'm definitely more equipped now," he says. "I don't have to worry about my résumé anymore because I have my degree. I can confidently move in the direction that I've always wanted to go."

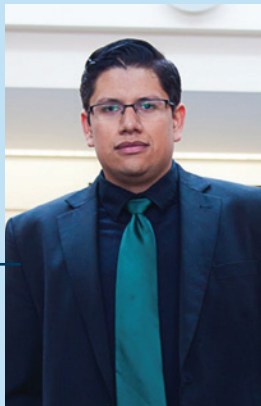
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Up.

11

11

Doors opened for him. Now, he holds them open for others.



“I was given this opportunity, and I wanted to use my skills to help others.”

– Alan Duran '14
College of Liberal Arts

An immigration attorney in Medford, Oregon, Alan Duran advocates for families navigating the complex immigration system in the U.S.

Duran, who earned a bachelor's degree in English from Oregon State before going to law school, has returned to the College of Liberal Arts to talk with students about finding their way after college.

Eight years ago, Duran thought few doors were open to him. He was undocumented, having come to the U.S. at age 5 from Hidalgo, Mexico. A conversation with an immigration attorney helped him see a different future — as a lawyer.

Now a U.S. citizen, Duran is a firm believer in giving back.

“College and law school are hard, and networking, encouragement and mentorship got me through both,” Duran says. He's determined to do the same for those who follow.



Preventing suicide is #DamWorthIt.

When Oregon State student-athletes Taylor Ricci, a gymnast, and Nathan Braaten, a soccer player, both lost teammates to suicide, they turned their grief into an action plan to address mental health challenges in collegiate athletics. Their campaign — #DamWorthIt — earned feature stories in Sports Illustrated and USA Today, as well as a \$60,000 grant from the Pac-12 to expand the program across the conference.

#DamWorthIt emphasizes mental health education, resources and peer-to-peer coaching. With backing from Oregon State Athletics, Ricci and Braaten made videos about their own struggles. Student-athletes teamed up with OSU Counseling and Psychological Services (CAPS) to provide information at athletic events. And at a home football game, they distributed more than 5,000 signs for athletes and fans to write out and share their own reasons why they're #DamWorthIt.

Because they are.