

# NM startup focuses on drug development

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Bio process could radically improve today's antibiotic development bottleneck, said HD3 founder and CEO Michelle Miller. That bottleneck has allowed drug-resistant bacteria to cripple efforts to control some diseases, such as deadly skin infections caused by the antibiotic-resistant bacteria MRSA.

"It has the potential to flat out change the way drugs are developed and brought to market," Miller said.

The LANL scientists, led by Koglin, used the lab's expertise and advanced capabilities in genomic sequencing and bioinformatics — the combination of computer science, statistics, mathematics and engineering to analyze biological data — to screen thousands of microorganisms to identify enzymes and microbial processes that have antibiotic potential.

From some 30,000 clusters of enzymes, the team isolated 75 with promising characteristics for further analysis. And from those, it managed to isolate two new antimicrobial compounds, thermocellomycin and aurantiamycin. In further testing, those compounds were shown to inhibit the growth of 13 pathogen species, including MRSA and other bacteria that cause things such as anthrax, plague and a life-threatening gastrointestinal disease.

The team's trick for rapid identification is not just the lab's high-tech advances in genomic sequencing and bioinformatics, but the way the team applied those processes. Rather than just keying in on new compounds, the scientists looked for clusters of enzymes that are scattered throughout cells that work together to form those compounds. It was a matter of identifying the key enzymes that need to be put together in a certain order to reproduce the process that the cell uses to create antimicrobial compounds, according to Rebecca McDonald, a LANL science writer who described the process in the October edition of LANL's science and technology magazine.

"It's kind of like looking for all the words in a sentence, but not requiring that they be

in the right grammatical order — just whether certain words are there, within certain proximity parameters," McDonald wrote.

After keying in on promising compounds, then identifying the enzyme clusters and processes that create them, the team worked to reproduce those compounds synthetically in a lab. Koglin calls it a "cell-free" reproduction process that eliminates the traditional need to grow cultures, which is tedious, slow and costly. Rather, NTxBio builds the compounds by mimicking the way the enzymes originally worked together in cells.

"It's basically a Frankenstein," Koglin said. "All the pieces are there, but it's not living."

By streamlining the process, NTxBio can not only rapidly identify and reproduce new potential antibiotics and other drugs, it could develop a pipeline of medicines to replace antibiotics as bacteria build up fresh resistance, Koglin said. As a result, the new system can immensely reduce drug discovery and development costs.

"The lifetime of patents can be stretched to provide a sustainable revenue stream over many years," Koglin said. "That will lead to the development of many more drugs while also lowering prices."

The company, which moved in December to a lab at Santa Fe Community College, is considering a variety of business models to market its technology. That includes licensing its system to pharmaceutical firms, doing drug discovery and reproduction on contract for companies, or pushing new drugs through pre-clinical studies on its own before allowing established drug companies to take over.

Company investors say they're now working to establish critical industry partnerships and develop the right business model.

"This company truly has the ability to be New Mexico's unicorn," said Matthew Ennis, a serial entrepreneur and one of the NTxBio investors. "It's still at a very early stage and many things can go wrong, but the core elements of the technology are very compelling."

# Vet finds WWII ambulance he drove

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high school," he said.

Grasser graduated June 11, 1943, and was sworn in to the Army six days later. Although he didn't know how to drive, he was designated as an ambulance driver and trained in California.

"And I suspect there may still be some marks on those redwood trees" from trainees' mistakes during driving lessons, he said.

Grasser finished basic training at the end of 1943 and shipped out to England at the beginning of 1944. He trained on rough terrain in northern England for a few months.

"But all of a sudden, the sky was just black with planes coming and going," he recalled.

The invasion of France on D-Day had begun.

About three weeks later, Grasser landed on Omaha Beach. The landing craft couldn't get the ambulances to shore, so the soldiers drove through shallow water.

Grasser said soldiers made the ambulances as waterproof as possible, wrapping parts of

the engines in waxy gauze-like material, duct-taping doors and putting a tube on the tail pipe to act as a snorkel. They drove through the water on metal grates laid on the sand for traction.

When a supply convoy headed to the front, Grasser and other ambulance drivers joined it. Early on, a plane dropped flares on the convoy. He assumed someone was going to take photos until German planes began strafing the Americans.

"Talk about a bunch of scared kids," he said.

When the planes came to the ambulances, they pulled up and stopped shooting. The pilots "respected the red cross" on the ambulances, he said.

In France, Grasser was part of the 593rd Motor Ambulance Company in Gen. George Patton's 3rd Army. When men were wounded, they were brought to a collection point. From there, Grasser helped transport them to an evacuation hospital.

Eventually, he followed the 5th Armored Division.

At one point, his unit drove

up on a field near Malmedy, Belgium, where retreating Germans had slaughtered about 85 American prisoners of war and left the bodies.

"That's the worst thing I've seen in my life," he said.

By the end of the war, Grasser had traveled through France, Belgium and Luxembourg to Germany. His company evacuated 25,000 patients between Omaha Beach and Aichach, Germany, and helped liberate two concentration camps, according to the **Albuquerque Journal**.

"To this day, I always say I had an angel on my shoulder because I didn't get a scratch," he said.

Grasser thinks his unit was about two weeks away from being shipped to the Pacific when the atomic bombs were dropped on Japan. So, Grasser went home in 1945.

In 1949, he moved to Santa Fe to attend art school.

Fast forward to last summer. An usher at Grasser's church told him about the World War II ambulance at the military history museum, then located on Lomas Boulevard. The two visited the museum.

When Misel showed them the ambulance, Grasser recognized the numbers on its bumper. Those numbers indicated the ambulance had been property of Grasser's unit, and Ambulance No. 14, the one he drove.

"The chances of that are nil," he said.

Misel said a photo of Grasser with the ambulance during the war shows the last three digits of a serial number on the vehicle's hood. Those same digits are on the hood of the museum's ambulance.

Santa Fe collector Nat Holzer, a World War II Pacific Theater veteran, gave it to the museum.

"This was part of his collection, and we don't know where he got it," Misel said.

Holzer died in 2008. His children are looking for the ambulance's title to learn more about its history.

Since discovering the ambulance, Grasser has appeared publicly with it, most recently at a gun show this month, and shared his story.

"God knows, I'm no hero," he said. "I'm just the lucky guy who outlived all the others."

# Is algebra unnecessary stumbling block in U.S.?

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Many U.S. educators, including the architects of the Common Core standards, disagree, saying math just needs to be taught more effectively. It's fine for students to have quantitative skills, they say, but algebra is important, too.

"Every study I've ever seen of workers in whole bunches of fields shows that you have to understand formulas, you have to understand relationships," said Philip Uri Treisman, a professor of mathematics and of public affairs at the University of Texas. "Algebra is the tool for consolidating your knowledge of arithmetic."

Bill McCallum, a professor at the University of Arizona who played a lead role in developing the Common Core standards for math, said he would oppose any division of K-12 students into an algebra track and a non-algebra track. "You might say only a certain percentage of kids will go

on to use algebra, but we don't know which kids those are," he said.

In New York City, home to the nation's largest public school system with 1.1 million pupils, just 52 percent of the students who took last year's statewide Regents test in Algebra I passed, mirroring statistics elsewhere in the country.

Rather than scaling back on algebra, New York City educators have announced an "Algebra for All" initiative that aims to keep students on track by providing specialized math teachers in fifth grade, before algebra is introduced.

"We believe in high standards," said Carol Mosesson-Teig, director of mathematics for the city Department of Education. "And we believe that the best way to serve the students is to strengthen the instruction."

Eighteen-year-old Isaiah Aristy took the algebra Regents test twice and failed it both times.

Aristy, now a freshman

at the Borough of Manhattan Community College who is hoping for a career in law enforcement, said he was good at math until he hit algebra.

"When it came to x and y and graphing, that's when I started dropping, and it made me feel low," he said. "But we don't need to learn what x and y is. When in life are we going to write on paper, 'X and y needs to be this?'"

Like millions of community college students across the U.S., Aristy must pass a remedial math class with no college credit, then pass at least one college-level math class, if he wants to get an associate's degree.

But Aristy isn't just repeating Algebra I again. BMCC is one of about 50 community

colleges in 14 state that offer an alternative track called Quantway, developed by the Carnegie Foundation for the Advancement of Teaching, that seeks to develop quantitative literacy.

"It includes some basic algebra concepts, but you don't learn how to factor polynomials or solve complex equations," said math department Chairman Fred Peskoff.

Project director Karon Klipple said the foundation devised Quantway and a statistics track called Statway in 2011 because of the sheer numbers of students dropping out of community college due to algebra. Sixty to 80 percent of community college students nationwide test into remedial math, and most don't pass it, she said.

"This is where their hopes and aspirations go to die," Klipple said. "They're in college to try to make a better life for themselves, and they're stopped by mathematics."



**ARISTY: Says he was good at math until algebra**

## THE LIGHTER SIDE

Hello everybody, and God bless America.

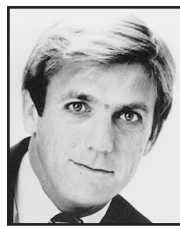
■ Ohio Gov. John Kasich told reporters he's staying in the GOP race in order to force a deadlock on the convention floor. He's self-inspiring.

Kasich said he will fight all the way to Cleveland, which may not sound like much of a fight, but you haven't seen their potholes.

■ The GOP primary race has its next stop in Wisconsin a week from Tuesday. It's gotten way too dirty. Parents are now turning off the TV whenever Donald Trump and Ted Cruz fight over their wives' looks and are forcing their kids to watch the Hulk Hogan tapes to see better parenting role models.

■ President Obama was seen tango dancing in

**ARGUS HAMILTON**



Argentina the night after ISIS attacked Belgium. It sent a message from the U.S. to the world. We may not be able to stop ISIS, but when it comes to dance contests, we are still the world's only superpower.

■ John Kerry flew to Moscow to butt heads with the very macho Vladimir Putin to try to find a political solution to the Syrian civil war. The other night, Putin struck and killed a deer. He said he feels terrible about it, but when he's jogging, he's in his own world.

■ Interpol went hunting for the ISIS terrorists in Muslim neighborhoods after they hit Belgium on Tuesday. The group strikes fear wherever they plant the black flag. ISIS co-opted the black flag as the symbol of terror after the Oakland Raiders disgraced it by losing games and doing charity work.

Argus Hamilton is host comedian at The Comedy Store in Hollywood. Email him at [Argus@ArgusHamilton.com](mailto:Argus@ArgusHamilton.com).

## TODAY IN HISTORY

**TODAY IS MONDAY, MARCH 28**, the 88th day of 2016. There are 278 days left in the year.

**TODAY'S HIGHLIGHT IN HISTORY:** On this date in 1941, novelist and critic Virginia Woolf, 59, drowned herself near her home in Lewes, East Sussex, England.

**In 1834**, the U.S. Senate voted to censure President Andrew Jackson for the removal of federal deposits from the Bank of the United States.

**In 1854**, during the Crimean War, Britain and France declared war on Russia.

**In 1896**, the opera "Andrea Chenier" by Umberto Giordano premiered in Milan, Italy.

**In 1898**, the Supreme Court, in United States v. Wong Kim Ark, ruled that a child born in the United States to Chinese immigrants was a U.S. citizen.

**In 1930**, the names of the Turkish cities of Constantinople and Angora were changed to Istanbul and Ankara.

**In 1935**, the notorious Nazi propaganda film "Triumph des Willens" (Triumph of the Will), directed by Leni Riefenstahl, premiered in Berlin with Adolf Hitler present.

**In 1955**, John Marshall Harlan II was sworn in as an associate justice of the U.S. Supreme Court.

**In 1965**, an earthquake of magnitude 7.4 struck La Ligua, Chile, leaving about 400 people dead or missing, according to the U.S. Geological Survey.

**In 1969**, the 34th president of the United States, Dwight D. Eisenhower, died in Washington, D.C., at age 78.

**In 1979**, America's worst commercial nuclear accident occurred with a partial meltdown inside the Unit 2 reactor at the Three Mile Island plant near Middletown, Pa.

**In 1987**, Maria von Trapp, whose life story inspired the Rodgers and Hammerstein musical "The Sound of Music," died in Morrisville, Vt., at age 82.

**In 1990**, President George H.W. Bush presented the Congressional Gold Medal to the widow of U.S. Olympic legend Jesse Owens.

**TODAY'S BIRTHDAYS:** Former White House national security adviser Zbigniew Brzezinski is 88. Author Mario Vargas Llosa is 80. Country musician Charlie McCoy is 75. Movie director Mike Newell is 74. Actress Conchata Ferrell is 73. Actor Ken Howard is 72. Actress Dianne Wiest is 70. Country singer Reba McEntire is 61. Olympic gold medal gymnast Bart Conner is 58. Actress Tracey Needham is 49. Actor Max Perlich is 48. Movie director Brett Ratner and country singer Rodney Atkins are 47. Actor Vince Vaughn is 46. Actor Ken L. and singer/songwriter Matt Nathanson are 43. Rock musician Dave Keuning is 40. Actress Annie Wersching is 39. Actress Julia Stiles is 35. Singer Lady Gaga is 30.

— The Associated Press

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	0-4-8 (day)	Powerball: 6	<b>Hot Lotto</b>
	7-9-1 (eve)	Power play: 3	8-11-21-32-47
			Hot ball: 13

Numbers supplied by The Associated Press and lottery websites

## Flying the colors

The flag is to be flown at full staff today.

