

# Accelerator Pipeline

NEWS FROM WARF'S TECHNOLOGY COMMERCIALIZATION TEAM



## TECHNOLOGY MONITOR

### A plastics revolution, startups break ground, a new solution for pulp mills and more

The WARF Accelerator Program speeds the development of technologies with exceptional potential for commercial success. With targeted funding and expert advice from seasoned business mentors known as Catalysts, the Accelerator Program helps inventors develop their technologies and advance to the marketplace.

#### MEDICAL DEVICES AND IN VITRO DIAGNOSTICS

##### BLOOD WORK:

When detected at early stages, colon cancer is highly treatable. But traditional screening procedures like colonoscopy are invasive and costly, and many people are never properly screened. More than half a million patients die every year.

A diagnostic test being developed by Michael Sussman and Melanie Ivancic (biochemistry) requires only a small blood draw. A pilot study suggests the new test is able to detect cancer at an early stage and may outperform or complement other screening methods such as Cologuard.

With help from the Discovery to Product (D2P) program on campus the team is currently assessing several market entry strategies. In-depth interviews with colorectal surgeons and medical oncologists continue to guide the project.

#### CLEAN TECH

##### DRIVING CHANGE:

Consumer plastics – everything from food containers to clothing – contain a key ingredient called polypropylene that is made from propylene. A team led by Ive Hermans (chemistry and chemical engineering) is developing new catalysts to drive the reaction that turns propane into propylene. The catalysts are nontoxic, efficient and potentially game changing.

They were recently featured in a leading industry publication with high praise from senior researchers at BASF and Exxon Mobil.

##### PULP ECONOMICS:

In order to produce pulp from wood, harsh chemicals are applied during cooking and bleaching mainly because lignin is tough to break down. To make it easier to degrade, John Ralph (biochemistry) discovered how chemically reactive bonds

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## BUILDING MOMENTUM



Before sharing some management news about our program, I am pleased to let you know GE Healthcare has become our second commercial licensee for the magnetic resonance imaging technology from PI Scott Reeder and assis-

tant professor Diego Hernando that enables non-invasive measurement of iron in the liver. GE is a market leader in the MRI industry and has a close working relationship with UW-Madison and WARF in the medical imaging sector. We are delighted to have GE add this AP-supported innovation to other medical imaging technologies they have licensed from WARF and will integrate into commercial MRI products that enhance patient care.

In this edition of the Accelerator Pipeline, I also want to let you know that Rich Schifreen will be wrapping up his tenure as our Accelerator Program Manager with his retirement from WARF at the end of February. Since Rich joined us in the summer of 2011, he has helped drive AP to become a better organized and more diligently managed endeavor. Rich has been instrumental in growing AP from three to five Market Focus Areas, significantly expanded our team of highly expert and valued Catalysts, and managed the review, funding and tracking for a steadily growing number of AP projects each year in partnership with UW-Madison. I know you have enjoyed working with Rich as much as we have. Please join all of us at WARF in wishing him the best in whatever he does next (which we suspect will involve his recent professional certification as a SCUBA Divemaster, at least for the near future).

– Leigh Cagan, lcagan@warf.org

# Accelerator Chronicle

## Ahead of the Game

**Campus spinout Ab E Discovery is set to smash business as usual. Founder Mark Cook reflects on his maverick reputation, and having job creation in his DNA.**

Some of the biggest players in the meat industry are losing their appetite for the status quo.

Tyson Foods made headlines when it pledged to eliminate human antibiotics from its chickens this year. Wendy's, Chick-fil-A and Taco Bell will follow suit; McDonald's already made the change.

Part consumer demand and part cagey marketing, it's a welcome trend for researchers like Mark Cook who are alarmed by the rise of drug-resistant pathogens in our food supply.

He believes it signals a sea change, considering that 70 percent of antibiotics in this country are used in farm animals. These are the same drugs used in human medicine.

But Cook, a UW-Madison animal scientist, isn't crowing just yet. Cook runs one of the most entrepreneurial labs on campus. His group identified the market opportunity several years ago, and with

support from the WARF Accelerator Program their prescience could be close to paying off.

Cook and collaborator Jordan Sand have received Accelerator support to advance the boldest alternative yet: a natural, drug-free method to protect poultry, pigs, dairy and beef cattle against common infections.

Their strategy turns the paradigm on its head: instead of trying to kill the "bugs" that cause disease, they are making animals' guts smarter.

Through millions of years of evolution, many types of bacteria, parasites and other pathogens have learned to deceive their animal hosts. They flip a "switch" in the immune system (more precisely, a protein called Interleukin 10), telling it to stand down. Then they invade.

This commonly occurs in animal intestines, wreaking diarrheal and respiratory havoc.

But Cook and Sand can prevent infection by removing the "switch." They do this by feeding the animals antibodies that neutralize Interleukin 10. The antibodies are produced in eggs laid by vaccinated

hens; those eggs are then added to feed.

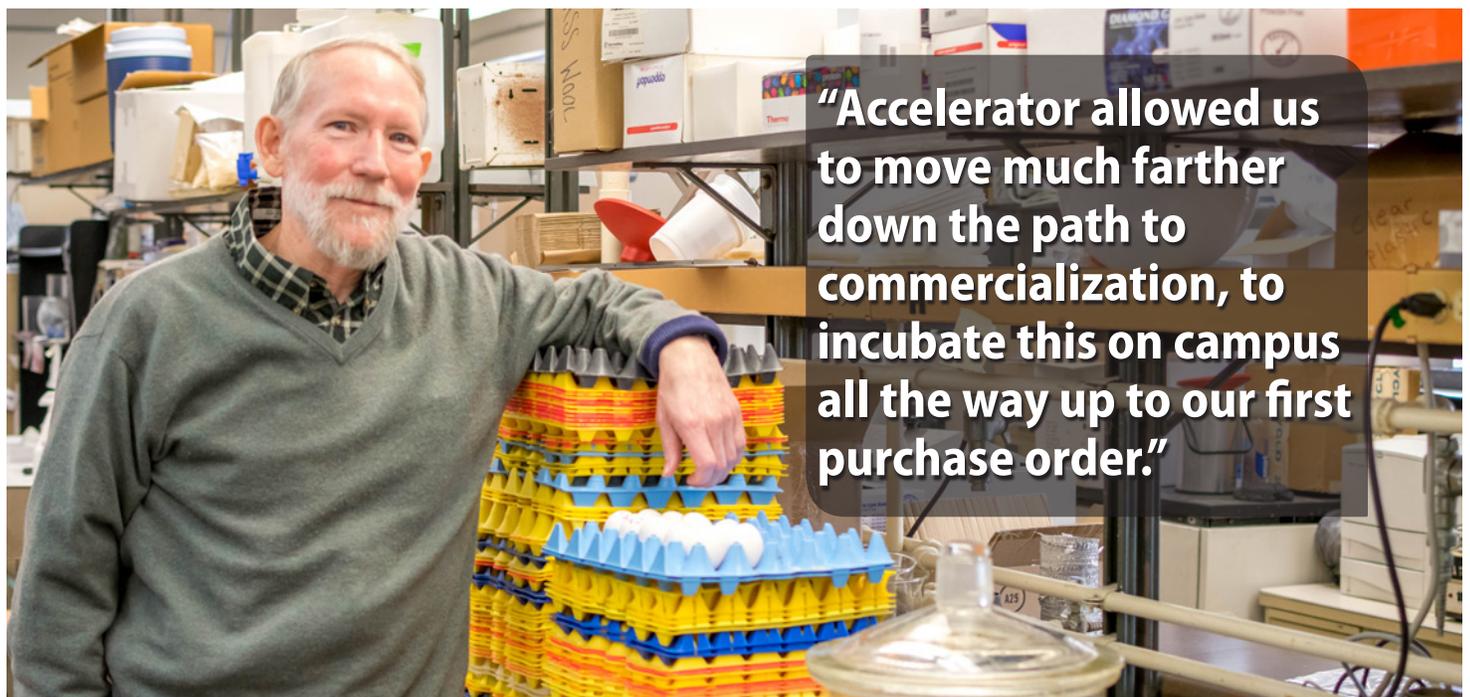
"It is a lot more natural than any drug or antibiotic currently used in agriculture," says Cook. "Think of all the chemicals we are replacing."

The results are making a splash. Media report that in tests with 300,000 chickens, the new method provided full protection against a major farm blight called coccidiosis and necrotic enteritis. Experiments on bovine respiratory disease are just as exciting.

Cook says that Accelerator funding, as well as executive guidance from Catalyst Chris Salm and D2P staff, have been "vital." The support has enabled them to scale up antibody production and answer key technical questions to the point where forming a startup made sense.

Their company, called Ab E Discovery, has licensed the technology from WARF and is marketing it to large-scale meat producers.

"Accelerator allowed us to move much farther down the path to commercialization, to incubate this on campus all the way up to our first purchase order," says Cook.



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# The Leading Edge

## Up to the Challenge

Drawn to an ambitious young tech scene, Greg Robinson ditched the Bay Area for Madison three years ago. Talent isn't tied to Silicon Valley anymore, why should venture capital be?

### Q: Does your mentorship role in the Accelerator Program complement your work at 4490 Ventures?

A: It does. At 4490 we typically invest in companies that are raising their first institutional round of capital, but we typically participate in the complete funding life cycle of companies. So giving feedback to emerging technologies coming out of the university is certainly in line with our mission. We want to stay involved with the most talented inventors and hopefully be a part of companies that can grow into large commercial successes.

### Q: From your perspective, how are we doing here at UW in the entrepreneurial sector?

A: There are two ingredients necessary to have a rich innovation ecosystem. The first piece, obviously, is having the inventors. On that level UW is doing very well. They are one of the top universities in the country in terms of research dollars. That speaks for itself in terms of innovation.

The other piece is the commercialization component. UW, like most institutions, is trying to sort out how to do that more effectively. The difference between a Stanford and a UW is the broader community and ecosystem surrounding the university. That is a critical role that WARF and the Accelerator Program can play, which is trying to bring to bear more of those resources, more of those people, and have a significant impact.

### Q: Did those challenges – and opportunities – draw you to the Midwest?

A: Yes. Silicon Valley is a wonderful place and an amazing ecosystem. But it's huge. It's established. It's very hard to feel like you can make an impact. The Midwest, Madison specifically, is a vibrant place

that is much earlier in its development. As an individual contributor like myself, you can certainly feel like you can make a difference and impact the trajectories of companies and programs in real and material ways.

### Q: 4490 Ventures wants to make an impact statewide, beyond Madison and Milwaukee. Have you been successful?

A: We have to take a long-term view of ecosystem development. That's usually measured in decades versus years. I always caution people: let's be optimistic, let's keep pushing forward, but understand that these projects are going to take time.

### Q: What keeps you optimistic?

A: I start with the broad thesis that it is now much easier for great companies to be started anywhere in the world. If you were going to start a new chip company 20 years ago you had to be in Silicon Valley next to all the other chip companies and equipment makers. Today, with the type of technologies we have, you can really be anywhere you want in the world and build a great company, assuming you can find other people to join you in that effort.

If you have an interesting city or geography where people want to live, you'll see very smart and capable people move there. We saw this happen in Boulder 15 years ago, and more recently in Austin. Boulder and Austin are places people want to live and now you are starting to see more and more people moving from the major metros to these cities hoping to start their new businesses. I'm hopeful that trend allows for more of these desirable cities to develop strong tech ecosystems. We're starting to see some semblance of that in a lot of these smaller, second tier cities.

### Q: Is the current political situation in the state and nation an issue?

A: It is an issue in that young, mobile, talented people who can live anywhere typically want to live in progressive places that also have a reasonable cost of living. These young people have options, and they'll move somewhere where policies are more in keeping with their own



**NAME:**  
Greg Robinson

**TITLE:**  
Managing Director of  
4490 Ventures

**EXPERIENCE:**  
In 2014 Robinson moved to Madison to build 4490 Ventures, a new early-stage venture capital fund focusing on investing in technology startups throughout the Midwest. Prior to 4490 he spent 12 years with Peninsula Ventures in Silicon Valley, and before that was a founder of the software firm Cogent Technologies.

Robinson earned a bachelor's degree in economics from Arizona State University and an MBA from Dartmouth College.

values and where they can be comfortable and find like-minded people.

### Q: What are some of the hottest trends you're seeing in IT right now?

A: Technology development is accelerating. Changes that used to take five or 10 years are taking effect in one or two, which is really exciting and a little daunting. We're seeing that in the pace at which each generation of companies gets built, and how quickly they reach critical mass. That's really exciting when you look at the pace of innovation and change.

I'm personally a huge fan of all of the technology that has gone into and continues to go into autonomous vehicles. The impact of autonomous vehicles is going to be dramatic on many levels. Much of this is going to be very positive; some of it could present challenges we haven't fully prepared ourselves for.

### Q: Within that space is there a role for university-based researchers?

A: There is always a role for universities, especially as it relates to solving some of these really hard problems. I'm very bullish about the role of universities and core R&D as the building blocks of technology going forward. We just need to do a better job of helping those inventors invent and then commercialize.

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can be introduced into the lignin through genetic modification. This concept has been produced and patented as Zip-lignin™ hybrid poplar.

Now, Troy Runge (biological systems engineering) has conducted pulping trials to compare Zip-lignin™ against wild-type poplar. The results demonstrate that the modified trees are more easily delignified as hypothesized, thus confirming the patented technology of the project. This advantage could help pulp mills cut chemical and energy costs and increase yield.

### FOE TO FRIEND:

Food scientist James Steele has taken a bacterium (*L. casei*) that is normally the bane of ethanol facilities and modified it to make it useful in fermentation. The modified strain is strongly resistant to the stresses of converting biomass to ethanol, rendering it ideal for industrial plants. Steele has launched a startup, Lactic Solutions, around this research. The company incorporated last fall.

Along with WARF and the Accelerator Program, Steele also credits the D2P



program on campus for helping him develop a business plan and polish his entrepreneurial skills.

## COMPUTER SCIENCE

### PLAN 'A' PROTOTYPE:

Akbar Sayeed (electrical engineering) and his team continue to make strides designing a hybrid analog-digital transceiver system that could dramatically improve wireless communications. Dubbed CAP MIMO, the

new system boosts data capacity, power and bandwidth efficiency.

Working closely with industrial partners, the team hopes to get their next generation prototype – with higher rate and longer range – up and running by spring. A recent live demonstration has sparked interest and potential collaboration with a leading firm in the information and communications technology (ICT) sector.

### BLUE LEDS:

Because of a phenomenon called “efficiency droop” in light emitting diodes (LEDs), less light is produced at higher currents. It is a problem that contributes to the relatively high cost of LED bulbs.

Jack Ma (electrical and computer engineering) may have the answer, and is making progress developing a new and improved blue LED (a critical component to making white light). The early results are exciting and his team continues to work closely with an industry partner to share data and technical expertise.

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He says that participating in the Discovery to Product (D2P) program on campus has been complementary, helping them de-risk the market for their bold new strategy.

A seasoned entrepreneur, Cook is something of a maverick on campus. Over the years he has spun four companies out of his lab. He's a magnet for entrepreneurial students and postdocs, and relishes tapping their passion.

“We start with the end problem,” he explains. “We immediately look at the regulatory issues, cost analysis, manufacturing and supply needs – all of that is

done before any idea is moved forward. I think that makes us unique.”

It's an applied model well suited to the agricultural sector. It's not for everyone but it comes naturally to Cook, the son of an oil and banking entrepreneur from southern Louisiana.

“I have always been interested in creating jobs,” he says. “It's how I grew up. I saw my family create jobs and that intrigued me.”

His success is also the upshot of a staggering breadth of interests. Cook is already

making strides in a second Accelerator-supported project directed at the aquaculture industry. That project is investigating how a poultry byproduct (dubbed “cosa-jaba oil”) can be used to promote growth and reduce mortality in high value fish species.

“We've identified the main market problem that we can solve and done the core experiments,” he says. “We're pivoting as we go and Accelerator has given us the flexibility to do that.”

“We try to keep a pipeline,” he smiles.

WARF supports a pipeline of promising projects in an effort to accelerate the public benefits of technologies developed in university laboratories.

Visit [warf.org/pipeline](http://warf.org/pipeline) to see a list highlighting the Accelerator Program's projects in medical devices, biopharmaceuticals, computer-related sciences and other fields.



[www.warf.org](http://www.warf.org)

For more information about available WARF technologies, please contact the technology commercialization team at [licensing@warf.org](mailto:licensing@warf.org).

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