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INNOVATION AND ECONOMIC PROSPERITY AWARDS PROGRAM

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CASE
STUDY

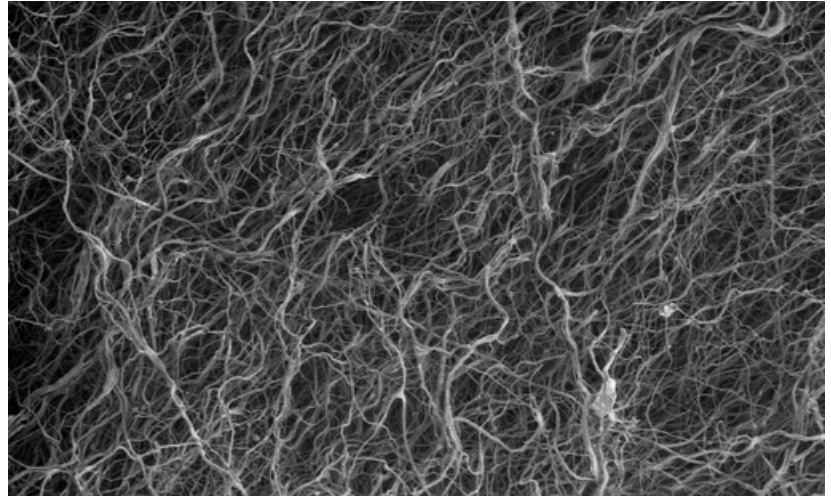
IEP CATEGORY - INNOVATION

**University of Alabama at
Birmingham**
TruSpin Nanomaterial Innovation, Inc.

ABOUT TRUSPIN NANOMATERIAL INNOVATION, INC.

TruSpin Nanomaterial Innovation has developed game-changing nanofiber production technology based on a UAB invention that finally enables the mass adoption of nanofibers to solve a wide range of industrial problems, which is anticipated to have a global impact.

Nanofibers have many possible applications, including tissue engineering, drug delivery, thermal insulation, lithium-ion batteries, and air and water filtration, among others.



TruSpin nanofibers as seen under a microscope

TruSpin is a University of Alabama at Birmingham (UAB) start-up company that spun off technology owned and patented by the UAB Bill L. Harbert Institute for Innovation and Entrepreneurship (HIIE).

Setting the Bar for Production

TruSpin's alternating current electrospinning system enables the high-output production of long, aligned nanofibers. The limitations of pre-existing electrospinning systems in the overall output and quality of nanofibers have inhibited the use of nanofibers in the many industries in which they could potentially deliver value.

TruSpin's AC electrospinning platform has a base output of 20,000 times that of a single direct current (DC) spinneret. Because of this astonishing production speed, the potential impact on various industries is limitless. "Scientists have been studying nanofibers for decades," said TruSpin co-founder Robert Agnew. "They've identified all kinds of ways to use them to improve just about every industry."

Andrei Stanishevsky, Ph.D., of UAB's Department of Physics, also developed a method by which ceramic nanofibers generated from AC electrospinning can be shaped into tubular structures, which can be potentially used in the water filtration systems. TruSpin recently licensed this technology from the HIIE.



Worldwide, more than two billion people lack access to clean drinking water, but a ceramic nanofiber water filter could be key to solving that problem. Once the filter is clogged, residue and dirt can be burned off and the filter can be reused. TruSpin co-founder Anthony Brayer, Ph.D., has shown through studies that such a filter could be reused hundreds of times before requiring replacement – a significant improvement over existing filters on the market.

Above all, TruSpin’s founders plan to shepherd the technology to partners who will use it to transform and improve human lives.

“The company has sold nanofibers to the research market, but the fulfillment of the potential impact of the technology on humanity, the long-term stewardship of the technology through the stages of proliferation, is prioritized over short-term metrics such as sales,” Agnew said.

Getting Started at UAB

TruSpin’s success, which is a true model of the university technology transfer process, has been deeply tied to UAB from the beginning.

Brayer, who has received three degrees in physics from UAB – a bachelor’s, master’s and Ph.D. – observed other early-stage approaches to novel electrospinning methods while studying abroad at a technical university in central Europe and had the idea for a machine design that would be a true breakthrough.

He used that inspiration to co-invent the designs essential to TruSpin’s AC electrospinning method with his mentor, Stanishevsky.

Armed with his technology and looking for potential collaborators, Brayer signed up for UAB’s student start-up accelerator, The Anvil. There, he met Agnew, and the two worked together to lay the ground for TruSpin. Since TruSpin’s founding, UAB has played a pivotal role in the company’s progression. The HIIE applied for multiple patents to move the start-up forward, and later helped facilitate connections to Birmingham’s business leaders. Brayer was also able to tap into technical knowledge in the Department of Physics when needed. Through UAB, TruSpin’s founders have also gained access to online databases for research publications and market reports.

TruSpin is currently located in UAB’s tech accelerator and incubator partner Innovation Depot, a Birmingham nonprofit.



Moving Forward

TruSpin has raised funding from several accelerators and organizations, including Alabama Launchpad, Techstars, National Science Foundation and Innovate Alabama.

Next, TruSpin plans to submit a proposal to the NSF for up to \$1 million in SBIR Phase II funding while also pursuing industrial partners interested in megatrend applications for nanofibers.

Agnew said that nanofibers like the ones TruSpin produces will soon change the world, and his team intends to be at the forefront.

“By the end of this decade – and a lot sooner if we have anything to do with it, nanofibers are going to impact every human on earth,” Agnew said. “The nanofiber market is growing at a compounding rate of almost 40 percent year over year, and we hold the keys to the manufacturing system that unlocks their industrial-scale production.”

LINKS TO FURTHER INFORMATION

Supporting Information:

- [Pneumococcal Disease](#)
- [SunFire Biotechnologies](#)

Articles:

- [Saving lives by making pneumonia vaccine affordable](#)

