

Our carbon-based magnetic beads simplify at-home RNA-based medical testing



magnetics.life Detroit MI

Technology Infrastructure Manufacturing B2B Healthcare

LEAD INVESTOR



Rick Goedert Managing Partner/
Great Lakes Bay Venture Capital Fund

Life Magnetics has developed and patented a manufacturing process to provide the stable storage and transportation of RNA. This is a significant problem with RNA based drugs. With 80% of the future drugs being RNA based, this problem can be greatly reduced. Central Michigan University Medical School will be partnering with Life Magnetics with lab space and staffing to provide testing and research. Life Magnetics is ready to increase their sales with additional working capital and equipment. They are on the leading edge of a huge market.

Invested \$25,000 this round & \$303,500 previously

[Learn about Lead Investors](#)

OVERVIEW UPDATES WHAT PEOPLE SAY ASK A QUESTION

Highlights

- 1 Funded by the National Science Foundation in 2017, we were doing RNA work before it was cool.
- 2 After COVID, we believe RNA testing and mRNA drugs will explode; we address storage and transport.
- 3 We rely on a quantum mechanical effect known since 2003 but are the first to manufacture at scale

Our Team



Kevin Hagedorn President

Performed physics simulations establishing a theoretical basis for the product, developed a manufacturing process, was awarded two grants from the National Science Foundation, and deployed a product solving RNA transport and manufacturing issues.

Institutes of Health, we saw the RNA revolution coming in 2015. There was a specific physical effect wherein RNA could interact with carbon through a quantum mechanical effect. We simulated, designed, and developed a product to take advantage of that effect.



Rishabh Kala

Pitch





The Challenge at Hand

Isolation and transport of RNA for medical testing, research, and drug delivery is historically very difficult. Compared to DNA's half life of 531 years, RNA has a half life of just 28 minutes.

COVID-19 has shown that this esoteric laboratory challenge is a huge business opportunity. Early on, we saw constant shortages of viral transport media needed to ship samples for diagnostic testing. More recently, the RNA-based vaccines are often in the news because of the challenges associated with keeping them refrigerated.



About The RNA Market



The Problem

For the last decade RNA research has been one of the most important fields in life sciences. Soon, these discoveries will have a profound impact on human health with 80% of drugs predicted to be RNA-based drugs by 2040 and next-generation sequencing

Simpler RNA isolation, storage, and transport is a critical challenge which will broadly impact how quickly these breakthroughs are brought to market.



Our Solution

The world's first carbon-based RNA extraction methods

- Allows RNA to be extracted, processed, shipped, and stored much more easily for diagnostic testing applications
- Isolates single-stranded nucleic acids with perfect yield and purity from even the most complicated biological matrices, which greatly simplifies RNA drug manufacturing (e.g. the COVID-19 vaccines)

Currently providing kits for isolating RNA from biological materials including blood, saliva, tissues, and plant matter.



Our Solution's Advantages

- INTEGRATED SHIPPING**
RNA complexes with carbon for stable shipping at room temperature, eliminating the need for cold freezers.
- SIMPLIFIED STORAGE**
Carbon surfaces eliminate the need for viral transport media.
- ULTRA PURE**
Carbon surfaces have no carryover of DNA, protein, or organic solvents.
- SIMPLE AUTOMATION**
Compatible with liquid and bead handling automated systems.
- QUICK AND ROBUST**
Isolate RNA in under 10 minutes.

These advantages significantly improve RNA use for at-home testing, synthetic mRNA manufacturing, and laboratory diagnostics and testing.

Life Magnetics

The Team Making it Happen



Michigan

- Solved optical engineering and laser cutting/welding problems for numerous companies in the Detroit area
- 6 publications and 6 issued patents
- Two small business innovation awards from the National Science Foundation

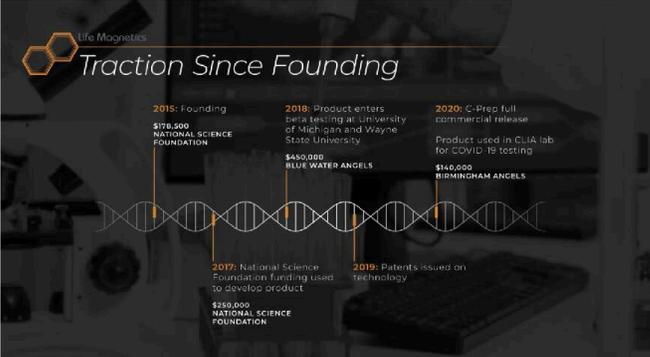


Birmingham

- Post doc at Richard Miller's lab at the University of Michigan studying aging, which many scientists now believe is caused by changes in RNA expression
- Experience in molecular testing labs

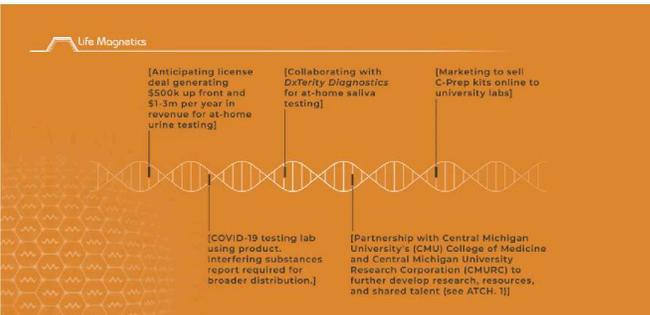
Life Magnetics

Traction Since Founding



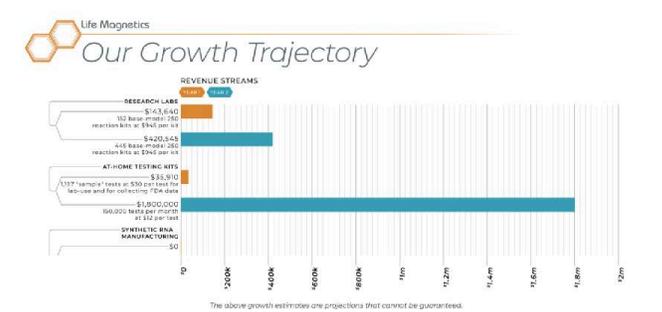
- 2015: Founding**
\$178,500 NATIONAL SCIENCE FOUNDATION
- 2017: National Science Foundation funding used to develop product**
\$250,000 NATIONAL SCIENCE FOUNDATION
- 2018: Product enters beta testing at University of Michigan and Wayne State University**
\$450,000 BLUE WATER ANGELS
- 2019: Patents issued on technology**
- 2020: C-Prep full commercial release**
Product used in CLIA lab for COVID-19 testing
\$146,000 BIRMINGHAM ANGELS

Life Magnetics



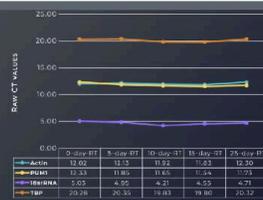
- [Anticipating license deal generating \$500k up front and \$1.3m per year in revenue for at-home urine testing]
- [Collaborating with Diverity Diagnostics for at-home saliva testing]
- [Marketing to sell C-Prep kits online to university labs]
- [COVID-19 testing lab using product, interfering substances report required for broader distribution.]
- [Partnership with Central Michigan University's (CMU) College of Medicine and Central Michigan University Research Corporation (CMURC) to further develop research, resources, and shared talent (see ATCH. 1)]

The anticipated milestones listed above are projections that cannot be guaranteed.



as a diagnostic RNA testing solution.

- Record setting RNA stabilization times
- 7+ days of stability at room temperature with urine samples in a one-step collection
- Stabilization can be extended to 30+ days if a magnet is included and the user can do one pour step



How Our Product Works

"It worked really well! I obtained about 10-20x as much RNA as I typically do, which was great to see. The 260/280 was 1.98 and the 260/230 was above 2 as well. It also was a very quick protocol, which was amazing too. When I was working with ~20 samples using our old method, it would've taken about an entire day just to get RNA what was DNase treated!"

— CHRISTOPHER MATACZYNSKI
Wayne State University, Detroit, MI

"We had positive news for your kit in the isolation of RNA from cell lines [good quality RNA with an overall RNA yield similar to Qiagen]. Your carbon based beads also bound RNA more efficiently in the low molecular weight range compared to Qiagen [RNeasy kit]."

— RNA DIAGNOSTICS, INC.
Toronto, Ontario, Canada



Anticipated Investments (Use of Funds)

\$200,022

- Advertising and sales support to generate revenue at university labs, which was the majority of our revenue pre-COVID (e.g. Google ad words, how-to video, sales staff) - 31.5%
- Application of the product to manufacturing RNA drugs such as the COVID-19 vaccine to address specific manufacturing issues. (Separating double stranded RNA from single stranded RNA) - 31%
- Additional sales and technical support for labs using or seeking to use our product in COVID-19 testing which is currently the majority of revenue - 30%
- Wefunder Fee - 7.5%

\$600,015

- Seminars at universities around the US to develop collaborations for RNA based at-home testing - 30%
- Add genomic testing equipment to support application development - 62.5%
- Wefunder fee - 7.5%

\$1,000,008

- Build out facility for at-home testing in collaboration with CMU to deploy a test which will demonstrate our unique capabilities. Opportunities are being evaluated but likely options are a urine-based at-home prostate cancer test or a saliva-based at-home COVID-19 test - 52.5%
- Wefunder fee - 7.5%



Recent Exits

- 200+ transactions in space since 2016 (Pitchbook)
- Ritechee acquired Adornet Cell Diagnostics, maker of nucleic acid sample prep products. Last round 2018.
- LCG acquired Lucigen. Products for nucleic acid extraction and purification. Terms undisclosed. 2018.
- Exact Sciences acquisition of Biomatrix. \$40mm 2018. Nucleic acid extraction and stabilization
- CNA Biosolutions raised \$35mm 2019. Products to capture and amplify nucleic acids.
- Tecan acquisition of NuGen. \$54mm 2018. Nucleic acid sample prep products.
- Dropworks raised \$12mm in 2018. Investors incl Arboretum Ventures. Tools for nucleic acid quantification.
- Swift Biosciences has raised \$35mm. Products to improve NGS sample prep. Last round 2016.

Exits supported by Life Magnetics board members and/or advisory members:

- Maravai / GTCR building portfolio of life science lab consumables. Acquired TRLink (estimate \$35mm 2016) and Solulink.

These notes are not predictive and cannot be guaranteed for Life Magnetics.



Attachment 1: CMU Partnership

We are excited by Life Magnetics' technology whereby it has developed the world's first carbon-based RNA extraction methods which allows RNA to be extracted, processed, shipped, and stored much more easily than with existing silica-based methods. Therefore, the College of Medicine and CMURC are prepared to explore further opportunities for collaboration with Life Magnetics. We commit to working with your company to discover opportunities that will enhance and strengthen all parties. Potential opportunities include, but are not limited to, the following:

- Shared talent, resources, and space
- Future applied learning for students
- Collaboration on scholarly publications and presentations
- Research partnerships

In short, we are committed to fostering the development of the relationship between the CMU College of Medicine, CMURC, and Life Magnetics for the benefits of both CMU and the company.

Signed,



David C. Weindorf, PhD, PG
Vice President for Research and Innovation
Central Michigan University



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