PITCH VIDEO INVESTOR PANEL

LIFE MAGNETICS

Next-Gen RNA Solutions: Leveraging Graphene for a Healthier World

magnetics.life Ann Arbor, MI B2B Biotech

Highlights

1. RNA is the future of medicine. The mRNA COVID-19 vaccines are just the beginning

2. Partnership leading to profitability in 2024 performing livestock surveillance testing

3. Licensing offers from pharmaceutical companies to use the product for mRNA therapeutic delivery

4. $1.6 Million raised to date - $300K soft circled for this second round (reg D)

5. $400k from the National Science Foundation Small Business and Innovation Research program

6. Collaboration with tier 1 industry partners like Novo Nordisk and Central Star (see video)

Featured Investor

Moses Gonzales

Invested $5,204

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"In 2020, I invested in Life Magnetics, driven by my conviction that RNA and mRNA are pivotal to the future of medicine and testing. I'm now pleased to not only represent the investors in this community round but also add to my initial investment.Kevin Hagedorn and his team are at the forefront of technology with the profound potential to transform lives. Their innovations enhance our ability to detect diseases and contaminants in both our food supply chain and the broader environment. Such precise and cost-efficient testing is paramount in safeguarding our food sources and mitigating risks for producers.Life Magnetics' achievements thus far position them favorably for both profitability and significant growth. Beyond their current accomplishments in testing, what truly excites me is the potential evolution of RNA technology. This could usher in a new era of pharmaceuticals—drugs that remain stable at room temperature and offer controlled, gradual medication release. The implications for distributing future treatments and vaccines are vast, potentially reducing side effects and enhancing patient outcomes. While success in this domain isn't assured, the transformative potential of such technology cannot be overstated.Ultimately, I believe Kevin and his team will make a difference."

Our Team

Our Team

Kevin Hagedorn CEO & Founder

12 patents, 2x National Science Foundation Awards, 1x Small Business Innovation Research Award

I have been convinced for a long time that RNA is the future of medicine and biotechnology. During my semiconductor-focused PhD, I became captivated by the potential of graphene's interaction with nucleic acids and decided to develop a method to harness this interaction. Motivated by this potential, I founded Life Magnetics, which later led to an NSF-funded breakthrough and the creation of a market-ready graphene nanoparticle enabling RNA stabilization.

Andy Raeder Business Development

Successfully structured merger and acquisition deals exceeding $4 Billion, with a primary focus on the life science tools sector

Kayla Wells Research Scientist

Microbiologist with extensive experience in developing diagnostic tests

Max von Wels Business Developer

Marketing and sales specialist with a strong understanding of the agri-tech space

Graphene Nanoparticles to Extract, Protect and Deliver RNA

The inherent fragility of RNA has long presented an obstacle for the

advancement of healthcare and biotechnology.

This vulnerability was evident during the COVID-19 pandemic, where stringent cold storage requirements complicated the distribution process, resulting in logistical challenges. It's also why you had to go to a testing center for a PCR test.

Half-life DNA = 531 years

Half-life RNA = 28 minutes

These challenges extend beyond mere inconveniences; they actively impede our capacity to respond swiftly to public health crises.

Life Magnetics has developed a novel graphene composition formed at high temperatures through laser plasma, which can isolate and stabilize RNA better than anything currently on the market.

Our C-prep RNA Kit is currently available to researchers.

We are now expanding into human therapeutics and livestock diagnostics. RNA drugs have a massive market potential ($320B Market), but it will take years to generate significant revenue in this field due to the lengthy drug development and FDA approval process.

In the meantime, the company plans to become profitable in 2024 through sales in livestock diagnostic testing. We have enthusiastic partners eager to use the technology for the surveillance of diseases in dairy cattle, which has been a growing problem in recent years due to the loss of genetic diversity. We see enormous opportunities within livestock testing in cattle and beyond.

Therapeutic Delivery

RNA drugs are transforming medicine, offering a level of precision and flexibility unmatched by traditional small-molecule drugs. Their design

allows for highly specific targeting, reducing the likelihood of side effects commonly seen with small molecules that can affect multiple pathways. Moreover, RNA-based therapies have the advantage of a vast array of targets – over 870,000 regulatory RNA elements, far surpassing the limited 1,000 protein targets of small molecule drugs.

For these reasons, RNA drugs are predicted to eclipse small-molecule drugs within 20 years.

However, delivering RNA drugs into cells efficiently and without triggering immune responses are challenges yet to be addressed.

Problem

What are the problems of RNA therapeutics that we are solving?

1) Complex Storage and Transport

RNA-based treatments, such as mRNA vaccines, degrade quickly at room temperature, requiring extremely cold storage conditions (as low as -70°C). This creates significant challenges in transportation and storage logistics. An example of this was seen with the distribution of mRNA COVID-19 vaccines.

2) Rapid Release and Side Effects

The quick release of RNA therapies can lead to a surge in dosage, potentially causing increased side effects. For instance, the temporary discomfort experienced by many after receiving the COVID-19 vaccine was due to a rapid, intense immune response. This is due to a sudden strong immune response and could be solved through a slow-release

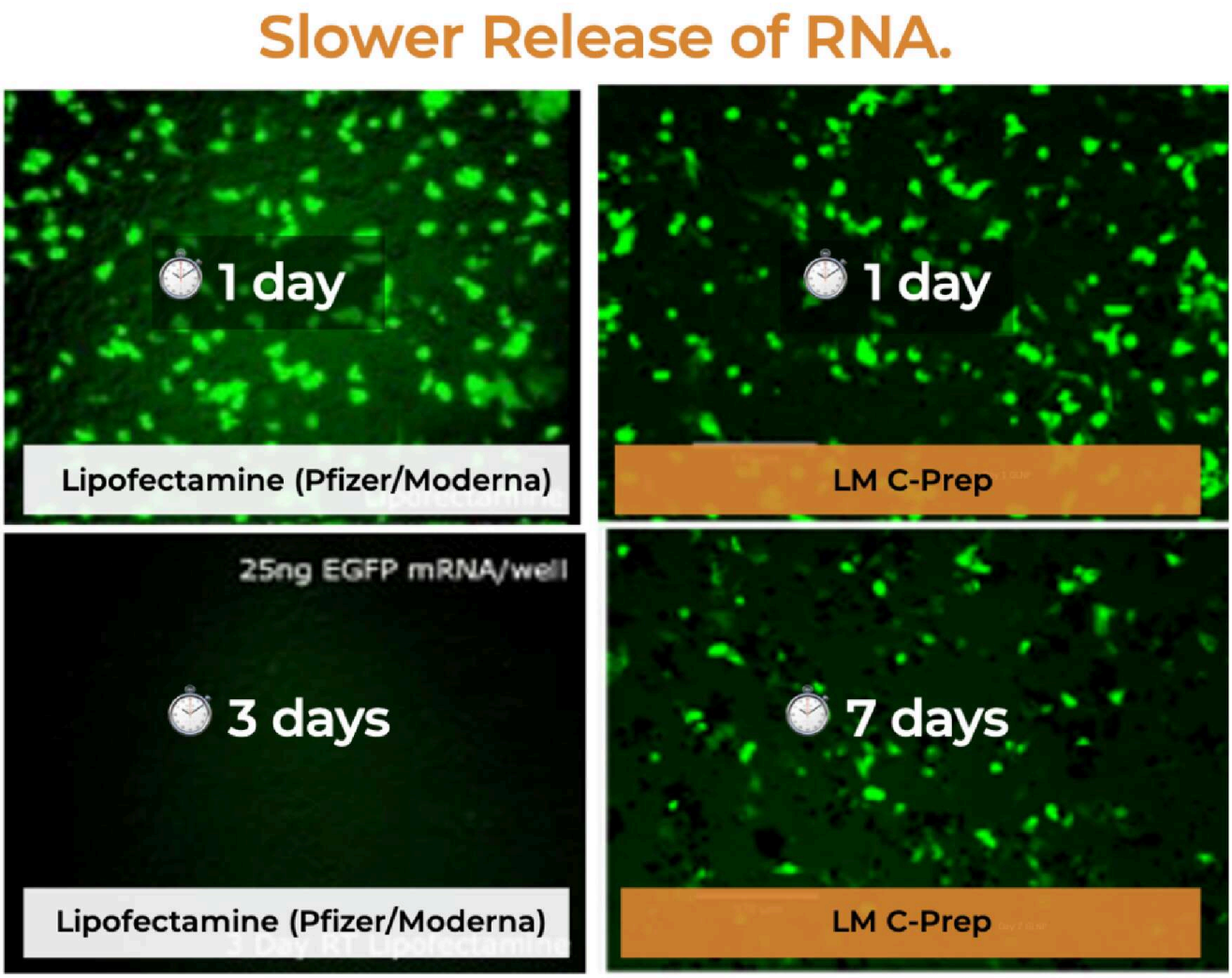
delivery mechanism. Also: You have to take a drug more frequently if it does not last that long.

3) Inefficiency in Entering Target Cells

Current delivery vehicles struggle with low transfection efficiency, meaning that they do not get a lot of the mRNA into the target cell.

Life Magnetics Solution

Life Magnetics, in collaboration with Esperovax and Novo Nordisk (the manufacturer of blockbuster drug Ozempic), is developing a delivery mechanism that can release a therapeutic over several days – with promising initial results.

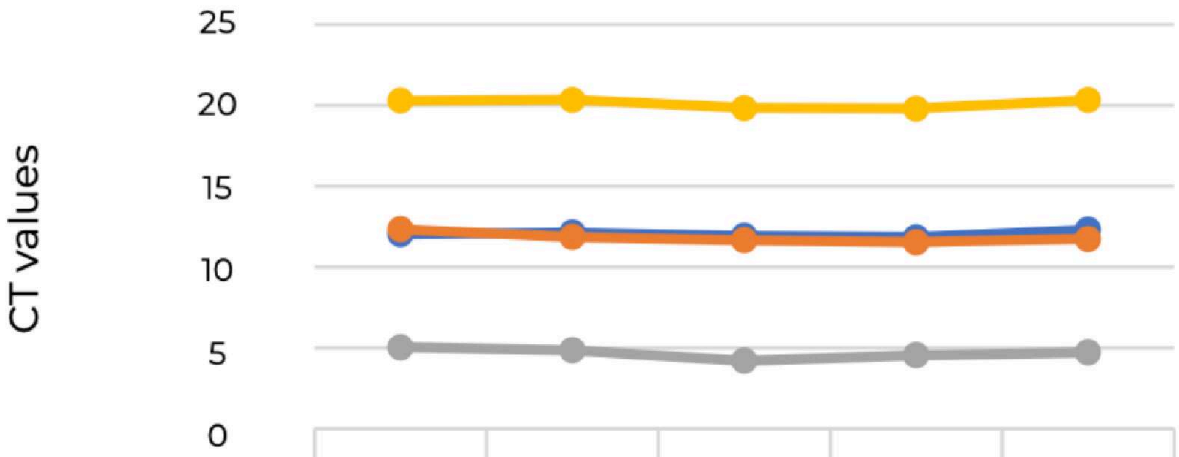


The experiment demonstrates that Lipofectamine and LM's C-prep

both successfully enable cells to produce green fluorescent protein, as directed by the mRNA they carry. However, Lipofectamine releases mRNA rapidly, leading to a quick but short-lived expression of the protein. On the other hand, LM's C-prep provides a steady release of mRNA that persists for over a week.

The benefits of LM's C-prep are threefold: firstly, it may help avoid the adverse effects of the sudden surge in protein expression typical of high initial dosages. Secondly, its prolonged action could reduce the need for frequent dosing. Finally, it is also superior in terms of the efficiency at which it introduces mRNA into the cell, meaning that less of the drug can achieve more of the desired effect.

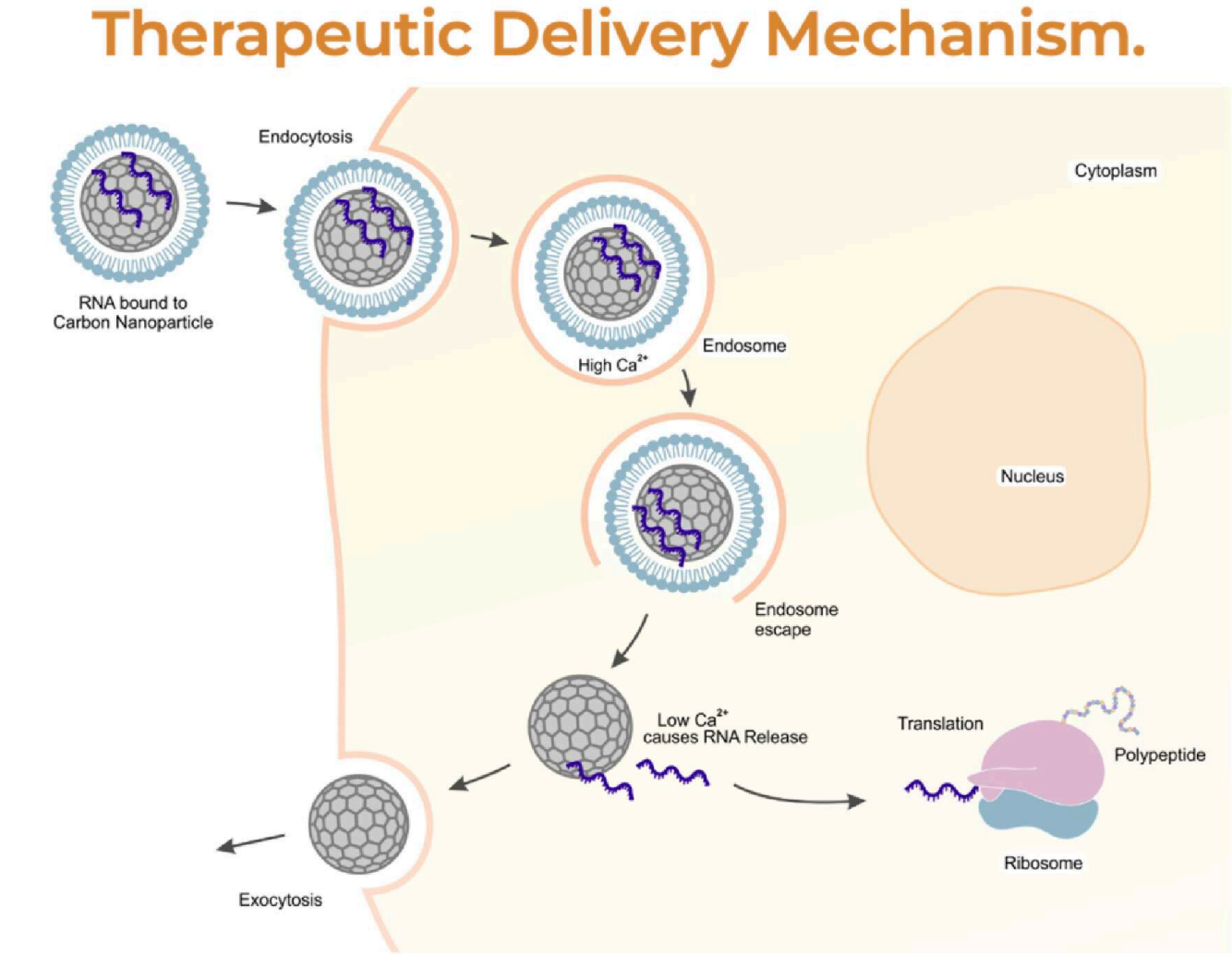
Stability of RNA at Room Temperature
Bound to LM's C-prep



	Day 0	Day 5	Day 10	Day 15	Day 25
Actin	12.02	12.13	11.92	11.83	12.30
PUM1	12.33	11.85	11.65	11.54	11.73
18srRNA	5.03	4.85	4.21	4.55	4.71
TBP	20.28	20.35	19.83	19.80	20.32

Furthermore, RNA-based therapeutics are stable for at least 25 days at room temperature when attached to our beads, simplifying logistics and

minimizing spoilage. This would bring down the cost associated with RNA-based drugs, possibly reducing the price for patients. It would also make mRNA therapeutics like a vaccine easy to ship to developing countries with less advanced cooling supply chains for therapeutics, saving lives in a future pandemic.



Our carbon nanoparticle enters the cell and through the changing level in Calcium concentration, the mRNA molecules are released. These are then translated by the ribosome, which produces the corresponding protein.

Esperovax, in partnership with Ford Health and Novo Nordisk, is conducting animal studies to confirm that the LM technology works as the initial tests indicate. Specifically, they will use C-prep to transport mRNA that codes for GLP-1. Novo Nordisk's GLP-1 drugs, Ozempic and Wegovy, are used to treat diabetes and (off-label) obesity and are predicted to bring in $15 Billion in revenue this year. An improved

version of this drug, based on our technology, presents an attractive long-term exit potential for investors coming in during this round.

Livestock Testing

Livestock is the ideal beachhead market for us, as there is a strong need for cheap and accurate testing especially because of the large number of samples that are common in the industry. For example, our initial customer and development partner, Central Star, processes over 5 million samples annually. Furthermore, there is no FDA approval needed, which allows us to get to revenue quickly.

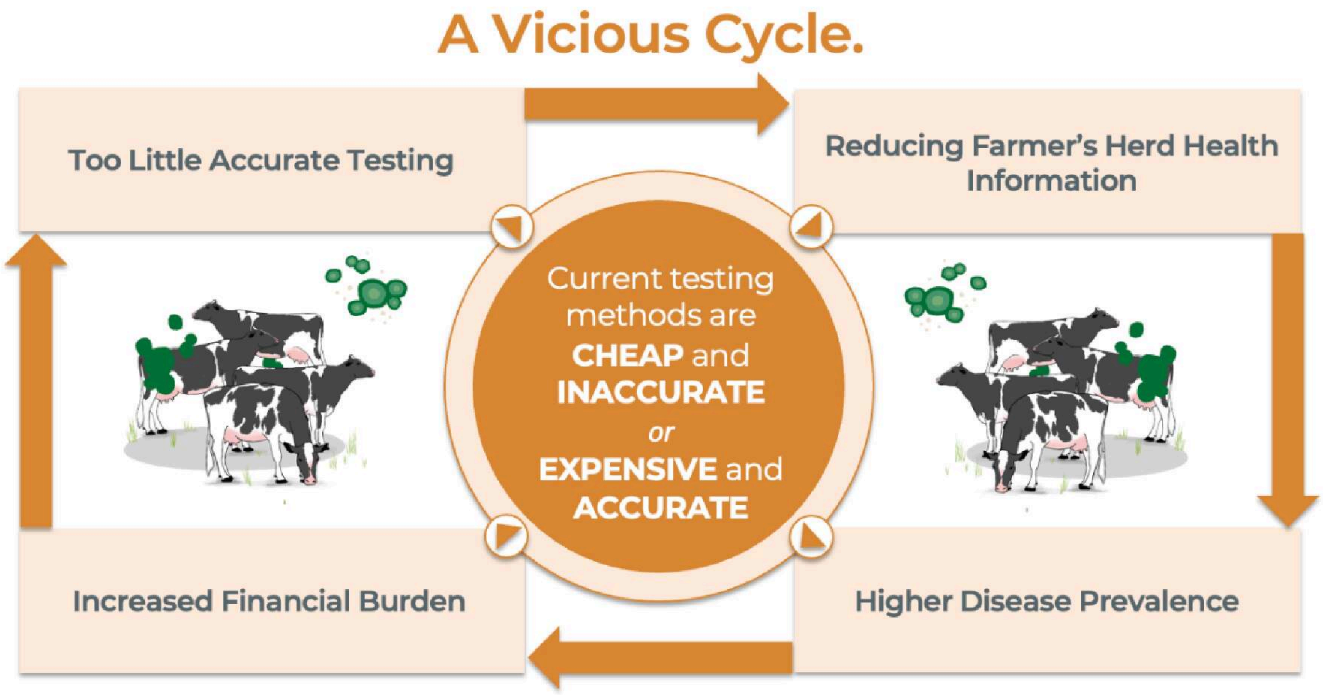
Over the last few years, we have used the knowledge from our therapeutics project to develop extraction methods for diagnostic testing. Before a test can be utilized in downstream applications like PCR, the DNA and RNA have to be extracted from a sample (e.g. milk or blood). LM's C-prep is not just good at stabilization but also at pulling nucleic acids from samples.

We use LM's C-prep to streamline the testing procedure, eliminating the need for hazardous chemicals and significantly reducing labor time as well as cost.

Problem

Livestock animals have changed **drastically** over the last 50 years. Selective breeding has been pushed to it's limit. This has improved productivity but also reduced genetic diversity, which is now causing disease outbreaks to be more common and severe.

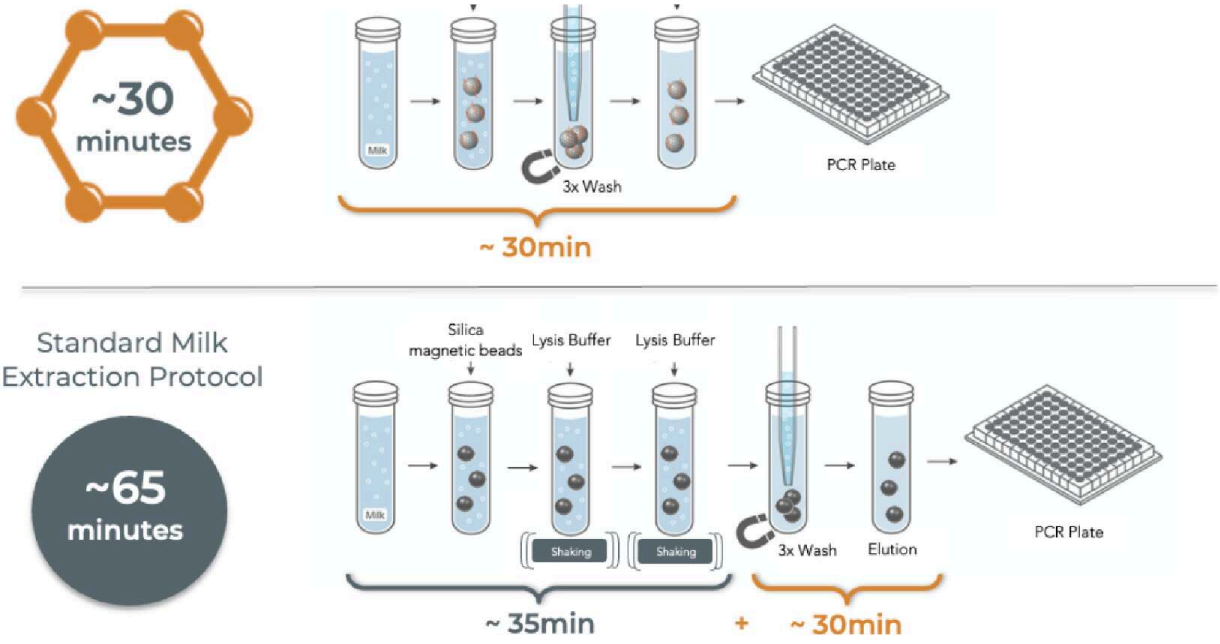
The most costly disease in dairy farming is Mastitis, estimated to cause up to $35 Billion in industry losses annually. It mainly causes decreased milk production in cows, but some bacterial strains causing the disease are antibiotic-resistant, spread incredibly fast and can even kill a cow.



Farmers rely on good herd health information to effectively tackle the disease, but those are difficult to come by. Current testing methods are either cheap and inaccurate or expensive and accurate. This puts farmers, who are already working with extremely tight profit margins, into a difficult situation and possibly a vicious cycle of worsening herd health and falling income.

Life Magnetics Solution

The unique interactions of our graphene technology with nucleic acids allow us to improve the current milk testing protocol for mastitis significantly. We eliminate the need for dangerous and costly chemicals needed to treat the milk before an extraction, we require no heating or shaking of the sample and we can put the beads directly into the PCR, skipping a few steps at the end of the process. In Mastitis testing, for example, we can reduce testing costs by up to 50%.



We solve the problem of livestock testing by making accurate testing affordable, allowing farmers to manage diseases in their herd better - improving their bottom line and the well-being of their animals.

Go-to-Market

We have been developing and testing extraction methods for a few livestock diseases with our partner and first customer, Central Star. They are one of the largest dairy laboratories in North America, serving nearly 2000 producers with over 600,000 animals. They are currently validating our Mastitis kit in their lab. We are expecting a sale as early as Q1 '24 and we will be able to use their endorsement and validation data to approach other similar organizations.

Downloads

Technical Deck and Performance Data.pdf