EDIT

Invest in LEAH Labs

Curing Cancer in Dogs

technology science community crowdfunding healthcare

LEAHLABS.COM ROCHESTER

Dogs are part of our families, and we don't feel that the current care dogs are afforded is up to par; they deserve the same care humans get. Additionally, we are passionate about using gene editing to solve problems in the world. Gene editing can help us cure our dogs.

Wesley Wierson Chief Executive Officer @ LEAH Labs

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Why you may want to invest in us...

1. You can make animal health history by helping us cure cancer in dogs.
2. Pets are part of the family and they deserve to benefit from the same medical innovations currently available to their humans.
3. We're a team of world class experts in gene editing, cell therapy, and veterinary oncology that have the expertise to get this job done.
4. By developing cancer therapies for dogs, we can directly impact how we research and treat human disease.
5. CAR-T Cell therapy is one of the hottest areas of cancer research today. The space has seen more than $21B in exits within the past 2 years.
6. **$275,000** raised from prior investors
7. **$0** lifetime revenue
8. **0** users and customers
9. For Admins: Incorporated: false | Financials: Yes

Our Team

AND OUR MAJOR ACCOMPLISHMENTS

Wesley Wierson
Chief Executive Officer
Genome hacker, budding entrepreneur, science communicator, and Layla the mutt's dad

Zachary C WareJoncas
Chief Operations Officer
Biotech focused entrepreneur and genetic engineer!

Stephen Carl Ekker
Scientific Founder - Translational Medicine
Entrepreneur, genome writer, dog dad and workout buddy of Peanut and Baby

Jonathan Mochel
Scientific Founder - Veterinary Pharmacology
Vet scientist improving the health and well-being of companion animals using novel therapeutics

Saad Kenderian
Scientific Founder - Immunobiology
Physician, scientist, entrepreneur, CAR T expert and inventor

Why people love us

LEAH Labs is doing real breakthrough science. CAR-T therapy is the biggest breakthrough in cancer care in many years, and LEAH labs is the only company taking this technology that has cured many people and bringing it to the veterinary world. There are very few people in the world who have the right scientific experience needed to do this, and the LEAH labs team has some of the top scientists in the field working with them.

Jared Friedman
Y Combinator Partner

Stephen has been a smart, deliberate and determined individual since he was a child. Over the more recent years, I have watched him repeatedly focus on solutions to improve the quality of life. If he doesn't know something he will make the time to get the knowledge he needs to be successful. He is also very discerning when it comes to selecting, and investing in people.
Charlotte Ekker Wiggins Sibling $10,000

Peter Ball Advisor $5,000

"It is an exciting time where we can bring novel, advance human health technology and apply it to the $70B+ Petcare space. We are excited to support Leah Labs and their efforts to cure cancer in dogs."
Joel Harris
Co-director of Ag Startup Engine

See more on Buzz

In the news

2 Ames startups receive $150k in seed money to advance their work

Two start-up companies that are part of the Ag Startup Engine at the Iowa State University Research Park were named to Y Combinator's winter cohort accelerator program with the companies each receiving

July 1, 2019 @ amestrib.com

Leah Laboratories receives seed investment from Ag Startup Engine

Illustration by Nathan Wright. The following article originally appeared on January 16, 2019 via Clay & Milk. By Jake Slobe Ag Startup Engine has made an initial seed investment in LEAH Laboratories. LEAH Labs is

July 1, 2019 @ isupark.org

All 88 companies from Y Combinator's W19 Demo Day 2

Today was the second half of Y Combinator's two-day Demo Day for its Winter 2019 class. Over 85 startups pitched on stage yesterday, and another huge batch launched today. Previously held at the Computer

July 1, 2019 @ techcrunch.com

ELEVATOR PITCH

The Problem
B cell lymphoma kills at least 300,000 of our canine family members every year, and the standard of care is a decades old, non-curative chemotherapeutic that only provides 10 months of life to our furry family members. Even still, pet owners spent $7,000 (in the midwest) to $12,000 (on the coasts) on this standard of care. This is unacceptable.

The Solution
LEAH Labs is developing chimeric antigen receptor (CAR) T cell therapy to fight canine cancer. CAR T cell therapy is the hottest area of cancer research today, and it has been shown to cure certain types of human blood cancers. Our furry friends get one of the same types of cancer that can be cured in humans with CAR T cell therapy, called B cell lymphoma.

The Innovation
Using precision gene editing, we are able to engineer CAR T cells for a fraction of the cost of current CAR T cell manufacturing protocols. We use CRISPR, the gene editing reagent that has taken the world by storm. Our patent-pending technology allows us to insert DNA encoding CAR proteins into cellular genomes, reprogramming those cells to become cancer fighting machines.

What's the story? How did you get started?

Prologue
It all started during an early morning one day in the fall of 2017. A meeting of expert scientists, veterinarians, and clinicians from Mayo Clinic and Iowa State University

brainstorming how to apply new technologies and forge new partnerships for biotechnology innovation. After a long back-and-forth conversation and several carafes of coffee the idea began to take shape: this group, with its shared expertise and resources could radically change the landscape of cell therapy. Their work could shepherd this exploding field of medicine from the exclusive and highly expensive arena of personalized medicine into a commonplace, consumer level treatment accessible to all. This would require the development of a new platform capable of integrating modern gene delivery and editing techniques for the production of scalable living therapeutics. Leveraging the extensive veterinary experience of our Iowa State colleagues an idea for a canine oncology company was born; LifEngine Animal Health Labs emerged from that meeting with the knowledge that we can cure cancer in dogs.

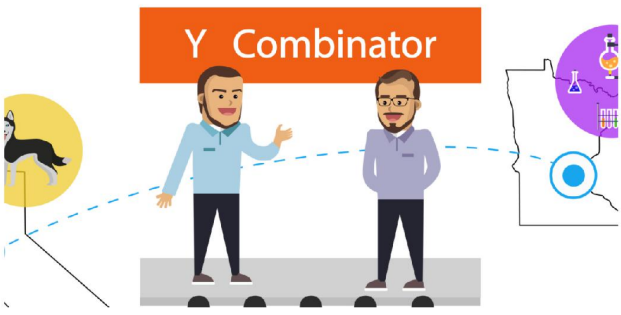
Chapter 1: The Formation

The idea for LEAH Labs percolated for nearly a year while essential business development was done and a certain CEO and co-founder completed his Ph.D. During this time, the core founding team came together with the necessary experience in gene editing, clinical hemato-oncology, and veterinary pharmacology to get the job done. Dr. Stephen Ekker, a career genetic engineer and entrepreneur, currently dean of the Mayo Clinic Graduate School of Biomedical Sciences, joined on as both a board member and scientific co-founder bringing years of experience in biotechnology and engineering. Dr. Saad Kenderian, an author on the CAR-T cell patent currently used by Novartis and a Mayo Clinic hematologist who deploys CAR-T cell therapy in his clinical work joined the scientific advisory team. Finally, to bring in the veterinary perspective LEAH Labs reached out to Iowa State veterinary pharmacologist, Dr. Jon Mochel. Jon has years of experience in veterinary pharmacology and has spent time with Roche and Novartis.

With an advisory team ready to go LEAH found a young entrepreneurial leader in CEO Dr. Wesley Wierson. Wes was still finishing his Ph.D. at Iowa State University, developing the critical genome editing technology needed to create LEAH Labs' product, when he was first introduced to the LEAH project. He took ownership early on and led LEAH Labs through the National Science Foundation's Innovation Corps Program (I-Corps). While learning lean business startup, product market fit, and general entrepreneurial skills during the I-Corps program, Wes began the in-depth research and concept-testing required for a start-up. This included customer discovery interviews, interviews with key opinion leaders in the vet space, and practice pitching the concept and company. LEAH Labs then entered its first pitch competition, the "Walleye Tank", a Minnesota contest inspired by Shark Tank and based on Y Combinator's Demo Day, a precursor of things to come.

Chapter 2: The Acceleration

The LEAH team had a well developed business hypothesis ready for funding. We applied to the prestigious Silicon Valley accelerator, Y Combinator, on the recommendation of a friend who had previously gone through the program. Long story short, LEAH Labs was accepted into Y Combinator as a part of the Winter 2019 batch and went through three months of intensive founder training and scientific development of core technology. Along the way, LEAH added another critical role to the lab team in Zachary WareJoncas as Chief Operating Officer. During this time LEAH went through a whirlwind of business and technological development, closing two additional deals on top of Y combinators initial investment, while building the first proof-of-concept iteration of LEAHs core CAR T cell technology. At the end of these three months LEAH Labs participated in Y Combinator's renowned Demo Day; all companies in the YC batch each get two minutes in front of thousands of investors both in person and on the web, launching the fundraising process.



Chapter 3: The Science
With the initial seed investment brought on by our acceptance into Y Combinator, our team quickly got to work in the lab. We quickly applied our patent-pending gene editing technology to T cell engineering and enhanced rates of gene delivery over 20% from the first experiments we ever ran. We have shown that we can kill canine cancer in a test tube, and are seeking more seed funding to continue the optimization of our technology to get our therapeutic into the clinic to save dogs.

Chapter 4: The Future
LEAH is continuing down the start-up path, working to close our seed fundraising round and get to work building our platform and moving through the USDA regulatory process. We have made many of our necessary partnerships for further technology development and are poised to create the next generation of therapies for the world's canine companions.

You can be part of our future.

Your support helps make our dream a reality and could someday save a dog that you know.

Join us!

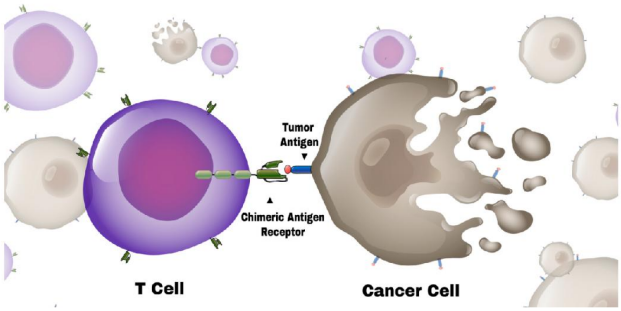
WHAT IS A CAR T CELL?

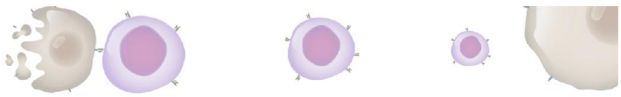
Chimeric Antigen Receptor T cell therapy is the result of decades of research and development. Thinks "chimera" of Greek mythology, CARs are the fusions of multiple different proteins on the surface of a T cell that can find, bind, and tell the T cell to kill.

The first part of CAR T cell therapy is the T cell itself. T cells are immune cells that fight off foreign invaders, but are normally not able to efficiently kill cancer.

The next part of CAR T cell therapy is the Chimeric Antigen Receptor. The antigene receptor is a piece of an antibody, a protein that can bind to different shapes found on cells or molecules in the body, engineered to bind specific proteins found only on cancer cells. In this way, we can "teach" T cells to find and bind to cancer.

The final part of CAR T cell therapy is what the antigen receptor is fused to: the T cell receptor. This is a natural part of a T cell that is able to turn on the killing response. When CAR T cells find cancer and bind to them, the T cell is told to kill.





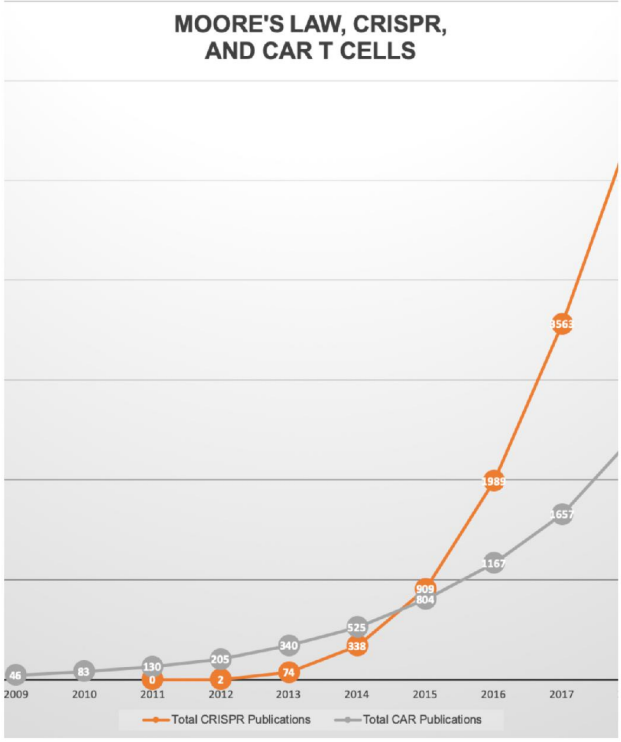
WHAT IS GENE EDITING?

Imagine writing a whole essay, but finding a typo in the middle or want to add a new paragraph. Using your computer mouse, you click where you need to change, and use the keyboard to add in the new material or fix the typo.

Advances in biotechnology have given scientists the ability to control DNA just like we control our writing on computers. Gene editing is the process of using biotechnology to alter DNA specifically, allowing the conceptual programming of the code of life like an essay document.

Scientists at LEAH Labs use CRISPR technology as a tool (the computer mouse) that can target specific genes (words and paragraphs) to change or add in DNA, giving cells the ability to do things that they previously couldn't.

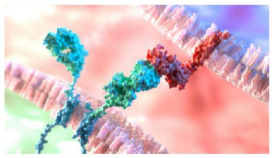
LEAH Labs uses gene editing to give immune cells the ability to recognize and eliminate cancer cells, something that they do not do effectively without genetic reprogramming.



CRISPR and CAR T are exploding fields of study and application right now. CRISPR has already hit the exponential growth phase, and we can see that CAR T cells are not far behind.

HOW DO YOU MAKE CAR T CELLS?

STEP ONE: Engineer CAR T cells. We provide T cells the genetic material that gives them the unprecedented ability to seek out and destroy tumors specifically. To do this, LEAH Labs uses patented gene editing technology that our co-founder and CEO developed while getting his PhD

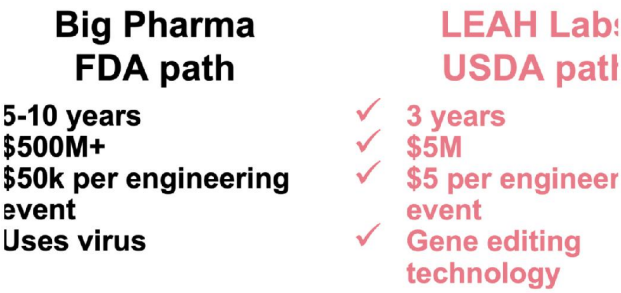


STEP TWO: Incubate CAR T cells. The genetic material that we give T cells tells them to create a new protein, called a CAR. The CAR is what gives T cells the ability to find and bind to cancer in the body. This is very different than current cancer treatments work: chemotherapy kills all dividing cells, while CAR T cell therapy kills ONLY the cancerous cells that express specific proteins that CARs can recognize.

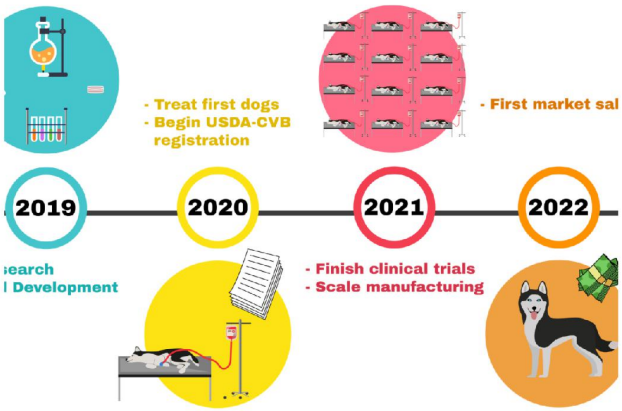
STEP 3: Infuse CAR T cells into the sick dog. After recognizing cancer cells, CAR T cells are able to kill them just like they would normally kill foreign invaders.

WHAT IS YOUR PATH TO MARKET?

Human cell therapies fall under the FDA path of approval, a long and arduous process that can take >5 years cost >$500,000,000 in development costs.

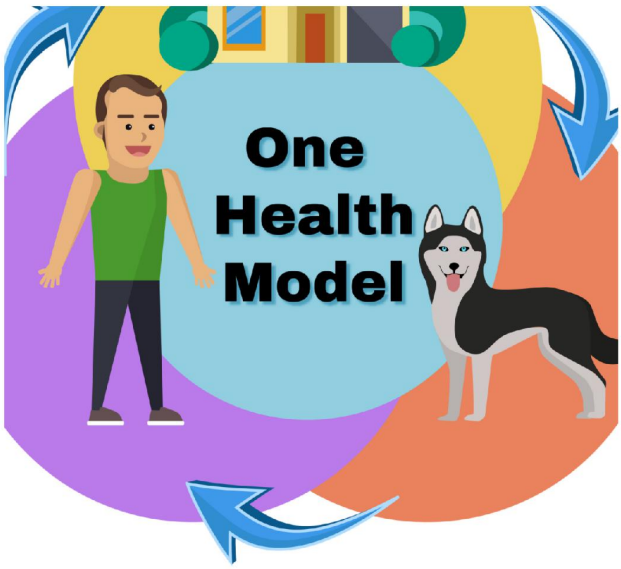


LEAH Labs therapeutics for canines fall under the United States Department of Agriculture - Center for Veterinary Biologics (USDA-CVB) path, which allows us to get to market in 3 years with only $5,000,000 in development costs.



THE ONE HEALTH INITIATIVE

Humans share everything with our furry friends, including the food we eat, the grass we play on, and the beds we sleep in. The One Health initiative focuses on the cross-talk between humans, animals, and our shared environment on Spaceship Earth. Thus, the One Health model is based on the study of spontaneous animal disease models such as canine cancers. Typically, mice models have been useful for studying the biology of cancer, but mice do not faithfully represent many of the features constitutive of human cancer, including genomic instability, tumor heterogeneity and long periods of latency. Additionally, laboratory mice are often immunocompromised and bred in sterile laboratories, unlike domesticated dogs that share the same habitat and are exposed to similar environmental carcinogens (e.g. UV light, pollution and food contaminants) as humans. As opposed to mice, cancers develop spontaneously in dogs (i.e. without genetic manipulation) and in the context of an intact immune system. Over the last decade, multiple reports have demonstrated the relevance of the canine model to bridge the knowledge gap between murine experiments and human clinical trials in comparative oncology. There is abundant recent literature highlighting the pathologic, biologic, immunophenotypic, genetic and treatment response similarities between human and canine lymphoma. Specifically, diffuse large B cell lymphoma (DLBCL) is the most common lymphoma subtype reported in both species. Utilizing immunohistochemistry and microarray analyses, similar gene expression profiles were noted between human and canine DLBCL. For instance, both canine and human patients present an overexpression of anti-apoptotic NF-κB target genes, which further promote lymphocyte proliferation. Provided this robust and expanding body of data supporting the parallels between the most common types of human and canine lymphoma, the opportunities for therapeutic development in one species to inform and progress that in the other species will only continue to grow.



By the numbers

90,000,000 Owned dogs in the USA in 2018	**33%** Percentage of dogs that get cancer	**50%** Percentage of dogs over 10 that die of cancer
$72B Growing companion animal market in the USA	**$7,000-12,000** Cost for non-curative standard of care for B cell lymphoma	**50,000** Dogs treated for B cell lymphoma
$350,000,000 Market for B cell lymphoma treatment	**$18B** Spent on animal health yearly in the USA	**85%** Percent of shared genes between dogs and humans

Investor Q&A

– COLLAPSE ALL

What does your company do?

LEAH Labs uses next generation technology to reprogram immune cells into cancer fighting machines.

Where will your company be in 5 years?

In 5 years, LEAH Labs has the only treatment in canine oncology that can CURE cancer. We have diversified our portfolio and now treat multiple cancer types. The data we have generated and the platform we have built is licensed to a leading human immuno-oncology company. Life is good, and dogs are living the best lives they ever have!

Why did you choose this idea?

Dogs are part of our families, and we don't feel that the current care dogs are afforded is up to par; they deserve the same care humans get. Additionally, we are passionate about using gene editing to solve problems in the world. Gene editing can help us cure our dogs.

What's new about what you're making? How is it different?

In principle, our technology is the same as what has proven to be curative in humans; chimeric antigen receptor (CAR) T cell therapy. However, currently FDA approved CAR T cell therapy is made using expensive and inefficient methods reliant upon virus to infect T cells in order to reprogram them. LEAH Labs uses gene editing to create CAR T cells, a technology that is proven to be more efficient and less expensive.

How big is the market?

There were almost 90,000,000 owned dogs in the USA last year, and canine B cell lymphoma, our first therapeutic target, kills at least 300,000 of them every single year. Our

estimates indicate that up to 50,000 dogs are actually treated with the non-curative, $7,000-$12,000 standard of care chemotherapy every single year, creating a potential market of $350,000,000-$600,000,000!

What do you understand about your business that others don't get?

There are a few current competitors who offer adoptive T cell transfer in order to fight different cancer in man's best friend. However, this is not CAR T cell therapy, as their products are not genetically engineered to fight cancer specifically. This is where our key value proposition comes in: we use gene editing to specifically reprogram T cell genomes, making them cancer fighting machines. Others do not understand the power of gene editing or do not have the expertise to apply it towards solving this type of problem. We do.

Genetic engineering? Are you making GMO dogs?

Simple answer: NO!
We do use gene editing to reprogram immune cells, and by definition those cells are genetically modified, but we are not making an organism from them. We are not making any dog GMO and there is no scientifically plausible way that any of our therapeutic could ever get into the environment.

Do you use CRISPR? I read that CRISPR can cause cancer.

CRISPR is a cornerstone of how LEAH Labs creates our therapy. CRISPR has revolutionized the way scientists are able to control cells and their DNA. With the proper experimental design, CRISPR can be effective, safe, and precise. LEAH Labs scientists take the utmost caution to be sure that our therapy is engineered safely and properly.

What aspect of LEAH Labs keeps your team up at night?

Creating new therapies is not an easy task, and some of our first furry pet patients may

suffer from toxicities due to our therapy. Pet owners will trust LEAH Labs to help their dog, not make them suffer. The reality is that some of the early tests may result in much needed moments of learning at the ultimate sacrifice of some of our patients. Some of the hardest moments may teach us the most, and we will always be learning how to limit these events.

How will you make money?

LEAH Labs will make money by selling our line of therapies directly to veterinary oncologists when they need to treat a sick animal. We also have opportunities to partner with human pharmaceutical companies in order to test new strategies in dogs that inform human trials, and can license our technology to other companies aiming to use our platform of gene editing.

Does pet insurance cover your product?

Yep! Most pet insurance companies cover cancer care as long as it's not a pre-existing condition. Though we're entering novel territory, there is a precedent for insurance covering cell therapy in dogs: the therapy of a company developing adoptive T cell transfer (not CAR T!) is covered by insurance.

How strong is your intellectual property?

We're in the final steps of getting our gene editing patent issued and will be able to defend the critical parts of that technology. The funds from this campaign will help us add to our IP portfolio with provisional patents coming soon.

If your technology is such a great way of making CAR T cell therapy, why aren't you doing this in humans?

Some day we might! Right now, there is an urgent and pressing need for new therapy in dogs with cancer. The fact that we're regulated via the USDA-CVB and can be to market in 3 years for literally two orders of magnitude less than if we were in the human CAR T cell space is another great reason to make our therapies for dogs. Also, what we develop at LEAH Labs could be directly licensed to human pharma.

What types of dogs get cancer?

All dogs can get cancer, but our first indication, B cell lymphoma, has a much higher frequency in big breeds like boxers, labs, rottweilers, german shephards, and golden retrievers.