



What it takes to be an Entrepreneur in Biotech

An in-depth interview with **Worcester HIV Vaccine (WHV)** by [Anna Wortman](#)

Interviewing:

Yegor Voronin, PhD, Chief operating officer

Shan Lu, MD, PhD, Co-inventor of the vaccine approach

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Many biotech founders and executives start their careers in academia, using their universities as resources for advice and inspiration. After more than three decades of scientific research at the University of Massachusetts Medical School, Dr. Shan Lu has applied his knowledge to help establish the local biotech company, [Worcester HIV Vaccine \(WHV\)](#).

WHV's main mission is to advance the clinical development of a preventative HIV vaccine candidate that's now in clinical trials. The candidate is based on extensive preclinical and clinical research conducted by the Lu laboratory and utilizes the *DNA-prime/protein-boost* approach.

Drs. Lu and Voronin spoke to me about starting a business beyond UMass and entrepreneurship in the biotech world.

How has UMass helped you in the development of this vaccine and starting a business?

There are a lot of misunderstandings in academia about the business of biotechnology. The University nurtures faculty to do research and they support PIs, postdocs, and students. In the United States the academic research process involves securing funding, conducting the science, collecting the data, and publishing with support from the University. Universities also help protect the intellectual property that is developed by faculty, including filing for patents. However, UMass cannot directly support the company that is based on the licensed IP. "Once you have a company, it's an independent legal entity" said Lu.

"At UMass I started as a researcher, doing my PhD in immunology, then I completed a postdoc in virology, began my own lab in the Department of Medicine, and began to grow. I've been developing the DNA immunization approach throughout my career, applying different fields of knowledge and experience with the University's help. Now UMass is recognized as one of the founding places for the DNA vaccine approach. The company is not a spin-off of my lab here, it's a new entity based off of technology licensed from UMass medical."

What has been the most difficult aspect of starting a business?

One thing in biotechnology is that no one believes you. If you go through all of the history of biotechnology, even in the success stories, no one will believe the inventors in the beginning. Your idea must be very novel, very unusual, very 'out-of-the-box'. Money is not the main issue. Once people sense that your approach will work, the money will come. Guaranteed. The challenge in biotechnology is the gamble early on - how do you know if I'm making the right bet? "Biotechnology is not just science, biotechnology is also betting and even an educated guess is still a bet." Scientists must believe in themselves and be persistent, but you must prove to investors that the risk is worth it.

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What are the qualities necessary to take your science from an idea to patentable research?

In my case, I think my physician background was very important. Nowadays people talk about translational medicine, but the current education is focused on molecular biology. Molecular biology is the core of modern biomedical science and that's fantastic, but we lose the big picture of the *in vivo* processes. Many biologists have never studied anatomy and physiology and these things are very important to be able to imagine how an idea would work in a human. Medical background helps you address how to select participants and how to interpret the results that you see. Ultimately, you need to integrate a multidisciplinary team. If you want to be a CEO or a project leader, you need to know the *in vivo* aspects of a project. You should be humble and accept that eventually you will need to move away from research and more towards development.

"The location issue is less and less important because we are in a digital age"

Why stay in Worcester when places like Boston are larger biotech hubs?

The location issue is less and less important because we are in a digital age. Many people do not directly work together, but are spread out across the world. If you're good, it doesn't matter where you are. "Don't blame environment or location for your own failure. Take advantage of any location."

At UMass I have a lot of good colleagues that are very smart. We have good interactions and we aren't too far from Boston. You just need people that know what biotechnology actually is and have worked in the industry. The limit is ideas and vision. We use the resources that are available to us and use the University to our advantage. "We named the company Worcester HIV Vaccine to give ownership to the city and to our Medical School." It's not what you can get from the city; it's what you can contribute to it.

"I don't think that there is just one path towards your career - that is a very narrow way of thinking"

What is your advice for students looking to pursue entrepreneurship or the business side of science?

Knowing biotech history, knowing your product, and knowing people- those are the things that are important. General biology knowledge is very useful, but the business side of biotechnology is equally as important. We need to train students how to solve questions and how to apply that knowledge.

I don't think that there is just one path towards your career - that is a very narrow way of thinking. There are immense and unlimited opportunities, it all depends on how creative you are. Do not limit yourself, work quickly and efficiently to pursue various topics, and step away from the bench. "Expose yourself to side projects, industry meetings, anything. You don't have to do everything yourself" Dr. Lu concluded.



(Yegor Voronin PhD, Shan Lu, MD, PhD and Anna Wortman)

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