

LunchWithSumiko

# Start with the 'what-if?'

Noubar Afeyan co-founded Moderna under his biotech incubator Flagship Pioneering. The Armenian billionaire tells executive editor Sumiko Tan that innovation is a form of 'intellectual immigration'



From the time he was a baby till he was 20, Dr Noubar Afeyan shared a bedroom with his great-aunt Armenouhi, who was 70 years older. They were roommates in Lebanon where he was born, then in Canada, when the family migrated there. Most children would not have been too pleased to be bunking with an elderly relative, but he did not mind.

"I can talk to you for hours about her," says the entrepreneur and scientist.

"She spoke five languages, she read a book a day, she was really a remarkable person, by far the most influential person in my life."

From her, he learnt about their Armenian roots and the horrors of the Armenian genocide of 1915 in which as many as 1.2 million Armenian Christians living in the Ottoman Empire were killed.

His great-aunt, who died at age 101, would have been proud of what he has achieved.

Dr Afeyan, 61, is the founder and chief executive of Flagship Pioneering, a biotech incubator that invents, builds and capitalises companies in life sciences, health and sustainability.

Its most well-known company is Moderna, which he co-founded in 2010 to study how messenger RNA (mRNA) technology could be used to fight a range of diseases.

Moderna was one of the earliest companies to come up with a vaccine when Covid-19 swept the world in 2020. Its Spikevax vaccine was approved for use in more than 70 countries and has protected millions of lives.

The Armenian businessman was in Singapore in November 2023 to attend the Bloomberg New Economy Forum. He also announced that Flagship Pioneering was setting up a Singapore office.

We are meeting for breakfast at W Singapore – Sentosa Cove. The hotel has given us a quiet spot at the Woobar for the interview.

The biotech billionaire – Forbes puts his fortune at US\$1.2 billion (S\$1.6 billion) – is pleasant, with a warm, soothing voice. His down-to-earth manner bears no hint of the fact that his businesses are at the cutting edge of science.

"It's always fun for me to see names like Woobar since my name is Noubar," he jokes as we settle in our seats.

He opts for granola with sliced banana on the side, while I have French toast. His granola comes without a spoon. "I'm being tested to see if I can eat this with a fork," he smiles, teasing the waitress.

He is fairly familiar with Singapore, having been here three or four times over the years.

In fact, in an interview with the Financial Times (FT) in 2022, he named Singapore's late founding prime minister Lee Kuan Yew as his leadership hero.

Mr Lee "embodied the notion of thinking future backwards as opposed to present forwards. He had to paint a vision and insist it was reachable", he told the FT.

He shares that he met Mr Lee when the latter visited Armenia in 2009 and learnt a lot about long-term strategy and leadership from the "entrepreneurial leader".

Dr Afeyan could be viewed as a visionary himself. Flagship Pioneering, which is based in Cambridge, Massachusetts in the United States, has founded more than 100 companies since it was started in 2000, and 30 have gone public.

It creates what are known as "platform" companies. These delve deeply into a particular technology – for example, gene therapy or mRNA technology – then figure out how to make many different drugs from it in a fast and scalable manner.

It currently has 40 platform companies with more than 9,000 employees working in areas such as anthromolecule therapies and drugs based on biomimicry.

The companies are at various stages of growth.

"Moderna has 7,000 people; our smallest company, which was formed several days ago, has three," says Dr Afeyan, who has a PhD in biochemical engineering from the Massachusetts Institute

of Technology (MIT). "The pace is different, but each one of them is its own story."

IMMIGRANT STORY

Dr Afeyan's paternal grandfather was from Adapazar, a town in western Turkey, which was majority Armenian at the time he lived there.

During the genocide, his grandfather fled to Bulgaria, where Dr Afeyan's father was born.

When the communists came to Bulgaria, the Afeyans moved again, this time to Lebanon, which was then a prosperous and cosmopolitan country and home to a sizeable Armenian diaspora with many Armenian churches and schools.

Dr Afeyan was born in Beirut in 1962, the youngest of three sons. His father was a businessman who imported plastics and his mother, an Armenian from Lebanon, was a pianist who gave lessons at home.

His paternal great-aunt Armenouhi was a widow whose only child died young and who then devoted her life to the extended family.

Her stories about Armenia left a huge impression on him.

Referring to the genocide, he reflects: "When you realise that you're that close to not existing, that kind of gives you purpose."

I tell him The Straits Times was started by an Armenian, Catchick Moses, back in 1845.

He is pleased to hear this and remarks that he knows Singapore's Raffles Hotel, too, was started by Armenians, the Sarkies brothers. He has also visited the Armenian Church in Singapore.

"Once in a while, I run into these things," he says. "We're such a small tribe now that just knowing that in the past, people did things, it's always fun to hear." I quip that the most famous Armenian is, of course, American reality TV star Kim Kardashian.

"At the moment, she's definitely the most visible, the most followed, yes," he allows, smiling.

In 1975, civil war broke out in Lebanon. "Every few hours, there'll be sirens and we'd go down to the basement. We saw the building a block away from us totally taken down," he recalls.

"At the time, you don't realise what that does to you because you're a kid, you can take anything, but in hindsight, it kind of leaves a further kind of mark of vulnerability and, I don't know, it influences your thinking."

His father decided to move the family. Europe would have been the natural choice but he wanted his sons to grow up in a country with more space. "Not physical space, but just space to do things and grow and have ambition," says Dr Afeyan.

His father landed on Montreal, the French-speaking city in Canada. In August 1975, the family, including Aunt Armenouhi, uprooted.

There were Armenians in Montreal but not as many as in Lebanon. His father went into the wood furniture business and his mother built new friendships. His teenage years were happy, with the occasional family holiday.

A highlight was the Montreal Olympic Games, which took place the year after he arrived.

Someone told him that if he stood outside the sporting venues just before the matches started, journalists would be giving away their tickets to children. "I was one of those kids. I got to see the basketball finals, soccer, any game I wanted to go to, pretty much. That was quite a memory."

He skipped a grade in school because the education system in Lebanon had been more demanding. He and his eldest brother, who is three years older, were into science. The brother is now a theoretical physicist running a consulting company in California. His second brother



Dr Noubar Afeyan was born in Lebanon, migrated to Canada in his teens and later did his PhD in biochemical engineering in the United States. His Flagship Pioneering biotech incubator has founded more than 100 companies, the most well known of which is Moderna. ST PHOTO: GAVIN FOO

took over and grew their father's furniture business and lives in Montreal.

After Dr Afeyan obtained a degree in chemical engineering at McGill University, he moved to the US to undertake a PhD at MIT. He chose the then new field of biochemical engineering and received his doctorate at 24.

In 1985, a chance meeting with Mr David Packard, the co-founder of information technology company Hewlett-Packard, inspired him to embark on the entrepreneurial path.

He founded PerSeptive Biosystems in 1989 to make instruments used by biotech researchers. It was acquired in 1998 in a US\$360 million deal.

NEW BUSINESS MODEL

Then only in his mid-30s, he had a vision of a new type of enterprise where multiple companies work in parallel, each answering big what-if questions that could change the world.

In 1999, he and a venture capitalist friend founded a company he named NewcoGen, short for "new company generation".

"But people told me it sounded like a disease. You know, 'you have NewcoGen'. So I thought I've better not use that name." He changed it to Flagship Ventures, then later Flagship Pioneering.

He notes how most start-ups come about quite randomly. The process usually starts with an entrepreneur with a business idea who then taps the science from universities and capital from venture capital groups until something is created. "It's quite improvisational, quite sporadic, you know, chance-driven."

Wouldn't it be better if the process was more thoughtful, planned and organised, he wondered?

Thus it is that Flagship adopts a systematic process for the creation of its companies.

TAKES NOTHING FOR GRANTED

**The big advantage of being an immigrant is that your mindset takes nothing for granted... you have something to prove, and you adapt.**



DR NOUBAR AFEYAN

It starts with someone asking bold "what-if" questions about the future.

In Moderna's case, the question was what if a patient's own cells could be instructed to produce proteins that could prevent, treat or cure diseases? At another Flagship company, the big question was what if technologies currently in development for human therapeutics could be leveraged to revolutionise agriculture?

Hypotheses and concepts are tested by "entrepreneurial scientists" and promising ones become "prototype companies" and are assigned a number. These go through more rounds of validation and if answers can be found to the what-if question, the prototype company becomes a new company, with a name and capital commitment from Flagship.

Each company focuses on developing a proprietary platform that will deliver years of important new products. The really promising ones get even more investors and, hopefully, a public listing.

Moderna, its star company, went public in 2018 and was valued at US\$604 million.

In January 2020, it was approached by the US

government to see if it could work on a vaccine for a virus that was spreading across the globe.

The company had been building its mRNA platform for years and was already trialling mRNA vaccines to fight, among other things, cytomegalovirus, Zika virus and respiratory syncytial virus.

Using the genetic sequence which scientists in China had put online on Jan 11, Moderna's scientists delivered the first Covid-19 doses for testing by Feb 24. Its first human trial took place on March 16, after which the vaccine was tested on 30,000 volunteers.

On Dec 18, the US authorised Moderna's vaccine for emergency public use and it was administered on Dec 21.

In Singapore, it was approved for use on Feb 3, 2021, arrived on Feb 17 and rolled out soon after. Another mRNA vaccine, from Pfizer-BioNTech, had been used here from Dec 30, 2020.

That period was stressful yet exciting, says Dr Afeyan, who chairs Moderna's board. "There was this feeling of you're in a battle, you have to win, people are depending on you."

Spikevax transformed Moderna into a US\$60 billion company, at its peak. The vaccine has generated over US\$36 billion in sales. As to how much longer it will be producing the vaccine now that Covid-19 is endemic, he says: "We'll see how it plays out. But for now, the expectation is that it'll be a seasonal vaccine."

He remains involved in Flagship's many companies as they grow and is on the board of several of them. He has also taught entrepreneurship and innovation at MIT and Harvard.

It sounds like a very full plate and I wonder what drives him.

He reflects that there are probably "subtle, subconscious motivations, you know, which is to do good, to contribute, to have impact, to do something special".

But his immigrant roots have played a role.

"If you are comfortable in a place where you're accepted and you're totally normal, then, you know, why bother going to these extremes? It's helped me that I haven't felt that way in my life journey," he says.

"The big advantage of being an immigrant is that your mindset takes nothing for granted. You realise you have to struggle to do well, you have something to prove, and you adapt, and that adaptive mindset is exactly what you need, it turns out, in doing start-ups and in doing entrepreneurship and innovation."

He in fact defines innovation as "intellectual immigration".

"Together with my colleagues, we're constantly going to new places. If we were comfortable where we are, we wouldn't have to go to new places. But we're not that comfortable."

Dr Afeyan, who became a US citizen in 2008, has spent the past two decades visiting Armenia to carry out philanthropic work.

In 2015, he and two fellow Armenians set up the Aurora Humanitarian Initiative. It is behind the yearly US\$1 million Aurora Prize for Awakening Humanity, which recognises those who risk their lives, health or freedom to save others.

His wife is a Swedish engineer he met at a conference in the US. They live in Boston and have four children – "three girls and the youngest is a boy, with four mothers. I always point out, when you have three older sisters, you basically have four mothers. That's kind of how his life is".

Three of the children are in the biotech field and the fourth is the executive director at Aurora.

A Flagship employee who has come with him on the trip reminds him that he has a meeting. As we wrap up, he tells me that the word Pioneering in the company's name is significant.

"If you're pioneering, you're perpetually immigrating, you're moving, moving, and that has become our company's life story," he says.

"You can't, what they call, 'rest on your laurels'. You can't say we did Moderna, therefore we're going to do XYZ. You keep having to relearn, re-earn your reputation. And that in my view is a great thing because it keeps you sharp, competitive, creative and humble."

Qualities which, in fact, describe him.

**WHAT WE ATE**

Woobar  
W Singapore – Sentosa Cove  
31 Ocean Way

1 W Roasted Granola: \$18  
1 W Brioche French Toast: \$22  
1 Americano: \$6  
1 English Breakfast Tea: \$8

**Total (with tax): \$64.15**



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SCAN TO WATCH  
How to create value: Moderna CEO

<https://str.sg/vid-afeyan>