Twitter Thread by Bansi Sharma



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1. Meet Katalin Karico

It is an inspiring story. And a most relevant one for now and going forward. It's my honor to introduce you to Katalin Karico, if you have never heard of her. I hadn't until yesterday.

There is no doubt in my mind she will win a Nobel Prize some day.



2. The pioneering Dr. Katalin Kariko — who fled Communist-run Hungary at 30 for the US in 1985 with $1,200 hidden inside her 2-year-old daughter's teddy bear — isn't as powerful or rich as Moderna's Stéphane Bancel or BioNTech's Ugur Sahin. Nor has she ever been celebrated.

3. Kariko's obsessive 40 years of research into synthetic messenger RNA was long thought to be a boring dead-end. She said she was chronically overlooked, scorned, fired, demoted, repeatedly refused government and corporate grants, and

threatened with deportation.

4. All along, though, Kariko held fast to her belief in mRNA, which has turned out to be key to building the complicated technology behind the new vaccines developed by Moderna and Germany's BioNTech (which has teamed with Pfizer.)

5. The co-inventor of modified mRNA, Katalin Karikó is finally getting her moment. She remembers sitting in her father's butcher shop as a little girl, unafraid of the blood and entrails.

6. She'd sit in the small store in Hungary, watching animal after animal get chopped up and sold to customers. Just sitting, just curious about the inner workings of living beings. It's that innate curiosity that's driven Karikó throughout her entire scientific career.

7. The road to the discovery that's come to define her research was not always smooth. Karikó first came to the United States in 1985, taking a job at the University of Pennsylvania. She had been focusing on mRNA technology even then.

8. Despite submitting her first mRNA therapy application in 1989, she couldn't get any grant funding to develop it. After a few years, Karikó's bosses at UPenn demoted her. But Karikó kept plugging away at the research, convinced of the technology's potential.

9. Eventually, she teamed up with one of her colleagues at Penn, Drew Weissman, and came up with a solution to the immune response problem — by modifying one of the nucleosides that make up the RNA.

10. In 2006, she and Weissman used the basis of that discovery to found a company called RNARx, where Karikó served as CEO. By the time their patent for the technology was accepted in 2012, however, Penn sublicensed it out to another company.

11. A few months later, Moderna — which at the time was still a nascent Flagship biotech — signed a $240 million deal with AstraZeneca to develop a VEGF mRNA.

12. Those blows essentially forced Karikó's outfit to close up shop, and Kariko herself decided she'd had enough of academia. She took a role at BioNTech soon after as senior vice president.

13. Now that mRNA vaccines are two of the leading candidates in the race for a Covid-19 cure at BioNTech/Pfizer and Moderna, whose technology is based on her old patent, Karikó is happy that her research is a part of the answer.

14. "I wish to tell some of those people who put me down and ridiculed me and whatnot, 'You see?'" Karikó says. "But that's OK. I am happy that the two leading mRNA vaccines, Moderna and BioNTech with Pfizer products, both of them are including something that I contributed."

15. "Other people may never even know because Moderna usually says that they discovered everything, but they did pay for that patent and sublicensed it from Penn."

16. The technology that Karikó co-invented could end up saving thousands of lives and has significant ramifications in areas outside Covid-19. Karikó originally aimed to develop an HIV vaccine, but mRNA-based therapies have popped up in other rare diseases and certain cancers.

17. Regardless of what comes next for mRNA, it’s already had a huge impact on the biotech and pharmaceutical world. Notably, Moderna’s co-founder Derrick Rossi has called for Karikó and Weissman to win the Nobel Prize in Chemistry for their mRNA research.

18. And for the next generation of women in biotech, Karikó wants them to know that you don’t have to choose between a career and your family.

19. Karikó remembers several instances where she’d be asked who her boss was, as many simply assumed that the “woman with the accent” had to report to somebody else. But the times are changing.