

Self-Amplifying RNA Vaccines

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Over the past year, the concept of messenger RNA (mRNA) vaccines has become relatively common knowledge. Covid-19 vaccines developed by Moderna and Pfizer/BioNTech are mRNA vaccines. They deliver genetic instructions to our cells to create proteins that then train the immune system against a pathogen, such as a virus.

Beyond mRNA Vaccines: Self-Amplifying RNA Vaccines

Further scientific work on this technology has focused on saRNA, or self-amplifying RNA vaccines. Building on the concept of mRNA vaccines, this saRNA technology allows cells not just to manufacture the proteins but also replicate the instructions and amplify the vaccine's effect.¹ In other words, 'companies [would] only need to manufacture, transport, and store much lower doses of genetic material – perhaps even 100 times less for each injection'.²

The relative ease of producing saRNA vaccines could result in a much faster rollout of vaccines in the future, and a dramatic increase in global coverage earlier on in a pandemic. Looking at the discrepancies in the speed of the Covid-19 vaccine rollout in the developed world highlights the need for more efficient production and distribution. And, in the case of the developing economies, the need is even more pronounced. Lower income countries such as India have been dealing with tragic consequences from a spike in cases and a relative inability to deal with the scale of the issue.

Ziphius Vaccines

One of the leading companies focused on saRNA technology is the Belgian startup Ziphius Vaccines, which has recently raised €29.3M to advance its proprietary platform that could produce a wide array of vaccines.³ The series A round of financing was significantly oversubscribed, with original target being for a raise of €20M. Funds raised are to support further development of the company's proprietary saRNA platform based on positive preclinical proof-of-concept data of ZIP-1642: the company's SARS-CoV-2 (Covid-19) candidate.⁴

According to an article and video referenced on the Ziphius Vaccines website and posted on the Belgian news website AVS Oost-Vlaamse Televisie, the Ziphius Vaccines Covid-19 vaccine could become the most effective vaccine. Their vaccine "would be 100% effective and only one dose would be sufficient".⁵

¹ Kotsev, Victor. "Next-Generation mRNA Vaccine Technology Unveiled in Series A Round". June 1, 2021. Labiotech.eu. Available at: <https://www.labiotech.eu/trends-news/mrna-vaccine-ziphius-vaccines/>. Accessed on June 1, 2021.

² *Ibid.*

³ Press Release. "Ziphius Vaccines Raises €29.3M in Oversubscribed Series A Financing". May 25, 2021. Ziphius Vaccines Website. Available at: <https://www.ziphius.org/210525-press-release>. Accessed on June 1, 2021.

⁴ *Ibid.*

⁵ Steyaert, Tim. "Does the best coronavaccine come from Merelbeke?" February 11, 2021. Ziphius Vaccines Website - Newsroom. Available at: <https://www.ziphius.org/210212-avs>. Accessed on June 1, 2021. [Video published on AVS on February 11, 2021: <https://www.avs.be/artikels/komt-beste-coronavaccin-uit-merelbeke-a79914>. Accessed on June 1, 2021.]

This claim may seem a bit premature. But, CEO of Ziphys Vaccines, Chris Cardon, has stated with confidence that “[w]hile current SARS-CoV-2 vaccines report 95% efficacy, our technology has the potential to add the remaining 5% and remain highly relevant to any future coronavirus mutations.”⁶

Going Forward

Vaccines used to take decades to develop and gain safety and efficacy data for approval from health authorities around the world. The record speed at which vaccine makers were able to develop the current range of Covid-19 vaccines and gain approval is nothing less than astounding.

Beyond the development and approval of these vaccines, the manufacturing and distribution logistics – as well as the influence of money and politics – have exposed a range of problems with the rollout of these vaccines. It is not entirely clear how much better the world would fare with future pandemic.

But, if the promise of saRNA is true, many of these hurdles may be overcome with greater ease in the future. And, the technology may even lead to more effective vaccines.

⁶ Sullivan, Josh. "Spurred on by Moderna and Pfizer's success, a Belgian biotech has big ambitions for its self-amplifying RNA vaccine play". May 25, 2021. Endpoints News. Available at: <https://endpts.com/spurred-on-by-moderna-and-pfizers-success-a-belgian-biotech-has-big-ambitions-for-its-self-amplifying-rna-vaccine-play/>. Accessed on June 1, 2021.