

# mRNA as a Vaccine-

## *"Who Invented It?"*

The first mRNA cancer vaccine for humans (prostate carcinoma) was developed by the Tuebingen-based company CureVac. This RNA vaccine was to become the company's lead vaccine and serve as a template for other tumor vaccines. CureVac failed in 2017 with the vaccine in the 2nd study phase. *"These results...pave the way for us to bring more effective prophylactic vaccine formulations into the clinic"*, spoke Ingmar Hoerr, then CEO and founder of CureVac.

Like BioNTech in Mainz/Germany, or Moderna in Cambridge/USA, CureVac started out with the goal of developing cancer vaccines. The fact that all three companies now specialize in corona vaccines is also due to the fact that none of them has yet succeeded in bringing a cancer vaccine to market. Neither CureVac, founded in 2000, nor BioNTech, founded in 2009, nor Moderna, founded in 2010, have a registered cancer vaccine for clinical use.

Sooner or later, the third-party funders might have withdrawn from the companies due to unsuccessfulness, so that financial bankruptcy would have been conceivable. Corona was the rescue. In only about 10 months, mRNA vaccines against SARS-CoV 2 were developed omitting animal experiments, tested directly in human clinical trials, and brought to market through emergency approval: *experimental vaccines*

Since 2017, CureVac has been developing an mRNA rabies vaccine, is following the regular route of the standard approval process with this vaccine and is still in phase 1. Whether this vaccine will ever reach the market is questionable. There has been no measurable success. But a Corona vaccine is being developed to market in about 10 months! That should give pause for thought.

***"Who invented it?"***

In a May 2020 interview with the Berliner *Tagesspiegel*, Ingmar Hoerr claims to have discovered by accident in **1999** that RNA forms a protein, an antigen, in his mouse experiment. *"I thought I had mixed something up or labeled it wrong."* Hoerr went on to say that at the time, RNA was still considered an unimportant copy of the DNA blueprint (1).

In an interview with the *Neue Zürcher Zeitung* (NZZ, New Journal of Zürich) on February 23, 2021, he repeated this claim. The article is titled *"Ingmar Hoerr discovered mRNA inoculation..."* (2)

***The truth and...***

As early as **1990**, it was shown for the first time that RNA produced in the laboratory is processed into a protein after injection into the mouse (3). The article was published in the prestigious journal SCIENCE. It was a breakthrough in RNA research. It was proof that mRNA becomes a protein after injection into animals. In **1993**, proof was provided that mRNA was suitable as a vaccine. A French research team developed an RNA vaccine with an influenza antigen. The mice produced killer cells against the antigen (4). Another seminal article appeared in **1995**, naked mRNA (naked because without packaging material) successfully immunized mice against the incorporated vaccine antigen (5). So much for the historical facts.

***...the tabloid***

On my hint to the NZZ author René Höltschi that far before Ingmar Hoerr others had already discovered mRNA as a vaccine candidate, Höltschi answered me on March 8: *"... The text was an interview for a broad audience about the career of Mr. Hoerr and of Curevac, not an own scientific research about the history of mRNA..."*.

Does this mean that the general public doesn't need to know the truth and research is superfluous? Then we have reached the yellowpress level and consume pretty stories only.

## References

1. Wie eine vermeintliche Laborpanne zur Hoffnung in der Pandemie wurde. 26.05.2020 <https://www.tagesspiegel.de/wissen/vom-zufallsfund-zum-impfstoff-kandidaten-wie-eine-vermeintliche-laborpanne-zur-hoffnung-in-der-pandemie-wurde/25856186.html>
2. Ingmar Hoerr entdeckte die mRNA-Impfung, überlebte eine Hirnblutung und überzeugte Tesla zur Zusammenarbeit. Er sagt: «Die Kreissparkasse hat uns vor der Insolvenz gerettet» <https://www.nzz.ch/wirtschaft/curevac-gruender-und-mrna-pionier-ingmar-hoerr-im-nzz-interview-ld.1602797>
3. Direct gene transfer into mouse muscle in vivo. J. A. Wolff et al., *Science* 23, 247, 1465-8, 1990.
4. Induction of virus-specific cytotoxic T lymphocytes in vivo by liposome-entrapped mRNA. F Martinon et al., *Eur J Immunol* 23(7):1719-22, 1993.
5. Characterization of a Messenger RNA Polynucleotide Vaccine Vector. Robert M. Conry et al., *Cancer Res* 55: 1397–1400, 1995.