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## **eTheRNA Launches an International Consortium and Starts Development of Cross-strain Protective CoV-2 mRNA Vaccine for High Risk Populations**

### **Niel (Belgium)**

eTheRNA immunotherapies NV (Niel, Belgium) announces that a consortium has been formed with North American and European partners to develop a novel mRNA vaccine against CoV-2 and preclinical development has started. Chinese partners may be added in the consortium in due course.

Administered intranasally, the proposed vaccine is intended primarily for high risk populations such as healthcare workers and families of confirmed cases. It is also designed to be protective against future variations of the virus by targeting conserved epitopes from the whole CoV-2 genome. eTheRNA and its partners EpiVax, Nexelis, REPROCELL and CEV\* have extensive experience in the mRNA vaccine field and this will help accelerate progress towards clinical trials with patient enrolment expected in early 2021.

Steven Powell, eTheRNA's CEO, explained the aims of the consortium: "Viral variation means traditional medicinal and preventive vaccine approaches may fall short when confronted with seasonal or outbreak situations. A vaccine to defend against current and future outbreaks of coronavirus and other respiratory viral pathogens should be robust against viral genome changes, provide a platform that enables rapid introduction of a new viral target, be easy and safe to administer and be scalable and suitable for stockpiling. The innovative vaccine program we have started with our partners incorporates all of these essential features."

Traditional vaccines are based on generating an antibody response to outer surface viral protein targets. However, viral variation may greatly reduce the effectiveness of this approach. For example, the SARS-CoV-2 outer surface spike protein (S) is less than 40% homologous to SARS-CoV-1. Furthermore, it has also been reported in several cases that vaccines with suboptimal antibody response (too low or not neutralizing) have facilitated viral entry and been linked to disease enhancement.

The eTheRNA consortium's approach selects conserved epitopes from the whole viral genome. Creating a vaccine that mounts a strong cellular (T cell) based response against these epitopes offers a better chance to overcome viral variability. Intranasal delivery has been chosen since the mucosa of the upper respiratory tract are the immune system's primary line of defense. A strong nasal T cell effector and memory response is claimed to fight viral replication, colonization of the lung and thus disease. mRNA has also been demonstrated to induce strong T cell responses by intranasal delivery.

The development programme has been initiated and is focused on a vaccine candidate that integrates 3 different technologies:

- eTheRNA's proprietary Trimix technology: an mRNA-based vaccine adjuvant that stimulates dendritic cells into activating a strong CD4 and CD8 T cell response.
- A combination of T cell epitopes from the virus brought together on a single mRNA construct. For SARS-CoV-2 this will employ an in-silico epitope prediction and design approach from EpiVax Inc. to identify the target.
- An intranasal vaccine delivery platform using a nasal atomizer and a proprietary formulation that delivers the mRNA to the nasal mucosa and optimizes expression. One of the most promising formulation candidates is being repurposed for clinical use in collaboration with REPROCELL.

"While valuable initiatives and strong support are being deployed into the development of medicinal and vaccine solutions for immediate use against SARS-CoV-2, it is also important that development of solutions for the longer

term should also start as soon as possible,” concluded Powell. “Our target is to bring this into clinical testing in early 2021.”

#### About eTheRNA Immunotherapies NV

eTheRNA immunotherapies NV is developing immunotherapy and vaccine products for the treatment of cancer and infectious disease from its multiple RNA, formulation and manufacturing technology platforms. The company is headquartered in Belgium and was established in 2013 and its founding shareholders include Progress Pharma and VUB. eTheRNA is supported by an international group of specialised investors; BNP Fortis Private Equity, Boehringer Ingelheim Venture Funds, Everjoy Fortune PTE. LTD, Grand Decade Development Limited, Fund+, LSP, Novalis Lifesciences, Omega Funds, PMV and Ying Zhou Enterprise Management Company Limited who share the Company’s ambition to build a world-leading company in the RNA field. To date, the Company has raised €63 million of venture funding. Further details relating to eTheRNA’s R&D pipeline can be found at <https://www.etherna.be/immunotherapies-rd-pipeline/>.

#### About TriMix

The TriMix platform, on which eTheRNA’s immunotherapies are based, comprises three mRNAs encoding proteins (caTLR4, CD40L and CD70) that work to deliver optimal activation of dendritic cells. These cells behave as immune response mediators and mobilize the immune system to attack cancer cells through inducing a T-cell response. Clinical proof of concept for TriMix-based immunotherapies has been established through an extensive dataset demonstrating clinical benefits in advanced melanoma patients.

#### About EpiVax

EpiVax is a 21-year old privately held biotechnology company located in Providence, Rhode Island. Scientists at EpiVax, led by co-founders Annie De Groot, MD and Bill Martin, lead in the fields of immunogenicity risk assessment and computational vaccinology with expertise in T cell epitope prediction, immune modulation, and rapid vaccine design. EpiVax’s broad portfolio of projects includes vaccines and immunotherapies for infectious diseases, autoimmunity and cancer. EpiVax’s proprietary in silico immunogenicity screening toolkits for therapeutics and vaccines, ISPRI and iVAX, are employed in advancing the research of a global roster of companies. Visit [www.epivax.com](http://www.epivax.com) for more information.

#### About Nexelis

With unrivaled expertise in immunology on both sides of the client/CRO relationship, and operating sites in North America (East and West Coast) and Europe, Nexelis is a leading provider of assay development and advanced laboratory testing services in the infectious diseases, metabolic diseases, and oncology fields. Our versatile team of scientists, working with our advanced technology platforms, were instrumental in the development, qualification, validation, and large-scale sample testing of assays that supported the FDA filing of almost 100 new molecular entities, including blockbuster vaccines, anti-viral drugs, and immunotherapy, gene and cell therapy products. Visit [www.nexelis.com](http://www.nexelis.com) for more information.

#### About REPROCELL

REPROCELL was established in 2003 to accelerate medical research via cutting-edge stem cell and human tissue-based technologies, including the use of novel transfection reagents and RNA-based methods for the generation of induced pluripotent stem cells. REPROCELL has further diversified its portfolio of products and services to include predictive drug discovery services in human fresh tissues, technologies for the manufacture of bioengineered human tissues, industry-leading gene editing technology and one of the largest commercial repositories of ethically sourced human tissue. Visit [www.reprocell.com](http://www.reprocell.com) for more information.

#### About CEV

The Centre for the Evaluation of Vaccination (CEV) of the University of Antwerp, headed by Prof. Pierre Van Damme, is a clinical trial centre specialized in the conduct of vaccine trials. It has performed Phase I until Phase IV clinical trials in all age groups. The CEV is internationally known for its professional and qualitative vaccine clinical trial facility and organisation and is therefore a regular partner in vaccine clinical trials, i.e. for EU funded clinical trials, for investigator-driven vaccine trials as well as for industry funded clinical trials. For more information visit <https://www.uantwerpen.be/en/research-groups/centre-for-evaluation-vaccination/>