BioNTech Starts Phase 1 Clinical Trial for Prophylactic Herpes Simplex Virus-2 Vaccine Candidate BNT163

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- *First-in-human study aims to evaluate the safety and immunogenicity of prophylactic herpes virus vaccine candidate BNT163*
- *BNT163 is the first candidate from BioNTech's infectious disease mRNA vaccine collaboration with the University of Pennsylvania to enter the clinic*
- *The program is part of BioNTech's strategy to address diseases with high unmet medical need, as no vaccine has been approved for prevention of genital lesions caused by HSV*

MAINZ, Germany, December 21, 2022 – BioNTech SE (Nasdaq: BNTX, "BioNTech" or the "Company") today announced that the first subject was dosed in a first-in-human Phase 1 clinical research study with BNT163, a herpes simplex virus (HSV) vaccine candidate for the prevention of genital lesions caused by HSV-2 and potentially HSV-1. The trial (NCT05432583) will evaluate the safety, tolerability, and immunogenicity of BNT163. The mRNA vaccine encodes three HSV-2 glycoproteins with the aim of helping to prevent HSV cellular entry and spread, as well as counteract the immunosuppressive properties of HSVs.

According to the World Health Organization ("WHO"), approximately 500 million people globally are estimated to be affected by genital infections caused by HSV-2,[1] with painful genital lesions, an increased risk for meningitis and high levels of emotional distress. Once acquired, HSV persists lifelong in the body with reoccurring symptomatic outbreaks. Moreover, HSV-2 infection increases the risk of acquiring HIV infections by approximately three-fold, and co-infections with both HIV and HSV-2 increase the likelihood of transmitting HIV to others according to the WHO.[2] No vaccine has been approved for prevention of genital lesions caused by HSV to date. Currently available HSV therapies only reduce the severity and frequency of symptoms.

BioNTech's placebo-controlled, observer blinded, dose-escalation Phase 1 trial is expected to enroll around 100 healthy volunteers aged 18 to 55 years without current or history of symptomatic genital herpes infections in the U.S. The study consists of a first dose escalation part that will focus on safety evaluations and assess the optimal dose-response in various dose levels. The second part of the trial is designed to expand the safety characterization for the selected dosing of BNT163 for a more comprehensive assessment of the impact of pre-existing immunity to HSV-1 and -2 on the safety and BNT163-induced immune responses.

"This program is part of our strategy to help address diseases with a high unmet medical need and of global health relevance by combining our new technologies such as mRNA and our expertise in immune engineering," said **Prof. Özlem Türeci, M.D., Chief Medical Officer and Co-Founder of BioNTech.** "BNT163 is based on three non-infectious mRNA-encoded HSV-2 glycoproteins. We aim to induce a broad immune response which is directed against multiple antigens of the virus and mobilizes various immune effectors to support virus neutralization and clearance."

"HSV-2 is a very challenging and life-altering disease which can only be partially prevented. My colleagues and I are proud to have contributed to the early development and preclinical testing of this exciting new mRNA vaccine candidate that may have the potential to prevent people from contracting the virus," said **Prof. Harvey M. Friedman, M.D., Professor of Infectious Diseases at the University of Pennsylvania's Perelman School of Medicine**, who conducted preclinical and discovery science work on HSV and is the University of Pennsylvania's principal investigator for the preclinical discovery and IND-enabling studies.

In 2018, Penn and BioNTech entered a research collaboration and license agreement to develop novel mRNA vaccine candidates for the prevention and treatment of various infectious diseases. Under the terms of the agreement, BioNTech can obtain an exclusive worldwide license to further develop and commercialize product candidates arising from the research collaboration. After completion of all IND-enabling studies, BNT163 is the first candidate from this collaboration to enter the clinic.

Editor's Note: The University of Pennsylvania has licensed some intellectual property related to the BNT163 vaccine candidate to BioNTech. The University of Pennsylvania receives sponsored research funding from BioNTech related to preclinical development of the BNT163 vaccine candidate. As inventors of certain intellectual property related to the BNT163 vaccine candidate, some of the scientists involved in the preclinical development of the candidate along with Penn, may receive additional financial benefits under the BioNTech license in the future.

About Herpes Simplex Virus
Herpes Simplex Virus-1 (HSV-1) and Herpes Simplex Virus-2 (HSV-2) cause two highly prevalent viral infections globally. Up to 95% of the global population are estimated to be infected by herpes with most of the infections remaining asymptomatic, but symptoms of herpes include painful blisters or ulcers that can recur over time.[3] HSV-1 is mainly transmitted by oral contact and causes lesions around the mouth but in some cases can also lead to genital infections and respective lesions. HSV-2 is a sexually transmitted disease that causes genital herpes. Both viruses are highly contagious and can also be transmitted during childbirth. Infections with HSV-2 further increase the risk of acquiring and transmitting HIV infections. As neurotropic and neuroinvasive viruses, HSV-1 and -2 persist in the body by hiding from the immune system in the cell bodies of neurons where they reside lifelong, and thus cannot be eradicated with current treatments.

About BioNTech
Biopharmaceutical New Technologies is a next generation immunotherapy company pioneering novel therapies for cancer and other serious diseases. The Company exploits a wide array of computational discovery and therapeutic drug platforms for the rapid development of novel biopharmaceuticals. Its broad portfolio of oncology product candidates includes individualized and off-the-shelf mRNA-based therapies, innovative chimeric antigen receptor T cells, bispecific immune checkpoint modulators, targeted cancer antibodies and small molecules. Based on its deep expertise in mRNA vaccine development and in-house manufacturing capabilities, BioNTech and its collaborators are developing multiple mRNA vaccine candidates for a range of infectious diseases alongside its diverse oncology pipeline. BioNTech has established a broad set of relationships with multiple global

pharmaceutical collaborators, including Genmab, Sanofi, Genentech, a member of the Roche Group, Regeneron, Genevant, Fosun Pharma, and Pfizer. For more information, please visit www.BioNTech.com.

BioNTech Forward-Looking Statements

This press release contains "forward-looking statements" of BioNTech within the meaning of the Private Securities Litigation Reform Act of 1995. These forward-looking statements may include, but may not be limited to: the collaboration and license agreement with the University of Pennsylvania; the investigational program candidate BNT163; the timing, for any data readouts of the BNT163 phase 1 trial; the registrational potential of BNT163; ability of BioNTech to further develop and commercialize a vaccine for the Herpes Simplex Virus (HSV); the ability of BioNTech's mRNA technology to demonstrate clinical efficacy outside of BioNTech's infectious disease platform; the potential safety and efficacy of our other product candidates; and BioNTech's anticipated market opportunity and size for its product candidates, the rate and degree of market acceptance of BioNTech's investigational medicines, if approved. Any forward-looking statements in this press release are based on BioNTech's current expectations and beliefs of future events and are subject to a number of risks and uncertainties that could cause actual results to differ materially and adversely from those set forth in or implied by such forward-looking statements.

For a discussion of these and other risks and uncertainties, see BioNTech's Quarterly Report as Form 6-K for the quarter ended September 30, 2022, filed with the SEC on November 7, 2022, which is available on the SEC's website at www.sec.gov. All information in this press release is as of the date of the release, and BioNTech undertakes no duty to update this information unless required by law.

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[1] https://www.who.int/news/item/01-05-2020-massive-proportion-world-population-living-with-herpes-infection

[2] https://www.nih.gov/news-events/nih-research-matters/why-genital-herpes-boosts-risk-hiv-infection

[3] Chayavichitsilp, Pamela et al. "Herpes simplex." *Pediatrics in review* 30 4 (2009): 119-29; quiz 130.