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## **First Joint InstaDeep-BioNTech research paper accepted at the NeurIPS AI conference**

- *This first research paper focuses on a novel in-silico approach to protein sequence design by combining computational biology with reinforcement learning to develop new therapeutics for infectious diseases. It has been accepted at two NeurIPS workshops, plus a special invitation to contribute in the COVID19 Symposium.*
- *This follows the recent announcement from BioNTech and InstaDeep about their strategic collaboration and the launch of a joint AI Innovation Lab to advance a portfolio of enterprise-wide digital initiatives in the areas of drug discovery and design, protein engineering, and operations*

**MAINZ, Germany and LONDON, United Kingdom, December 9th, 2020** -- [BioNTech SE](#) (Nasdaq: BNTX, “BioNTech”) and [InstaDeep Ltd](#) today announced that their first joint research [paper](#), “Designing a Prospective COVID-19 Therapeutic with Reinforcement Learning”, has been accepted at the Neural Information Processing Systems (NeurIPS) Conference, in two workshops, Machine Learning for Structural Biology (MLSB) and ML for Molecules, in addition to an invitation to the COVID-19 Symposium.

This first joint effort in the BioNTech-InstaDeep collaboration focuses on using Artificial Intelligence (AI) and reinforcement learning to discover decoy proteins with a potentially higher binding affinity, than that of the human receptor, which the virus uses to attack the cell. Such proteins would prevent the sequence of events leading to release of the viral genome and viral replication.

An alternative solution, of *de-novo* design of mini protein binders, while being very promising, may pose a risk of misfolding and adverse immune reactions. Using an AI, reinforcement learning-driven approach allows the system to propose a minimal set of mutations to increase the affinity of a native protein variant to its partner, while retaining its stability and remaining innocuous from the immune system viewpoint, as was confirmed *in-silico*. This joint paper displays the first innovative results of the collaboration.

In the [recently announced](#) long-term collaboration between BioNTech and InstaDeep for an AI innovation lab, AI and Machine Learning (ML) play a crucial role to support the discovery and development of novel immunotherapies, notably with InstaDeep's DeepChain™ platform. The strategic collaboration will focus on three core areas, one being Novel Drug Design where BioNTech is advancing a pipeline of novel mRNA-based vaccines and therapeutics. It will apply DeepChain™ to engineer new mRNA sequences for protein targets, including for its RiboMab™ and RiboCytokine™ platforms, which use messenger RNA to encode antibodies and cytokines *in-vivo*.

The multi-year collaboration expands the existing cooperation between InstaDeep and BioNTech, started in 2019. InstaDeep is headquartered in London and was recently [nominated](#) by CB Insights as one of the 100 most promising AI start-ups in the world.

#### **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, bi-specific checkpoint immuno-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, Bayer Animal Health, Genentech, a member of the Roche Group, Regeneron, Genevant, Fosun Pharma, and Pfizer. For more information, please visit [www.BioNTech.de](http://www.BioNTech.de).

#### **About InstaDeep**

Founded in 2014, InstaDeep is today an EMEA leader in decision-making AI products for the Enterprise, with headquarters in London, and offices in Paris, Tunis, Lagos, Dubai and Cape Town. With expertise in both machine intelligence research and concrete business deployments, the Company provides a competitive advantage to its partners in an AI-first world. Leveraging its extensive know-how in GPU-accelerated computing, deep learning and reinforcement learning, InstaDeep has built products, such as its novel [DeepChain™](#) protein design platform, that tackle the most complex challenges across a range of industries. InstaDeep has also developed collaborations with global leaders in the Artificial intelligence ecosystem, such as Google DeepMind, Nvidia and Intel. The Company is part of Intel's AI Builders program and was named a Preferred Deep Learning Partner by Nvidia. To learn more, please visit [www.Instadeep.com](http://www.Instadeep.com).

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