Neon Therapeutics Logo

Neon Therapeutics Announces Publication in Immunity of Novel Approach to Predict MHC Class II Cancer-Specific Neoantigens

September 5, 2019

Proprietary class II prediction tool achieved up to a 61-fold improvement in predicting MHC class II peptides compared to standard methods

Proprietary capabilities to be integrated into Neon's RECON® bioinformatics platform to predict recruitment of CD4 $^{+}$ T cells to potentially enhance tumor control and improve efficacy of immunotherapies

CAMBRIDGE, Mass., Sept. 05, 2019 (GLOBE NEWSWIRE) -- Neon Therapeutics, Inc. (Nasdaq: NTGN), a clinical-stage immuno-oncology company developing neoantigen-based therapeutics, today announced publication in the scientific journal *Immunity* of a breakthrough process for predicting which neoantigens will be presented by MHC class II molecules in the tumor microenvironment. Predicting the relevant cancer-specific antigens is a crucial precursor to developing immunotherapies that effectively train T cells to traffic to the tumor and destroy malignant cells. In the paper, titled "Defining HLA-II ligand processing and binding rules with mass spectrometry enhances cancer epitope prediction," Neon's proprietary mono-allelic profiling technology called MAPTAC™ facilitated the development of convolutional neural network-based predictors. These algorithms achieved up to a 61-fold improvement in predicting MHC class II peptides compared to publicly available tools. This MHC class II technology will be integrated into Neon's RECON bioinformatics platform and is expected to improve the efficacy of immunotherapies developed by Neon by predicting recruitment of CD4^{+} T cells, which are believed to be important in controlling tumor growth.

"The publication of this work represents an extensive research initiative to significantly improve the recruitment of CD4 $^{+}$ T cell responses. We believe this novel technology and prediction approach significantly advances the neoantigen field by setting a new benchmark for understanding the MHC class II pathway. These new insights may enable the development of improved immunotherapies, as well as therapies for other areas, including autoimmune disorders," said Richard Gaynor, M.D., Neon's President of Research and Development.

Neon will be integrating its MHC class II prediction tool into its RECON bioinformatics platform, which is powered by machine-learning neural networks and trained on proprietary MAPTAC data sets. RECON identifies, predicts and selects the most therapeutically relevant neoantigen targets associated with each patient's tumor. This information is used to design personal immunotherapies customized to each patient's unique mutational fingerprint and precision immunotherapies targeting shared cancer neoantigens.

"Until recently, neoantigen-directed therapies have been focused primarily on eliciting CD8 $^{+}$ T cell responses toward ligands presented on MHC class I molecules. It has been historically difficult to predict the antigens that will be presented through class II due to inaccurate peptide binding prediction and unsolved complexities of the class II pathway. Through the research published today in *Immunity*, we have integrated novel proteomics and genomics strategies to build a more accurate tool for defining and understanding the rules of the class II pathway, leading to algorithms that have been shown to significantly outperform currently available prediction tools," said Jennifer Abelin, Ph.D., Associate Director, Proteomics at Neon and lead author of the paper.

The findings in the *Immunity* publication demonstrate that Neon's proprietary class II prediction algorithms substantially outperform NetMHCIIpan, the current benchmark for class II prediction. Key findings in the research include the development of novel proteomic strategies that resolve over 40 MHC class II motifs and the observation that intra-tumoral MHC class II presentation is dominated by professional antigen presenting cells (APCs) rather than tumor cells. Tracking which tumor epitopes are most readily phagocytosed and presented by APCs further enhances the ability to pinpoint therapeutically relevant epitopes.

A proprietary approach powering Neon's RECON bioinformatics platform for MHC class I molecules was first described in an earlier article published in *Immunity* in 2017.

About Neon Therapeutics
Neon Therapeutics is a clinical-stage immuno-oncology company and a leader in the field of neoantigen-targeted therapies, dedicated to transforming the treatment of cancer by directing the immune system towards neoantigens. Neon is using its neoantigen platform to develop both vaccine and T cell therapies, including NEO-PV-01, a clinical-stage neoantigen vaccine for the treatment of metastatic melanoma, non-small cell lung cancer, and bladder cancer; NEO-PTC-01, a neoantigen T cell therapy for the treatment of solid tumors; and NEO-SV-01, a neoantigen vaccine for the treatment of a subset of hormone receptor-positive (HR+) breast cancer.

For more information, please visit **neontherapeutics.com**.

Forward-Looking Statements
This press release contains "forward-looking statements" of Neon Therapeutics, Inc. within the meaning of the Private Securities Litigation Reform Act of 1995. These forward-looking statements may include, but may not be limited to, express or implied statements regarding the design and potential efficacy of our therapeutic approaches; the design and efficacy of our proprietary bioinformatics platform, and our ability to improve immunotherapies. Any forward-looking statements in this press release are based on management'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. These risks and uncertainties include, but are not limited to: uncertainties related to the initiation, timing and conduct of studies and other development requirements for our product candidates; the risks related to the development. enhancement and effectiveness of our proprietary bioinformatics platform and the ability of that platform to accurately identify, predict and select the most therapeutically relevant neoantigens; the risk that any one or more of our product candidates will not be successfully developed and commercialized; the risk that the results of preclinical studies and clinical trials may not be predictive of future results in connection with future studies or trials; risks related to our ability to protect and maintain our intellectual property position; and risks related to the ability of our licensors to protect and maintain their intellectual property position. For a discussion of these and other risks and uncertainties, and other important factors, any of which could cause Neon's actual results to differ from those contained in the forward-looking statements, see the section entitled "Risk Factors" in Neon's most recent Quarterly Report on Form 10-Q, as filed with the Securities and Exchange Commission, as well as discussions of potential risks, uncertainties, and other important factors in Neon's other

filings with the Securities and Exchange Commission. All information in this press release is as of the date of the release, and Neon undertakes no duty to update this information unless required by law.

Investor Contact:
Paul Cox, Corporate Affairs and Strategy
pcox@neontherapeutics.com
617-337-4762

Media Contact:
Stephanie Simon, Ten Bridge Communications
stephanie@tenbridgecommunications.com
617-581-9333

Source: Neon Therapeutics, Inc.