Genocea Announces Publication in Cancer Discovery Highlighting the Advantages of Neoantigen Identification with the ATLAS™ Platform

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Study validates ATLAS bioassay for developing patient-specific cancer immunotherapies by including neoantigens of anti-tumor T cell responses and excluding Inhibigens™, or neoantigens of pro-tumor T cell responses

CAMBRIDGE, Mass., Jan. 28, 2021 (GLOBE NEWSWIRE) -- Genocea Biosciences, Inc. (NASDAQ: GNCA), a biopharmaceutical company developing next-generation neoantigen immunotherapies, today announced a milestone publication in *Cancer Discovery*, a journal of the American Association for Cancer Research. The paper, titled, "An empirical antigen selection method identifies neoantigens that either elicit broad anti-tumor T cell responses or drive tumor growth," builds on years of preclinical research and clinical experience. It shows that ATLAS zeroes in on tumor mutations that are either neoantigens that activate anti-tumor responses or inhibitory antigens (Inhibigens) that are targets of pro-tumor responses, in both $CD8^+$ (killer) and $CD4^+$ (helper) T cells. This breakthrough improves neoantigen immunotherapies by potentially ensuring they are targeting the right neoantigens and excluding Inhibigens.

ATLAS profiling of neoantigen-specific T cell responses in a cohort of lung cancer patients revealed three critical observations. First, many of these tumor-specific helper and killer T cells were inhibitory and shut off neighboring beneficial T cell responses. Second, none of the common features used for *in silico* predictions, currently in use for identifying neoantigens for vaccine or cell therapy targeting, accurately identify either Inhibigens or neoantigens. Third, patients have existing T cell responses to a much greater proportion of neoantigens than previously reported by others using epitope prediction algorithms.

Preclinical results demonstrate the biological relevance of Inhibigens. In the B16F10 mouse melanoma model, T cell responses to Inhibigens stifle protective anti-tumor immune responses *in vivo*. ATLAS-identified Inhibigens on their own, or more importantly, when combined in an otherwise protective vaccine formulation and administered to tumor-bearing mice, led to tumor growth that was comparable to, or in some cases surpassed, tumor growth in control animals. In contrast, when an ATLAS-identified anti-tumor neoantigen was added to the same formulation, tumor growth was either significantly delayed or completely abrogated, an effect that was durable and protected animals upon tumor re-challenge.

"To effectively treat cancer patients with neoantigen-targeted therapies, it is essential to identify the correct tumor antigens, both presented by the tumor and recognized by the immune system, against which to direct T cell responses," said Jessica Baker Flechtner, Chief Scientific Officer of Genocea. "Our research in both humans and mice has consistently shown that Inhibigens are negatively associated with responses to tumor immunotherapy and must be excluded from treatments because of their tendency to completely undermine efficacy. In this way, Genocea's ATLAS platform is proving to be an invaluable tool in identifying what does – and what does not – belong in an immunotherapy."

More evidence of the relevance of ATLAS is emerging from Genocea's GEN-009 neoantigen vaccine Phase1/2a trial evaluating its safety, immunogenicity and efficacy. The study authors found that participants immunized with GEN-009 generated broad $CD4^+$ and $CD8^+$ T cell responses to 99% of the vaccinated peptide neoantigens. Importantly, $CD8^+$ killer T cell responses were measurable directly from the blood without any requirement for specialized amplification in the laboratory – a remarkable and unprecedented result based on peer-reviewed neoantigen vaccine clinical trial publications to date.

"Our ongoing Phase 1/2a study evaluates the GEN-009 vaccine in combination with standard-of-care immunotherapy regimens," said Thomas Davis, M.D., Chief Medical Officer of Genocea. "The ability to selectively elicit a T cell response against relevant personalized targets, those presented by the tumor and recognized by the T cells, while avoiding specific suppression of immunity by Inhibigens, is a novel and fundamental concept that can drive the development of safer and more effective vaccines and cell therapies for patients. The results to date suggest that GEN-011, a personalized cell therapy targeting up to 30 neoantigens, should have broad and potent anti-tumor effects in the ongoing phase 1 TITAN™ study."

About Genocea Biosciences, Inc.
Genocea's mission is to conquer cancer by developing personalized cancer immunotherapies in multiple tumor types. Our unique ATLAS™ platform comprehensively profiles each patient's T cell responses to potential targets, or antigens, on the tumor. ATLAS enables us to optimize the neoantigens for inclusion in our immunotherapies and exclude inhibitory antigens, Inhibigens™, that can exert an immunosuppressive effect. We are advancing two ATLAS-enabled programs: GEN-009, our neoantigen vaccine and GEN-011, our neoantigen-specific cell therapy using T cells derived from peripheral blood. To learn more, please visit www.genocea.com.

Forward-Looking Statements
This press release includes forward-looking statements, including statements related to the use of ATLAS-based insights to potentially identify both the right targets and Inhibigens to advance programs. Such forward-looking statements are subject to risks and uncertainties that could cause actual results to differ materially from those expressed or implied in such statements. Genocea cautions that these forward-looking statements are subject to numerous assumptions, risks and uncertainties that change over time. Applicable risks and uncertainties include those identified under the heading "Risk Factors" included in Genocea's Annual Report on Form 10-K for the year ended December 31, 2019 and any subsequent SEC filings. These forward-looking statements speak only as of the date of this press release and Genocea assumes no duty to update forward-looking statements, except as may be required by law.

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