November 11, 2016

Genocea's Proprietary ATLAS™ Technology Identifies Unique Candidate Antigens for Potential Personalized Cancer Vaccines

- ATLAS discovers neoantigens, through functional T cell responses, which were not identified by predictive algorithms -

- Majority of antigens predicted by algorithms not biologically relevant in ATLAS assays -

- Data to be presented at 2016 SITC Annual Meeting -

CAMBRIDGE, Mass., Nov. 11, 2016 (GLOBE NEWSWIRE) -- Genocea Biosciences, Inc. (NASDAQ:GNCA), a company developing T cell-directed vaccines and immunotherapies, today presented new findings supporting the potential of ATLAS™, the Company's proprietary rapid antigen identification screening system, to identify clinically meaningful personalized neoantigens that could guide development of neoantigen vaccines. This study, conducted in collaboration with Memorial Sloan Kettering Cancer Center (MSK), analyzed neoantigens in one non-small cell lung cancer (NSCLC) patient successfully treated with pembrolizumab (KEYTRUDA®) and will be presented at the Society for Immunotherapy of Cancer's (SITC) 31st Annual Meeting & Associated Programs in National Harbor, Maryland on Saturday, November 12, 2016.

Genocea's ATLAS technology screened 103 patient-specific tumor mutations with the patient's own T cells to determine which were true neoantigens and potentially contributing to their anti-tumor immune response. Specifically, ATLAS discovered several neoantigens as biologically relevant T cell targets associated with significant cytotoxic T cell responses. Many of the neoantigens were not identified by commonly used predictive computer algorithms. Furthermore, the majority of neoantigens that were identified by those algorithms were not associated with meaningful T cell responses in ATLAS. Additionally, multiple neoantigens were identified by ATLAS that were associated with a downregulation of immune response. *(Poster #374: Genome-scale neoantigen using ATLAS™ prioritizes candidates for immunotherapy in a non-small cell lung cancer patient)*. As part of this ongoing collaboration, further analysis of multiple additional patient tumor samples will be conducted.

"These data are the first evidence that personalized neoantigens can be comprehensively identified using functional evidence of T cell responses through ATLAS," said Jessica Baker Flechtner, Ph.D., chief scientific officer at Genocea. "The differences between neoantigens identified by ATLAS and those noted by standard predictive algorithms reinforces the weaknesses of these algorithms and the potential for ATLAS to find better neoantigens. We believe that by improving antigen selection we can develop more effective cancer vaccines."

Genocea's proprietary ATLAS technology comprehensively re-creates a patient's actual T cell immune response to cancer *ex vivo*. This means ATLAS can potentially identify - not just predict - targets to which patient T cells are responding to kill a tumor. It may also allow ATLAS to distinguish between neoantigen candidates that stimulate productive T cell responses and those that are irrelevant or are associated with inhibitory responses.

"For the immune system's T cells to effectively activate tumor destruction, they must first recognize antigens that direct them to specific, impactful targets at the site of the tumor. If this system fails, disease can progress," said Timothy A. Chan, M.D., Ph.D., Vice Chair, Department of Radiation Oncology at MSK. "These findings support the hypothesis that next-generation personalized T cell immunotherapies with biologically evidenced neoantigens may improve outcomes for patients for whom current therapies are ineffective."

The collaboration between Genocea and Timothy A. Chan, M.D., Ph.D., Vice Chair, Department of Radiation Oncology, and Jedd D. Wolchok, M.D., Ph.D., Chief of Melanoma and Immunotherapeutics Service, Department of Medicine and Ludwig Center at Memorial Sloan Kettering Cancer Center, will seek to further validate these findings in ongoing studies and continue to provide a meaningfully different picture of relevant - and potentially inhibitory - antigens than traditional methods currently produce.

About ATLAS
ATLAS is a first of its kind proprietary rapid antigen identification screening system that is designed to find targets of protective T cell responses. The technology solves challenges to date associated with finding targets of T cell responses. ATLAS can examine T cell responses from large, diverse human populations, and comprehensively screen every potential

antigen from a pathogen or target indication in a rapid, high-throughput manner, taking weeks versus years to find relevant antigens. Because targets identified by ATLAS are based on actual human immune responses to all potential antigens, with no guesswork or predictions, by the time these candidates reach clinical trials there may be a greater likelihood of success in clinical development. This approach provides the ability to identify smarter targets for use in developing vaccines and immunotherapies to treat infectious disease, cancer and autoimmunity.

About Genocea
Genocea is harnessing the power of T cell immunity to develop life-changing vaccines and immunotherapies. T cells are increasingly recognized as a critical element of protective immune responses to a wide range of diseases, but traditional discovery methods have proven unable to identify the targets of such protective immunity. Using ATLAS™, its proprietary technology platform, Genocea identifies these targets to potentially enable the rapid development of medicines to address critical patient needs. Genocea's pipeline includes GEN-003, a novel T cell-enabled immunotherapy for genital herpes in Phase 2 clinical development, and earlier-stage investments in immuno-oncology. For more information, please visit the company's website at www.genocea.com.

Forward-Looking Statements
Statements herein relating to future business performance, conditions or strategies and other financial and business matters, including expectations regarding clinical developments, are forward-looking statements within the meaning of the Private Securities Litigation Reform Act. Genocea cautions that these forward-looking statements are subject to numerous assumptions, risks and uncertainties, which change over time. Factors that may cause actual results to differ materially from the results discussed in the forward-looking statements or historical experience include risks and uncertainties, including Genocea's ability to progress any product candidates in preclinical or clinical trials; the ability of ATLAS to identify promising product candidates in oncology; the scope, rate and progress of its preclinical studies and clinical trials and other research and development activities; anticipated clinical trial results; current results may not be predictive of future results; even if the data from preclinical studies or clinical trials is positive, regulatory authorities may require additional studies for approval and the product may not prove to be safe and efficacious; Genocea's ability to enter into future collaborations with industry partners and the government and the terms, timing and success of any such collaboration; risks associated with the manufacture and supply of clinical and commercial product; the cost of filing, prosecuting, defending and enforcing any patent claims and other intellectual property rights; Genocea's ability to obtain rights to technology; competition for clinical resources and patient enrollment from drug candidates in development by other companies with greater resources and visibility; the rate of cash utilized by Genocea in its business and the period for which existing cash will be able to fund such operation; Genocea's ability to obtain adequate financing in the future through product licensing, co-promotional arrangements, public or private equity or debt financing or otherwise; general business conditions; competition; business abilities and judgment of personnel; the availability of qualified personnel and other factors set forth under "Risk Factors" in Genocea's Annual Report on Form 10-K for the fiscal year ended December 31, 2015 and other filings with the Securities and Exchange Commission (the "SEC"). Further information on the factors and risks that could affect Genocea's business, financial conditions and results of operations is contained in Genocea's filings with the SEC, which are available at www.sec.gov. These forward-looking statements speak only as of the date of this press release and Genocea assumes no duty to update forward-looking statements.

For media:

Liz Bryan

Spectrum Science Communications

O: 202-955-6222

lbryan@spectrumscience.com

For investors:

Jonathan Poole

Genocea Biosciences

O: 617-876-8191

jonathan.poole@genocea.com

Primary Logo

Source: Genocea Biosciences

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