BrightPath
Biotherapeutics

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University of Tokyo and BrightPath Conclude Collaborative Research Agreement for Fully Personalized Cancer Immunotherapy

Tokyo, December 19, 2018 — The University of Tokyo and BrightPath Biotherapeutics Co., Ltd., a biopharmaceutical company, have entered into a new collaborative research agreement aimed at improving the accuracy and efficacy of algorithms for identifying highly effective neoantigens for use in fully personalized cancer immunotherapy.

Cancer is caused by genetic mutations, which allow cancer cells to continue growing uncontrollably. Focusing on the fact that gene mutations and their developments vary among individual patients, fully personalized cancer immunotherapy is intended to eliminate cancer cells by inducing strong immune responses that target patient-specific cancer mutations. The immunotherapy to be developed under this collaborative research project will use machine learning algorithms to analyze gene mutations accumulating in cancer cells to identify highly immunogenic mutations as neoantigens. Based on these results, a fully personalized vaccine to attack such neoantigens will be made and administered to each patient.

It is a challenging task to precisely identify the gene mutations unique to cancer cells. Among others, the heterogeneity in tumor tissues, which originates from the accumulation of intricately branching gene mutations in cancer cells, and the uncertainty of immunogenicity predictions constitute major factors that increase the difficulty of identifying effective neoantigens. We therefore need to develop new computational techniques to identify neoantigens based on mathematic modeling of cancer genomics data. To develop and implement algorithms for the neoantigen identification, BrightPath has decided to collaborate with a team of academics in the field of bioinformatics focused on cancer genomics and immuno-oncology at the University of Tokyo, led by Professor Satoru Miyano (Human Genome Center, the Institute of Medical Science) and Professor Seiya Imoto (Health Intelligence Center, the Institute of Medical Science).

BrightPath has already been pursuing multiple projects for fully personalized cancer immunotherapy with various academic groups. In BrightPath's research framework aimed at clinical application of neoantigen-based vaccines, this new collaborative project serves as the last piece of the puzzle to improve the accuracy of algorithms for predicting effective neoantigen targets.

*   A neoantigen is defined as a tumor antigen generated from gene mutations present in cancer cells. The human immune system recognizes antigens, and induces immune responses to eliminate pathogens and tumor cells. While the immune system does not strongly respond to the body's normal "self" antigens, a strong immune response is generated against "non-self" neoantigens since they are present only in tumor cells.

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BrightPath is a clinical stage biopharmaceutical company focused on the development of novel cancer immunotherapies to transform cancer treatment for progressive or refractory cancers that cannot be treated using conventional standard therapies. In addition to the cancer peptide vaccines currently under clinical trials in the United States, BrightPath is actively involved in developing cell therapies, immunomodulatory antibodies and new drugs targeted toward cancer-specific neoantigens.

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