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Aichi Cancer Center and NEC launch joint research on fundamental study aimed at advanced cancer immunotherapy through the fusion of AI and experimental immunology

Nagoya and Tokyo, Japan - July 6, 2020 - Aichi Cancer Center (*1) and NEC Corporation (NEC; 6701) today announced the launch of fundamental research aiming to realize the promise of advanced personalized cancer immunotherapy by improving the performance of NEC's neoantigen prediction system and developing predictive biomarkers for patient stratification through the fusion of AI and experimental immunology.

This research aims to identify suitable neoantigen for vaccine use by using the neoantigen prediction system which NEC has been working on and the screening techniques using T cells for neoantigen from Aichi Cancer Center. In addition, this research aims to develop biomarkers for patient stratification using AI based on analytical data on a tumor immune microenvironment and clinical data.

The partners will realize the promise of advanced personalized cancer immunotherapy which boosts the immune system especially in combination with immune checkpoint inhibitors (ICIs).

Background

Although the ICIs showed a certain degree of therapeutic success in cancer therapeutics, the therapeutic effect is limited to few cases. Previous studies have suggested that there is a significant correlation between tumor neoantigen load and the clinical efficacy of ICIs. Accordingly, the immunotherapy could improve the therapeutic efficacy if the brakes on the immune system are disabled, and at the same time, the immune responses to neoantigens are accelerated. The important things for realizing effective cancer immunotherapies are 1.) the selection of neoantigens that harness the immune system and 2.) the patient stratification in treatment planning for ICI therapy, cancer vaccine therapy, and their combination therapy.

The Division of Translational Oncoimmunology at the Aichi Cancer Center has been conducting translational research using patient samples in collaboration with the departments of Thoracic Surgery and Thoracic Oncology at the Aichi Cancer Center Hospital. Specifically, this division specializes in experimental immunology and focuses on analyzing the immune microenvironment and the tumor-specific immune responses of each patient.

NEC is actively working on applied research in the drug development field using AI and has developed a unique AI-based neoantigen prediction system. NEC was accepted into the Tumor neoantigEn SeLection Alliance (TESLA) consortium given the uniqueness of this system and became the first Japanese company to join TESLA, founded and managed by the Parker Institute for Cancer Immunotherapy and the Cancer Research Institute (*2).

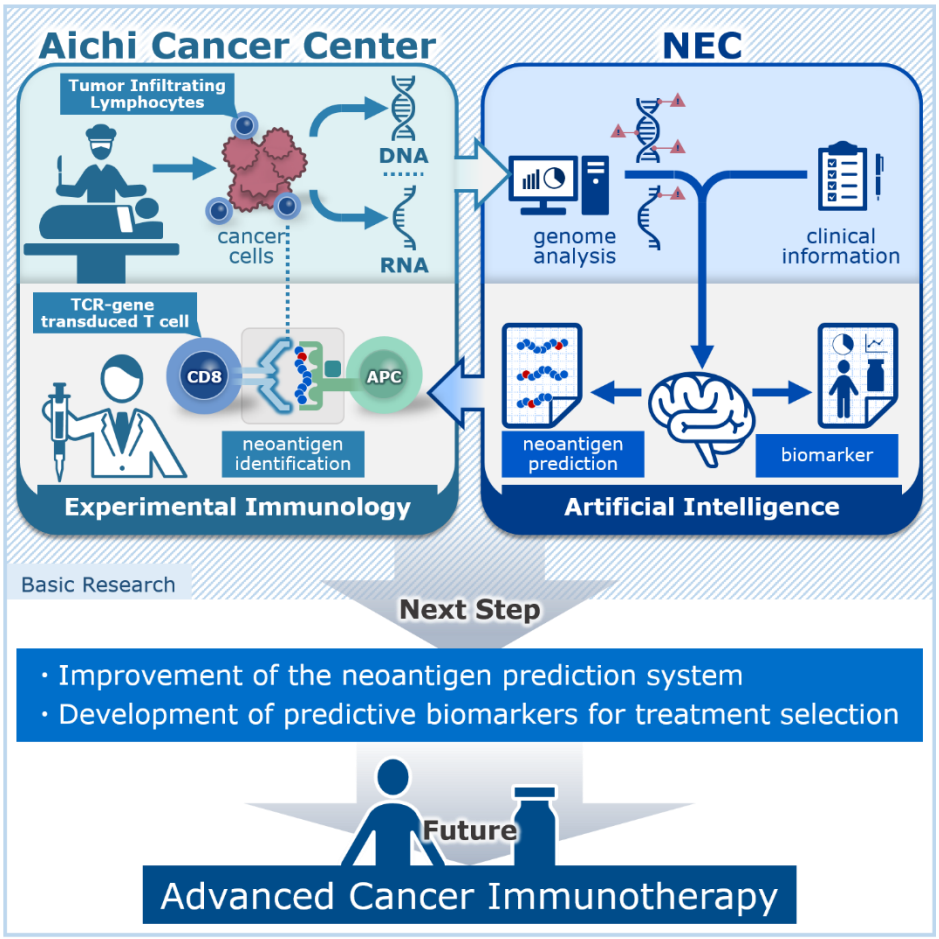
Outline of the Joint Research

1. Performance improvement of the neoantigen prediction system

Aichi Cancer Center and NEC will identify neoantigens recognized by T cells by using both the neoantigen prediction system and the immunological experimental approach. In the future, NEC will improve the performance of the neoantigen prediction system by using this high-quality data.

2. Development of biomarkers for patient stratification

Aichi Cancer Center and NEC will comprehensively analyze the tumor immune microenvironment of each patient. This research aims to develop biomarkers for patient stratification using AI based on clinical information, genetic mutation, gene expression, and experimental data obtained from experiments described above.



Outline of the Joint Research

Future Initiatives

Aichi Cancer Center will aim to carry out clinical trials of cancer immunotherapy. The clinical trials of cancer immunotherapy will be conducted at Aichi Cancer Center Hospital, and additional research will be conducted at Aichi Cancer Center Research Institute. The hospital and research institute will work together as a comprehensive cancer center.

NEC has been conducting applied research in the drug development field using AI for about 20 years. Through this joint research, NEC will accelerate its AI-driven drug development business by improving the performance of neoantigen prediction systems and developing biomarkers for patient stratification.

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・Notes

*1) Aichi Cancer Center

Designated by Japan's Minister of Health, Labour and Welfare as a hub hospital for cancer genome medical

care.
*2) NEC becomes the first Japanese company to join the TESLA consortium's fight against cancer
https://www.nec.com/en/press/201905/global_20190514_01.html

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