

Takeda and Noile-Immune Biotech Collaborate to Advance Next Generation CAR-T Cell Therapy Effective for Solid Tumors

Osaka and Tokyo, Japan, September 4, 2017

Takeda Pharmaceutical Company Limited (TSE: 4502) and Noile-Immune Biotech Inc. announced that they have entered into a collaboration to develop next generation chimeric antigen receptor T cell therapy (CAR-T). The next generation CAR-T cell therapy was developed by Professor Koji Tamada at Yamaguchi University and Noile-Immune has exclusive license for this platform technology. The CAR-T therapy produces cytokines, chemokines, and other molecules, which is expected to potentially influence or alter the tumor microenvironment of solid tumor tissues to enhance the anti-tumor effect of the therapy. The companies intend to use this technology to discover and develop new CAR-T cell immunotherapies, with the aim of treating a broad range of cancers.

The collaboration between Takeda and Noile-Immune Biotech will accelerate research and development of CAR-T cell therapy. In addition to providing resources required for implementation, Takeda will make a technology access payment to Noile-Immune Biotech and additionally Takeda will make an equity investment. Takeda will have exclusive options to obtain licensing rights for the development and commercialization of Noile-Immune's pipeline and products resulting from this partnership on pre-agreed terms. Additional terms of this agreement are not disclosed.

"This technology forms the basis for developing potentially transformational treatments for solid tumors," said Dr. Hidenobu Ishizaki, President of Noile-Immune. "The platform was developed by our founder, director, and CSMO, Professor Koji Tamada at the Department of Immunology at Yamaguchi University Graduate School of Medicine. We believe our collaboration with Takeda is a significant step towards rapidly delivering therapies that use this technology to cancer patients."

"We recognize the enormous potential of next-generation CAR-T cell therapy technology to deliver transformative medicines in oncology, one of our core therapeutic areas," said Chris Arendt, Head of the Oncology Drug Discovery Unit, Takeda. "This collaboration is another example of our commitment to invest in highly innovative technologies and to work with top external

scientific and clinical teams as we seek to deliver therapies that address the needs of patients with cancer. We are especially excited that our collaboration with the outstanding team at Noile-Immune will be located at our cutting-edge Shonan Research Center in Japan, allowing our Takeda scientists to work side-by-side with the Noile-Immune team to accelerate the advancement of innovative cellular immunotherapies to the clinic.” Takeda signed an agreement with Noile-Immune through its wholly-owned subsidiary, Millennium Pharmaceuticals, Inc.

About Noile-Immune Biotech Inc

Noile-Immune Biotech, Inc., based in Tokyo, Japan, was founded in 2015 as a biotechnology company focusing on the development of innovative cancer immunotherapy. Its next generation CAR-T cell therapy was developed by Professor Koji Tamada. Noile-Immune will accelerate execution of clinical trials through its partnerships with the National Cancer Center Japan and Yamaguchi University.

CAR-T cell therapy is a type of immunotherapy and is a gene engineering technology that uses a patient’s own immune system to attack tumor cells in addition to gene engineering technology. T cells are genetically modified to produce artificial receptors on their surface called “chimeric antigen receptors (CARs).” CARs are composed of an extracellular single-chain variable fragment (scFv) derived from an antibody, and the intracellular T cell signaling domains of the T cell receptor. CAR-T cells can specifically recognize a surface antigen on tumor cells through the scFv.

Additional information about Noile-Immune is available through its website, <https://www.noile-immune.com/en/>

About Takeda Pharmaceutical Company Limited

Takeda Pharmaceutical Company Limited ([TSE: 4502](#)) is a global, research and development-driven pharmaceutical company committed to bringing better health and a brighter future to patients by translating science into life-changing medicines. Takeda focuses its R&D efforts on oncology, gastroenterology and central nervous system therapeutic areas plus vaccines. Takeda focuses its R&D efforts on oncology, gastroenterology and central nervous system therapeutic areas plus vaccines. Takeda conducts R&D both internally and with partners to stay at the leading edge of innovation. New innovative products, especially in oncology and gastroenterology, as well as Takeda’s presence in Emerging Markets, are currently fueling the growth of Takeda. Around 30,000 Takeda employees are committed to improving quality of life

for patients, working with Takeda's partners in health care in more than 70 countries.

For more information, <https://www.takeda.com/newsroomroom>