



## Press Release

# The Institute of Medical Science, the University of Tokyo, and Astellas Enter into an Agreement for Expansion of the Scope of Collaborative Research Utilizing Rice-Based Oral Vaccine”MucoRice” Technology

Tokyo, May 11, 2016 - the Institute of Medical Science, the University of Tokyo (Tokyo, Dean: Yoshinori Murakami, “IMSUT”) and Astellas Pharma Inc. (TSE: 4503, President and CEO: Yoshihiko Hatanaka, “Astellas”) today announced that they have signed an agreement for expansion of the scope of collaborative research utilizing the rice-based oral vaccine “MucoRice” (“MucoRice”) to viral gastroenteritis diarrhea<sup>\*1</sup> including norovirus<sup>\*2</sup> infection.

MucoRice is a rice-based oral vaccine genetically expressing antigens and suppressing the endogenous rice storage protein, which was developed by Prof. Hiroshi Kiyono, Project researcher Yoshikazu Yuki and their colleagues at International Research and Development Center for Mucosal Vaccines in IMSUT.

Since 2016, IMSUT and Astellas have been engaged in the project for collaborative research on vaccines against cholera<sup>\*3</sup> and enterotoxigenic *Escherichia coli*<sup>\*4</sup> utilizing MucoRice system. MucoRice is the rice-based oral vaccine which activates the mucosal immune system in the intestine and induces a protective immunity. Thus, the scope of collaborative research will be expanded to viral gastroenteritis diarrhea<sup>\*1</sup> including norovirus<sup>\*2</sup> infection where unmet medical needs remain.

Through this collaborative research project, IMSUT and Astellas will promote research on vaccines against infectious diseases seriously affecting social life and new treatments, and attempt to develop the new drug discovery technology platform for development of innovative new drugs and hope we can address unmet medical needs.

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**\*1 Viral gastroenteritis diarrhea:** Viral gastroenteritis diarrhea is an acute diarrhea which is caused not by bacteria such as Cholera but by rotavirus and norovirus.

**\*2 Norovirus:** Norovirus is one of the viruses that can cause infectious gastroenteritis and food poisoning. The virus, which enters the body through the mouth, proliferates in the intestinal tract and causes the symptoms of retching, vomiting, diarrhea and abdominal pain. Generally, the symptoms of viral infection are mild in people not having poor health. However, small infants and elderly people with less physical strength occasionally experience exacerbation of infection or are at the risk of choking on vomit and dying.

**\*3 Cholera:**

Cholera is an acute gastroenteritis by *Vibrio cholera* which produce cholera toxin causing severe diarrhea. It is spread through contaminated food or water, therefore it is more common in developing countries.

**\*4 Enterotoxigenic *Escherichia coli*:**

Enterotoxigenic *E coli* is the *E coli* which produces a toxin that causes diarrhea and abdominal pain in humans. Severe diarrhea is caused by ingesting food or water contaminated by it. It is common in areas that lacks an adequate environmental sanitation, responsible for diarrhea in infants, and is also known to be a major cause of diarrhea in tourists who visit these areas.

**About the Institute of Medical Science, the University of Tokyo**

The Institute of Medical science, the University of Tokyo (IMSUT) was founded by Prof. Shibasaburo Kitasato in 1892 as “The Institute of Infectious Disease”. IMSUT with its own affiliated hospital is Japan's foremost university-associated research institute for medical and life science. Focusing on infectious disease, cancer and immunological diseases, our mission is to translate basic research findings directly to novel drug, vaccine and medical therapies. Thus, research environment of IMSUT is represented by the "bed to bench and bench to bed" inheriting the Kitasato's DNA of “Wisdom and Practice” for medical science leading to the next generation of Genome-based medicine, Antibody-drugs, Mucosal Vaccines, Gene-therapy and Regenerative medicine.

**About Astellas**

Astellas Pharma Inc., based in Tokyo, Japan, is a company dedicated to improving the health of people around the world through the provision of innovative and reliable pharmaceutical products. We focus on Urology, Oncology, Immunology, Nephrology and Neuroscience as prioritized therapeutic areas while advancing new therapeutic areas and discovery research leveraging new technologies/modalities. We are also creating new value by combining internal capabilities and external expertise in the medical/healthcare business. Astellas is on the forefront of healthcare change to turn innovative science into value for patients. For more information, please visit our website at [www.astellas.com/en](http://www.astellas.com/en).

**Cautionary Notes**

In this press release, statements made with respect to current plans, estimates, strategies and beliefs and other statements that are not historical facts are forward-looking statements about the future performance of Astellas. These statements are based on management's current assumptions and beliefs in light of the information currently available to it and involve known and unknown risks and uncertainties. A number of factors could cause actual results to differ materially from those discussed in the forward-looking statements. Such factors include, but are not limited to: (i) changes in general economic conditions and in laws and regulations, relating to pharmaceutical markets, (ii) currency exchange rate fluctuations, (iii) delays in new product launches, (iv) the inability of Astellas to market existing and new products effectively, (v) the inability of Astellas to continue to effectively research and develop products accepted by customers

in highly competitive markets, and (vi) infringements of Astellas' intellectual property rights by third parties.

Information about pharmaceutical products (including products currently in development) which is included in this press release is not intended to constitute an advertisement or medical advice.

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