News Release

Three Chugai Researchers Behind the Discovery of Hemlibra for Hemophilia A Receive Prestigious U.S. Lasker Award, One of the World's Most Respected Scientific Honors
- Recognized for the invention of a bispecific antibody that transformed treatment paradigm through an unconventional approach –

- Recognized for realizing a novel drug discovery concept in which a bispecific antibody replaces the function of coagulation Factor VIII, which is deficient in hemophilia A.
- Provided improved convenience through prolonged activity and subcutaneous administration, and provided a treatment option regardless of factor VIII inhibitors, thereby helping address unmet medical needs in hemophilia A.
- First time since the establishment of the Lasker Foundation in 1945 that three Japanese researchers have received the award simultaneously.

TOKYO, September 9, 2026 -- Chugai Pharmaceutical Co., Ltd. (TOKYO: 4519) today announced that Dr. Kunihiro Hattori (former Senior Fellow of Chugai), Dr. Takehisa Kitazawa (Deputy Head of Research Division, Chugai), and Dr. Tomoyuki Igawa (Head of Research Division, Chugai), who led the creation of Hemlibra (emicizumab), a treatment for hemophilia A, have been awarded the Lasker-DeBakey Clinical Medical Research Award, one of the world's most prestigious scientific honors.

Hemophilia A is caused by a deficiency of coagulation Factor VIII, one of the proteins required for normal blood clotting. When activated, Factor VIII serves as a bridge that facilitates the activation of Factor X by activated Factor IX on the surface of activated platelets. The award recognizes the unconventional concept of replacing this function of Factor VIII with a bispecific antibody, which enabled prolonged therapeutic activity, the convenience of subcutaneous administration, and sustained bleed prevention regardless of the presence or absence of Factor VIII inhibitors(antibodies), thereby making a significant contribution to addressing unmet medical needs in hemophilia A.

The Lasker Awards are among the most respected medical research awards in the United States, honoring individuals who have made significant contributions to medical science and public health. They are presented in the fields of basic medical research, clinical medical research, and public service. This marks the second time Japanese researchers have received the award in the clinical medical research category since the inception of the Lasker Awards in 1945, and the first time that three Japanese researchers have been recognized simultaneously in this category.

Emicizumab is an antibody drug created through extensive research conducted by Chugai scientists. Conventional antibody therapeutics typically exert their effects through a "subtractive" approach, inhibiting the activity of disease-related molecules or cells, or

CHUGAI PHARMACEUTICAL CO., LTD. Corporate Communications Dept.
1-1 Nihonbashi-Muromachi 2-chome, Chuo-ku, Tokyo 103-8324 Japan
Media Relations Group TEL: +81-(0)3-3273-0881 E-mail: pr@chugai-pharm.co.jp
Investor Relations Group TEL: +81-(0)3-3273-0554 E-mail: ir@chugai-pharm.co.jp

eliminating target cells through immune-mediated mechanisms. In contrast, emicizumab became the world's first antibody medicine to embody an “additive” approach, restoring a missing biological function by endowing the antibody itself with a function normally performed by a different protein*. It is also the world's first recombinant full-length IgG bispecific antibody therapeutic designed to bind two different targets. During its creation, Chugai also developed and applied its proprietary antibody engineering technology, ART-Ig, which enabled commercial-scale manufacturing.

The realization of this treatment was made possible through collaboration with Nara Medical University, which possesses extensive expertise in both basic and clinical research on hemophilia. Emicizumab was licensed out to Roche and Chugai worked together with Roche and Genentech to advance global clinical development and regulatory submissions, ultimately bringing the product to patients as Hemlibra. Following its approval in the United States in 2017 and in Japan and Europe in 2018, Hemlibra is now approved in more than 120 countries and regions worldwide**. An integrated analysis of the phase III HAVEN 1–4 studies demonstrated that, regardless of the presence or absence of factor VIII inhibitors, disease severity, or age, the primary endpoint of the annualized bleeding rate (ABR) for treated bleeds over 24-week intervals throughout the study was 1.4 events per year. Moreover, 70.8% of participants (277/391) experienced zero treated bleeds during Weeks 1–24, and this proportion increased over time to 82.4% (140/170) during Weeks 121–144. No new safety signals were identified, and the most common adverse event was injection-site reactions (27.8%).[1] In addition to providing sustained bleed prevention regardless of the presence or absence of factor VIII inhibitors, emicizumab offers a new treatment option by not inducing new factor VIII inhibitors and improving convenience through subcutaneous administration and extended dosing intervals. To date, it has been used by more than 30,000 people with hemophilia A worldwide (cumulative global total as of June 30, 2026).

*As of 2023, among approved antibody drugs, emicizumab was the first drug in which the antibody itself substitutes for the function of a different protein that is deficient or dysfunctional.

** This product was evaluated and approved based on a clinical data package that included results from clinical studies involving dosing regimens not approved in Japan. Therefore, this document may contain descriptions that differ from the approved dosage and administration in Japan.

Dr. Osamu Okuda, Chugai's President and CEO, commented, “I am truly delighted that this original concept, inspired by our desire to reduce the burden on people with hemophilia A and their families, together with the innovative drug discovery technologies that brought it to life, has been recognized through this prestigious award. Emicizumab has delivered sustained bleed prevention regardless of the presence or absence of inhibitors, disease severity, or age, while reducing treatment burden through subcutaneous administration once every one to four weeks*, thereby bringing a new everyday life to people with hemophilia A and their families. I would like to extend my heartfelt congratulations to the three researchers and express my profound respect for their

creativity, leadership, and perseverance in tackling formidable challenges, as well as for the many individuals whose dedication and contributions to research and development made this achievement possible.

“This scientific breakthrough could not have been realized as Hemlibra and delivered to people with hemophilia A around the world without the collaboration and support of healthcare professionals, including those at Nara Medical University, as well as our partners at Roche and Genentech. I would also like to express my sincere gratitude to all those who have supported this endeavor over many years.

“Looking ahead, we will continue to strengthen our proprietary technologies and scientific capabilities while promoting collaboration with diverse partners. Through these efforts, we remain committed to delivering innovative drugs and services to patients around the world.”

Summary of Award

Award	**Lasker-DeBakey Clinical Medical Research Award** For invention of a bispecific antibody that joins blood clotting Factors IX and X, restoring the deficient Factor VIII activity in hemophilia A and preventing the severe bleeding in this hereditary disorder
Laureates	Dr. Kunihiro Hattori, former Senior Fellow of Chugai Dr. Takehisa Kitazawa, Deputy Head of Research Division, Chugai Dr. Tomoyuki Igawa, Head of Research Division, Chugai
Achievement Recognized	Hemophilia A is a bleeding disorder caused by a deficiency of coagulation Factor VIII. Rather than replacing Factor VIII itself, Hattori and team pursued a novel concept of substituting its function with an antibody. They developed a bispecific antibody that bridges activated Factor IX and Factor X at the appropriate orientation and spatial position on the surface of activated platelets, leading to the creation of ACE910 (later named emicizumab). They also developed ART-Ig, a proprietary antibody-engineering technology that improves expression and purification efficiency for commercial-scale manufacturing. The significance of this work lies in its demonstration of a groundbreaking concept that redefined the capabilities of antibody therapeutics and transformed the treatment paradigm for hemophilia A. Emicizumab provides sustained bleed prevention regardless of the presence or absence of Factor VIII inhibitors (antibodies). Through the convenience of subcutaneous administration and extended dosing intervals, it has helped reduce the treatment burden for people with hemophilia A and their families.

Award Ceremony	Thursday, September 17, 2026 (EDT) Venue: The Pierre Hotel (New York, NY, USA) Program: Luncheon and acceptance remarks by laureates

Remarks from Laureates

Dr. Kunihiro Hattori:

Contribution: Originated the concept of a bispecific antibody based on expertise in blood coagulation and antibodies, and led the research project

“I am deeply honored that our collective efforts, together with many researchers and clinicians, dedicated to advancing science for society and for patients, have been recognized through this award. I believe our continuing mission is to ensure that this treatment reaches patients around the world who can benefit from it.”

Dr. Takehisa Kitazawa:

Contribution: Led pharmacology and biology research, advancing the discovery of the candidate antibody and the demonstration of factor VIII-mimetic activity

“It has been a privilege to contribute to the creation of emicizumab through collaboration with numerous healthcare professionals and fellow researchers. I would also like to extend my heartfelt gratitude to the people with hemophilia A and their families who participated in the clinical studies. I hope this recognition will inspire further innovation, and I remain committed to advancing the next generation of scientific breakthroughs.”

Dr. Tomoyuki Igawa:

Contribution: Led the design of emicizumab and the establishment of technologies for the efficient manufacturing of bispecific antibodies

“The desire to lessen the burden on patients and their families while helping them lead fuller lives has motivated us to overcome many scientific challenges. I am truly honored that the three of us have received such a prestigious award together. We will continue to pursue innovative drugs that make a meaningful difference in people’s lives through scientific excellence and creative thinking.”

(From left: Dr. Kitazawa, Dr. Hattori, and Dr. Igawa)
For biographies of the laureates, please click here.

About Hemophilia A[2,3]

Hemophilia is primarily classified into two types, hemophilia A and hemophilia B. Hemophilia A is a bleeding disorder caused by a deficiency of a protein called coagulation factor VIII (FVIII), which is essential for normal blood clotting. As a result, people with hemophilia A have difficulty forming blood clots. Hemophilia A can be either congenital, caused by an inherited genetic abnormality, or acquired, which develops later in life. Congenital hemophilia A predominantly affects males and occurs in approximately one in 5,000 male births. Occurrence in females is extremely rare because congenital hemophilia A is an X-linked recessive disorder.

Symptoms associated with bleeding in hemophilia A vary, but a characteristic feature of the disease is the frequent occurrence of internal bleeding that is not externally visible. Internal bleeding can lead to the formation of hematomas, or localized collections of blood, which may compress surrounding nerves and blood vessels, causing pain and functional impairment. Bleeding commonly occurs in joints such as the elbows, knees, and ankles, as well as in muscles, often resulting in swelling, warmth, and severe pain. In

patients with severe hemophilia A, bleeding into joints and muscles can occur even during normal daily activities. Repeated joint bleeding may lead to progressive joint damage, significantly affecting quality of life.

Since around 2000, prophylactic treatment with regular replacement of the missing factor VIII has become widely adopted. However, this approach requires intravenous infusions as frequently as once to several times per week. In addition, people with hemophilia A who developed an immune response to factor VIII, a non-self protein, resulting in the formation of factor VIII inhibitors, faced significant treatment challenges due to the limited treatment options available to them.

About the Lasker Foundation

Established in 1945 by Albert and Mary Lasker. Through its internationally renowned Lasker Awards, educational initiatives, and public advocacy, the Foundation raises awareness of the power of biomedical science to save and improve human lives. Through these efforts, the Foundation advocates for support for biomedical research, with the goal of advancing the prevention and treatment of disease and disability.
More information at laskerfoundation.org.

About the Lasker Awards

Renowned as America's preeminent biomedical research prize, 360 laureates have received Lasker Medical Research Awards since 1945. Over these years, 101 Lasker Laureates have also received the Nobel Prize, including 28 in the last two decades. The laureates are selected by an international jury chaired by Joseph L. Goldstein, who received both the Lasker Award for Basic Medical Research and the Nobel Prize in Physiology or Medicine in 1985.
More details on the Lasker Award laureates, the full citations for each award category, video interviews and photos of the awardees, and additional information on the Foundation are available at laskerfoundation.org.

Collaboration with the Department of Pediatrics, Nara Medical University

The Department of Pediatrics at Nara Medical University has long been a pioneer in hemophilia care in Japan and has advanced both basic and clinical research in the field over many years.

Since 2003, Chugai has conducted collaborative research with the university. This collaboration has generated numerous achievements, including the establishment of coagulation assay systems for evaluating emicizumab.

In addition, the university made significant contributions to the clinical development of emicizumab, including its early clinical studies in Japan. Furthermore, during global clinical development, the network of international researchers and hemophilia specialists cultivated over many years by the Department of Pediatrics at Nara Medical University served as a major asset for Chugai as it entered a new therapeutic area.

About Chugai Pharmaceutical

Chugai Pharmaceutical Co., Ltd., headquartered in Tokyo, is a research-based pharmaceutical company with world-class drug discovery capabilities, including proprietary antibody engineering technologies. Chugai is committed to creating innovative pharmaceutical products that may satisfy unmet medical needs. Chugai is listed on the Prime Market of the Tokyo Stock Exchange. While maintaining autonomy and management independence, Chugai is an important member of the Roche Group. Additional information is available at https://www.chugai-pharm.co.jp/english/.

Excerpt from the electronic package insert information *Relevant sections only

4. Indications

- For routine prophylaxis to prevent or reduce the frequency of bleeding episodes in patients with congenital hemophilia A (congenital factor VIII deficiency).

6. Dosage and Administration

<For routine prophylaxis to prevent or reduce the frequency of bleeding episodes in patients with congenital hemophilia A (congenital factor VIII deficiency)>

- Administer emicizumab (genetically engineered) by subcutaneous injection at a dose of 3 mg/kg once weekly for the first 4 weeks. One week after the fourth dose (Week 5 from the initial dose), administer one of the following maintenance regimens by subcutaneous injection:
- 1.5 mg/kg once every week
- 3 mg/kg once every two weeks
- 6 mg/kg once every four weeks

Sources:

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2. Japanese Society on Thrombosis and Hemostasis (JSTH), Clinical Practice Guidelines https://www.jsth.org/wordpress/guideline/index.html (in Japanese only, accessed September 2026)
3. Information Center for Specific Pediatric Chronic Diseases, 40. Hemophilia A https://www.shouman.jp/disease/details/09_21_040/ (in Japanese only, accessed September 2026)

Additional Information:

- Lasker Foundation https://laskerfoundation.org/
- Papers released alongside the Lasker Award announcement
  1. JAMA: https://jamanetwork.com/
  2. Proceedings of the National Academy of Sciences of the United Stated of America: https://www.pnas.org/
  3. The New England Journal of Medicine: https://www.nejm.org/
- Key publications and review articles on Emicizumab drug discovery
  1. Takehisa Kitazawa, et al. Nature Medicine. 2012;18.(10);1570-1574. A bispecific antibody to factors IXa and X restores factor VIII hemostatic activity in a hemophilia A model. https://www.nature.com/articles/nm.2942
  2. Zenjiro Sampei, et al. PLoS One. 2013;8(2);e57479. Identification and multidimensional optimization of an asymmetric bispecific IgG antibody mimicking the function of factor VIII cofactor activity. https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0057479
  3. Atsushi Muto, et al. Journal of Thrombosis and Haemostasis. 2014;12(2):206-213. Anti-factor IXa/X bispecific antibody (ACE910): hemostatic potency against ongoing bleeds in a hemophilia A model and the possibility of routine supplementation. https://www.jthjournal.org/article/S1538-7836(22)03861-2/fulltext
  4. Atsushi Muto, et al. Blood. 2014;124(20):3165-3171. Anti-factor IXa/X bispecific antibody ACE910 prevents joint bleeds in a long-term primate model of acquired hemophilia A https://ashpublications.org/blood/article/124/20/3165/33262/Anti-factor-IXa-X-bispecific-antibody-ACE910
  5. Takehisa Kitazawa, et al. Thrombosis and Haemostasis. 2017; 117(7);1348-1357. Factor VIIIa-mimetic cofactor activity of a bispecific antibody to factors IX/IXa and X/Xa, emicizumab, depends on its ability to bridge the antigens

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7. Tomoyuki Igawa. Experimental Medicine, Vol. 36, No. 11, pp. 1823–1829. The Impact of Next-Generation Antibody Therapeutics: Technology Development of Bispecific Antibodies and Drug Discovery, with a Focus on Next-Generation Antibody Therapeutics for Hemophilia https://jglobal.jst.go.jp/en/detail?JGLOBAL_ID=201802264570677621 (In Japanese only)
8. Takehisa Kitazawa, Midori Shima. Int J Hemotol. 2020 Jan;111(1):20-30. Emicizumab, a humanized bispecific antibody to coagulation factors IXa and X with a factor VIIIa-cofactor activity. https://link.springer.com/article/10.1007/s12185-018-2545-9
9. Takehisa Kitazawa, et al. Successful Drug Discovery vol 5. 2020. Discovery and Development of Emicizumab (HEMLIBRA ®): A Humanized Bispecific Antibody to Coagulation Factors IXa and X with a Factor VIII Cofactor Activity https://onlinelibrary.wiley.com/doi/abs/10.1002/9783527826872.ch7
10. Takehisa Kitazawa, Kunihiro Hattori. Experimental Medicine, April 2021, Vol. 39, No. 6, pp. 971–975. Emicizumab Born from a Bold Idea: An Antibody that Replaces Blood Coagulation Factor Function https://www.yodosha.co.jp/jikkenigaku/series.html?type=zokusouyaku (In Japanese only)

- Biographies of the Laureates https://www.chugai-pharm.co.jp/english/media/conference/files/20260909_eMaterial2.pdf
- Message from the President and CEO https://www.chugai-pharm.co.jp/english/media/conference/files/20260909_eMaterial3.pdf
- About Hemophilia A https://www.chugai-pharm.co.jp/english/media/conference/files/20260909_eMaterial4.pdf

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