



2018 FNIH Lurie Prize in Biomedical Sciences Winner Discovered How DNA Stimulates Immune Response

Prize bestowed to Dr. Zhijian “James” Chen for discovery of the cGAS enzyme and its DNA-sensing pathway and their impact on immune defense and autoimmune disease

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BETHESDA, MD, April 3, 2018 – The Foundation for the National Institutes of Health (FNIH) is delighted to recognize Zhijian “James” Chen, Ph.D., with the 2018 [Lurie Prize in Biomedical Sciences](#) for discovery of the enzyme cyclic GMP-AMP synthase (cGAS) and its corresponding pathway, which solved a century-old mystery about DNA. Long before DNA was known to be a genetic material, scientists knew that it could activate the body’s immune system to fight infections. However, they did not understand the cellular process that occurred to trigger this response until Dr. Chen’s discovery. The cGAS enzyme and its DNA-sensing pathway are the catalyst for the critical immune response that defends the body against viruses, bacteria and tumors, but surprisingly, they also can inflict autoimmune disease. Now in its sixth year, the Lurie Prize in Biomedical Sciences will be presented to Dr. Chen at the FNIH Award Ceremony hosted by CNN’s Wolf Blitzer on May 16, 2018 in Washington, D.C.

“We are proud to honor Dr. Chen with the 2018 Lurie Prize in Biomedical Sciences for the discovery of the cGAS enzyme and pathway and their unique role in immune and inflammatory response,” said Maria C. Freire, Ph.D., President and Executive Director of the FNIH. “Dr. Chen joins five other Lurie Prize winners, who are shaping the future of human health through their profound biomedical research.”

Dr. Chen is the George L. MacGregor Distinguished Chair in Biomedical Science and Professor of Molecular Biology at the University of Texas Southwestern Medical Center and an Investigator of the Howard Hughes Medical Institute. In 2012, Dr. Chen and his team discovered the cGAS enzyme and showed that it detects DNA as a danger signal to stimulate immune and inflammatory responses through an elaborate cellular process. Using elegant biochemistry, Dr. Chen revealed that the cGAS enzyme finds and binds itself to a virus’s DNA after it enters a cell’s cytoplasm. The enzyme then becomes activated and creates a small molecule called cyclic GMP-AMP (cGAMP) that instructs the immune system to fight the virus. This process enables the body to not only attack viruses such as the Herpes virus and HIV, but also other pathogens that harbor DNA, including those that can cause diseases

such as tuberculosis and malaria. Dr. Chen also uncovered that if the cGas enzyme binds itself to the individual's DNA and the pathway becomes hyperactive, it can trigger autoimmune diseases, such as lupus and rheumatoid arthritis. Therapies that target this pathway could lead to treatments or prevention of autoimmune diseases, infectious diseases and even some cancers.

The Lurie Prize in Biomedical Sciences recognizes outstanding achievement by a promising scientist aged 52 or younger. The prize includes a \$100,000 honorarium, which is made possible by a donation to the FNIH by philanthropist Ann Lurie, who serves as President of the Ann and Robert H. Lurie Foundation and the President of Lurie Holdings, Inc.

"We are pleased to recognize Dr. Chen with this year's Lurie Prize in Biomedical Science for his formative research and its effects on a wide-range of areas, from autoimmune disease to cancer," said Ms. Lurie. "Through the Lurie Prize, each year we strive to empower young biomedical researchers so that they can continue advancing discoveries that can improve the quality of people's lives. This, in turn, we hope will inspire young students to participate in STEM so that some of them may one day be the next generation of Lurie Prize recipients."

Dr. Chen earned a Ph.D. from State University of New York at Buffalo and completed undergraduate work in Biology at Fujian Normal University in Fujian, China. He is a Member of the National Academy of Sciences.

"I am so honored and humbled to join the ranks of previous Lurie Prize winners. I am very grateful to the recognition and support of Ms. Lurie, the Foundation for the NIH and the distinguished jury who selected me for this tremendous honor," said Dr. Chen. "This honor belongs to a team of talented and dedicated scientists and students in my lab, who have worked hard to make original discoveries. The Lurie Prize is special in that it has the implicit expectation for the recipients, who are in their mid-careers, to continue to make new discoveries. This is most encouraging and empowering."

Dr. Chen was selected by a jury of six distinguished biomedical researchers, chaired by Solomon H. Snyder, M.D., Distinguished Service Professor of Neuroscience, Pharmacology & Psychiatry, The Solomon H. Snyder Department of Neuroscience at Johns Hopkins University and Vice Chairman for Science of the FNIH.

Previous winners of the Lurie Prize in Biomedical Sciences are David M. Sabatini, M.D., Ph.D., from the Whitehead Institute for Biomedical Research and the Massachusetts Institute of Technology (2017), Jeannie T. Lee, M.D., Ph.D., from Massachusetts General Hospital and Harvard Medical School (2016), Karl Deisseroth, M.D., Ph.D., from Stanford University (2015), Jennifer Doudna, Ph.D., from the University of California, Berkeley (2014) and Ruslan M. Medzhitov, Ph.D., from Yale University School of Medicine (2013).

The FNIH is grateful to Pfizer for being a Visionary Sponsor of the 2018 FNIH Award Ceremony. For more information about the FNIH Award Ceremony and a complete list of sponsors, visit fnih.org/AwardCeremony.

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