THE GOLDEN GOOSE AWARD

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Seven COVID-19 Researchers Recognized with 2020 Golden Goose Award for Scientific Contributions with Great Societal Benefit

Researchers to be honored at December 1 virtual award ceremony

WASHINGTON, D.C. – The ninth annual Golden Goose Award ceremony on December 1, 2020 will recognize three teams of scientists whose research has greatly benefited society. Led by the American Association for the Advancement of Science (AAAS), the award committee includes a bipartisan group of Congressional supporters and several science and higher education organizations.

For its 2020 recipients, the Golden Goose Award highlights outstanding examples of researchers whose federally funded research is informing scientific responses to COVID-19, including the development of vaccines and treatments that have the potential to help tackle the global pandemic.

"By shining a spotlight on just a few of the research teams working to address the COVID-19 pandemic, we honor the collective work of thousands of scientists and engineers in the United States and around the world," said Sudip Parikh, chief executive officer at AAAS.

While the full impact of their groundbreaking research is not yet known, the 2020 Golden Goose Award recipients demonstrate how scientific advances resulting from foundational research can help respond to national and global challenges.

Representative Jim Cooper (D-TN), who initiated the idea for the Golden Goose Award, said he hopes now is a time "we can appreciate science more than ever, and hopefully boost the budgets of government-funded programs so that more scientists can do more great work to help lead our nation, our world, and our universe forward."

The 2020 Golden Goose Award winners are:

A Spike in Momentum
Kizzmekia Corbett, Barney Graham, Emmie de Wit, and Vincent Munster

Two pairs of intramural researchers at the National Institutes of Health (NIH) – Kizzmekia Corbett and Barney Graham, Emmie de Wit and Vincent Munster – have worked for several years on the development of experimental vaccines against coronaviruses including SARS and MERS. Their ongoing research well positioned them to quickly pivot to generating a vaccine candidate targeting SARS-CoV-2, the virus that causes COVID-19, soon after the viral genome

was sequenced in January by other scientists. Leveraging existing vaccine platforms and prior research on the structure of MERS-CoV, Corbett, Graham, and collaborators including Jason McLellan and his team at the University of Texas at Austin, rapidly identified and worked to better understand the SARS-CoV-2 spike protein as a promising vaccine target. Prior validation of relevant animal models by de Wit and Munster and ongoing evaluation of MERS vaccine candidates also facilitated rapid preclinical testing. Due to the collaborative work of Corbett, Graham, de Wit, Munster, and McLellan, several vaccine candidates are currently in Phase 3 clinical trials for effectiveness in preventing COVID-19 infection in humans.

A Llama Named Winter
Jason McLellan and Daniel Wrapp

Jason McLellan, a structural virologist at the University of Texas at Austin, and Daniel Wrapp, a doctoral student in McLellan's lab, worked in partnership with researchers at Ghent University to link a special antibody produced by llamas to a human antibody, creating a new antibody that can bind to the spike protein on the coronavirus that causes COVID-19 and prevent the virus from infecting human cells. In the 1990s, scientists discovered that camelids, the family of animals that includes llamas, alpacas, and camels, produce a kind of antibody known as nanobodies. That discovery helped researchers find ways to use nanobodies in the development of promising therapies to treat various diseases in humans. One way an antibody can disrupt a coronavirus is by binding to key areas on the spike protein. Because they are smaller, the nanobodies produced by camelids can attach to the spike protein in places where larger antibodies may be blocked. These nanobodies also can be linked with other antibodies, including human antibodies, to increase their effectiveness in the human immune response.

Once COVID-19 emerged, the McLellan team was well positioned to rapidly map the structure of the SARS-CoV-2 spike protein and develop a stabilized version that could be used as a COVID-19 vaccine antigen. Genetic information from this stabilized spike protein, developed in partnership with Graham's lab at NIH, has been incorporated into several of the vaccine efforts currently underway.

Using the prior research on nanobodies, the McLellan team also developed an antibody that tightly binds to a key area of the spike protein, effectively blocking it from infecting human cells. Thus, coronavirus research previously conducted on llamas – including one named Winter – has helped in the development of antibody therapies currently being investigated as potential treatments for COVID-19 patients. Federal agencies supporting this research include NIH and the Department of Energy's Argonne National Lab.

The Human Immunome: Small Moves Become a Movement
James Crowe

For decades, James Crowe and his team at the Vanderbilt Vaccine Center have worked to better understand the complexities of the human immune system, now assisting rapid progress in the fight against COVID-19. An inventory of the cells, genes, and proteins that make up our immune system – the human immunome – offers the potential to tailor immune response and better ward off illness. Advances in immunology have led to a focus on monoclonal antibodies, lab-produced proteins that can bind to substances in the body that cause disease. Crowe's lab has generated such antibodies to target viruses that include dengue, Ebola, HIV, influenza, norovirus,

respiratory syncytial virus (RSV), rotavirus, Zika virus, and now SARS-CoV-2. With blood samples from COVID-19 patients in Wuhan, China, Crowe and his team made thousands of monoclonal antibodies. After selecting the most promising ones and rapidly testing them against the virus in animal models, they sent the leading candidates for antibody tests and treatments to pharmaceutical companies. These antibody sequences have led to potential treatments now being tested in five Phase 3 clinical trials. Federal agencies supporting this research include NIH and the Defense Advanced Research Projects Agency (DARPA).

About the Golden Goose Award
The Golden Goose Award honors scientists whose federally funded work may have been considered odd or obscure when first conducted but has resulted in significant benefits to society. In 2012, a coalition of business, university and scientific organizations created the Golden Goose Award, conceived by Rep. Jim Cooper (D-TN) as a strong counterpoint to criticisms of basic research as wasteful federal spending such as the late Sen. William Proxmire's (D-WI) Golden Fleece Award. Learn more about the award, including past winners and supporters: www.goldengooseaward.org.

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For reporters only:

Media are welcome to attend the virtual award ceremony on December 1 at 4:00 pm ET. Please RSVP to media@aaas.org. The ceremony video will also be archived. Brief videos of the winners' stories are available upon request.

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