Human antibody has potential for treating Alzheimer’s disease

BY ILENE SCHNEIDER

WYNNE, Pa.—An international research team, led by scientists at the Lankenau Institute for Medical Research (LIRM), a non-profit biomedical research organization, reported that it has discovered a human antibody that shows promise as a treatment for Alzheimer’s disease (AD). The researchers, who shared their findings in the April 22, 2015, issue of The Journal of Neuroscience (“A Human Monoclonal IgG That Binds Aβ Assemblies and Diverse Amyloids Exhibits Anti-Amyloid Activities In Vitro and In Vivo”), said that “naturally occurring human IgG can recognize a conformational, amyloid-specific epitope and have potent anti-amyloid activities, providing a rationale to test their potential as antibody therapeutics for diverse neurologi- cal and other amyloid diseases.”

The research was supported by the Sharpe-Strumia Research Foundation of Bryn Mawr Hospital, the Edward N. and Della F. Thorne Memorial Foundation, NIH Grant AG1844 and Science Foundation Ireland.

Building on previous research showing that human serum contains antibodies that recognize and neutralize activity of the toxic beta-amyloid proteins implicated in AD, the researchers wanted to isolate a single human antibody that is highly specific for beta-amyloid aggregates and to determine its possible protective effects in animal models. They discovered such an antibody by studying the immune response of a healthy young volunteer.

LIRM scientist Dr. Scott Dessain has developed a method of isolating and replicating human antibodies produced by the body to fight infection in their native configurations. The objective is to customize therapy for infectious diseases in a way that circumvents resistance issues usually associated with conventional antibiotics.

Dessain and his LIRM colleagues collaborated with an international research team that included Dr. Yona Levites and Dr. Todd Golde of the University of Florida in Gainesville, Dr. Brian O’Nuallain and Dr. Dominic Walsh of Brigham and Women’s Hospital in Boston and Dr. Tomas Ondrejcak and Dr. Michael LIRM CONTINUED ON PAGE 13

‘Homing beacon’ for pathogens

UCSD research leads to tool that might help researchers to track and attack pathogenic bacteria

BY ZACK ANCHORS

SAN DIEGO—Homing beacons are regularly used to track planes, packages, animals and people, but there’s been little effort to use the devices to track bacterial pathogens. A recent study that explored using homing beacons to fight multidrug resistance suggests that may not be the case for long. Researchers at University of California, San Diego’s profit biomedical research and Skaggs School of Pharmacy and Pharmaceutical Sciences have reported preliminary success tagging bacteria with a “molecular homing beacon” that attracts preexisting antibodies to attack the harmful pathogens.

The researchers involved tell DDNews that their study potentially opens up a completely new approach to fighting multidrug resistant bacteria and infectious diseases more generally.

“This is the first essential proof of principle of an entirely novel approach to infectious UCSD CONTINUED ON PAGE 13

RESEARCH & DEVELOPMENT

ANTI-AMYLOID ANSWER?

Dr. Scott Dessain of the Lankenau Institute for Medical Research has developed a method of isolating and replicating human antibodies produced by the body to fight infection in their native configurations. This work may have important implications in the treatment of Alzheimer’s disease.

A new player in New Jersey

ATCC and ILSE announce establishment of translational microbiology center

BY KELSEY KAUSTINEN

UNION, N.J. & MANASSAS, Va.—In its inaugural partnership, the Institute for Life Science Entrepreneurship (ILSE), a non-profit translational science research integrator, accelerator and incubator, is collaborating with ATCC to establish the ATCC Center for Translational Microbiology (CTM) at ILSE. Per the terms of the multi-year, multi-million-dollar partnership, initial funding to ILSE will enable the recruitment of a 10- to 12-person scientific team and the start-up of research operations. Once the new center is established, additional funding

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**UCSD**

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Rowan of Trinity College in Dublin. The team analyzed the immune response of a healthy young person and cloned one antibody, called 3H13, that specifically bound to beta-amyloid aggregates. Not only did 3H13 prevent the formation of toxic aggregates of beta-amyloid protein in vitro, it also strongly inhibited the toxic effect of these aggregates in a mouse brain model of human AD.

One of the significant features of the study was the use of an adenovirus associated virus to express a 3H13 antibody fragment in the brains of mice prone to developing beta-amyloid deposition similar to AD. In experiments performed by Levites, the antibody was shown to reduce the load of toxic beta-amyloid in this mouse model of AD. Levites then extended the study to show that 3H13 also reduces deposition of a similar aggregated amyloid protein in a mouse model of human AD.

“The exciting study demonstrates the potential power of the human immune system to make antibodies we can use to treat diseases. After all, the human immune system has evolved to protect us, and the antibodies it makes reflect that critical role. Artificial systems for making antibodies, using rodents or single-celled organisms, have a much harder time replicating such unique and valuable molecules.”

Dr. George Prendergast, president and CEO of the Lankenhau Institute for Medical Research

in a mouse model of familial Danish dementia. These results suggest that the antibody 3H13 may have value as a potential treatment for AD and other amyloid-related diseases in humans. Until recently, antibodies have failed to show promise as a potential treatment for AD in clinical trials. However, in March 2015, Biogen released an interim analysis of data from a Phase 1b trial of aducanumab, which, like 3H13, is an antibody with high affinity for binding toxic beta-amyloid aggregates. The early analysis showed that patients with AD, aducanumab resulted in a reduction in the levels of amyloid plaques in the brain and significant slowing of cognitive and functional decline, compared to placebo.

According to Dr. George Prendergast, president and CEO of LIMR, “This exciting study demonstrates the potential power of the human immune system to make antibodies we can use to treat diseases. After all, the human immune system has evolved to protect us, and the antibodies it makes reflect that critical role. Artificial systems for making antibodies, using rodents or single-celled organisms, have a much harder time replicating such unique and valuable molecules.”

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