

Patent for Method to Dampen Immune Response

Discovery holds promise for treatment of cancer, autoimmune diseases, transplant rejection

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DENVER — National Jewish Health has been issued a US patent claiming a method to desensitize B cells by inactivating antigen receptors on their surfaces. The method, discovered by John Cambier, PhD, Chairman of the Integrated Department of Immunology at National Jewish Health, holds promise for treatment of B-cell mediated diseases, such as lymphoma and leukemia, rheumatoid arthritis, lupus and rejection of organ transplants. This therapeutic approach has the potential advantage of inactivating B cells instead of killing them as current treatments do. Therefore, this potential therapy could be more rapidly adjusted in response to the changing needs of patients.

B cells are a crucial part of the adaptive immune response, responsible for making antibodies that can neutralize and destroy pathogens. Several diseases, however, are associated with malfunction of B cells. For example, B cells can turn cancerous in diseases such as lymphoma and leukemia. In autoimmune diseases, such as rheumatoid arthritis or lupus, B cells turn against their own bodies and attack their tissues. B cells can also attack transplanted organs, which they recognize as foreign and potentially harmful.

The recently issued patent describes a method to inactivate B cells by disassembling their B-cell receptors. B cells begin producing antibodies after their B-cell receptors encounter foreign protein fragments, known as antigens. The B-cell receptor contains two distinct subunits; a receptor, which engages antigens, and a transducer, which transmits an activating signal to the interior of the cell.

About a decade ago, Dr. Cambier's laboratory, discovered that the two subunits could be separated, which disables the B cell's ability to recognize antigens and produce antibodies. In 2003, National Jewish Health received a patent (#6,503,509) for this method of B-cell desensitization. The most recent patent (#7,825,224) related to this technology claims the use of antibodies that bind to the transducer subunit of the receptor to inactivate the B cell.

Dr. Cambier's laboratory has recently developed several antibodies against one of the transducer elements, CD79 that have already yielded promising results.

"In contrast to current therapies for B-cell diseases, this method does not kill B cells, it merely inactivates them," said Dr. Cambier. "That could potentially allow for greater flexibility in using a therapy that is developed with this technology. Instead of the months to years it sometimes takes for the effects of current therapy to wane, our method could be reversed within days."

Dr. Cambier has recently received research funding from the State of Colorado and National Jewish Health through the Bioscience Discovery Evaluation Grant Program to further develop this promising technology.

"This research funding underlines our commitment to promote the translation of our scientists' research findings into therapeutic or diagnostic products that can ultimately help patients worldwide," said Emmanuel Hilaire, PhD, Manager of the Technology Transfer Office at National Jewish Health. "National Jewish is currently exploring various commercialization venues for its licensing, including the creation of a start-up company in Colorado."

National Jewish Health is known worldwide for treatment of patients with respiratory, cardiac, immune and related disorders, and for groundbreaking medical research. Founded in 1899 as a nonprofit hospital, National Jewish Health remains the only facility in the world dedicated exclusively to these disorders. Since 1998, U.S. News & World Report has ranked National Jewish the #1 respiratory hospital in the nation.

National Jewish Health is the leading respiratory hospital in the nation. Founded 121 years ago as a nonprofit hospital, National Jewish Health today is the only facility in the world dedicated exclusively to groundbreaking medical research and treatment of patients with respiratory, cardiac, immune and related disorders. Patients and families come to National

Jewish Health from around the world to receive cutting-edge, comprehensive, coordinated care. To learn more, visit the [media resources page](#).

Media Contacts

Our team is available to arrange interviews, discuss events and story ideas.

William Allstetter

303.398.1002

allstetterw@njhealth.org

Adam Dormuth

303.398.1082

dormutha@njhealth.org