

# Discovery!

continued

## FUNDAMENTAL RESEARCH BY WAYNE STATE UNIVERSITY

### IS PAVING THE WAY FOR DEVELOPMENT OF FIRST VACCINE FOR HEART DISEASES

Researchers at Wayne State University have made a fundamental discovery and, in subsequent collaboration with scientists at La Jolla Institute for Allergy and Immunology (LIAI), are one step closer to the goal of developing the world's first T Cell peptide-based vaccine for heart disease — the number one killer in the nation.

Atherosclerosis is a chronic inflammatory disease of the arterial walls, which thicken due to accumulation of fatty materials such as cholesterol and triglycerides. Blocking of arteries supplying blood to the heart is the underlying cause of many heart diseases.



Nearly 600,000 Americans die of heart disease every year. Although cholesterol is believed to be a major factor in creating the plaque that leads to heart disease, immune inflammation is another important contributor in arterial plaque buildup. The goal of the vaccine is to reduce immune-based inflammation in the arteries, leading to decreased plaque buildup.

The scientists published their findings in the December 2013 issue of *Frontiers in Immunology*, titled “Atheroprotective vaccination with MHC-II restricted peptides from ApoB-100.” These experiments show proof of concept for the development of an autoantigen-specific vaccine for reducing the amount of atherosclerotic plaques in mice. If successful, the vaccine could aid in preventing heart

disease and stop or reduce disease progression. In addition to heart disease, the vaccine could target strokes, which are also a product of plaque buildup in arteries.

The published work, performed in the laboratory of Klaus Ley, M.D., a prominent vascular biologist of LIAI, was based on the fundamental discovery made by Harley Tse, Ph.D., professor of immunology and microbiology in Wayne State’s School of Medicine, and professor in Wayne State’s Cardiovascular Research Institute, and Michael Shaw, Ph.D., adjunct assistant professor of immunology and microbiology at Wayne State. Shaw and Tse are the first to demonstrate that two T cell epitopes of the autoantigen apoB100 are deeply involved in the development of the disease.

Their novel discovery is reported in the article, "Identification of two Immunogenic T cell Epitopes of ApoB-100 and their Autoimmune Implications," published in the April – June 2014 issue (volume 2) of *Journal of Immunology and Clinical Research*.

## PRENATAL EXPOSURE CAN MAKE ALCOHOL SMELL MORE PLEASANT

Young adults exposed to high levels of alcohol before birth found the smell of it more pleasant than a control group did, according to researchers at Wayne State University. In the sample of 75 participants, higher levels of prenatal alcohol exposures were related to higher relative ratings of pleasantness for odors of alcohol beverages. This is the first published study to assess the influence of prenatal alcohol exposure on young adult responses to alcohol odors.

Exposure to alcohol in utero can lead to lifelong neurobehavioral and social problems, including a higher risk of early alcohol use and drinking-related problems. WSU's findings are consistent with the idea that positive associations to the odor of alcohol are acquired prenatally and retained into young adulthood despite many years of intervening experiences. Additional research could investigate the relationships between altered responses to alcohol odors and drinking behavior.

John H. Hannigan, Ph.D., deputy director of the Merrill Palmer Skillman Institute at WSU, and co-lead author Lisa M. Chiodo, Ph.D., of the University of Massachusetts, found that young adults with prenatal exposure to alcohol were more than twice as likely to rate alcohol odors as "pleasant" compared to those without such exposure. "Prenatal exposure may increase the likelihood of people using alcohol at younger ages and drinking more often, because the smell of alcohol is more pleasing to them," Hannigan says. The question of how prenatal exposure changes the perception of alcohol odors remains, but a larger study could examine those mechanisms, the influence of other pre- and postnatal factors, and the young adults' current drinking patterns.

The article, "Prenatal alcohol exposure selectively enhances young adult perceived pleasantness of alcohol odors," was published in the Jan. 19 issue of *Physiology & Behavior*. The article can be found at [sciencedirect.com/science/article/pii/S0031938415000335](http://sciencedirect.com/science/article/pii/S0031938415000335)

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