ASN LEADING THE FIGHT AGAINST KIDNEY DISEASE

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Press Release

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STUDY PROVIDES INSIGHTS ON IMMUNE CELLS INVOLVED IN KIDNEY DISEASE

Highlights

- New research indicates that the role of dendritic cells in kidney inflammation is more complex than previously thought. Different types of dendritic cells communicate with each other to control the magnitude of the immune response.
- The findings may lead to a better understanding of various types of kidney disease.

Irrespective of the initiating cause, kidney diseases have inflammation and immune system activation as a common underlying mechanism.

Washington, DC (December 7, 2017) — Researchers have uncovered new information on cells involved in the body's immune response following kidney injury. The findings, which appear in an upcoming issue of the *Journal of the American Society of Nephrology* (JASN), may lead to new strategies to help protect individuals' kidney health.

Dendritic cells are a type of immune cell thought to form a barrier around organs to help defend against the invasion of pathogens. Because kidney diseases have inflammation and immune system activation as a common underlying mechanism, a team led by Bernd Zinselmeyer, PhD, Sebastian Brähler, MD (Washington University School of Medicine in St. Louis), and Andrey Shaw, MD (now at Genentech) examined the function of dendritic cells and their location in the kidney.

Using new research tools, including state of the art imaging methods, the investigators discovered that the cells that form a barrier around kidneys are actually not dendritic cells, but rather other immune cells called macrophages. Dendritic cells are mainly clustered around blood vessels and are recruited into the tissue during injury.

"We found that the role of dendritic cells in kidney inflammation is more complex than previously thought with different types of dendritic cells communicating with each other to control the magnitude of the immune response," explained Dr. Dr. Brähler. "This work suggests that we need to go back and reexamine some of our previous ideas about how the kidney reacts to injury and how it keeps the immune system from spinning out of control."

After injury to the kidney, dendritic cells appeared to migrate away from the blood vessels to the area of injury. Removal of one of the types of dendritic cells (cDC2) inhibited the immune response to injury while the absence of another type (cDC1) resulted in a heightened response. “A molecular analysis of what the cells were doing, suggested that the cDC1 cell functions to control the function of the cDC2 cell, showing that these 2 cells must work together to control the immune response,” said Dr. Zinselmeyer.

The researchers noted that a better understanding of distinct immune cell subsets and their function in kidney inflammation and repair is likely to help generate new strategies that will improve the understanding and treatment of kidney disease.

Study co-authors include Sebastian Brähler, Bernd H. Zinselmeyer, Saravanan Raju, Maximilian Nitschke, Hani Suleiman, Brian T. Saunders, Michael W. Johnson, Alexander M.C. Böhner, Susanne F. Viehmann, Derek J. Theisen, Nicole M. Kretzer, Carlos G. Briseño, Konstantin Zaitsev, Olga Ornatsky, Qing Chang, Javier A. Carrero, Jeffrey B. Kopp, Maxim N. Artyomov, Christian Kurts, Kenneth M. Murphy, Jeffrey H. Miner, and Andrey S. Shaw.

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The article, entitled “Opposing Roles of Dendritic Cell Subsets in Experimental GN,” will appear online at http://jasn.asnjournals.org/ on December 7, 2017, doi: 10.1681/ASN.2017030270.

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