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Press Release

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NEW FINDINGS MAY HELP PROTECT THE KIDNEY HEALTH OF INDIVIDUALS WITH OBESITY

Highlights

- A particular receptor in kidney cells plays an important role in obesity-induced fat accumulation, dysfunction, injury, inflammation, and scarring in the kidney.
- The receptor acts through a certain signaling pathway.
- Targeting this receptor or the signaling pathway may help protect the kidneys of individuals who develop obesity.

Structural and functional changes in the kidneys develop early in the course of obesity.

Washington, DC (August 31, 2017) — A new study provides insights on the mechanisms behind the development of kidney damage due to obesity. The findings, which appear in an upcoming issue of the *Journal of the American Society of Nephrology* (JASN), point to a potential target for protecting the kidney health of individuals with obesity.

Obesity can cause structural and functional changes in the kidneys, which may help explain why individuals with obesity face an elevated risk of chronic kidney disease and its progression to kidney failure. Although multiple metabolic factors have been proposed to contribute to obesity-induced kidney problems, the underlying mechanisms are not completely understood.

To investigate, a team led by Joseph Tam, DMD, PhD and PhD student Shiran Udi, MSc (Institute for Drug Research, The Hebrew University of Jerusalem, in Israel) examined the kidney cells that are responsible for the reabsorption of nutrients, while allowing other substances of no nutritional value to be excreted in the urine. These renal proximal tubular cells (RPTCs) are especially sensitive to the accumulation of fat, or lipids, an effect called lipotoxicity. The researchers examined the potential role of endocannabinoids, lipid molecules that act on a cellular receptor (CB_1R), in RPTC lipotoxicity.

Mice that lacked expression of the receptor in RPTCs experienced significantly less obesity-induced lipid accumulation in the kidney as well as less kidney dysfunction, injury, inflammation, and scarring. Moreover, the study revealed the molecular signaling

pathway involved in mediating the CB_1R-induced kidney injury and lipotoxicity in RPTCs. Specifically, these deleterious effects associated with decreased activation of liver kinase B1 and the energy sensor AMP-activated protein kinase, as well as reduced fatty acid β-oxidation.

“This work provides a novel approach to slow the development of renal injury through chronic blockade of peripheral CB_1Rs,” said Dr. Tam. “And, it also supports strategies aimed at reducing the activity of the endocannabinoid system, specifically in the kidney, to attenuate the development of RPTC dysfunction in obesity.”

Study co-authors include Liad Hinden, PhD, Brian Earley, MSc, Adi Drori, PhD, Noa Reuveni, Rivka Hadar, MSc, Resat Cinar, PhD, and Alina Nemirovski, PhD.

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The article, entitled “Proximal Tubular Cannabinoid-1 Receptor Regulates Obesity-Induced CKD,” will appear online at http://jasn.asnjournals.org/ on August 31, 2017, doi: 10.1681/ASN.2016101085.

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