ASN LEADING THE FIGHT AGAINST KIDNEY DISEASE

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Press Release

EMBARGOED FOR RELEASE until October 13, 2016 – 5:00 PM (ET)

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FACTORS SECRETED BY GUT BACTERIA MAY HELP COMBAT KIDNEY STONES

Highlight

- Factors secreted by *Oxalobacter formigenes*, a bacterium that lives in the large intestine, can reduce urinary excretion of oxalate in mice. Such factors may therefore help prevent or treat kidney stones.

Kidney stone disease is the second most prevalent kidney disease in United States after hypertension.

Washington, DC (October 13, 2016) — Researchers have discovered that factors secreted by gut bacteria might help prevent or treat kidney stones. The findings appear in an upcoming issue of the *Journal of the American Society of Nephrology* (JASN).

Kidney stones can pose serious health problems for people and can increase their risks of developing chronic kidney disease and kidney failure. Oxalate is a small anion that can complex with calcium to form calcium oxalate kidney stones under certain conditions, and elevated urinary excretion of oxalate can be an indicator of increased risk. The intestines play a crucial role in oxalate balance, and *Oxalobacter formigenes* (*Of*) is an anaerobic bacterium that lives in the large intestine and utilizes oxalate as its exclusive energy source.

When studying this bacterium, Hatim Hassan, MD, PhD (University of Chicago) and his colleagues found that factors secreted by *Of* can stimulate oxalate transport by human intestinal cells grown in tissue culture. The team also revealed that the mechanisms of the observed stimulation involve the PKA signaling pathway and a protein transporter called SLC26A6. Importantly, *Of* factors reduced urinary oxalate excretion by >32.5% in mice by stimulating colonic oxalate secretion.

“Probiotic bacteria have several health benefits; however, the difficulties in determining intestinal bacterial bioavailability and biosafety concerns when administering live probiotics are potential problems facing current probiotics clinical applications. Developing probiotics-derived factors as novel therapeutic agents is an alternative approach that addresses such concerns,” said Dr. Hassan. “The fact that these factors retain their biological activity and can effectively reduce urinary oxalate excretion in mice

indicates their significant potential as novel therapeutic agents, and provides a compelling reason for the aggressive pursuit of their characterization, which is currently underway."

Study co-authors include Donna Arvans, BA, Yong-Chul Jung, PhD, Dionysios Antonopoulos, PhD, Jason Koval, MS, Ignacio Granja, Mohamed Bashir, PhD, Eltayeb Karrar, MD, Jayanta Roy-Chowdhury, MD, Mark Musch, PhD, John Asplin, MD, and Eugene Chang, MD.

Disclosures: John Asplin and Ignacio Granja are employed by Litholink Corporation, Laboratory Corporation of America® Holdings, Chicago, IL.

The article, entitled "*Oxalobacter formigenes*-Derived Bioactive Factors Stimulate Oxalate Transport by Intestinal Epithelial Cells," will appear online at http://jasn.asnjournals.org/ on October 13, 2016; doi: 10.1681/ASN.2016020132.

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