

# Disrupted Alpha-Ketoglutarate Homeostasis: Understanding Kidney Diseases from the View of Metabolism and Beyond

**Lijing Guo**

Institute of Nephrology, Affiliated Hospital of Guangdong Medical University, India

## Abstract

Alpha-ketoglutarate (AKG) is a key intermediate of various metabolic pathways including tricarboxylic acid (TCA) cycle, anabolic and catabolic reactions of amino acids, and collagen biosynthesis. Meanwhile, AKG also participates in multiple signaling pathways related to cellular redox regulation, epigenetic processes, and inflammation response. Emerging evidence has shown that kidney diseases like diabetic nephropathy and renal ischemia/reperfusion injury are associated with metabolic disorders. In consistence with metabolic role of AKG, further metabolomics study demonstrated a dysregulated AKG level in kidney diseases. Intriguingly, earlier studies during the years of 1980s and 1990s indicated that AKG may benefit wound healing and surgery recovery. Recently, interests on AKG are arising again due to its protective roles on healthy ageing, which may shed light on developing novel therapeutic strategies against age-related diseases including renal diseases. This review will summarize the physiological and pathological properties of AKG, as well as the underlying molecular mechanisms, with a special emphasis on kidney diseases.

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## Biography

Lijing Guo is Specialist in Nephrology. He held leadership roles in various institutions that shaped the practice of nephrology across the continent including Deputy Director of the East African Institute (EAKI), President of the African Nephrology Society (AFRAN) and the representative of East and Central Africa Region on the International Society of Nephrology Global Outreach (ISN GO).