NRF2 as a Pharmacological Target in Renal diseases

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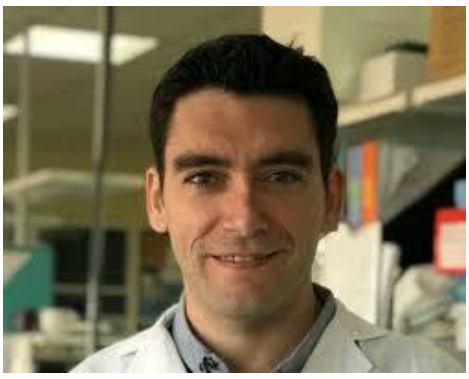
Renal disease is one of the most important public health problems due to its elevated prevalence, high mortality rates, and decreased health-related quality of life. Renal disease may be classified as chronic kidney disease (CKD) and acute kidney injury (AKI). CKD is related to a progressive loss of renal function, leading to dialysis or kidney transplantation AKI refers to a sudden decrease in renal function that may be associated to increased mortality risk. Pathologically, renal disease is related to increased oxidative stress and inflammation. However, therapies to slow or prevent renal disease progression remain an unmet need. NRF2 (nuclear factor erythroid 2-related factor 2) is a transcription factor that plays a key role in protection against oxidative stress and regulation of the inflammatory response. Consequently, the use of compounds targeting NRF2 has generated growing interest for nephrologists. Increased expression of NRF2-regulated genes has been observed in experimental models and human renal biopsies of both CKD and AKI patients. Pre-clinical and clinical studies have demonstrated that NRF2-inducing strategies prevent CKD progression. Moreover, our group has demonstrated that activation of NRF2 may be useful to protect from AKI by decreasing oxidative stress, inflammation and cell death.



Juan Antonio Moreno is a Ramon y Cajal Tenure Track Researcher at Department of Cell Biology, Physiology and Immunology, Cordoba University. He is also chief of the Group GE-06 Pathophysiology of renal and vascular damage at Instituto Maimonides de Investigación Biomédica de Córdoba (IMIBIC). Our group is unravelling novel pathogenic mechanisms involved in the development of renal and vascular diseases. We aim to understand the basis for alterations in renal and vascular wall to identify new molecules involved in the progression of these pathologies that may be used as potential diagnostic/prognosis biomarkers and to develop novel therapeutic approaches. Specifically, we are interested in certain cellular and molecular aspects (oxidation, inflammation, apoptosis, fibrosis, intracellular signalling pathways..) involved in the progression of several pathologies (atherothrombosis, diabetic nephropathy, glomerular diseases, acute kidney injury, renal fibrosis, among others). In the last years, we have evaluated the role of Nrf2 in renal diseases and we are interested in the validation of novel compounds targeting Nrf2 to decrease renal damage.