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## **Shedding a new light: The implication of microRNAs in chronic kidney disease**

**Development of disease is often related to the deregulation of a gene program controlled at the post-transcriptional level by microRNAs (miRNAs). A new review [1], published in *Nephrology Dialysis Transplantation* during this week's ERA-EDTA Congress in Copenhagen, shows that miRNAs are potential innovative biomarkers, and are promising as groundbreaking drugs. "The review of Laurent Metzinger and colleagues summarizes the current state of art of the research on miRNAs in kidney disease", explains Professor Denis Fouque, editor-in-chief of *Nephrology, Dialysis, Transplantation (NDT)*.**

This review describes how miRNAs were shown in recent years to be implicated not only in cellular and animal models of kidney disease, but also in chronic kidney disease (CKD), hemodialysis and transplant patients, as well as in acute kidney injury patients.

The working group of Metzinger et al. has already shown that miR-126 and miR-223 are implicated in CKD and are associated with vessel damage, such as vascular calcification and atherosclerosis. miR-223 is increased in vitro in vascular smooth muscle cells subjected to uremic toxins and also in vivo in aortas of a murine model of CKD [2] miR-126 and miR-223 levels have been found to be deregulated in murine and human serum in the course of experimental CKD and in human diabetic patients. [2, 3] Previously it was shown that miR-223 play a role in monocyte differentiation into osteoclast in the context of chronic kidney disease-mineral and bone disorder [4].

Nowadays miRNAs are considered to be promising biomarkers in nephrology, but larger cohorts, as well as the standardization of methods of measurement, will be needed to confirm their usefulness. It will also be of the utmost importance to select biofluids and specific tissues to make miRNAs appropriate in day-to-day clinical practice. In addition, up- or down-regulating miRNAs that were described as deregulated in kidney diseases may represent novel therapeutic ways to cure these disorders. The review outlines the most recent methods that could be used to deliver miRNAs in a specific and suitable way to the kidney and other organs damaged by kidney failure.

"The review of Laurent Metzinger and colleagues summarizes the current state of art of the research on miRNAs in kidney disease", explains Professor Denis Fouque, editor-in chief of *Nephrology, Dialysis, Transplantation* (NDT). Taken together, the findings shed new light on the molecular mechanisms involved in CKD.

- [1] Metzinger-Le Meuth et al. The expanding roles of microRNAs in kidney pathophysiology. *Nephrol Dial Transplant* 2018
- [2] Taibi F, Metzinger-Le Meuth V, M'Baya-Moutoula E, et al. Possible involvement of microRNAs in vascular damage in experimental chronic kidney disease. *Biochim Biophys Acta* 2014; 1842: 88-98
- [3] Metzinger-Le Meuth V, Burtey S, Maitrias P, et al. microRNAs in the pathophysiology of CKD-MBD: Biomarkers and innovative drugs. *Biochim Biophys Acta* 2017; 1863: 337-345
- [4] M'Baya-Moutoula E, Louvet L, Metzinger-Le Meuth V, et al. High inorganic phosphate concentration inhibits osteoclastogenesis by modulating miR-223. *Biochim Biophys Acta* 2015;1852(10 Pt A): 2202-2212

#### **About ERA-EDTA**

With more than 7,500 members, the ERA-EDTA ("European Renal Association – European Dialysis and Transplant Association") is one of the biggest nephrology associations worldwide and one of the most important and prestigious European Medical Associations. It supports basic and clinical research in the fields of clinical nephrology, dialysis, renal transplantation and related subjects. It also supports a number of studies as well as research groups and has founded a special "Fellowship Programme" for young investigators as well as grant programmes. In order to involve young nephrologists in all its activities, ERA-EDTA has created the "Young Nephrologists' Platform" (YNP), a very active committee whose board includes members who are 40 years old or younger. In addition, it has established various working groups to promote the collaboration of nephrologists with other medical disciplines (e.g. cardiology, immunology). Furthermore, a "European Renal Best Practice" (ERBP) advisory board was established by the ERA-EDTA to draw up and publish guidelines and position statements. Another important goal of the ERA-EDTA is education: The series of CME courses combined with the annual congress offer an attractive scientific programme to cover the need for continuous medical education for doctors working in the fields of nephrology, dialysis and transplantation. The association's journals, NDT (*Nephrology, Dialysis, Transplantation*) and CKJ (*Clinical Kidney Journal*), are currently the leading nephrology journals in Europe; furthermore NDT-Educational is the online educational journal of the society, with free access for all users, as well as being a very important and useful feature of the NDT-Educational "Literature Review". The ERA-EDTA Registry is a large epidemiologic database comparing countries by assessing nephrology practices throughout Europe. ENP, the European Nephrology Portal, is the latest new initiative of ERA-EDTA, where all those interested in the activities of the Society can find everything that is happening, all in one place. Finally, ERA-EDTA is a member of the European Kidney Health Alliance (EKHA), a consortium of patients, nurses and foundations relating to renal issues that actively interacts with the European Parliament. For more information, please visit [www.era-edta.org](http://www.era-edta.org)