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Indoxyl sulfate accelerates vascular smooth muscle cell calcification via microRNA-29b dependent regulation of Wnt/β-catenin signaling

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Highlights

- miR-29b was suppressed in calcified radial arteries from patients with ESRD.
- miR-29b was a negative regulator of IS induced HASMCs calcification.
- To our acknowledgement, we demonstrated firstly that miR-29b attenuated IS induced vascular calcification through repressing Wnt7b/β-catenin expression.

Abstract

Vascular calcification (VC) is a very common phenomenon in patients with chronic kidney disease(CKD) and it increases the incidence of cardiovascular disease and leads to high mortality in CKD patients. It has been reported that some microRNAs (miRs) play roles in vascular calcification as an epigenetic regulator. Indoxyl sulfate (IS) is a protein-bound uremic toxin which has been proven as one of the major risk factors of cardiovascular disease in CKD. Here we investigated whether microRNA-29b (miR-29b) is involved in IS-induced vascular calcification. We found that vascular miR-29b was down-regulated in radial arteries of patients with end-stage renal disease. Consistently, IS also decreased miR-29b expression in human aortic smooth muscle cells (HASMCs) and potentiated their calcification. MiR-29b mimics significantly suppressed, while miR-29b anti-miR markedly enhanced, IS-induced runt-related transcription factor 2 and osteopontin expression. The expression of