THE KOREAN SOCIETY OF NEPHROLOGY
APCN & KSN 2024
June 13(Thu) - 16(Sun), 2024 Coex, Seoul, Korea
APSN
Promoting Sustainable Kidney Health: The Asia-Pacific and Beyond

Abstract Submission No.: A-0133

Acetylase Sirtuin 6 Expression in Kidneys

Huiwen Ren[1], Che Bian[2], Zhilin Luan[1], Jing Gao[3]
[1]Department of Advanced Institute for Medical Sciences, Dalian Medical University, China
[2]Department of Department of Endocrinology and Metabolism, the Fourth Affiliated Hospital of China Medical University, China
[3]Department of Department of Cardiology, Xinqiao Hospital, Army Medical University (Third Military Medical University), China

Objectives : Silent information regulator 2-related enzymes (Sirtuin or SIRT) are the first discovered class III histone deacetylases. Our previous study has found that, one of its members, Sirtuin 6 is correlated with urinary albumin excretion rate in its circulating expression of type 2 diabetic patients [1]. Thus, the purpose of this study is to explore the expression of Sirtuin 6 in the kidneys.
Methods : Renal tissues from SD rats were extracted and cortex, inner and outer medulla were separated. The target protein and mRNA in renal tissues were co-located by immunofluorescence and immunohistochemistry using multiple biomarkers. Semi-quantitative analysis was performed by molecular biology experiments.
Results : Sirtuin 6 is mainly expressed in the cortical and proximal medullary nephron regions (Figure 1 and 2). The single cell sequencing in Figure 3 showed that the whole Sirtuin family expressed similar expressions in renal tissues, which may have similar physiological functions. The subcellular immunofluorescence in Figure 4 showed that Sirtuin 6 was mainly expressed in the nucleus, and partly in the cytoplasm. Moreover, there is a joint expression area with the endoplasmic reticulum that colored orange.
Conclusions : Sirtuin 6 is mainly expressed in the cortex and the proximal medullary nephron, and is mainly expressed in the nucleus, and to a certain extent in the cytoplasm, especially in the endoplasmic reticulum. These findings have important implications for further study of the renal physiological function of the Sirtuin family.

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Huiwen Ren[1*], Che Bian[2], Zhilin Luan[1], Jing Gao[3].

1 Advanced Institute for Medical Sciences, Dalian Medical University, Dalian, Liaoning, China.

2 Department of Endocrinology and Metabolism, The Fourth Affiliated Hospital of China Medical University, Shenyang, China.

3 Department of Cardiology, Xinqiao Hospital, Army Medical University (Third Military Medical University), Chongqing, China.

*: Submitting author. Email: rhwcmu@163.com

APCN & KSN 2024

Asian Pacific Congress of Nephrology 2024

In conjunction with

The 44th Annual Meeting of the Korean Society of Nephrology

June 13(Thu) - 16(Sun), 2024 Coex, Seoul, Korea

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Introduction

Silent information regulator 2-related enzymes (Sirtuin or SIRT) are the first discovered class III histone deacetylases. Our previous study has found that, one of its members, Sirtuin 6 is correlated with urinary albumin excretion rate in its circulating expression of type 2 diabetic patients [1]. Thus, the purpose of this study is to explore the expression of Sirtuin 6 in the kidneys.

Methods

Renal tissues from SD rats were extracted and cortex, inner and outer medulla were separated. The target protein and mRNA in renal tissues were co-located by immunofluorescence and immunohistochemistry using multiple biomarkers. Semi-quantitative analysis was performed by molecular biology experiments.

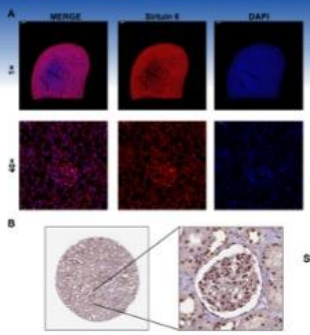

Figure 1. Localization of Sirtuin 6 in renal tissues.

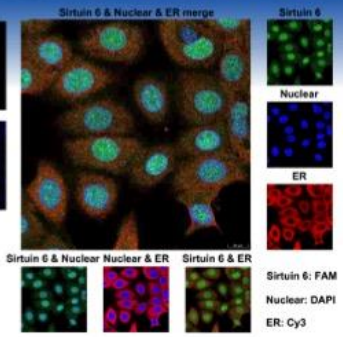

Figure 2. Sirtuin 6 expression levels in various parts of renal tissues.

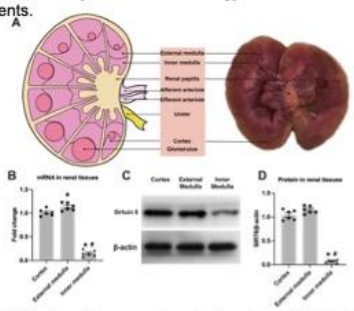

Figure 3. Single cell sequencing for the whole Sirtuin family.

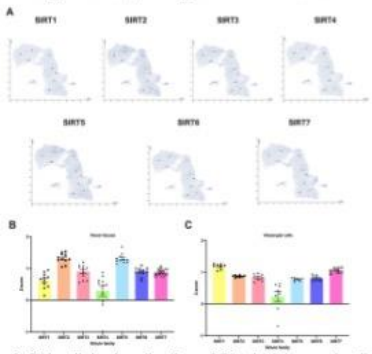

Figure 4. Subcellular localization of Sirtuin 6 in renal cells.

Results

Sirtuin 6 is mainly expressed in the cortical and proximal medullary nephron regions (Figure 1 and 2). The single cell sequencing in Figure 3 showed that the whole Sirtuin family expressed similar expressions in renal tissues, which may have similar physiological functions. The subcellular immunofluorescence in Figure 4 showed that Sirtuin 6 was mainly expressed in the nucleus, and partly in the cytoplasm. Moreover, there is a joint expression area with the endoplasmic reticulum that colored orange.

Conclusion

Sirtuin 6 is mainly expressed in the cortex and the proximal medullary nephron, and is mainly expressed in the nucleus, and to a certain extent in the cytoplasm, especially in the endoplasmic reticulum. These findings have important implications for further study of the renal physiological function of the Sirtuin family.

References

[1] Bian C, Gao J, Wang Y, et al. Association of SIRT6 circulating levels with urinary and glycometabolic markers in pre-diabetes and diabetes. Acta Diabetol. 2021;58(11):1551-1562. doi:10.1007/s00592-021-01759-x

Acknowledgement

This study was supported by the Innovation Support Plan for Young and Middle-aged People of Shenyang City (Grant No.RC210460), the Medical and Industrial Cross-Project of Natural Science Foundation of Liaoning Province (Grant No.2022-YGJC-24), the Youth Project Supported by Basic Scientific Research Fund of Human Provincial Education Department (Grant No. JYTQN202351), and the Doctoral Research Initiation Fund Project of Liaoning Province (Grant No. 2021-BS-206).