

**Abstract Submission No. : 2143**

**Ceriazirconia antioxidant nanoparticles attenuate kidney injury in Fabry disease model by enhancing autophagy flux**

**Se-Hee Yoon**<sup>1</sup>, Jong Hun An<sup>1</sup>, Min Young Cho<sup>1</sup>, Kuk Ro Yoon<sup>3</sup>, Sang-Eun Hong<sup>3</sup>, Moon Hyang Park<sup>2</sup>, Yohan Park<sup>1</sup>, Won-Min Hwang<sup>1</sup>, Sung-Ro Yun<sup>1</sup>

<sup>1</sup>Department of Internal Medicine-Nephrology, College of Medicine, Konyang University, Korea, Republic of

<sup>2</sup>Department of Pathology, College of Medicine, Konyang University, Korea, Republic of

<sup>3</sup>Department of Chemistry, Hannam University, Korea, Republic of

**Objectives:** In Fabry disease, one of the storage disease, the intracellular autophagy function is significantly reduced, which contributes to the intracellular accumulation of metabolites. Ceriazirconia antioxidant nanoparticles (CZNPs) have been reported to enhance autophagy flux. In this study, we analyzed whether CZNPs plays a role in the recovery of kidney injury in cellular and animal models of Fabry disease.

**Methods:** CZNPs were synthesized using a non-hydrolytic sol-gel reaction method. HK-2 cells and human podocytes were reverse transfected with  $\alpha$ -galactosidase A ( $\alpha$ -GLA) siRNA for cellular model for fabry disease. For *in-vivo* study 4-week-old male *B6;129-Gla<sup>tm1Kul</sup>/J* mice were treated for 8 weeks with 10mg/kg of CZNPs twice per week via intraperitoneal injection. PCR, immunoblotting, immunofluorescence assay, flow cytometry, electron microscopy analysis, biochemical and histological analysis were done.

**Results:** CZNPs effectively reduced Gb3 levels in cellular and animal model of fabry disease. CZNPs improved apoptosis in HK-2 cells and attenuated epithelial mesangial transition (EMT) in human podocytes. This effect was revealed through the improvement of the intracellular autophagy flux function and the reduction of reactive oxygen species (ROS).

**Conclusions:** These results suggest that Fabry disease might be alleviated by promoting autophagy flux using CZNPs