

## 저칼륨혈증 흰쥐에서 주세포와 사이세포 사이의 변형분화에서 자가포식현상의 역할

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### Role of Autophagy in Transdifferentiation between PCs and ICs in Potassium Treated Rat Kidney

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**Purpose** : Potassium depletion induces hypertrophy and hyperplasia of intercalated cells (ICs) and principal cells (PCs). In contrast, potassium repletion induces regression of these changes. Autophagy is a self-digesting pathway responsible for the removal of long-lived proteins and organelles by the lysosomal compartment. In mammalian cells, autophagy is an important survival mechanism and has protective functions. The purpose of this study was to examine the changes in the cellular composition, the role of autophagy behind these changes in potassium treated rat kidney.

**Methods** : Sprague-Dawley rats received  $K^+$ -depleted diets for 1, 7, and 14 days. After 2 weeks of  $K^+$ -depletion, some rats were received normal diets for 1, 3, 5, and 7 days.  $H^+$ -ATPase and AE1 were used to identify IC, and AQP2 was used to identify PC. Autophagy were identified with an antibody against LC3.

**Results** : In  $K^+$ -depletion ( $K^+$ -D), the fraction of the PCs was decreased, but the fraction of ICs was markedly increased. In  $K^+$ -repletion ( $K^+$ -R), these changes were rapidly disappeared and became the control level on  $K^+$ -R7. In  $K^+$ -D14 and  $K^+$ -R3, some cells were all negative or all positive for AQP2,  $H^+$ -ATPase, and AE1. A result of immunoblotting, LC3 protein levels were markedly increased  $K^+$ -D7 and  $K^+$ -R3 compared with the control groups. Interestingly, in  $K^+$ -D14,  $K^+$ -R1, autophagic vacuoles (AVs) were increased in PCs, but after  $K^+$ -repletion, AVs were detected mainly in ICs.

**Conclusion** : This suggests that the  $K^+$ -induced fractional change in the density of IC is associated with transdifferentiation of ICs between PCs and autophagy has important roles during these changes.

**Key Words** : 자가포식현상, 변형분화, 저칼륨혈증

Autophagy, Transdifferentiation, Hypokalemia