CHAPTER IX

CONCLUSSION

The present study was performed to investigate the role of supplemental L-ascorbic acid in the renal pathophysiology in streptozotocin-induced diabetic rats. The results showed that the supplementation of L-ascorbic acid for 16 weeks could ameliorate the renal physiology, including increased GFR and ERPF, decreased RVR. The renal pathological change was attenuated by the supplementation of AA. It could decrease the number of abnormal glomeruli, so that more number of normal glomeruli was seen. Another feature of renal pathology was seen in the STZ-induced diabetic rats supplemented with AA is the percentage of KW/BW was decreased. Futhermore, the findings, which were found in the present study, were inspected. AA supplementation is able to decrease the oxidative stress in the renal cortex. MDA, the lipid peroxidation indicator, was decreased after the AA supplementation for 16 weeks. TGF-β1, a mediator of diabetic nephropathy, was normalized by the AA supplementation at week 16. Glut 1 overexpression was seen in the diabetic rats supplemented with AA. This finding is expected that the overexpression of Glut 1 is caused by AA stimulation for AA uptake in to the cells. The opinion of the AA stimulation for the Glut 1 overexpression is supported with the present evidences of the decrease in the oxidative stress and TGF-β1. The improved renal functions and the decrease in renal pathology were confirmed that more survived renal cells were present in STZ-AA. In contrast, the diabetic rats without the AA supplementation, Glut 1 overexpression was not apparent in the chronic diabetic rats. This result corresponds with the more glomerular damage in STZ. In addition, AA could decrease hyperglycemia at week 16. The preserved pancreatic β-cell function might be assumed in STZ-AA rats. However, some beneficial effects of AA on the renal dysfunctions did not prolong to week 24. It might be other factors, which possibly affect the renal metabolic disturbance in chronic diabetes. Therefore, AA might be considered as a supplemental agent for diabetes mellitus underlying a further pharmacological study

In conclusion, the AA supplementation is capable to ameliorate the renal pathophysiology in STZ-induced diabetic rats (Figure 9-1). The mechanism of AA is possible due to the inhibition of TGF-β1 production via the decrease in oxidative stress and the up-regulation of Glut 1, which is expected to increase AA uptake by the renal cells. The proposed mechanism based on the roles of AA supplementation in the STZ-induced diabetic rats in the present study is shown in Figure 9-2.

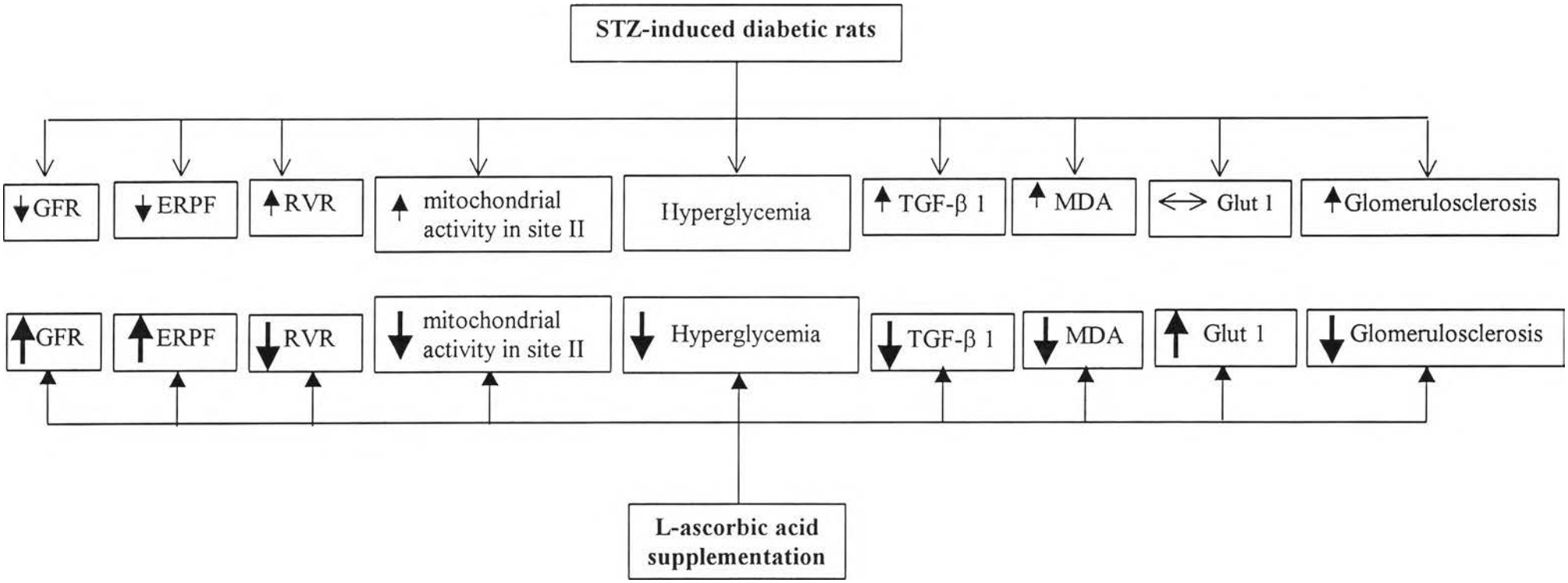

Figure 9-1 A scheme represents the effects of supplemental L-ascorbic acid on the renal pathophysiology in the chronic STZ-induced diabetic rats.

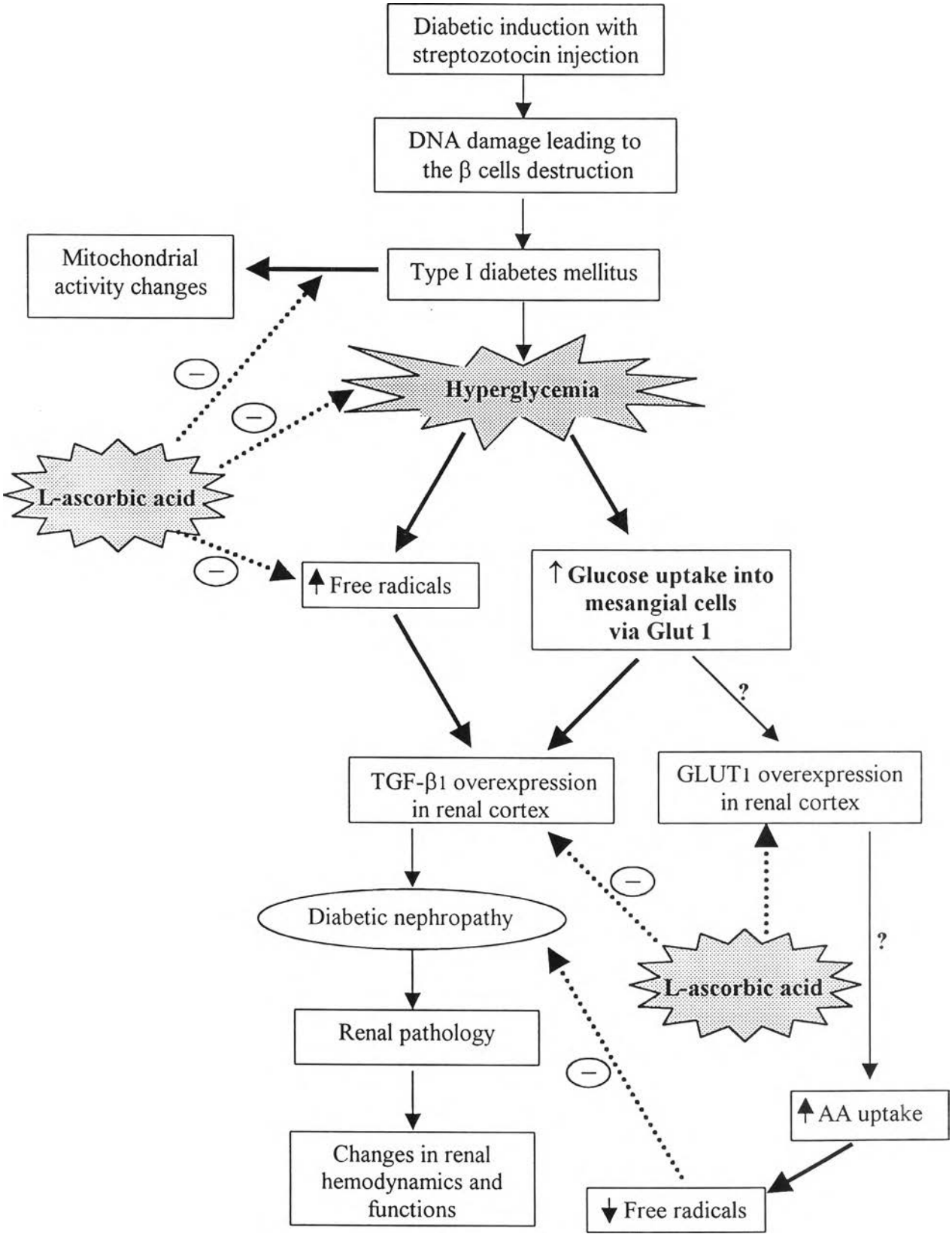

Figure 9-2 A scheme represents the proposed mechanisms of L-ascorbic acid effects on the chronic STZ-induced diabetic rats.