

Study for Gene Expression in Cultured Human Mesangial Cell by Angiotensin II Receptor Blocker Treatment

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Background : Many studies have demonstrated that angiotensin type 1 receptor blockers (ARB) prevent renal progression in patients with glomerular nephritis or diabetic nephropathy by inhibition of HMC proliferation and reduce of extracellular matrix expansion and glomerulosclerotic changes. However, the molecular effects of ARB in cultured HMC have not been completely defined. We investigated differential gene expression by ARB treatment on cultured HMC according to time sequence.

Methods : MC was grown in DMEM with 10% FBS and then ARB was treated on cultured MC. RNAs of HMC at different time points (4, 8, and 24h after ARB treatment and no treatment) were compared using a cDNA microarray technique. To validate the patterns of gene expression analyzed by the microarrays, some genes were selected and semi-quantitative RT-PCR was performed.

Results : Among 8,170 genes, 92, 34, and 66 genes were up-regulated 2-fold above and 55, 49, and 45 genes were down-regulated 2-fold below for 4, 8, and 24h after ARB treatment. We also classified the regulated genes into groups according to their changing patterns. Group 1 genes were up-regulated at 4hr and then decreased as time goes by. Group 2 genes were up-regulated 2-fold above at 8hr. Group 3 genes were down-regulated 2-fold below at 8hr. Group 4 genes were up-regulated 2-fold above at 24hr. Group 5 genes were gradually down-regulated and 2-fold below at 24hr.

Conclusion : The present study demonstrates profile of gene expression as time goes by after ARB treatment on proliferation of human MC. Gene expression by ARB treatment on cultured HMC showed sequential changes. Our results provide us much information about the molecular mechanisms of ARB treatment on HMC. Further evaluation of individual genes will be conducted to elucidate molecular mechanism.