Controlled Regulation of Erythropoietin Producing Cells for Renal Failure Induced Anemia
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Introduction

Anemia is an inevitable outcome of chronic renal failure. We have previously shown that primary cultured renal cells may be used as a potential treatment option for renal failure induced anemia (1). In this study we investigated whether production of EPO could be controlled by exposing EPO producing cells to different environmental conditions.

Materials and Methods

Renal cells from 2-3 week old rats were isolated, expanded and characterized for EPO expression. For level assessment, cells were incubated under normoxic and hypoxic (1% O$_2$) conditions for varying time periods up to 72 hours. To test the feedback mechanism, renal cells were grown in conditions either with or without media changes. All cells were collected at the end of each experiment for assessment using RT-PCR.

Results

Immunocytochemical analysis showed the expression of EPO at each subculture stage. RT-PCR analysis of renal cells exposed to hypoxia showed up-regulation of EPO gene expression over a period of 24 hours followed by a gradual decrease in the next 48 hours. However, this decrease was reversed completely when culture media was changed every 24 hours, which indicates their ability to regulate EPO production through a negative feedback mechanism. Decrease in EPO expression was also observed when cells under hypoxia were transferred to normal conditions.

Discussion and Conclusions

These results demonstrate that EPO producing renal cells possess the ability to regulate EPO expression in response to varying levels of oxygen. These findings indicate that EPO producing renal cells may be used as a treatment option for renal failure induced anemia.

References


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Disclosures

Drs. Atala and Yoo serve as consultants to Tengion, Inc.