P53, CDKN1A, STEAP3, CASP10 Gene expressions in RPTEC/TERT1, HRTPT, and HREC24T from the cell line

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Abstract

The proximal tubules, located in the kidneys, are one of the main sites of injury to kidneys. This is due to large surface area, increased blood flowrate, and high amounts of mitochondria. There are stem/progenitor cells that are involved in the regeneration of the renal tubules but the mechanisms by which these cells repair the tubules is not fully understood. To grasp a fuller understanding of how this process works we were studying the regulation of cell cycle progression during this process. Two renal progenitor cell lines were used: RPTEC/TERT1, and HREC24T. HREC24T are stem/progenitor cells that have no expression for the HRTPT cells while the significant increase in expression of these genes gives a clue to the characteristics and predicted to be differentiated cell type may have acquired senescence characteristics, therefore increased expression of these relevant markers involved in senescence and cell death process.

Results

Figure 1. Flow cytometry analysis of CD133 and CD24 expression in HREC24T and HRTPT cell populations. The cell populations were sorted based on the expression of CD133 and CD24 markers were named HRTPT or CD133+/CD24+ and the cell population HREC24T were sorted based on the expression of CD133 and CD24 marker.

Conclusion & Discussion

The results of the RT-qPCR displayed gene expression levels of P53 to have a significant increase in expression in the HREC24T cell population while there was a non-detectable level of expression in the HRTPT cell population. CDKN1A also had a significant increase in expression in the HREC24T cell population and with non-detectable expression in the HRTPT. Similarly, STEAP3 and CASP10 both showed significant increase in their expression in the HREC24T cell populations with non-detectable levels of expression in the HRTPT.

Overall, there was a significant up-regulation in the HREC24T cells and a non-detectable expression levels of these genes in the HRTPT cells. The RT-qPCR results follow the expression patterns displayed by the microarray data analysis performed by this laboratory [7]. Study on the expression on these genes gives important knowledge about the characteristics and cell types of the HRTPT and HREC24T cells. The results obtained from this study may suggest that the HREC24T behave more like differentiated cell type and might possess lower growth and cell division capability than the HRTPT cells.

References


Thanks

I would like to thank Matthew Kalonic, Peter Knutson, Swojani Shrestha, Aaron Mehus, Brent Voels, Seema Somji, Scott Garrett for the opportunity to further my knowledge of the biomedical sciences and for the guidance.

This work was supported by grants P01DK047273 from the National Center for Research Resources, and P01GM062433 and 1UL1TR000123 from the National Institute of General Medical Sciences of the National Institutes of Health, and the grant R01ES015100 from the National Institute of Environmental Health Sciences.