Poster: free communications

Characterisation of a new human renal proximal tubular cell line (RPTEC/TERT1), generated by the introduction of telomerase activity

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Telomeres are tandemly repeated hexamers at the end of mammalian chromosomes which shorten at each cell division and act as a replicative clock. Primary cells in culture eventually enter replicative senescence due critically short telomeres. It has been shown for some cell types that the introduction of human telomerase reverse transcriptase (hTERT), an enzyme which extends the telomere, can confer cells with unlimited life span. In addition, hTERT extends the life span of cultured cells far beyond normal senescence without causing neoplastic transformation. Here we carried out extensive characterisation of a human renal proximal tubular cell line (RPTEC/TERT1), immortalised by hTERT transfection.

The cells exhibit an almost normal karyotype, with 47 chromosomes compared to 58 for the HPV transformed cell line HK-2 cells. RPTEC/TERT1 show morphological properties of proximal tubular cells including cobble stone morphology, contact inhibition and the expression of numerous microvilli. They exhibit polarised transport of water and solutes and exhibit transepithelial electrical resistance similar to that of primary proximal tubular cells. The cells possess pH dependent ammonia genesis. They increase cAMP upon parathyroid hormone, but not arginine vasopressin stimulation. And they express alkaline phosphatise and gamma glutamyl transpeptidase. Interestingly these cells also appear to further differentiate over 1-2 weeks at confluence, dramatically reducing their glycolytic metabolism. In conclusion these cells offer a real alternative to primary cells for in vitro studies of the proximal tubule and may prove to be an invaluable tool for in vitro nephrotoxicity studies.

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