We studied whether hypoxia of corneal tissue increases the collagenolytic activity due to release of reactive oxygen and nitrogen species. We found no differences in the corneal tissue in the gel electrophoretic profile of collagenous proteins and gelatinolytic activity between normoxic and hypoxic rats. We did not find any sign of radical tissue injury. There were no changes in the vascularization of corneas after exposition to hypoxia. The environmental 10 % hypoxia does not induce radical tissue injury and an increase of collagenolytic activity in the rat cornea.
We studied the effect of several culture substrates and culture conditions on lens epithelial cells (LEC) proliferation and -smooth muscle actin (-SMA) expression. There was no difference in growth characteristics of primary cultures on different collagen substrates and plastic dishes. The cells growth worse on the glass. In secondary cultures, LECs adhered better to collagen-coated surfaces. The culture substrate influenced LEC proliferation and -SMA expression. The proliferation was greater when the medium was changed than when extra medium was added on the 4th day. The cells did not synthesize -, - or -crystallin. It is necessary to consider the effects of the medium exchange protocol, serum supplementation, cell density and other cell culture conditions in lens epithelial cell experiments.
Both oxidants and antioxidants have been shown to modulate cell proliferation. We studied the effects of hydrogen peroxide and two antioxidants (-tocopherol and retinol) on the rate of proliferation of LECs in culture. The effect of hydrogen peroxide was dependent on the amount of cells in an individual culture well, indicating decomposition of hydrogen peroxide by cellular enzymes. We found that hydrogen peroxide, generated by 1–50 mU. ml-1 of glucose oxidase significantly increased the rate of cell proliferation. Both antioxidants completely inhibited proliferation at concentrations of 30 mM and higher