

## **Abstract**

Vascular smooth muscle cells display a certain level of phenotype plasticity. Under specific conditions fully differentiated cells are able to undergo dedifferentiation and to restart growth and proliferation. An organ culture method is a useful technique for the analysis of dedifferentiation of vascular smooth muscle cells, because it provides an opportunity for studying the changes in cell phenotype. The aim of this study was to investigate the basic contractile characteristics in rat femoral arteries cultured for different time periods (from one to three days). In addition, the effects of fetal bovine serum (FBS), that contains various growth factors and other biological active molecules, on contractile function were studied. We also tried to attenuate cell dedifferentiation by lowering the calcium influx, because calcium is an important second messenger participating in cell growth and proliferation. To achieve this goal we used cultivation with nifedipine, a voltage-dependent calcium channel inhibitor. The cultivation without FBS slightly decreased arterial contractility, whereas the cultivation with FBS decreased arterial contractility considerably. The major change in contractility of arteries cultivated with FBS occurred approximately within 24 hours of cultivation. The cultivation with nifedipine improved the contractility of femoral arteries. Apart from a lower arterial contractility, there are also important changes in the contribution of different components of calcium-dependent arterial contraction in the course of the organ culture.