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**Fundamental study of shock induced acceleration of cell growth by
plane shock waves**

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This paper describes effects of shock waves on cells to certificate the angiogenesis by shock wave in the clinical application. Especially, the effects of plane shock waves without cavitation bubbles on the endothelial cells are investigated by experiments and computation. In the experiments, the plane shock waves using shock tube apparatus are applied to the endothelial cells. The peak pressure working on the cells in the test case is 0.4 MPa, which is under disintegration level for endothelial cells. After working shock waves on suspended cell, the disintegration and growth rate are measured. It is found that the initial growth rate of the shock-worked cells are clearly higher than that of control ones. As for the effect of rise time of working shock waves, to change the rise time of shock wave, Air and He gas are used as driver gas in the shock tube. As a result, the shorter rise time brings higher growth rate. In the computation, to check the effects of rise time on the pressure and stress distribution on the cells, fluid and structural interaction model are analyzed. The result shows that shorter rise time makes high stress level distribution on the cell membrane.