Group name	**Bio-Mechanics and Bio-Medical Engineering group**
Staff (e-mail)	Professor Tadashi KOSAWADA(kosawada@) Technical staff Ken-ichi SUZUKI(suzu-ken@) (Please add “yz.yamagata-u.ac.jp” following the font of @)
Group Homepage	http://kosawada_lab.yz.yamagata-u.ac.jp/
Main Subjects	1. 3-D sensing and actuating devices for living cells and tissues 2. Effect of dynamic stimulations on cellular physiology 3. Mechanics and simulations of vesicular transport in cells

Content

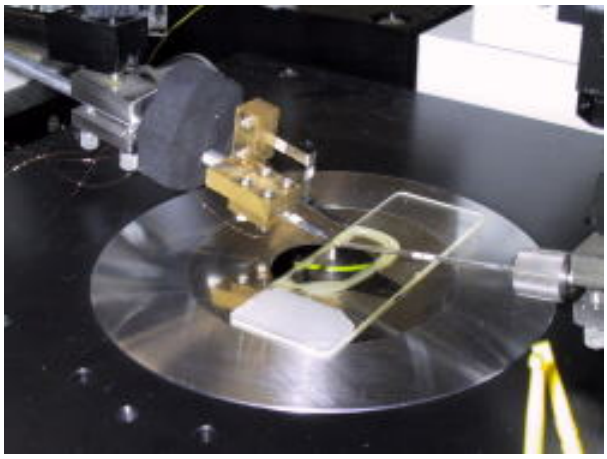

Fig.1 3-D actuator-sensor complex system for the living cells

Our group has developed micro 3-D vibration devices. A 3-D actuator -sensor complex system (Fig. 1), which enables us to have stimulation and detection for the living cells. We try to accelerate the recovery progress of the locally damaged cells by using the developed actuator-sensor complex system. Also a developed 3-D vibration stage is extended to control device for cell culture. This device is useful as an effective means of investigation not only in load response of cultured cell but also initiation of cellular functions.

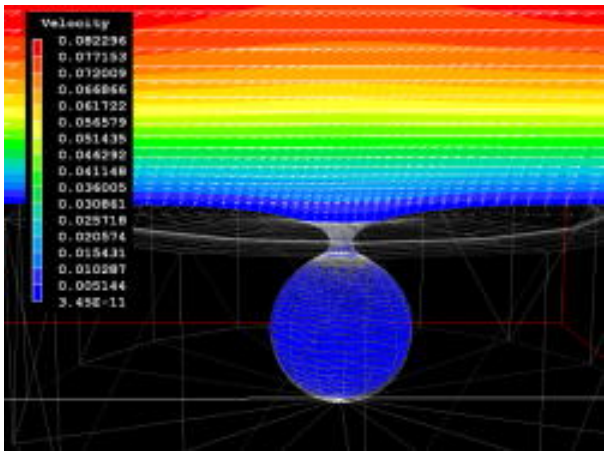

Fig.2 3-D fluid flow field in and around caveolae of endothelial cell

Also our group has studied the mechanics and simulations of vesicular transport, which is considered as crucial function in living cells. We have computed with a 3-D numerical analysis the fluid flow field as well as diffusion field in and around caveolae(Fig. 2). Shapes of the caveolae was determined by solution of the membrane equilibrium for a spherical inner and flat outer membrane domain based on minimization of bending and in-plane shear strain energy.