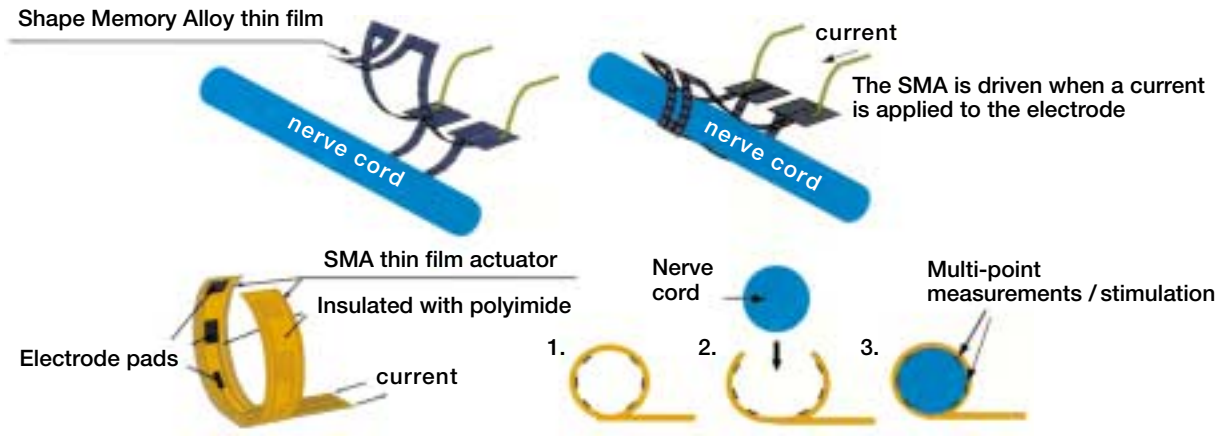
## Study on Cuff Microelectrodes using MEMS Technology

**Shoji Takeuchi**, Lecturer, Institute of Industrial Science, the University of Tokyo

This study focuses on microelectrodes designed to measure biological data. Electrodes built with MEMS technology can monitor spatial and regional activity through multiple channels better than conventional needle electrodes and glass tube microelectrodes. Accordingly, these electrodes are in extremely high demand in the field of biomedicine, where their industrialization is greatly anticipated. In this study, we investigate cuff microelectrodes using shape memory alloy (SMA) thin film microactuators with the aim of developing minimally invasive microelectrodes for taking measurements of living organisms.

Design and Fabrication of a cuff microelectrode formed of a shape memory alloy actuator designed to clip a nerve cord




The electrodes are made implantable by insulating them with polyimide

## Study on Heart-Emulating Microactuators Using Self-Oscillating Gel

**Ryo Yoshida**, Associate Professor, School of Engineering, the University of Tokyo

A novel self-oscillating gel was developed with the capacity to oscillate autonomously in a spontaneous rhythm, like the heartbeat. A molecular design that functions to convert chemical energy into mechanical energy is achieved by inducing a cyclic BZ reaction in the gel, as in a metabolic response, causing the gel to periodically swelling and deswelling. In order to develop new micromachines capable of imitating biological functions, such as self-beating/peristaltic motion actuators, we are establishing a technology for developing micro-size gel and conducting a behavioral analysis in a microenvironment. We are also conducting basic studies for constructing a material system.