



Medical and Biotech
Developments, Inc.

Actuator System for MicroNeedles



For most applications, the microneedle chip will be used in conjunction with an actuator to provide optimum advancement rate and applied force. Use of the actuator also insures that the microneedle does not experience lateral shear that would compromise its integrity. Because the microneedle chip has a variety of uses there is no one-size-fits-all actuator. The acuator could be a rather simple lancet device for sampling or could have a mechanism to deliver a precise amount of a material. Alternatively, it could be integrated into a sophisticated hand held instrument able to obtain a sample, perform an assay, and display results.

Several types of laboratory prototype actuator systems have been designed and used internally for microchip development. These are not currently available for purchase. As an example, the photograph above shows a prototype actuator-meter instrument. This instrument contains both an electromechanical mechanism for precise blood sampling and a programmable electrochemical analysis system for the detection of a particular blood analyte. Disposable microneedle chips containing miniature biosensors are used with the instrument. To reiterate, the advantage is painless sampling and direct assay without blood transfer, as is required by existing lancet test strip systems.