

Automatic BioMEMS Smart Drug Delivery System

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Abstract: Medicine injection for disease treatment is generally operated by medical professionals such as nurses or doctors. This brings inconvenience for the patients and increases the cost of medical care. Many senior patients with chronic diseases may need to inject multiple medicines everyday. Remembering to deliver the right medicine on the right time is not easy. Some medicine (such as insulin for diabetic patients) needs to be delivered with precise dosage control according to the patient's real-time need. All these made the medicine delivery a complicated and challenging task. In this research, a smart drug delivery system which can automatically inject the medicines according to prescribed dosage and scheduling without human interference is proposed. It consists of a micropump, micro drug reservoirs and microneedle array integrated with a smart control circuitry. It can deliver multiple medicines with precise dosage control according to the pre-programmed sequence. The proposed smart drug delivery system leads to improved efficiency and it is expected to bring revolutionary change to the current medicine delivery process.

Keywords: Bio-MEMS (Bio-Microelectromechanical Systems), Smart drug delivery system (SDDS), Micropump, Microneedle, Microfluid.

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