



Touch Actuated Micropump for Transdermal Drug Delivery

Published date: May 30, 2013

Technology description



Background

Transdermal delivery of medications and other compounds has been aggressively pursued for many decades. Although patches have been used to deliver small hydrophobic molecules such as nicotine and nitroglycerin, an external pressure source in conjunction with a direct subcutaneous access port are required to deliver the majority of therapeutically important drugs through the skin. Microfluidics has played an important role in this area by providing microneedle arrays and miniature pumps. Although microneedle arrays made of silicon, polymers, and metals have reached a high degree of maturity in the past decade, their application has been limited due to the lack of a suitable micropump with adequate flow rate and back pressure.

Technology Summary

Purdue University researchers have developed a new type of pump for drug-delivery patches that would use arrays of microneedles to deliver a wider range of medications possible than with conventional patches. The pump contains a liquid that boils at body temperature so that the heat from a finger's touch causes it to rapidly turn into a vapor, exerting enough pressure to dispense the drug through the microneedles. This technology's low-cost and battery-less operation make it the ideal single-use disposable transdermal drug dispenser.

Application area

Medical Devices
Medicine/Healthcare
Pharmaceuticals
Drug Development

Advantages

Battery-less operation
Low-cost and disposable

Institution

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