

Frugal Microfluidic Device for Drug Screening and Testing

Problem Statement: Drug screening is performed to select the most effective molecule from the bucket of a few potential candidates. The effectiveness of a potential drug is estimated by treating target cells with various concentrations created manually in multi-well plates. This method is prone to human error and demands significant time and energy. Furthermore, the complexity increases enormously if combinations of drugs are to be tested. Although various flow-based microfluidic assays have been proposed to create concentration gradients, they are cumbersome and difficult to use. Hence, a simple, user-friendly yet inexpensive system is needed for easy in vitro testing of potential drug molecules.

Uniqueness of the Solution: The proposed device is a static (without flow) gradient generator that can be fitted in a single well of a six-well plate. Tens of combinations of multiple drugs can be tested in a single device, making the process fast, inexpensive and user-

friendly. The device does not need any external accessories such as pumps and tubing; it is portable and can be used “off the shelf”. Various post-treatment studies, such as immunofluorescence assays, are possible in this device. Also, as a continuous flow of media is not needed, it saves the cost of expensive reagents and precious patient samples.

Current Status of Technology: The device is ready and tested for at least two different drugs on two different cell types.

Societal Impact: The proposed device will bring down the time and cost involved in drug testing. The device is inexpensive, ready-to-use and portable, thereby making it transport friendly to remote areas. As it does not involve any other accessories or expertise, it will help low-budget research labs and pathology-clinics to screen drugs faster and efficiently.

Patent(s): Filed

Relevant Industries: Pharma, Medical Devices.

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