Lab-on-a-chip microfluidics in drug discovery pdf

Micro and nanoscale technologies in the delivery of oral drugs. Ahadian S, Finbloom JA, Mofidfar M, Diltemiz SE, Nasrolla F, Davudi E, Hosseini V, Mylonaki I, Sangabathuni S, Montazerian H, Fetah K, Nasiri R, Dokmeci MR, Stevens MM, Desai TA, Khademhosseini A. A. Ahadian S. Adv Drug Deliv Rev. 2020 July 22:S0169-409X (20)30096-X. doi: 10.1016/j.addr.2020.07.012. Online before printing. Adv drug Deliv Rev. 2020. PMID: 32707147 Free PMC article. Reviews. Authorial affiliation - Relevant authors of the European Laboratory of Molecular Biology (EMBL), Division of Genome Biology, Meyerhofstrasse 1, Heidelberg, Germany Email: merten@embl.de Droplet-based microfluids allows analyses to be conducted at a very high bandwidth (up to a thousand samples per second) and allows researchers to work with very limited material such as primary cells, patient biopsies or expensive reagents. An additional force of technology is the ability to perform large-scale genotypic or phenotypic screens at the same cell level. Here we will critically examine the latest developments in antibody screening, drug detection and highly multiplex genomic applications such as targeted genetic workflows, single-celled RNAseq and single-celled ChIPseq. Starting with a comprehensive implementation for non-experts, we identify current limitations, analyze how they can be overcome, and give an insight into exciting future applications. This article is open access Please wait until we download your content ... Something went wrong. Try again? 1. Keseru GM and Makara GM Effect strategy of opening lead on the properties of drug candidates. Nature Rev. Drug Discov 8, 203-212 (2009). (PubMed) (Google Fellow) 2. Manz A, Graber N and Widmer HM Miniaturized Systems of General Chemical Analysis: A New Chemical Sensing Concept. Senators B Chem 1, 244-248 (1990). (Google Fellow) 3. 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D Thermocapillaria-actuated drops of generation19. E. Generation drops with distinct compositions using mechanical valves (where 'aqu.' means aqueous solution)25. F -1 Schematic illustration of the screening of cell drugs based on drops 46. The two nozzles encapsulate the cells and fluorescent dyes. The fork allows intercygation of the streams, causing the cells containing the droplets to alternate with dye droplets. FB Fusion Module provides a variable electric current that allows electrically controlled fusion droplets. The dyes are then carefully mixed with the cells in the passive micromixer. Fd Delay Line optimizes cell staining, allowing incubation drops on the chip. The Fe Detection Module limits the side and vertical drop to collect laser-excited fluorescent signals. Image A is reproduced with the permission of the REF. © 11, 2003, at the American Institute of Physics. 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