2ND INTERNATIONAL MICROFLUIDICS CONGRESS

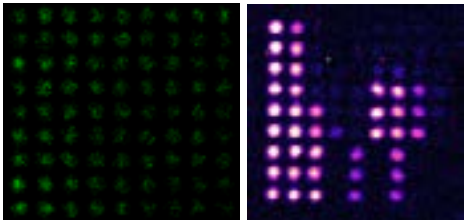
May 23-24, 2019 | Las Vegas, USA

Ching Te Kuo

National Taiwan University, Taiwan

Streamlined drug synergy evaluations via bioinspired nanodroplet processing platform for optimal cancer treatment

Synergistic combination of two or more drugs has been a major avenue targeting cancers. This regimen not only improves the therapeutic efficacy by triggering synthetic lethality in target cells but also minimizes the side effects by reducing drug doses. Therefore, the identification of optimal combination of various possible concentrations from a set of drugs presents a substantial challenge. Several approaches to optimize the selection regime have been demonstrated by various approaches; however, challenges still remain. For example, the time adopted for cell/drug preparation among the total independent screenings would last for days. In addition, the usage of standard multi-well plate assays would counter the feasibility for personalized medicine, which is inherently subject to a limited cell count from patient tumors. To address the technology gap described above, we herein present a bioinspired nanodroplet processing (BioNDP) platform for facilitating the high-throughput screening of optimal drug combinations. The platform was fabricated by a novel wax-imprinted laser direct writing, which is inspired from Stenocara gracilipes beetle's bumpy back surfaces. Leveraging on advantages of utilizing customized liquid dispensing, cell counts, and drugs adopted can be retained down to 50 cells and 200 nl for each test, respectively. We demonstrated an approximate 500-fold miniaturization of drug volumes does not impact both the *in vitro* and in vivo outcomes. In addition, such platform could present in vivo predictions more accurate than standard drug screening assays. Taken together, our results highlight the BioNDP platform could serve a cost-effective and high-throughput toolkit for improving pre-clinical drug screenings.



Biography

Ching Te Kuo received the PhD degree in Institute of Applied Mechanics from National Taiwan University, Taipei, Taiwan, in 2013. In 2013-2018, his Postdoctoral Studies, from National Taiwan University to UT Southwestern Medical Center, focused on the development of *in vitro* mimicking of tumor microenvironments as well as high-throughput drug screenings by microfluidics. Currently, he is a Post-doctoral Researcher at National Taiwan University. His research interests include microfluidics, system control engineering, bioinspired material, tumor microenvironment and metastasis.

andyjfykuo@gmail.com