Danilo A. Tagle, J Mol Parm Org Process Res 2022, Volume 10

Microphysiological systems: Tissue chips for drug screening program for •ƒˆ‡–›á ‡ˆÐ‹…ƒ…›ƒ•† ’”‡…‹•‹•• •‡†‹…‹•‡

Danilo A. Tagle
E Ÿ}v o vš Œ (}Œ À v]vP dŒ v•o Ÿ}v o ^] v •U h^

Approximately 90% of drugs fail in human clinical trials due to adverse reactions and/or due to lack of e cacy. ese failures can be attributed to poor predictability of human response from animal studies and 2D in vitro models being used preclinical drug development. To address these challenges, the Tissue Chips Microphysiological Systems for Drug Screening program supports the development of alternative approache for more predictive readouts of toxicity and e cacy of candidate drugs. Tissue chips are bioengineered 3D micro uidic chips with human-derived cells and tissues thaon previous preclinical data but was withdrawn d 200 patient deaths and 10 liver transplants) outperforming liver spheroids which showed a sensitivity of onl 47%. In addition to toxicity studies in drug development, tissue chips are also being used to model various huma diseases and conditions when animal models do not mirror the pathology or are unavailable. Tissue chips w used to model chronic in ammatory demyelinating polyneuropathy and multifocal motor neuropathy, a pair of rare, devastating neuromuscular diseases, which led to the identi cation of a repurposed drug and approval b the FDA for phase 2 clinical trial. A more recent application of tissue chips is on its use as “clinical trials on chips to inform clinical trial design and implementation. is new initiative will help establish patient recruitment criteria, stratify patients to determine who the best responders to speci c therapies are, include populatio diversity and identify clinically relevant biomarkers. Presentation will also include an overview over the decad of support from NIH, partnerships with various stakeholders including the FDA and pharmaceutical industry.

Biography

'DQLOR 7DJOH LV FXUUHQWO\ 'LUHFWRU 2ˆFH RI 6SHFLDO ,QLWLDWLYHV DW WKH 1DWLRQDO Institutes of Health (NIH). He obtained his PhD in molecular biology and genetics from Wayne State University School of Medicine in 1990. He was DQ 1,+ 1DWLRQDO 5HVHDUFK 6HUYLFH $ZDUG SRVWGRFWRUDO IHOORZ LQ KXPDQ JHQHWLFV publications and has garnered numerous awards, including more recently the Roscoe O. Brady Award for Innovation and Accomplishment; the Henry J. Heimlich Award for Innovative Medicine and the HHS Secretary's Award for Distinguished Service: Rapid Acceleration of Diagnostics (RADx) Initiative.

Received W ^ ‰ š u ŒAcôéptedìWi V^ ‰ š u ŒPûblishêd Nov ember 21, 2022