TESTING DRUG TOXICITY AND CURING DISEASE USING THREE-DIMENSIONAL CELL CLUSTERS

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For decades, tests to understand how the body works, and how it responds to drugs have been conducted with a single layer of cells attached to a plastic petri dish. In other words, the testing system critical to discovering cures operates in a 2D environment. Therein lies the problem. We live in a 3D world, and our bodies are made up of cells attached to each other in a moving 3D structure. 2D testing isn't a true predictor of how cells react to drugs, but it's used because it has been the available option.

Scientists recently found a way to study the basic physiology of the body in small 3D structures. Like the body, 3D structures are difficult to work with and can be extremely complicated. However, Likarda developed a new method of allowing cells to find each other for attachment – our proprietary 3D cluster technology.

Miniaturized organ-like cell clusters are not a new science concept. However, Likarda's patented microplates can produce and test more than 200,000 cell clusters in the same amount of space that others use to create a maximum of 384 clusters.

By placing cells in close contact with each other so they can find each other and giving them the space to do what they naturally do, Likarda's microplates enhance the formation of miniature 3D structures that can be used for drug testing, developing cell-based transplantations and regenerative medicine. This technology spans both human and animal platforms, and is truly scalable with vast applicability. In fact, Likarda scientists have already published scientific papers (A simple, reliable method for high-throughput screening for diabetes drugs using 3D β-cell spheroids and Assessment of re-aggregated human pancreatic islets for secondary drug screening) in this area illustrating how this micromold improves drug testing to find new drugs to treat diabetes. Also, Likarda scientists used the micromold to test the effects of a client's compound on prostate cancer (Arum Palaestinum with isovanillin, linolenic acid and β-sitosterol inhibits prostate cancer spheroids and reduces the growth rate of prostate tumors in mice).

Currently, the Likarda team is involved with additional studies to verify whether or not these 3D cell clusters can be used to determine if a new chemical is toxic to humans. Toxicity is one of the main reasons that a promising compound fails as a new drug. For example, a drug may have positive results improving insulin secretion for diabetes, but could simultaneously cause toxic effects on other body organs.

Likarda has a number of new assays, such as testing in 3D, they've developed and are in the process of validating; all with the goal of finding effective drugs earlier in the discovery process so these life-saving treatments can be brought to market faster, more affordably and successfully.

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