

# Gravity-defying drug discovery

Tecan and InSphero have developed a novel solution for analyzing 3D cell cultures based on the Infinite® M200 PRO and InSphero's 3D InSight™ microtissue technology. This solution is designed to facilitate the use of 3D cell culture formats in drug screening applications, helping to reduce the cost of early phase drug development.

“Tecan has been very proactive in helping us to fine-tune the instrument set-up for our applications.”

InSphero AG – based in Schlieren, close to Zurich in Switzerland – is a leading supplier of organotypic microtissues for biomimetic drug testing. The Company's scaffold-free three-dimensional (3D) cell culturing technology, 3D InSight, allows the rapid, reliable formation of multicellular spheroid cultures in a 96-well format, providing automation-friendly cell cultures that mimic the *in vivo* environment. Dr Jens M Kelm, Co-founder and Chief Scientific Officer of InSphero, explained: “There is great demand within the pharmaceutical industry for new cell-based assays which can provide a more effective

way of identifying candidate compounds or biological agents for the development of new drugs. Classical 2D cell culture techniques are still widely used throughout the industry, but their limitations are becoming increasingly apparent. The efficacy of a candidate drug depends on a number of factors, including the physical and chemical environments *in vivo*, drug penetration and clearance rates. 2D cell cultures do not accurately reflect how all of these factors will affect drug behavior *in vivo*. This has led to an increasing number of costly failures of candidate drugs in the latter stages of the development process, creating a real need for alternative strategies.”



InSphero co-founders (left to right): Dr Jan Lichtenberg, Dr Wolfgang Moritz and Dr Jens M Kelm

“3D cell culturing techniques offer greater biological relevance for drug screening, but the application of these technologies has traditionally been limited by the low throughput associated with most methods. InSphero was established in order to commercialize our hanging drop culturing technology, allowing reliable, high throughput production of microtissues. One of our principle aims was to create an assay format that would allow these 3D cultures to be shipped, assay-ready, for use by the pharmaceutical industry in compound screening applications. This required the development of a system to allow the harvesting of cultures into a plate that conformed to ANSI/SLAS microplate standards, permitting the use of automated liquid handling systems and standard format microplate readers.”

“The GravityTRAP™ plate has been designed to allow simple harvesting of hanging drop cultures with a single media addition step. Each conical well is covered in a specially

developed non-adhesive coating to maintain the 3D structure of the microtissues over a period of weeks in culture. Crucially, the base of each well has a clear, flat bottom to ensure that the plate has proper optical characteristics, simplifying analysis. We were already using an Infinite M200 PRO multimode reader in our research and development, and this reader is ideally suited to the needs of the GravityTRAP plate. The system's bottom reading optics are a good match for the conical well design of the plate, allowing the entire well to be scanned at once, without the need for multiple acquisitions at different points across each well. The instrument's multiple reading modes also provide a lot of flexibility in terms of the assay reporter mechanisms which can be employed."

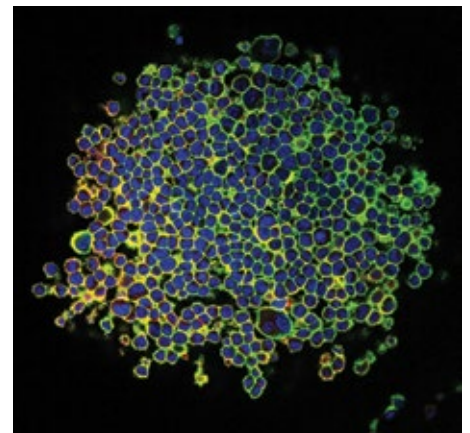
"We have already demonstrated the suitability of this set-up for a wide range of different assay types – including Promega's NanoLuc® Luciferase Technology – and have also developed several multiplexed assays using transgenic cell lines with either fluorescence- or luminescence-based reporter mechanisms. Since we first spoke to Tecan about optimizing this system on the Infinite reader, the Company's application specialists have been very proactive in helping us to fine-tune the instrument set-up for our applications; they have been very enthusiastic about the project, and we have worked closely together to create a system that can be used effectively in routine drug discovery. As a result, 12 of the top 15 global pharmaceutical and cosmetics companies are now using our 3D microtissue technology, and many of these companies are also using Tecan readers."

To find out more on Tecan's Infinite 200 PRO multimode readers, visit

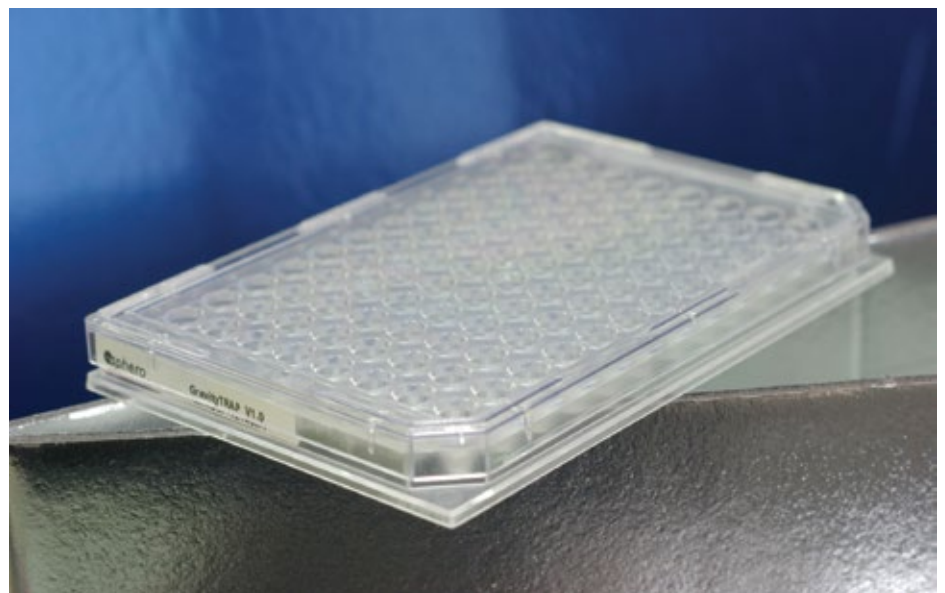
[www.tecan.com/infinite200pro](http://www.tecan.com/infinite200pro)

To find out more about InSphero, visit

[www.insphero.com](http://www.insphero.com)



InSphero's 3D InSight microtissues more closely mimic the *in vivo* environment than traditional 2D culture formats



The GravityTRAP plate allows hanging drop cultures to be quickly and conveniently harvested into an automation-friendly format