

# High speed immunodiagnosics with multicolor imaging

**High throughput imaging of cells is a key part of immunological research, allowing the visualization of the mechanisms of action and *in vivo* effects of infectious viruses to aid the development of effective antiviral treatments and vaccines. Chinese biotechnology company FantasiaBio is using automated multicolor imaging to accelerate its development of innovative technologies for immunodiagnosics and vaccine development.**

FantasiaBio, based in the Jinhua region of China's Zhejiang province, understands the power of imaging live cells, and has created a range of fluorescence-based tools to exploit the power of multiplexed live cell imaging for clinical research and development. In 2020, the company developed an innovative *in vitro* assay to quantify

neutralizing antibodies against SARS-CoV-2, allowing researchers to evaluate an individual's level of protection after administration of a COVID-19 vaccine. Qin Xiao-Feng, Co-founder and Chief Scientific Officer at FantasiaBio, explained: "The kit uses a vesicular stomatitis virus (VSV) as a pseudotype vector with a green fluorescent protein

(GFP) payload. If the COVID-19 vaccine stimulates effective production of neutralizing antibodies, the VSV pseudovirus is unable to infect human target cells, so the GFP gene is not expressed in these cells. The expression of GFP can normally be seen using a fluorescence microscope, and the number of green 'dots' is inversely



The FantasiaBio team is reaping the benefits of introducing the Spark Cyto into the laboratory

proportional to the antibody activity. However, imaging in this way requires researchers to be sitting in front of a microscope for long periods of time to manually assess samples, which is time consuming, laborious and leads to inter-operator variability in results. We therefore needed a way to streamline and accelerate whole-well imaging for multiwell plates.”

Qin continued: “We are a technology-driven company, and routinely perform two-, three- or even four-color multiplex studies for up to 100 microplates a day, so automation is essential. Automated microscopes have come a long way over the last few years, but these high resolution systems have limited throughput, so we needed a better balance between speed and resolution. When Tecan introduced the Spark® Cyto in the China market, we immediately recognized that it was exactly what we were looking for. We did a quick proof-of-concept study to perform high throughput testing of our neutralizing antibodies assay, and found it to be a good fit for our needs, so we purchased a system in October 2020.”

“The main feature of the Spark Cyto that was attractive to us was its combination of wide field imaging and high imaging speed. We use the low magnification lens – 2x or 4x – which we have found to be sufficient to obtain

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quality images and accurate single cell counts. Thanks to the Spark Cyto, we now have the capacity to rapidly image an entire 96-well plate, with just one single frame to cover the entirety of each well, avoiding the need to stitch together multiple frames for analysis.”

“The system is also proving invaluable for screening and evaluating COVID-19 vaccine candidates. Our aim is to develop a new generation of vaccines that prompt a stronger and longer-lasting immune response – mucosal as well as T cell activation – that will lead to the prevention of infection, instead of helping to reduce the symptoms or mortality. This means that we do a lot of routine work, such as viral titer assays and precisely measuring antibody titers ( $ID_{50}$ ) in samples collected from various anatomical locations, which is well suited to an automated instrument such as the Spark Cyto.”

“The Tecan team has been very helpful, from when we started looking at new imaging instruments to being quick in providing technical support and addressing our specific challenges since purchasing the Spark Cyto. Our local engineer is very helpful, and quickly helps us resolve most issues by phone, or sometimes they just come from Shanghai to rescue us! This local support is very important, and we’re very glad to have it.”

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**To find out more about Tecan’s Spark Cyto, go to**

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

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