

# The cutting edge of assay development

Tecan has partnered with Sword Diagnostics, a leader in detection chemistries, to optimize the sensitivity of immunoassays using the patented Sword™ Detection System on the flexible Infinite® M200 and Infinite M1000 microplate readers.



Sword Diagnostics, based in Chicago, Illinois, was founded in 2005 to commercially develop United States Navy technology originally intended for biological weapon detection. Sword has become a leading authority in making diagnostic tests more sensitive, and its Sword Detection System provides outstanding sensitivity for scientists studying and quantifying low-abundance biomarkers in ever-decreasing sample volumes.

Mitch Gaver, Director of Business Development and Marketing at Sword, explained: "The Sword technology is based on Raman spectroscopy; the patented Sword Peroxidase Reagent has a very low Raman signal until it is oxidized by horseradish peroxidase, when it gives a high signal. The stronger signal of this technology offers greater sensitivity compared with traditional colorimetric or chemiluminescent assays, so our customers get better performance from their assays in terms of sensitivity, precision and accuracy, particularly at very low target concentrations. Alternatively, it allows

the customer to reduce their sample sizes, permitting more tests for the same amount of sample. However good their existing assay is, a vast majority of researchers want more sensitivity, and our customers have been very excited about the enhanced sensitivity this technology brings."

Dr Neal Siegel, Chief Scientist at Sword, added: "Our chemistry focuses on improving signal detection; by directly substituting a given assay's existing detection chemistry, we get improved performance without the need to make any substantial changes to other aspects of the assay. Substrates such as tetramethylbenzidine (TMB) have fundamental limitations to their detection, and we are able to overcome these. In addition, by working with our customers and with Tecan's experts in detection hardware to optimize the assay, we have been able to further improve the detection limits for our reagents, something that cannot be readily achieved with TMB\*. This will not be surprising to assay development scientists; when any new



detection system is introduced into an existing assay, further adaptation or optimization of the assay to the new detection system is often beneficial.”

“Tecan is an excellent choice as instrument provider for this technology,” explained Dr Charlie Ginsburgh, Senior Scientist at Sword. “In the early stages of our product development, we thought we would need an instrument that would specifically detect Raman scattering. This would not be ideal in many respects, not least because potential customers would need to buy a new instrument just to take advantage of the chemistry. As we reviewed different instrument options, we discovered that Tecan’s Infinite series readers have outstanding optics for fluorescence detection, and are easily able to detect the Raman signal. By partnering with Tecan, we are able to offer a new substrate technology that will improve assay performance, using kits and instruments our customers already have in the laboratory. Our chemistry is manufactured in an ISO certified facility, and works very well on Tecan’s Quad4 Monochromators™-based Infinite M200 and M1000 plate readers, with no special modifications required.”

Mitch concluded: “The new technology was received with great interest by visitors to LabAutomation in January. Many assays are based on horseradish peroxidase detection, and so we have initially concentrated on this substrate, however we are already looking

at other types of molecules and substrates, and eventually hope to apply this technology to direct labels. In addition, although the Sword Detection System is currently authorized for research use only, our goal is to also incorporate the technology into diagnostic tests.”

To find out more on Tecan’s Infinite series, visit [www.tecan.com/detection](http://www.tecan.com/detection)

To learn more about Sword Diagnostics, go to [www.sworddiagnostics.com](http://www.sworddiagnostics.com)

\*Technical notes describing Sword Diagnostics technology in use with Tecan’s Infinite M200 and Infinite M1000 multimode readers are available at [www.tecan.com/infinitem1000literature](http://www.tecan.com/infinitem1000literature) and [www.tecan.com/infinite200proliterate](http://www.tecan.com/infinite200proliterate)



Sword Detection System enhances immunoassay sensitivity