

Enhancing clinical diagnostics

Turkish company Zivak Technologies develops analytical kits and instrumentation for use in the food, healthcare and environmental sectors, and relies on Tecan's Cavro® Omni Robot for its automated HPLC and LC-MSMS systems.

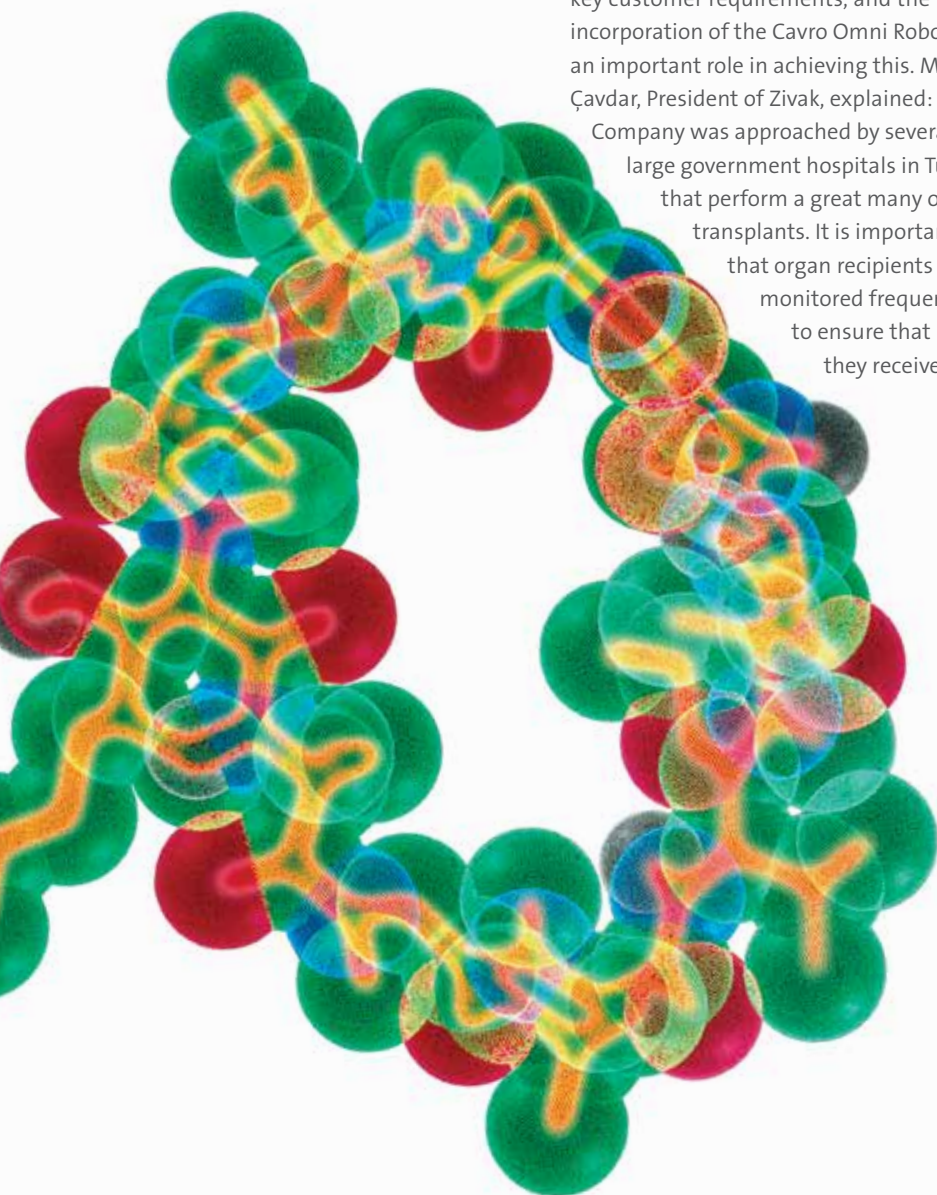


Zivak Technologies, based in Istanbul, Turkey, was established with the principal aim of developing and manufacturing assay kits targeted at commonly measured analytes in the clinical diagnostics, food, environmental and forensic arenas, as well as the production of HPLC and LC-MSMS instrumentation for assay automation. Analytical precision and ease of use are key customer requirements, and the incorporation of the Cavro Omni Robot plays an important role in achieving this. Mr Avni Çavdar, President of Zivak, explained: "Our Company was approached by several large government hospitals in Turkey that perform a great many organ transplants. It is important that organ recipients are monitored frequently to ensure that they receive the

appropriate dose of immunosuppressant drugs; patients may wait years before a donor is found, and it is vital to administer the correct dose to minimize the chance of an organ being rejected. Obtaining rapid, accurate results is crucial, and the hospitals needed an automated mass spectrometry-based method for monitoring immunosuppressants. When the level of immunosuppressant in a patient's blood is monitored by immunoassay, it may be two or three hours before the result is available. The consequence of this is that any medication prescribed is based on the level of immunosuppressant present several hours previously, and this may have changed. If the assay also has a high error, this has a huge impact on the medication prescribed and, potentially, on the success of the transplant."

Mr Çavdar continued: "Historically, HPLC and LC-MS have not been used in clinical diagnostics, and there are a number of reasons for this: it must be possible to run the instrument 24 hours a day; a great deal of sample preparation is necessary; and the interpretation of the results, particularly for LC-MSMS, requires highly trained scientific staff. In 2005, when the pharma industry was specifying a results bias of $\pm 0.1\%$, the clinical diagnostics field was working to a bias of ± 25 to 30% , and we foresaw a future for the gold standard techniques of HPLC and LC-MS. In addition to validated assay kits and reagents, we decided to develop and manufacture automated LC and LC-MSMS analyzers for the clinical diagnostics market."

"Hospitals need straightforward clinical analyzers that simply require the samples – blood, plasma, serum or urine – to be loaded, and then automatically carry out all the preparation and analysis, generating





Kübra Balyemez shows how the Cavro Omni Robot has been incorporated into Zivak's 25-OH Vitamin D₂-D₃ HPLC Analyzer

results in a user-friendly format that confirms whether a patient sample is positive or negative, and that control samples are within limits. To enable the sample preparation stages to be performed, we needed to integrate a precise and reliable liquid handling system – the Cavro Omni Robot. Combining the Cavro Omni Robot with our technologies – including PC-controlled vortexers and centrifuges, online SPE and shaker/heater units, as well as in-house developed software – has enabled us to produce a series of fully automated HPLC and LC-MS/MS based analyzers that can measure 25-OH metabolites of vitamin D₂ and vitamin D₃, immunosuppressants, amino acids and organic acids in minutes, rather than the hours that may be required for other assay types. The Cavro Omni Robot is very versatile, offering flexible sample handling for up to 180 samples per run, and can accommodate a range of different sample formats, from vacutubes and vials to microplates, as well as allowing us to integrate a variety of

modules. Reliability and accuracy are crucial. Thousands of analyses were performed prior to going to market to ensure the robustness and accuracy of the analyzers, and we have demonstrated errors as low as 1 %.

“The Tecan staff are very honest and open, which is important because it is the people that show you what a company and its management are like.”

“When you plan to develop a lot of things, you recognize that you will be spending large sums of money, and you have to know that you are working with a company that you can trust. The Tecan staff are very honest and open, which is important because it is the people that show you what a company and its management are

like. This gave us the confidence to build a relationship with Tecan, and to adopt the Cavro Omni Robot for our automated systems,” concluded Mr Çavdar.

To find out more about Tecan's Cavro Omni Robot, visit www.tecan.com/omnirobot

To learn more about Zivak Technologies, visit www.zivak.com